File: 292-30/HTH-2025-51751

December 9, 2025

Sent via email: kristen@secondstreet.org

[redacted]

Dear Kristen Schulz:

Re: Request for Access to Records
***Freedom of Information and Protection of Privacy Act* (FOIPPA)**

I am writing further to your request received by the Ministry of Health. Your request is for:

Documentation on the protocol for patients requiring potentially lifesaving heart surgery. Specifically, documentation that indicates patients must be informed at the time they decide to proceed with surgery or when it is presented as an option of the expected wait time for surgery and the maximum recommended wait time for surgery. (Date Range for Record Search: From 1/1/2022 To 8/10/2025)

These records are provided to you in their entirety.

Your file is now closed.

These records will be published on the BC Government's Open Information website a minimum of ten business days after release. To find out more about Open Information, please access the Open Information website at: www.gov.bc.ca/openinformation

The records located in response to your request will be delivered through the BC Secure File Transfer Service. Separate emails will follow from the BC SFT Notification Service directing you how to set up an account and where to obtain your records. A guide for using the SFTS is available by clicking here.

If you have any questions regarding your request, please contact Edmond Chung, the analyst assigned to your request, at 236 478-1386. This number can also be reached toll-free at 1 833 283-8200. Please provide the FOI request number, HTH-2025-51751, in any communications.

.../2

You have the right to ask the Information and Privacy Commissioner to review this decision. I have enclosed information on the review and complaint process.

Sincerely,

Edmond C

Edmond Chung, FOI Analyst
Information Access Operations

Enclosures

How to Request a Review with the Office of the Information and Privacy Commissioner

If you have any questions regarding your request, please contact the analyst assigned to your file. The analyst's name and telephone number are listed in the attached letter.

Pursuant to section 52 of the *Freedom of Information and Protection of Privacy Act* (FOIPPA), you may ask the Office of the Information and Privacy Commissioner to review any decision, act, or failure to act regarding your request under FOIPPA.

Please note that you have 30 business days to file your review with the Office of the Information and Privacy Commissioner. In order to request a review please write to:

Information and Privacy Commissioner
PO Box 9038 Stn Prov Govt
4th Floor, 947 Fort Street
Victoria, BC V8W 9A4
Telephone: (250) 387-5629
Fax: (250) 387-1696

If you request a review, please provide the Commissioner's Office with:

1. A copy of your original request;
2. A copy of our response; and
3. The reasons or grounds upon which you are requesting the review.

BRITISH COLUMBIA

Request # HTH-2025-51751

SUMMARY OF ALL REDACTIONS

pg(s). 1 - 84	Disclosed in full

Partial Disclosure = Some information on a page is released; Full disclosure = all information on a page is released and Withheld in full = no information on a page is released.

Should you seek any additional clarifications on the Freedom of Information redaction process and details regarding sections they can be found here: https://www2.gov.bc.ca/gov/content/governments/services-for-government/policies-procedures/foippa-manual

Ministry of Citizens' Services
Information Access Operations

Mailing Address:
PO Box 9569 Stn Prov Govt
Victoria BC V8W 9K1

Email: FOI.Requests@gov.bc.ca
Website: http://www.gov.bc.ca/freedomofinformation/

Phone: 250-387-1321
Toll Free: 833-283-8200
(ask for Information Access Operations)
Fax: 250-387-9843

REFERRAL AND WAITLIST MANAGEMENT FOR CARDIAC SURGERY AND PROCEDURAL SERVICES
Policy

PURPOSE

The objectives of this policy are to:

1. Improve management of procedural waitlists and ensure consistency in practice.
2. Improve the collection and entry of relevant referral, assessment and waitlist data.
3. Optimize access to cardiac procedural services for patients in British Columbia.
4. Ensure accurate waitlist and wait time data.

BACKGROUND AND SCOPE

Cardiac Services BC (CSBC) provides funding in support of cardiac procedures in BC, and additionally for cardiac program triage coordination and data entry teams. The coordinators and data entry staff have responsibility for maintaining an accurate patient status in the provincial cardiac registry CVI.Source (CVIS). Since the registry contains personal health information, access to and management of patient level data is the responsibility of designated/approved CVIS users with the requisite training. Waitlists should be managed by designated cardiac program triage team members and in cooperation with the health authority waitlist staff.

Cardiac data is collected from the time a patient referral is received by the triage office for a procedure, while the patient is assessed, waitlisted, until the patient is removed from the waitlist, and required follow-up data is completed. The collection and maintenance of timely and accurate data enables waitlist analysis and proactive patient triage that optimizes access to care. Cardiac data requires prospective data entry to allow accurate wait time calculation and/or case prioritization to occur.

This policy provides requirements and standards as to the expected management of waitlists for Cardiac Services in British Columbia. Since workflows may differ at the hospital level, this policy provides the standard that must be achieved in BC.

POLICY

Referral for a Cardiac Procedure

Receiving and Entering Referrals

1. **Complete referrals** are received and entered into CVIS by the triage office.

2. Referrals are a request for service and therefore multiple referrals are not permitted. For patients who require more than one intervention within an **Episode of Service**, only one referral should be entered.
3. The **triage team** enters referrals into CVIS ideally within 48 hours and to a maximum of 5 days (as per current practice) of referral receipt (at triage office). If a referral is received outside of business hours, it will be entered as soon as possible.
4. Incomplete referrals will be sent back to the referring **provider**'s office: sending and receiving teams will work together to smooth workflow.
5. Referral is reviewed by the most responsible provider and/or care team within 7 days.

Referral Management

1. Ideally, referrals will be managed as below. Understanding that all the required documents may not be available within the allowed time for **Received** status (14 days), and closing referrals may disadvantage the patient, the **Referral Under Review** status is used at the discretion of the triage team and needs to be monitored regularly.
2. If the referral is not accepted but reassessment at a later date is recommended, the referral should be closed and returned to the referring provider's office for ongoing management until the patient's condition or related investigations are completed, so the patient is then appropriate for a re-referral.
3. If a decision about acceptance of a referral cannot be made at the time of the **care team**'s first review, the team will determine testing or details needed to allow for decision and the referral will be reviewed again within a reasonable time period that the team must define. A decision should then be made, and the referral would be accepted or not accepted.
4. Patients whose referral is not accepted will be sent back to referring provider's office with reasons, and any related recommendations by the relevant care team.
5. Received referrals should only be in Received status for a maximum of 14 days.
6. In situations where more time is needed for reviewing the referrals, patients will be placed in Referral Under Review status (up to 6 months) until an appropriate decision can be made regarding referral acceptance, at which time patient status will be changed to **Waitlist/Scheduled**. Appropriate reasons for Referral Under Review are identified in Appendix 1.
7. Patients whose status in CVIS is Received (means referral received) cannot be placed **On Hold**. On Hold status is used only for patients who have previously been waitlisted or scheduled.

Emergency Procedures

1. **Emergency procedures** do not require a referral entry.
2. Data entry at the time of the emergency procedure will indicate procedure type for completion as the information is not previously entered.
3. If a procedure referral arrives as an emergency and the patient condition is changed to urgent or elective, a referral can be entered retrospectively for appropriate follow up service.

Adding Patients to a Procedural Waitlist/Scheduled List

1. Patients are only placed on a waitlist when they are ready, willing, and able to have their procedure (Ready to Treat), meaning:
    a. The care team has recommended the procedure and the patient has been contacted to confirm readiness and has agreed to the treatment.
    b. The patient has:
        i. Completed all other therapies prescribed to address the issue (this does not include prescribed adjunct therapies to be administered before/in addition to procedure).
        ii. Completed all diagnostic and/or procedural tests required to determine diagnosis and confirm the procedure is indicated. This excludes pre-procedure tests routinely done days or weeks in advance of the procedure, or tests that can only be performed once the patient is waitlisted.
        iii. Met any related clinical criteria that may impact their readiness to have the procedure, as determined by the care team, e.g., stabilization of an existing medical condition, required medication changes, etc.
2. When a decision has been made to waitlist a patient (who is ready, willing and able) for a procedure, it must be entered into CVIS within 48 hours. In the exceptional case when this is not possible, the waitlist date documented should reflect the patient's acceptance date.
3. Patients will not be **future dated**. Patients must be waitlisted as soon as they are ready, willing and able to have their procedure, e.g., the referral cannot be held until the time a procedure date is known or the patient is ready to be scheduled.
4. Patients requiring more than one procedure can be on a waitlist for each different procedure, but not on more than one waitlist for the same procedure.
5. For patients who have not been waitlisted, a scheduled date is equivalent to the waitlist date.
6. When a decision has been made to schedule a patient for a procedure, it must be entered into CVIS ideally within 48 hours and to a maximum of 5 days (as per current practice).

Waitlist Management

Managing Wait times

1. Wait times are calculated from the time of the first waitlist/scheduled date stamp (including redirections).
2. When a patient is approaching or has exceeded their recommended maximum wait time, where appropriate and with patient's approval, the triage team will investigate options for the patient to receive their procedure at an alternative adult cardiac center. The patient should receive care based on priority/clinical status and approaching **benchmark** of the original waitlist date.
3. Every attempt must be made to prevent operationally related postponements for patients, being sensitive to the geographic barriers and travel costs for rural and remote residents.

4. When a postponement of a patient's planned procedure date occurs, an offer of an acceptable new date should occur as soon as possible.

Managing On Hold

1. The use of On Hold is restricted to patients who have been waitlisted or scheduled.
2. Appropriate reasons for On Hold are identified in Appendix 1.
3. It is allowable for a patient to be unavailable during their wait for a procedure or clinical and/or non-clinical reasons. The sum of the unavailable periods cannot exceed 6 months, except in exceptional circumstances which must be documented by the care provider and/or health authority.
4. On Hold patients who are approaching six months will have a re-evaluation by the care team.
5. If the patient cannot be returned to the waitlist at six months, the patient will be removed from the waitlist and the referring provider's office must be notified.

Ensuring Accurate Waitlists

1. Waitlists should be monitored weekly for patients who are approaching or exceeding recommended maximum wait times, and to review clinical status/condition.
2. A more fulsome waitlist review should be completed quarterly to ensure that a patient's status is accurate, and they remain prioritized appropriately.
3. The triage team will facilitate the identification and removal of cases from the waitlist where one or more of the following are true:
    a. Provincial records show the patient as deceased;
    b. Change in a patient's clinical condition indicating the procedure is no longer indicated or possible;
    c. The procedure was completed elsewhere;
    d. The patient has been unavailable for more than the allowable patient On Hold time;
    e. The patient has refused 2 procedure dates, or failed to keep a scheduled procedure date twice without notice to the site of circumstances;
    f. The patient no longer wishes to undergo the procedure;
    g. Inability to contact a patient when all reasonable efforts to contact the patient have been exhausted (3 attempts over an 8-week period).
4. Discretion should be exercised on a case-by-case basis to avoid disadvantaging patients who are suffering hardship, a misunderstanding, or other extenuating circumstances.
5. If a patient is removed from the waitlist, the referring provider's office is to be notified in writing.
6. All relevant procedural data will be entered into CVIS within 5 business days of procedure completion.
7. The triage team will conduct weekly reviews of waitlists to ensure that completed procedures have been removed. Any procedures missing data require follow up with the appropriate provider and/or care team.

8. If known, patient death should be entered into CVIS. The appropriate time frame being monitored is from the time of referral for a cardiac procedure until 1 year after the procedure completion, appropriate documentation of patient death must be completed in CVIS within 14 days. For patient deaths that are not captured via direct entry into CVIS, a reconciliation with Discharge Abstract Database (DAD) will serve as the information source.

Redirection

1. Received/waitlist/scheduled cases may be redirected to an appropriate site for the following reasons: service not provided by the site, operator with an extensive waitlist, unforeseen site challenges or patient preference.
2. When the primary provider has an extensive waitlist, consideration should be given as to whether a received/waitlist/scheduled case should be redirected to another provider from the same site or another site with a shorter wait list as indicated by patient acuity.
3. The possibility of redirection is confirmed with the patient.
4. Received/waitlist/scheduled cases for redirection should be discussed between sending and receiving sites prior to the redirection occurring. It is expected that a discussion between providers to clarify reasons for not accepted occurs and to ensure that the patient understands the final decision.
5. If a redirected inpatient is not accepted, the site of original referral is to be notified within 24 hours.
6. Redirected cases do not need another referral entry. Patients who are redirected for care at another site or health authority do not require a new referral, they should be redirected in CVIS.
7. Redirected cases will be assessed by receiving site within 48 hours and will not be placed On Hold while waiting for assessment.

Patient Communication

1. Patients should be given the opportunity to identify which method of communication they prefer and their language preference.
2. A member of the triage team will communicate with newly waitlisted/scheduled patients within 2 weeks of receipt of referral and patients' will be provided with the following information:
    a. The proposed procedure for which they are waiting (with plain language description);
    b. An estimated wait time for the proposed procedure, including wait time specific to providers if possible.
    c. Details on who to contact if they have questions about the wait or if their clinical condition changes; and
    d. Details regarding the parameters for being removed from the waitlist, including:
        - Change in their clinical condition such that the procedure is no longer indicated or possible.
        - They had the procedure completed elsewhere.

- They have been unavailable for more than the allowable patient On Hold time.
- They have refused 2 procedure dates or failed to keep a scheduled procedure date twice without notice to the site of circumstances.
- They no longer wish to undergo the procedure.
- Inability to contact them when all reasonable efforts to contact the patient have been exhausted (3 attempts over an 8-week period).

3. Patients must be informed of a postponement of a procedure by the care team as early as possible and be advised of the circumstances that resulted in the need to reschedule.
4. Patients must be informed if they have been removed from a waitlist or the procedure is cancelled by the health authority and/or provider, along with the reason(s) why.

MONITORING AND EVALUATION

1. Any amendments to waitlists are to be conducted by the designated triage team at the waitlisting site.
2. Requirements and processes to ensure data quality are outlined in Cardiac Services BC Data Quality Policy.
3. Triage teams and local health authorities are required to collaborate on waitlist clean up and maintenance to ensure CVIS and the health authority records (e.g., Meditech or Cerner) reflect matching information.

APPENDIXES

APPENDIX 1: ACCESS DEFINITIONS

Complete referrals

A complete referral includes all information required to assess the referral's appropriateness and details of service requested. A complete referral includes the following details:

- Referral Date
- Receiving Site
- Requested Priority
- Requested Service / Service Details
- Reason for Service (e.g. Primary Indication)
- All recent relevant consultations
- All supporting cardiac tests completed
- Relevant patient assessment and history

Episode of Service
A series of events within a particular cardiac service that occur over a period of time. EOS events may include referral, waitlist status, clinical assessment, procedures, discharge, follow up, clinic encounters and quality of life questionnaires.
Episode of Service groups include:

- Cardiac Surgery
- Cardiac Catheterization (Diagnostic and Interventional)
- Transcatheter Heart Valves (THV)
- Electrophysiology
- Heart Rhythm Devices
- Heart Function Clinics
- Atrial Fibrillation Clinics
- Cardiovascular Genetics

Triage team
A group led by triage coordinators responsible for the assessment and triage of patients.

Provider
Includes cardiologist, specialist, internist, or specialized nurse practitioner. Referrals for cardiac services are not accepted from family physicians unless reviewed with an authorized receiving provider.

Referral Under Review
Referral Under Review status is used for patients whose referral is *Received* but who are not yet ready, willing, and able to proceed to waitlist or scheduled status. Reasons for the use of Referral Under Review include:

- Additional assessment/testing required
- Patient personal reason (indecision, travel, family commitment)
- Change in medical status/condition

Care team
The team of healthcare professionals responsible for the patient's care.

Received
Status of a patient who has been referred for a service, for which a decision has not been made by the care team yet.

Waitlist/Scheduled
Status of a patient who has been accepted for the procedure. Acceptance is determined by the following criteria:
1. The team has agreed to perform the procedure and a final treatment recommendation is made.
2. The patient must be ready, willing, and able to proceed with the procedure.
Note: The patient does not need to be given a planned procedure date to be added to the waitlist. The "Scheduled Entry Date" is equivalent to the "Waitlist Date" if patient not previously waitlisted. All diagnostics and testing required to determine the final treatment recommendation must be completed

before an acceptance date can be assigned – this is consistent with the historical interpretation of this time stamp.

On Hold

A patient on a waitlist or with a scheduled date who is no longer ready, willing, and able to proceed to procedure. On Hold status does not apply to patients under referral or under assessment prior to being placed on a waitlist or given a scheduled date. Reasons for the use of On Hold include:

- Personal Reason (Indecision, Travel, Family Commitment)
- Change in Medical Status/Condition
- Additional Assessment/Testing Required
- And exclude site operational or staffing issues

Emergency procedures

An emergency procedure is unexpected and one that requires immediate intervention for a life threatening condition.

Future dated

The assignment of a waitlist or entry date in the future. This practice does not accurately reflect the patients wait time.

Benchmark

The provincially accepted wait time standard that has been established. See Appendix 2.

Redirection

A process of transferring a patient to an alternative healthcare provider or site when it is determined to be more appropriate or efficient to address the patient's healthcare requirements/needs.

APPENDIX 2: PRIORITIES AND RECOMMENDED MAXIMUM WAIT TIMES

CVI.Source Wait time Definitions	
Surgery	
Emergency	Immediate surgery to support life or limb
Priority I	3 days
Priority II	42 days
Priority III	90 days
Cardiac Catheterization	
Emergency	Immediate to support life or limb
Urgent-In-Hospital / Transfer	5 days (urgent inpatient transfer)
Urgent Out-of-Hospital	14 days

Elective	42 days
Electrophysiology	
Urgent	14 days
Elective	90 days
Heart Rhythm Device	
Urgent Inpatient	≤72 hours
Urgent Outpatient	≤14 days
Elective Outpatient	≤42 days
Transcatheter Heart Valve	
P0 Emergent	≤ 2 days
P1 Urgent	≤ 14 days
P2 Elective	≤ 42 days
P3 Elective	≤ 90 days

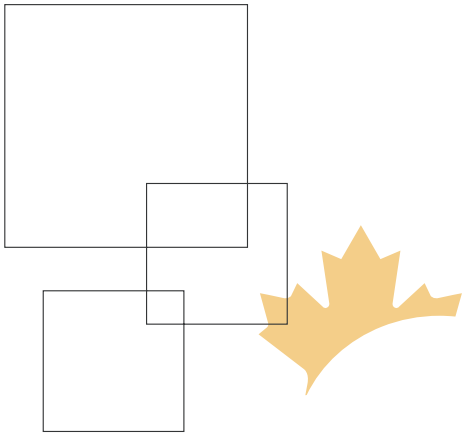
APPENDIX 3: REFERENCES AND RESOURCES

1. Ministry of Health Policy Directive; Surgical Waitlist Management. 13 July 2021. http://www.bcwomens.ca/Gynecology-Site/Documents/Gyne%20Surgical%20Services/Surgical%20WL%20Policy%202021.pdf
2. CVI.Source Clinical Data Dictionary. https://app.powerbi.com/groups/me/apps/b04b8233-2c58-499e-89e9-af62e6e3077d/reports/6ac8e292-cc5e-484c-81c1-0a5128145c3c/ReportSectione49117209e79bb31310d?experience=power-bi
3. Canadian Cardiovascular Society Access to Care Working Group. Wait-time benchmarks for cardiovascular services and procedures. It's about time: Achieving benchmarks and best practices in wait time management. Final report by the Wait Time Alliance for Timely Access to Health Care. 2005 Aug:68-87. https://www.canm-acmn.ca/Resources/Documents/wta-final.pdf
4. HEARTis Data Dictionary. https://your.healthbc.org/sites/heartis/_layouts/15/start.aspx#/Training%20Materials/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fheartis%2FTraining%20Materials%2FHEARTis%2FData%20Dictionary&FolderCTID=0x012000E7ACB305697902448D3C380C1CD2D69D&View=%7B1C16A9FA%2D73B2%2D4A86%2DA180%2DC5D02B453BF7%7D
5. CSBC Data Quality Policy – In development.

Universal Access, but When?

Treating the Right Patient at the Right Time

WAIT TIME BENCHMARKS FOR CARDIOVASCULAR SERVICES AND PROCEDURES



L'accès universel, mais quand?

Traiter le bon patient au bon moment

POINTS DE REPÈRE POUR DES TEMPS D'ATTENTE POUR DES SERVICES ET DES INTERVENTIONS EN SANTÉ CARDIOVASCULAIRE

Canadian Cardiovascular Society
Leadership. Knowledge. Community.

Société canadienne de cardiologie
Communauté. Connaissances. Leadership.

CCS Commentaries on Access to Care

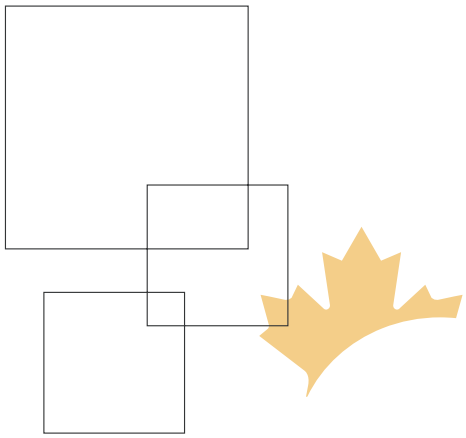
Commentaires de la SCC sur l'accès aux soins

The report was prepared by the Access to Care Working Group of the Canadian Cardiovascular Society. The CCS acknowledges the work of those health professionals who contributed their time and expertise to the development of these commentaries. The CCS is particularly indebted to Dr Blair O'Neill for his leadership and commitment to this important initiative.

CCS Access to Care Working Group

Blair O'Neill MD, (Chair), Halifax, Nova Scotia
Robert Beanlands MD, Ottawa, Ontario
James Brophy MD, Montreal, Quebec
William Dafoe MD, Edmonton, Alberta
Anne Ferguson, Canadian Cardiovascular Society
Kevin Glasgow MD, Toronto, Ontario
Michelle Graham MD, Edmonton, Alberta
Merril Knudtson MD, Calgary, Alberta
David Ross MD, Edmonton, Alberta
Heather Ross MD, Toronto, Ontario
John Rottger MD, Pincher Creek, Alberta
Chris Simpson MD, Kingston, Ontario
Marcella Sholdice, Project Manager

Reprinted from *The Canadian Journal of Cardiology*
All commentaries are also available on-line at www.ccs.ca



Le rapport a été préparé par le Groupe de travail sur l'accès aux soins de la Société canadienne de cardiologie. La SCC reconnaît le travail des professionnels de la santé qui ont contribué leur temps et leur compétence à l'élaboration de ces commentaires. En particulier, la SCC tient à remercier le Dr Blair O'Neill pour son leadership et son engagement à l'égard de cette importante initiative.

Groupe de travail sur l'accès aux soins de la SCC

Dr Blair O'Neill, (président), Halifax, Nouvelle-Écosse
Dr Robert Beanlands, Ottawa, Ontario
Dr James Brophy, Montréal, Québec
Dr William Dafoe, Edmonton, Alberta
Anne Ferguson, Société canadienne de cardiologie
Dr Kevin Glasgow, Toronto, Ontario
Dr Michelle Graham, Edmonton, Alberta
Dr Merril Knudtson, Calgary, Alberta
Dr David Ross, Edmonton, Alberta
Dr Heather Ross, Toronto, Ontario
Dr John Rottger, Pincher Creek, Alberta
Dr Chris Simpson, Kingston, Ontario
Marcella Sholdice, Chef de projet

Réimprimé de la revue *Journal canadien de cardiologie*
Tous les commentaires sont aussi disponible enligne à www.ccs.ca

CCS Commentaries on Access to Care

COMMENTARIES

Continued on page 2

CCS Commentaries on Access to Care

COMMENTARIES (CONTINUED)

APPENDICES

Letter from the CCS President / Lettre du président de la SCC

As President of the Canadian Cardiovascular Society (CCS), I am impressed by the dedication and the energy of our members who provide valued leadership in shaping Canadian health policy. These Access to Care Commentaries are an example of an important contribution to the national dialogue on access to quality cardiovascular care.

The CCS Access to Care Working Group, chaired by Dr Blair O'Neill, brought together cardiovascular experts who are committed to improving patient access to health care. These professionals were asked to develop wait time benchmarks based on the best available evidence or, where evidence was lacking, on the consensus opinion of highly experienced specialists in all areas of cardiovascular care.

National wait time targets for access to cardiovascular care are an important requirement of an accountable and equitable health care system that can provide Canadians with access to quality cardiovascular care, when they need it.

I sincerely thank all those individuals who contributed to this important work and urge all cardiovascular health professionals and decision-makers to critically review the recommended benchmarks. I encourage you to discuss them with your colleagues, local policy-makers, health care funders and administrators for adoption in your jurisdiction.

Denis Roy
President
Canadian Cardiovascular Society

En tant que président de la Société canadienne de cardiologie (SCC), je suis impressionné par le dévouement et l'énergie de nos membres qui font preuve d'un important leadership dans le façonnement de la politique canadienne en matière de santé. Ces commentaires sur l'accès aux soins sont un exemple d'une importante contribution au dialogue national sur l'accès à des soins cardiovasculaires de qualité.

Le Groupe de travail sur l'accès aux soins de la SCC, présidé par le Dr Blair O'Neill, a réuni des spécialistes cardiovasculaires qui ont a cœur d'améliorer l'accès des patients aux soins de santé. On a demandé à ces professionnels d'établir des points de repère pour des délais d'attente fondés sur les meilleures données scientifiques ou, lorsque les données étaient insuffisantes, sur l'accord général de spécialistes chevronnés de tous les domaines des soins cardiovasculaires.

Les cibles nationales des temps d'attente pour l'accès aux soins cardiovasculaires sont une condition essentielle d'un système de santé qui est à la fois responsable et équitable et qui peut assurer aux Canadiens l'accès à des soins cardiovasculaires de qualité, et ce, lorsqu'ils en ont besoin.

Je remercie sincèrement tous ceux qui ont contribué à ce travail important et j'encourage vivement tous les professionnels de la santé cardiovasculaire et les décideurs à examiner de façon éclairée les points de repère recommandés. Je vous invite à discuter de ces points de repère avec vos collègues, les décideurs locaux, les bailleurs de fonds des soins de santé et les administrateurs afin qu'ils soient adoptés dans votre juridiction.

Denis Roy,
président
Société canadienne de cardiologie

Letter from the Chair of the Access to Care Working Group / Lettre du président du Groupe de travail sur l'accès aux soins

For the past two years, I have had the honour of working with over 50 cardiovascular health care professionals through the exciting and challenging process of developing Canada's first ever comprehensive wait-time benchmarks for cardiovascular care. In keeping with our belief that Canadians everywhere should have reasonable access to cardiovascular care, these are also the first pan-Canadian access targets.

Our team looked beyond the traditional interventions because we understand that, from the patient's perspective, the waiting begins long before a procedure is scheduled. From the start, we knew that our work would be meaningful only if we developed benchmarks for the entire continuum of care – from initial consultation with a cardiologist through diagnosis to treatment and, ultimately, to rehabilitation and secondary prevention.

Our Working Group made recommendations across a full range of cardiac diseases, including coronary artery disease, sudden death, arrhythmia and valvular disease, and based our urgency classifications on the risk of the patient's condition.

We realize that achieving these benchmarks will be a major challenge for health care policy-makers and funders, and for health care professionals. However, it will only be by accepting these benchmarks that we will be able to identify and quantify the human resource, financial and infrastructure requirements that will be necessary to achieve these benchmarks. Thus, establishing these benchmarks is a necessary first step in working toward the goal of improved access to care. We firmly believe that it will only be through initiatives like this that confidence will be restored in our cherished publicly funded health care system.

We've taken the first step toward improved and more equitable access to cardiovascular care across our country. Our team looks forward to working with all stakeholders to plan for the adoption and implementation of our proposed benchmarks from sea to sea to sea.

Blair O'Neill
Chair, Access to Care Working Group

Depuis deux ans, j'ai l'honneur de travailler avec plus de 50 professionnels de la santé cardiovasculaire dans le cadre d'un processus passionnant et stimulant visant à établir les premiers points de repère détaillés au Canada de délais d'attente pour les soins cardiovasculaires. Étant conformes à notre conviction selon laquelle tous les Canadiens doivent avoir un accès raisonnable aux soins cardiovasculaires peu importe où ils résident, ces points de repère constituent également les premières cibles pancanadiennes en matière d'accès aux soins.

Notre équipe a regardé au-delà des interventions traditionnelles parce que nous comprenons que du point de vue du patient, l'attente commence bien avant la planification d'une intervention. Nous savions dès le début que notre travail n'aurait d'importance que si nous établissions des points de repère pour tout le continuum de soins – de la consultation initiale avec un cardiologue au diagnostic, au traitement et, en dernier lieu, à la réadaptation et à la prévention secondaire.

Notre groupe de travail a fait des recommandations pour une vaste gamme de maladies cardiaques, y compris la coronaropathie, la mort subite, l'arythmie et la valvulopathie, et nous avons fondé notre classification par degré de priorité selon le risque présenté par l'état de santé du patient.

Nous reconnaissons que l'atteinte de ces points de repère représentera un défi majeur pour les décideurs de la politique en matière de soins de santé et les bailleurs de fonds ainsi que pour les professionnels de la santé. Cependant, ce n'est qu'en acceptant ces points de repère que nous pourrons déterminer et quantifier les besoins en ressources humaines, en financement et en infrastructure qui sont nécessaires pour atteindre ces points de repère. Ainsi, l'établissement de ces points de repère constitue donc une première étape essentielle vers l'objectif, lequel est d'améliorer l'accès aux soins. Nous sommes convaincus que ce n'est qu'à l'aide de telles initiatives que nous pourrons restaurer la confiance envers notre système de santé subventionné par l'État auquel nous tenons.

Nous avons franchi la première étape visant à améliorer l'accès aux soins cardiovasculaires et à rendre cet accès plus équitable dans l'ensemble du pays. Notre équipe se prépare à travailler avec toutes les parties prenantes afin de planifier l'adoption et la mise en œuvre, d'un océan à l'autre, des points de repère que nous avons proposés.

Blair O'Neill,
Président du Groupe de travail sur l'accès aux soins

Proposed upper limit for wait time benchmarks for cardiovascular services and procedures by urgency category

Indication	Upper limit of wait time benchmarks			
	Emergent	**Urgent**	**Semiurgent**	**Scheduled**
Initial specialist consultation	Immediate to 24 h	1 week	4 weeks	6 weeks
Echocardiography	1 day	7 days	7 days	30 days
Cardiac nuclear imaging	1 day	3 days	N/A	14 days
Diagnostic catheterization				
After ST segment elevation myocardial infarction	Immediate to 24 h	3 days	7 days	N/A
After non-ST segment elevation acute coronary syndrome	Immediate to 48 h	3 days	7 days	N/A
Stable angina	N/A	N/A	14 days	6 weeks
Stable valvular heart disease	N/A	N/A	14 days*	6 weeks
Percutaneous coronary intervention				
After ST segment elevation myocardial infarction	Immediate	Immediate	Immediate	N/A
After non-ST segment elevation acute coronary syndrome	Immediate	Immediate	Immediate	N/A
Stable angina†	N/A	Immediate‡	14 days	6 weeks
Coronary artery bypass graft surgery				
After ST segment elevation myocardial infarction	Immediate to 24 h	7 days	14 days	N/A
After non-ST segment elevation acute coronary syndrome	Immediate to 48 h	14 days	14 days	6 weeks
Stable angina	N/A	N/A	14 days	6 weeks
Valvular cardiac surgery	Immediate to 24 h	14 days	N/A	6 weeks
Heart failure services	Immediate to 24 h	14 days	4 weeks	6 weeks
Electrophysiology				
Referral to electrophysiologist	Immediate to 24 h	3 days	30 days	90 days
Permanent pacemaker	N/A	3 days	2 weeks	6 weeks
Catheter ablation	N/A	14 days	N/A	3 months
Implantable cardioverter defibrillator	N/A	3 days§	N/A	8 weeks¶
Cardiac resynchronization therapy devices	N/A	N/A	N/A	6 weeks
Cardiac rehabilitation	Immediate**	3 days	7 days	30 days

**For symptomatic aortic stenosis; †Ad hoc percutaneous coronary intervention is appropriate for all patients with stable angina in centres that practice in that manner; ‡Symptomatic; §Secondary prevention; ¶Primary prevention; **Some patients have significant psychosocial issues (eg, severe depression). Such patients should be managed by emergency or acute care psychiatry. N/A Not applicable*

NOTICE: *This summary table is provided for quick reference only. The reader is strongly urged to review the detailed papers that follow to ensure that these benchmarks are interpreted and applied appropriately, and to see the definitions of the patient factors that constitute an emergent, urgent or semiurgent condition.*

Limite supérieure proposée des points de repère pour les délais d'attente – Services et interventions cardiovasculaires, par catégorie d'urgence

	Limite supérieure des points de repère pour les délais d'attente			
Indication	**Très urgent**	**Urgent**	**Semi-urgent**	**Non urgent**
1re consultation – spécialiste	Sans délai à 24 h	1 sem.	4 sem.	6 sem.
Échocardiographie	1 jour	7 jours	7 jours	30 jours
Imagerie nucléaire cardiaque	1 jour	3 jours	s.o.	14 jours
Cathétérisme diagnostique				
Après IM ST+	Sans délai à 24 h	3 jours	7 jours	s.o.
Après SCA ST–	Sans délai à 48 h	3 jours	7 jours	s.o.
Angine de poitrine stable	s.o.	s.o.	14 jours	6 sem.
Valvulopathie stable	s.o.	s.o.	14 jours*	6 sem.
Intervention coronarienne percutanée				
Après IM ST+	Sans délai	Sans délai	Sans délai	s.o.
Après SCA ST–	Sans délai	Sans délai	Sans délai	s.o.
Angine de poitrine stable†	s.o.	Sans délai‡	14 jours	6 sem.
Pontage coronarien				
Après IM ST+	Sans délai à 24 h	7 jours	14 jours	s.o.
Après SCA ST–	Sans délai à 48 h	14 jours	14 jours	6 sem.
Angine de poitrine stable	s.o.	s.o.	14 jours	6 sem.
Chirurgie valvulaire	Sans délai à 24 h	14 jours	s.o	6 sem.
Insuffisance cardiaque	Sans délai à 24 h	14 jours	4 sem.	6 sem.
Électrophysiologie				
Consultation – Électrophysiologiste	Sans délai à 24 h	3 jours	30 jours	90 jours
Stimulateur cardiaque permanent	s.o.	3 jours	2 sem.	6 sem.
Ablation par cathéter	s.o.	14 jours	s.o.	3 mois
Défibrillateur implantable	s.o.	3 jours§	s.o.	8 sem.¶
Dispositif de RC	s.o.	s.o.	s.o.	6 sem.
Réadaptation cardiaque	Sans délai**	3 jours	7 jours	30 jours

**Pour la sténose aortique symptomatique; †L'intervention coronarienne percutanée ad hoc convient à tous les patients souffrant d'une angine de poitrine stable dans les centres qui réalisent cette intervention; ‡Symptomatique; §Prévention secondaire; ¶Prévention primaire; **Certains patients présentent des troubles psychosociaux importants (p. ex., dépression grave). Ces patients devraient recevoir des soins d'urgence ou des soins de courte durée en psychiatrie. IM ST+ Infarctus du myocarde avec élévation du segment ST; RC Resynchronisation cardiaque; SCA ST– Syndrome coronarien aigu sans élévation du segment ST; s.o. Sans objet*

AVIS : *Ce tableau récapitulatif est fourni à des fins de consultation rapide seulement. Nous engageons vivement le lecteur à consulter les documents détaillés qui suivent pour s'assurer que ces points de repère sont interprétés et appliqués adéquatement et pour connaître les définitions des facteurs du patient qui constituent un état très urgent, urgent, semi-urgent ou non urgent.*

General commentary on access to cardiovascular care in Canada: Universal access, but when? Treating the right patient at the right time

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In 2004, the Canadian Cardiovascular Society formed an Access to Care Working Group with a mandate to use the best science and information available to establish reasonable triage categories and safe wait times for common cardiovascular services and procedures through a series of commentaries. The present commentary is the first in the series and lays out issues regarding timely access to care that are common to all cardiovascular services and procedures. The commentary briefly describes the 'right' to timely access, wait lists as a health care system management tool, and the role of the physician as patient advocate and gatekeeper. It also provides advice to funders, administrators and providers who must monitor and manage wait times to improve access to cardiovascular care in Canada and restore the confidence of Canadians in their publicly funded health care system.

Key Words: *Health services accessibility; Medically acceptable wait times; Waiting lists; Wait times*

Commentaire général sur l'accès aux soins cardiovasculaires au Canada : L'accès universel, mais quand ? Traiter le bon patient au bon moment

En 2004, la Société canadienne de cardiologie a formé un groupe de travail sur l'accès aux soins, dont le mandat consistait à utiliser les meilleures données scientifiques et la meilleure information disponibles afin d'établir des catégories de triage raisonnables et des temps d'attente sécuritaires pour obtenir des services et des interventions courants en santé cardiovasculaire, au moyen d'une série de commentaires. Le présent commentaire est le premier de la série et présente les enjeux reliés à l'accès rapide aux soins partagés par la totalité des services et des interventions en santé cardiovasculaire. Le commentaire décrit brièvement le « droit » à un accès rapide, les listes d'attente à titre d'outil de gestion du système de santé et le rôle du médecin à titre de défenseur des patients et de contrôleur d'accès. Il contient également des conseils à l'intention des bailleurs de fonds, des administrateurs et des dispensateurs qui doivent surveiller et gérer les listes d'attente pour améliorer l'accès aux soins cardiovasculaires au Canada et restaurer la confiance des Canadiens envers le système de santé subventionné par l'État.

THE ISSUE

Canadians have clearly identified waiting times for medical care and diagnostic testing as a pressing issue that must be addressed by governments. In an annual survey performed since 1999, and most recently in 2004, less than one-half of Canadians surveyed were satisfied with health care access at home and in their community (1). In a recent poll commissioned by the Canadian Medical Association (CMA) (2), 49% of Canadians said that they or a member of their household had had to wait longer than they felt was reasonable to see a medical specialist. Thirty-one per cent of respondents felt that they had had to wait too long for diagnostic tests (up from 14% in 1999). Only 14% believed that Canada has an adequate supply of physicians. Clearly, there is increasing public angst about timely access to care.

Access to care has been a major focus of lobbying by the CMA and the Canadian Nurses' Association (3). These concerns are also shared by the cardiovascular physician community. In a survey of cardiovascular specialist physicians in 2001, the Canadian Cardiovascular Society (CCS) found that one-half of all surveyed cardiologists reported that patients had to wait five days or longer for a first visit with the specialist for an urgent consultation. For nonurgent referrals, one-half of the cardiologists reported that a patient had to wait eight weeks or longer for a first consultation. Fifty-two per cent reported that average wait times had increased in the previous year (4).

Improved access to care has become the rallying cry for those who wish to repair the tarnished reputation of Canada's health care system. Many have felt that the system is at a crossroads,

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and that funders, administrators and providers must ensure that the system is able to meet current and future projected needs.

THE 'RIGHT' TO TIMELY ACCESS

An interesting legal battle is emerging that will define patients' right to timely care. While the third of the so-called 'five principles' of the 1984 Canada Health Act – accessibility – was not originally intended to address the issue of the timeliness of access (rather, it was intended to prevent discrimination on the basis of age, health status or income), the question of whether Canadians have a right to timely access under the Charter of Rights and Freedoms is currently being seriously considered.

The courts have not yet ruled that Section 7 of the Charter – which guarantees the right to life, liberty and security of the person – should be interpreted to mean that patients have a right to timely care in our publicly funded health care system, but many believe that the courts will eventually have to weigh in on the debate. The Senate Standing Committee on Social Affairs, Science and Technology, for example, recently stated:

> *"…in the committee's opinion, the failure to deliver timely health services in the publicly funded system, as evidenced by long waiting lists for services, is likely to lay the foundation for a successful Charter challenge to laws that prevent or impede Canadians from personally paying for medically necessary services in Canada, even if these services are included in the set of publicly insured health services"* (5).

In June 2004, the Supreme Court of Canada heard an appeal in the matter of *Chaoulli v. Quebec*, where the plaintiffs claimed that certain provisions of Quebec's Health Insurance Act and Hospital Insurance Act are unconstitutional and violate Section 7 of the Canadian Charter of Rights and Freedoms. The impugned provisions prohibit private insurers from covering health services that are insured by the provincial health plan. The lower courts ruled that the impugned provisions do not contravene the Charter.

If the Supreme Court allows the appeal and rules that timely access to care is a right protected under the Charter, the door to privately funded health care may be opened. The demand for a private tier of health care continues to grow and will not diminish unless governments demonstrate a commitment to the delivery of timely care within the public system with the necessary funding. Politicians, bureaucrats, managers, administrators and health care professionals are all highly motivated to address this problem.

WAIT LISTS AS A HEALTH CARE SYSTEM MANAGEMENT TOOL

In the Canadian health care system, wait lists have been generally accepted, at least in principle, as one consequence of the rationing of health care resources. In fact, most providers would agree that an appropriately triaged and monitored wait list allows for the most efficient use of health care resources in a publicly funded system. Lack of a wait list, in fact, means that operating rooms and physicians are idle while waiting for the next appropriate patient. The keys to fair and legitimate wait list strategies include evidence and consensus-based criteria that aim to minimize adverse events. In addition, there must be measures to establish public confidence, assuring them that the system is transparent, safe and fair. There must be appropriate engagement of physicians, other health professionals, hospital administrators and government officials in the decision-making process, and a rigorous monitoring system that tracks both individual and population outcomes – along with mechanisms to allow for positive change based on quality assurance feedback. Unfortunately, far too often, the status of individual wait lists reflected the level of investment that funders were willing to make in care delivery in that particular area rather than the demand based on medical appropriateness.

THE PHYSICIAN AS PATIENT ADVOCATE AND GATEKEEPER

Wait lists become unsafe when they increase due to insufficient resources to meet the medically determined demand. This may relate to shortages of specialist physicians or to inadequate time or budgetary resources available in the operating room, or catheterization or electrophysiology laboratory. These resources must then be rationed among the patients who require them. The reality of fiscal constraints is that they will inevitably lead to rationing of services when there are not enough resources to provide the best treatment for every single patient or even most patients at the optimal time.

At the macro level, rationing decisions are made by health care funders (eg, government ministries) when they eliminate, reduce or underfund health delivery programs. At the 'meso' level, hospital managers create 'cutoff' points or 'ceiling limits' for some expensive programs. At the micro level, rationing is physician-based. This bedside rationing is defined by the following situation:

- the patient must be given less than the best available health care;
- the best health care must be withheld because of limited societal resources; and
- the physician must have control over the health care decision (6).

Physicians have traditionally been patient advocates. Indeed, the physician's fiduciary obligation to his or her patients has been firmly established by two decisions of the Supreme Court of Canada in the early 1990s (7,8). In contrast, there appears to be no corresponding legal duty on the part of a physician to act as a gatekeeper. A physician may not act as a gatekeeper when to do so would place the physician in conflict with his or her duty to the patient. The law is clear that a physician must act in the best interest of his or her patients at all times. All decisions made in respect of patient care must be made using sound medical judgment within the accepted standard of practice expected by a reasonable and competent physician in similar circumstances. In the event that the physician's duty to the patient conflicts with financial constraints within the health care system, the duty to the patient must prevail (9).

The duty owed by a physician to his or her patient includes three components, namely, the duty to provide care and treatment to the patient in accordance with reasonable standards of practice; the duty to inform the patient; and the duty to advocate on behalf of the patient.

The duty to inform a patient includes more than simply obtaining an informed consent, but has been extended to include the duty to inform patients of all available investigation and treatment options, whether available in the local community or elsewhere. The scope of the duty to advocate has not yet been fully defined in Canada, but would likely include the duty of a physician to take steps to reasonably

advocate on behalf of his or her patient to obtain the resources that are reasonably necessary to provide appropriate care.

While physicians are being asked, with increasing frequency, to take on the role of gatekeepers, this may place them in direct conflict with the legal and ethical duties that they owe to their patient. Physicians are finding themselves in a clinical and moral dilemma in which fiscal pressures may influence their decisions in ways that are inconsistent with a patient's best interest.

Physicians, both individually and through their professional organizations, have an important role in advocating on behalf of their patients and the general public to ensure that the policymakers have the appropriate information and knowledge to make decisions regarding the amount of public resources that should be made available for the competing priorities within the public health care system. In addition, physicians and their professional associations have an important role in developing consensus within the profession and, where possible, appropriate guidelines and standards for the allocation and use of the limited health care resources.

Primary responsibility for the allocation of resources in the health care system should not be placed on physicians, but rather on those who provide the funds and determine where and how they are to be spent. If the health care system continues to underfund the delivery of care, thereby allowing fiscal considerations to outweigh individual patient needs, then funders must be prepared to acknowledge and defend this conclusion publicly, and to engage in the institutional design that is necessary for developing a legitimate and transparent process of rationing.

PROVINCIAL SYSTEMS TO MONITOR AND MANAGE WAIT TIMES FOR CARDIOVASCULAR CARE

There are no national standards for access to cardiovascular procedures or office consultations. Some provinces have developed targets for some procedures (eg, coronary artery bypass graft [CABG] surgery, percutaneous coronary intervention and diagnostic catheterization), but these are not consistent across the country.

It is instructive to recall that the Cardiac Care Network (CCN) of Ontario came into being in the early 1990s after a patient died while on the waiting list for CABG surgery in Ontario. The political fallout at the time resulted from the perception that wait lists were not well managed. This led to the birth of the CCN. As a testament to the CCN's success, the CABG wait list mortality has been maintained at well below 0.5% (the benchmark) since 1997 through the implementation of an urgency rating score system and the establishment of recommended maximum waiting times (10) that are specific to each urgency rating score.

Governments and organizations in other provinces have initiated wait list projects as well, including surgical wait list registries in British Columbia, Quebec, Manitoba and Alberta; the Saskatchewan Surgical Care Network; the Nova Scotia Provincial Wait Time Monitoring Project; and the Western Canada Wait List Project.

GOVERNMENT INITIATIVES TO IMPROVE ACCESS TO CARE

The growing public and professional concern about waiting times featured prominently in the last federal election campaign. Because it is a leading cause of death and disability among Canadians, access to cardiovascular care was one of the priority areas identified by the federal government.

The First Ministers have agreed that clear public reporting on health system performance, including waiting times for key diagnostic and treatment services, must be a priority. In addition, the most recent First Ministers' Conference on Health Care established a $4.5 billion Wait Times Reduction Fund, through which the federal government will require provinces to develop and report 'comparable data' on access to care, as well as to establish benchmarks for medically acceptable wait times for priority areas.

POTENTIAL SOLUTIONS

The solution to these access-to-care barriers can be addressed through the framework of the 10-point plan established by the CMA position paper "The Taming of the Queue: Toward a Cure for Health Care Wait Times" (3), which addresses the broader wait time issue.

Set priorities through broad consultation

Cardiovascular care encompasses a broad spectrum of care delivered by various cardiovascular health professionals, as well as diagnostic testing and therapeutic interventions. Access to cardiovascular care arguably begins with access to specialist consultation by primary care practitioners. Access to risk factor modification is extremely important in disease prevention or disease modification. Access to therapeutic interventions, such as biventricular pacing, implantable defibrillator, percutaneous coronary intervention and cardiac surgery, has been shown to improve both quality and quantity of life. Access to new and emerging drugs and devices is also a growing challenge for our stretched treasuries, and fair and equitable strategies to introduce them must be developed. The public and major stakeholders need to be engaged in this discussion. Decisions made by governments based only on 'affordability', without regard for patient safety, outcomes and medical standards, cannot be regarded as legitimate in a single-payer system.

Address patient and public expectations through transparent communications

Patient satisfaction is improved when confidence in the integrity of a waiting list management system is established. Full transparency and public accountability for the decisions taken are needed. This requires more robust databases on risk stratification, wait lists and cardiovascular outcomes.

Address immediate gaps in health human resources and system capacity

Efforts must be made to plan for the future by assessing the existing capacity and the capacity for future growth in each province. Alternative models of care must be explored. Standards for access need to be set, and the ability of current resources to meet these standards and targets then needs to be assessed.

Improve data collection through investments in information systems

Without information systems to assess waiting times and outcomes on the wait list, intelligent and effective decision-making is severely hampered. Efforts to maintain the queue within the standard becomes more difficult, and public confidence is eroded. Investment in database and information systems infrastructure is an absolute requirement if there is to be monitored and improved access to cardiovascular care.

TABLE 1
Terms used in Access to Care Working Group commentaries

Term	Definition
Wait time	For consultations, the time elapsed between referral by the family physician and the first consult with the specialist; for diagnostic tests, the time elapsed between decision to delivery of service; for therapeutic procedures (including surgeries), the time elapsed between the decision to treat and the procedure
Wait time indicator	Standardized measure of wait time for a given health service that is comparable across jurisdictions and provides an accurate picture of wait times for a cohort of patients
Medically acceptable wait time standard	Threshold wait time for a given health service and level of severity beyond which the best available evidence and clinical consensus indicate that patient health is likely to be adversely affected; such guidelines are intended to supplement, not replace, the physician's clinical judgment
Wait time target	A target wait time for a given health service that may be equal to or exceed the medically acceptable wait time for a given proportion of patients; a wait time target is in effect for a given period of time and represents a step along the continuum to achieving the medically acceptable wait time for all patients
Urgency	The extent to which immediate clinical action is required based on the severity of the patient's condition and considerations of expected benefit
Urgency rating score	A score based on the clinical description of an individual patient's condition to determine the urgency for care

Develop wait time standards through clinical and public consensus

Urgency or risk-adjusted rating scores and medically acceptable wait times can be developed, tested, verified and implemented in a relatively short period of time if the resources to do so become available. The establishment of a standard or target adjusted for risk status is a crucial first step to earning public confidence and to establishing fair access for those in the queue.

Strengthen accountability by way of public reporting

All jurisdictions must commit to public accountability for maintenance of established standards. When standards or targets cannot be met, there needs to be clear accountability for redressing this, as well as public disclosure of both the problem and the remedy to correct the deficiencies.

Maximize efficiencies by aligning incentives properly

Working within practice guidelines and being fully accountable for their clinical decisions, physicians should be empowered to make care delivery decisions at the individual patient level on the basis of need and consensus-determined eligibility.

Address upstream and downstream pressures by investing in the continuum of care

Both primary and secondary prevention are important in the access to care continuum. Similarly, access to primary care for risk factor modification must be considered together with access to tertiary and quaternary level specialized care for advanced disease. All pressure points in the care continuum deserve equal consideration.

Expand interjurisdictional care options by enhancing portability provisions

Patients who are far from comprehensive cardiac centres (including out of province) would benefit from enhancements to interprovincial reciprocal billing agreements and a streamlining of processes that allow care to be delivered outside the usual care area.

Commit to adoption of best practices through enhanced research and collaboration

Cardiovascular researchers have a long history of productive collaborative research relationships. For instance, the Canadian Cardiovascular Outcomes Research Team, established in 2001 (11), has contributed significantly to the body of literature in health services and outcomes research in Canada. This group and other investigators can play an important role in the coordination of interinstitutional and interprovincial research and clinical care relationships.

THE RESPONSE OF THE CCS

The CCS is the national professional society for cardiovascular specialists and researchers in Canada. In 2002, at the CCS Congress Public Policy Session, Senator Wilbert Keon stated that an important role of a national professional organization such as the CCS is to develop national standards for access to cardiovascular care that can be validated and adopted or adapted by the provinces. Further, he noted that it was the right time for such initiatives, given that policy-makers and the health care system were grappling with access and waiting time issues.

A professional organization such as the CCS, with its broad-based membership of cardiovascular experts, is ideally positioned to initiate a national discussion and commentary on appropriate standards for access to care for cardiovascular services and procedures. In spring 2004, the CCS Council formed an Access to Care Working Group, with a mandate to use the best science and information available to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures through a series of commentaries.

These commentaries will summarize the current variability of standards and wait times across Canada, where this information is available. They will also summarize the currently available data, particularly focusing on the relationship between the risks of an adverse event and increasing wait times, and identify gaps in the existing data. Using best evidence and expert consensus, each commentary will take an initial position on what the medically acceptable standard for access to care ought to be for the cardiovascular service or procedure. The commentaries will also serve to call on cardiovascular researchers to fill the gaps in this body of knowledge and further validate safe wait times for given risk profiles of patients.

Definitions of access terms used in Access to Care Working Group commentaries are given in Table 1.

CONCLUSIONS

At no other time in the history of health care delivery in Canada has access to care been such an urgent priority for the public, health care professionals, administrators and policy-makers. The timing is right for the CCS to come forward and lend its expertise

with the goal of establishing national standards for access to cardiovascular services and procedures.

The proposed series of commentaries on access to cardiovascular care will support the development of reasonable standards to assure most Canadians that they will receive the most appropriate care within a safe and appropriate time frame, regardless of where they live. The commentaries will be about treating the right patient at the right time, and will propose solutions that incorporate the principles of transparency, accountability and broad consultation. Our aim is to facilitate the development of national standards that are worthy of the public's confidence and trust.

REFERENCES

1. Health Care in Canada Survey 2004. <http://www.mediresource.com/e/pages/hcc_survey/pdf/2004_hcic_rt.pps#767,2> (Version current at November 2, 2005).
2. Sullivan P. New CMA data confirm access-to-care concerns rising. <http://www.cma.ca/index.cfm/ci_id/4470/la_id/1.htm> (Version current at November 2, 2005).
3. Canadian Medical Association and Canadian Nurses Association. The Taming of the Queue: Toward a Cure for Health Care Wait Times. Discussion Paper, July 2004. <http://www.cna-nurses.ca/CNA/documents/pdf/publications/Taming_Queue_e.pdf> (Version current at November 2, 2005).
4. The Canadian Cardiovascular Society Workforce Project Steering Committee. Profile of the cardiovascular specialist physician workforce in Canada. Can J Cardiol 2002;18:835-52.
5. Standing Senate Committee on Social Affairs, Science and Technology. The Health of Canadians – The Federal Role: Final Report. Vol 6: Recommendation for Reform. Ottawa: Parliament of Canada, 2002.
6. Simpson CS, Hoffmaster B, Dorian P. Downward delegation of implantable cardioverter defibrillator decision-making in a restricted-resource environment: the pitfalls of bedside rationing. Can J Cardiol 2005;21:595-9.
7. *McInerney v. MacDonald*, [1992] 2 S.C.R. 138.
8. *Norberg v. Wynrib*, [1992] 2 S.C.R. 224.
9. *Law Estate v. Simice* [1994] B.C.J. No. (B.C.S.C.), aff'd [1995] B.C.J. No. 2596 (B.C.C.A.)
10. Cardiac Care Network of Ontario. Cardiac Care Within An Integrated System: The Cardiac Care Network of Ontario Perspective, February 6, 1997. <http://www.ccn.on.ca/pdfs/ccn-w-int-sys-feb97.pdf> (Version current at November 2, 2005).
11. The Canadian Cardiovascular Outcomes Research Team (CCORT). <http://www.ccort.ca/> (Version current at November 2, 2005).

Commentaire général sur l'accès aux soins cardiovasculaires au Canada : L'accès universel, mais quand ? Traiter le bon patient au bon moment

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Commentaire général sur l'accès aux soins cardiovasculaires au Canada : L'accès universel, mais quand ? Traiter le bon patient au bon moment

En 2004, la Société canadienne de cardiologie a formé un groupe de travail sur l'accès aux soins, dont le mandat consistait à utiliser les meilleures données scientifiques et la meilleure information disponibles afin d'établir des catégories de triage raisonnables et des temps d'attente sécuritaires pour obtenir des services et des interventions courants en santé cardiovasculaire, au moyen d'une série de commentaires. Le présent commentaire est le premier de la série et présente les enjeux reliés à l'accès rapide aux soins partagés par la totalité des services et des interventions en santé cardiovasculaire. Le commentaire décrit brièvement le « droit » à un accès rapide, les listes d'attente à titre d'outil de gestion du système de santé et le rôle du médecin à titre de défenseur des patients et de contrôleur d'accès. Il contient également des conseils à l'intention des bailleurs de fonds, des administrateurs et des dispensateurs qui doivent surveiller et gérer les listes d'attente pour améliorer l'accès aux soins cardiovasculaires au Canada et restaurer la confiance des Canadiens envers le système de santé subventionné par l'État.

Mots-clés : *Accessibilité aux services de santé; délais d'attente médicalement acceptable; listes d'attente; temps d'attente*

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In 2004, the Canadian Cardiovascular Society formed an Access to Care Working Group with a mandate to use the best science and information available to establish reasonable triage categories and safe wait times for common cardiovascular services and procedures through a series of commentaries. The present commentary is the first in the series and lays out issues regarding timely access to care that are common to all cardiovascular services and procedures. The commentary briefly describes the 'right' to timely access, wait lists as a health care system management tool, and the role of the physician as patient advocate and gatekeeper. It also provides advice to funders, administrators and providers who must monitor and manage wait times to improve access to cardiovascular care in Canada and restore the confidence of Canadians in their publicly funded health care system.

Key Words: *Health services accessibility; Medically acceptable wait times; Waiting lists; Wait times*

L'ENJEU

Les Canadiens ont clairement identifié les temps d'attente pour obtenir des soins médicaux et subir des tests diagnostiques comme un problème urgent dont les gouvernements doivent s'occuper. Un sondage annuel réalisé depuis 1999, et plus récemment en 2004, a révélé que moins de la moitié des Canadiens sondés étaient satisfaits de l'accès aux soins de santé à domicile et dans leur communauté (1). Selon un sondage récent réalisé pour le compte de l'Association médicale canadienne (AMC) (2), 49 % des Canadiens ont indiqué qu'un membre de leur famille ou eux-mêmes avaient dû attendre plus longtemps que ce qu'ils jugeaient être un délai raisonnable pour consulter un médecin spécialiste. Trente et un pour cent des répondants estimaient qu'ils avaient dû attendre trop longtemps pour subir des tests diagnostiques (une hausse par rapport à 14 % en 1999). Seulement 14 % des répondants croyaient qu'il y avait suffisamment de médecins au Canada. Manifestement, le public est de plus en plus angoissé au sujet de l'accès rapide aux soins de santé.

L'accès aux soins est au cœur des activités de lobbying de l'AMC et de l'Association des infirmières et infirmiers du Canada (3). Dans l'ensemble, les médecins cardiovasculaires partagent les mêmes préoccupations. Ainsi, dans le cadre d'un sondage mené en 2001 par la Société canadienne de cardiologie (SCC) auprès des spécialistes cardiovasculaires, la moitié des cardiologues sondés ont rapporté que les patients attendaient cinq jours ou plus pour une première visite auprès d'un spécialiste aux fins d'une consultation urgente. Pour une

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**Les opinions exprimées dans ce texte ne reflètent pas nécessairement les positions officielles des organismes affiliés indiqués.*

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recommandation non urgente, la moitié des cardiologues ont rapporté que les patients attendaient huit semaines ou plus pour obtenir une première consultation. Cinquante-deux pour cent ont rapporté que les temps d'attente moyens avaient augmenté au cours de l'année précédente (4).

L'amélioration de l'accès aux soins de santé est devenu le cri de ralliement de ceux et celles qui souhaitent rétablir la réputation ternie du système de santé canadien. Plusieurs estiment que le système est à la croisée des chemins, et que les bailleurs de fonds, les administrateurs et les fournisseurs de soins de santé doivent s'assurer de la capacité du système à répondre aux besoins projetés, tant actuels que futurs.

LE « DROIT » À UN ACCÈS RAPIDE

Une intéressante bataille juridique qui définira le droit des patients aux soins en temps opportun se dessine. Alors qu'initialement l'accessibilité, troisième de ce que l'on appelle les « cinq fondements » de la Loi canadienne sur la santé de 1984, ne visait qu'à prévenir la discrimination fondée sur l'âge, l'état de santé ou le revenu du patient pas et non à assurer la rapidité de l'accès aux soins, on étudie maintenant sérieusement le droit des Canadiens d'obtenir, en vertu de la Charte canadienne des droits et libertés, des soins en temps opportun.

Jusqu'à maintenant, aucun tribunal n'a statué que l'article 7 de la Charte garantissant le droit à la vie, à la liberté et à la sécurité de la personne devait être interprété de manière à reconnaître le droit des patients d'obtenir des soins en temps opportun, dans le cadre de notre système de santé financé par l'État. Par contre, plusieurs observateurs croient que les tribunaux devront éventuellement trancher la question. À titre d'exemple, le Comité sénatorial permanent des affaires sociales, des sciences et de la technologie a récemment indiqué :

> *« …le Comité estime que l'incapacité du système public de soins de santé à fournir les soins en temps opportun, comme en font foi les longues listes d'attente pour l'obtention des services, ouvre vraisemblablement la porte à une contestation judiciaire fondée sur la Charte contre les lois qui empêchent les Canadiens ou limitent leur droit de payer personnellement pour obtenir, au Canada, des services jugés nécessaires sur le plan médical, même lorsque tels services sont couverts par le régime public d'assurance santé.* » (5).

En juin 2004, la Cour suprême du Canada a entendu l'appel de l'affaire *Chaoulli c. Québec*, dans lequel les demandeurs plaidaient l'inconstitutionnalité de certaines dispositions de la Loi sur l'assurance-maladie et de la Loi sur l'assurance-hospitalisation du Québec au motif que celles-ci violaient l'article 7 de la Charte canadienne des droits et libertés. Les dispositions contestées interdisent aux assureurs privés de couvrir les services de santé déjà assurés par le régime de santé de la province. Les tribunaux inférieurs ont statué que les dispositions contestées n'étaient pas contraires à la Chartre.

Advenant que la Cour suprême accueille l'appel et décide que l'accès, en temps opportun, aux soins de santé est un droit protégé par la Charte, elle pourrait ouvrir la porte aux soins de santé privés. La demande pour un système privé des soins de santé ne cesse de croître et ne diminuera que si les gouvernements démontrent que la fourniture des soins en temps opportun, dans le cadre du système public de santé, leur tient à cœur et qu'ils sont prêts à fournir les fonds pour y parvenir. Les politiciens, fonctionnaires, gestionnaires, administrateurs et professionnels de la santé sont tous très motivés à résoudre ce problème.

LES LISTES D'ATTENTE COMME OUTIL DE GESTION DU SYSTÈME DE SANTÉ

Dans le système de santé canadien, les listes d'attente ont généralement été acceptées, du moins en principe, comme une conséquence du rationnement des ressources en matière de soins de santé. En fait, la plupart des fournisseurs de soins de santé sont d'opinion qu'une liste d'attente contrôlée avec triage approprié constituerait l'utilisation la plus efficace des ressources en soins de santé du système public. De fait, sans les listes d'attente, les salles d'opération seraient vides et les médecins n'auraient rien à faire en attendant l'arrivée de leur prochain patient. Pour garantir leur caractère légitime et équitable et afin de réduire au minimum les événements indésirables, les stratégies reliées aux listes d'attente doivent reposer sur des critères qui font l'objet d'un consensus et découlent de l'expérience clinique. De plus, on doit mettre en œuvre des mesures pour gagner la confiance du public, et le rassurer sur le fait que le système est sûr, équitable et transparent. Les médecins, les autres professionnels de la santé, les administrateurs d'hôpitaux et les représentants des gouvernement doivent s'engager dans le processus décisionnel et disposer d'un système de surveillance rigoureux qui fait le suivi des résultats individuels et de la population en général et de mécanismes permettant d'apporter des changements positifs fondés sur les commentaires liés à l'assurance de la qualité. Malheureusement, beaucoup trop souvent, le statut des listes d'attente individuelles reflète le montant des investissements que les bailleurs de fonds sont disposés à consacrer à la prestation de soins dans un domaine spécifique plutôt que de refléter la demande fondée sur la pertinence médicale.

LE RÔLE DU MÉCECIN À TITRE DE DÉFENSEUR DES DROITS DES PATIENTS ET DE CONTRÔLEUR DE L'ACCÈS AUX SOINS

Les listes d'attente deviennent dangereuses lorsqu'elles s'allongent parce que les ressources sont insuffisantes pour satisfaire la demande établie au plan médical. Cette situation peut être causée par une pénurie de médecins spécialistes ou le manque de disponibilité ou de ressources budgétaires des salles d'opération ou des laboratoires de cathétérisme ou d'électrophysiologie. Ces ressources font alors l'objet d'un rationnement parmi les patients qui en ont besoin. En réalité, les contraintes budgétaires entraînent inévitablement le rationnement des services lorsque la rareté des ressources ne permet pas de fournir le meilleur traitement à tous les patients, ni même à la plupart des patients, dans un délai optimal.

À l'échelle macro, les décisions sur le rationnement sont prises par ceux qui financent le système de santé (c.-à-d. les ministres des gouvernements) lorsqu'ils choisissent d'éliminer, de réduire ou de sous-financer les programmes de distribution des soins de santé. À l'échelle méso, les gestionnaires d'hôpitaux déterminent des plafonds pour certains programmes plus coûteux. À l'échelle micro, le rationnement relève des médecins. Ce rationnement « au lit du malade » est défini par les critères suivants :

- le patient doit recevoir des soins inférieurs aux meilleurs soins disponibles;
- les meilleurs soins doivent être refusés en raison des ressources sociales limitées; et
- le médecin doit avoir le contrôle sur la décision en matière de soins de santé (6).

Historiquement, les médecins ont toujours défendu les droits des patients. En outre, le devoir fiduciaire du médecin envers ses patients a été clairement établi au début des années '90 (en 1997 et 1998) dans deux décisions de la Cour suprême du Canada. Par contre, il ne semble exister aucune obligation légale correspondante obligeant un médecin à agir à titre de contrôleur de l'accès aux soins de santé. Un médecin ne peut contrôler l'accès aux soins de santé lorsqu'en agissant ainsi il violerait son devoir envers son patient. La loi énonce clairement, qu'en tout temps, le médecin doit agir dans le meilleur intérêt de son patient. Toutes les décisions sur les soins à fournir aux patients doivent être prises en fonction des connaissances médicales établies et conformément aux normes de pratique acceptées dont on s'attend d'un médecin raisonnable et compétent dans des circonstances similaires. Lorsque le devoir du médecin envers son patient est incompatible avec les contraintes financières du système de soins de santé, le devoir envers le patient doit primer. (9)

Le devoir d'un médecin envers son patient comprend trois éléments, soit l'obligation de fournir au patient des soins et un traitement conformes aux normes de pratique raisonnables; l'obligation d'informer le patient; et l'obligation de défendre l'intérêt du patient.

L'obligation d'informer le patient dépasse le simple fait d'obtenir un consentement éclairé. Elle comprend également l'obligation d'informer le patient de toutes les études et options thérapeutiques disponibles, que celles-ci soient offertes dans la communauté locale ou ailleurs. Au Canada, l'étendue de l'obligation de défendre les intérêts du patient n'a pas encore été définie dans ses moindres détails, mais elle comprendrait probablement pour le médecin l'obligation de prendre les mesures pour défendre d'une manière raisonnable l'intérêt de son patient à obtenir les ressources raisonnablement nécessaires pour lui fournir les soins appropriés.

Alors qu'on demande de plus en plus souvent aux médecins de jouer le rôle de contrôleur de l'accès aux soins, le fait d'accéder à telle demande pourrait contrevenir directement aux obligations qu'ils ont envers leurs patients et qui résultent de la loi ou de l'éthique. Les médecins sont confrontés à un dilemme clinique et moral dans lequel les pressions budgétaires pourraient influencer leurs décisions d'une manière qui serait incompatible avec le meilleur intérêt d'un patient.

Tant individuellement que par l'entremise de leurs associations professionnelles, les médecins jouent un rôle important dans la défense de l'intérêt de leurs patients et du grand public pour s'assurer que les décideurs détiennent les informations et connaissances appropriées pour décider des niveaux des ressources publiques qui seront affectées aux diverses priorités concurrentielles du système de santé public. De plus, les médecins et leurs associations professionnelles jouent un rôle important dans l'élaboration d'un consensus au sein de la profession et, lorsque possible, de lignes directrices et de normes appropriées pour la répartition et l'utilisation des ressources limitées en soins de santé.

Les médecins ne devraient pas être tenus d'assumer la principale fonction liée à la répartition des ressources dans le système de santé. Cette responsabilité devrait plutôt être assumée par ceux qui fournissent les fonds et déterminent où et comment telles sommes seront dépensées. Si le système de santé persiste à sous-financer la prestation des soins, permettant ainsi aux considérations budgétaires de l'emporter sur les besoins individuels des patients, ceux qui financent ce système devraient être prêts à reconnaître et défendre publiquement leurs décisions, et à s'engager à concevoir un système institutionnel, lequel est nécessaire afin d'assurer la transparence et la légitimité du processus de rationnement.

SYSTÈMES PROVINCIAUX POUR SURVEILLER ET GÉRER LES LISTES D'ATTENTE POUR LES SOINS CARDIOVASCULAIRES

Il n'existe aucune norme nationale applicable à l'accès aux interventions cardiovasculaires ou aux consultations au cabinet. Certaines provinces ont fixé des cibles pour certaines interventions (p. ex., le pontage coronarien, l'intervention percutanée coronarienne et le cathétérisme diagnostique), mais ces cibles ne sont pas uniformes à l'échelle du pays.

Il est pertinent de rappeler que le Réseau de soins cardiaques (RSC) de l'Ontario a été créé au début des années '90 suite au décès d'un patient alors qu'il était inscrit sur la liste d'attente pour un pontage coronarien en Ontario. À l'époque, les retombées politiques négatives qui en ont résultées découlaient de la perception que les listes d'attente étaient mal gérées, ce qui a provoqué la naissance du RSC. Comme preuve du succès du RSC, la mortalité associée à la liste d'attente pour un pontage coronarien s'est maintenue depuis 1997 bien en deça de 0,5 % (le point de repère) grâce à la mise en œuvre d'un système de score de classification par degré de priorité et l'établissement de temps d'attente maximaux recommandés (10) et spécifiques à chaque score.

Les gouvernements et les organismes des autres provinces ont aussi mis en œuvre des projets reliés aux listes d'attente, y compris des registres de listes d'attente chirurgicales en Colombie-Britannique, au Québec, au Manitoba et en Alberta; le Réseau de soins chirurgicaux de la Saskatchewan (*Saskatchewan Surgical Care Network*), le Projet de surveillance des temps d'attente en Nouvelle-Écosse (*Nova Scotia Provincial Wait Time Monitoring Project*); et le Projet sur les listes d'attente dans l'Ouest du Canada (*Western Canada Wait List Project*).

INITIATIVES GOUVERNEMENTALES VISANT À AMÉLIORER L'ACCÈS AUX SOINS

Les préoccupations croissantes du public et des professionnels à propos des temps d'attente étaient un thème prioritaire de la dernière campagne électorale fédérale. Étant une des principales causes de décès et d'incapacité chez les Canadiens, l'accès aux soins cardiovasculaires était l'un des secteurs prioritaires qui avait été identifié par le gouvernement fédéral.

Les Premiers ministres ont convenu que l'établissement de rapports publics clairs sur le rendement du système de santé, y compris les temps d'attente pour des services diagnostiques et thérapeutiques clés, devait constituer une priorité. En outre, la plus récente Conférence des Premiers ministres sur les soins de santé a créé un fonds de réduction des temps d'attente de 4,5 milliards $, par lequel le gouvernement fédéral exigera des provinces qu'elles élaborent et communiquent des « données comparables » sur l'accès aux soins, en plus d'établir des points de repère pour des temps d'attente médicalement acceptables dans les domaines prioritaires.

SOLUTIONS POSSIBLES

On peut commencer à chercher une solution aux obstacles à l'accès aux soins en prenant comme modèle le plan en 10 points établi dans le document de réflexion produit par l'AMC

TABLEAU 1
Termes utilisés dans les commentaires sur l'accès aux soins de santé

Terme	Définition
Temps d'attente	Pour les consultations, laps de temps qui s'écoule entre la recommandation par un médecin de famille et la première consultation auprès d'un spécialiste; pour les tests diagnostiques, laps de temps qui s'écoule entre la décision de fournir un service et la prestation du service; pour les interventions thérapeutiques (y compris les chirurgies), laps de temps qui s'écoule entre la décision de traiter et l'intervention.
Indicateur de temps d'attente	Mesure normalisée du temps d'attente pour un service de santé donné qui est comparable entre les juridictions et fournit un tableau précis des temps d'attente pour une cohorte de patients.
Normes pour les délais d'attente médicalement acceptables	Temps d'attente seuil pour un service de santé donné et un niveau de gravité au-delà duquel les meilleures données probantes disponibles et le consensus indiquent que l'état de santé d'un patient risque de subir des effets indésirables; ces lignes directrices visent à compléter, et non à remplacer, le jugement clinique du médecin.
Cible de temps d'attente	Temps d'attente visé pour un service de santé donné qui peut égaler ou surpasser le temps d'attente médicalement acceptable pour un pourcentage donné de patients; un objectif de temps d'attente est en vigueur pour une période donnée et représente une étape dans le continuum visant à atteindre le temps d'attente médicalement acceptable pour tous les patients.
Urgence	Mesure dans laquelle une action clinique immédiate s'impose d'après la gravité de l'état du patient et les avantages escomptés.
Score de classification par degré de priorité	Score s'appuyant sur la description clinique de l'état de d'un patient afin de déterminer le degré de priorité des soins.

« *Maîtriser les files d'attente : vers une solution aux délais de prestation des soins* » (3), qui traite du problème plus vaste des temps d'attente.

Établir les priorités à partir d'une vaste consultation
Les soins cardiovasculaires comprennent une vaste gamme de soins administrés par divers professionnels de la santé cardiovasculaire, ainsi que des tests diagnostiques et des interventions thérapeutiques. On peut affirmer que l'accès aux soins cardiovasculaires commence par l'accès à la consultation d'un spécialiste par des praticiens de premier recours. L'accès à la modification des facteurs de risque est extrêmement important dans la prévention des maladies ou la modification de l'évolution des maladies. On a démontré que l'accès aux interventions thérapeutiques, comme la stimulation biventriculaire, le défibrillateur interne, l'intervention percutanée coronarienne et la chirurgie cardiaque, améliore la longévité et la qualité de vie des patients. L'accès à de nouveaux médicaments et dispositifs émergents constitue aussi un défi croissant pour nos ressources financières déjà sollicitées au maximum, et on doit élaborer des stratégies à la fois justes et équitables pour les instaurer. Le public et les principales parties prenantes doivent participer à cette discussion. Dans un système à payeur unique, on ne peut accorder de légitimité aux décisions des gouvernements fondées uniquement sur le caractère « abordable » des soins, sans égard à la sécurité des patients, aux résultats ou aux normes médicales.

Répondre aux attentes des patients et du public en communiquant ouvertement
Le taux de satisfaction des patients augmente lorsqu'ils ont confiance dans l'intégrité du système de gestion des listes d'attente. Les décisions doivent être prises de la manière la plus transparente qui soit et l'obligation de rendre compte au public doit exister, ce qui exige des bases de données plus robustes sur la stratification des risques, les listes d'attente et les résultats des soins cardiovasculaires.

Combler les écarts existants entre les ressources humaines et la capacité du système
Des efforts doivent être déployés pour planifier l'avenir en estimant la capacité existante et la capacité de croissance future dans chaque province. D'autres modèles de soins doivent être explorés. On doit établir des normes applicables à l'accès aux soins et évaluer ensuite la capacité des ressources actuelles de se conformer à ces normes.

Améliorer la collecte de données en investissant dans les systèmes d'information
Sans les systèmes d'information pour évaluer les temps d'attente et les résultats des listes d'attente, l'intelligence et l'efficacité du processus décisionnel est sérieusement compromise. Les efforts pour maintenir les temps d'attente à l'intérieur des limites fixées par les normes deviennent plus difficiles et la confiance du public diminue. Si l'on souhaite vraiment surveiller et améliorer l'accès aux soins cardiovasculaires, il est absolument essentiel d'investir dans l'infrastructure des bases de données et des systèmes d'information.

Établir des normes sur les temps d'attente fondés sur un consensus clinique et public
Des scores de classification par degré de priorité ou corrigés en fonction des risques et des temps d'attente médicalement acceptables peuvent être élaborés, éprouvés, vérifiés et mis en place dans un délai relativement court si l'on dispose des ressources pour ce faire. L'élaboration d'un critère ou d'un objectif corrigé en fonction du statut de risque représente une première étape cruciale pour gagner la confiance du public et établir le caractère équitable de l'accès pour ceux qui sont en attente.

Utiliser les rapports publics pour renforcer l'imputabilité
Toutes les juridictions doivent s'engager à rendre compte au public quant au maintien des normes établies. Lorsque les normes ou les cibles ne peuvent être satisfaites ou atteintes, il doit être possible d'identifier clairement à qui incombe la responsabilité de corriger la situation, et tant le problème que la solution pour y remédier doit être communiqué à la population.

Maximiser l'efficience en harmonisant les incitatifs
Travaillant dans le cadre des lignes directrices de pratique et étant pleinement responsable de leurs décisions cliniques, les médecins doivent être habilités à prendre des décisions relatives à l'administration des soins à fournir à chaque patient, et ce, en fonction du besoin et de l'admissibilité établie par consensus.

S'attaquer aux pressions en amont et en aval en investissant dans la continuité de soins

La prévention primaire et la prévention secondaire jouent chacune un rôle important dans l'accès à la continuité des soins. De même, l'accès aux soins primaires en vue d'une modification des facteurs de risque doit être considéré conjointement à l'accès aux soins spécialisés de niveau tertiaire et quaternaire dans le cas de maladie avancée. On doit considérer également toutes les sources de pression dans la continuité des soins.

Améliorer la transférabilité des soins en élargissant les choix de soins à l'extérieur du réseau provincial

Les patients qui sont éloignés des centres de soins cardiaques intégrés (y compris à l'extérieur de la province) bénéficieraient de l'amélioration des accords interprovinciaux sur la facturation réciproque et d'une rationalisation des processus qui permettent aux patients de se faire traiter à un endroit autre que là où les soins sont normalement fournis.

S'engager à adopter des meilleures pratiques en améliorant la recherche et la collaboration

Les chercheurs en santé cardiovasculaire travaillent depuis longtemps en équipes interdisciplinaires produisant des recherches concertées. Par exemple, l'équipe de recherche canadienne sur les résultats des soins en cardiologie (*Canadian Cardiovascular Outcomes Research Team*, ou CCORT), établie en 2001 (11), a contribué d'une manière importante à l'ensemble de la documentation sur les services de santé et à la recherche sur les résultats des soins au Canada. Ce groupe et d'autres chercheurs peuvent jouer un rôle clé dans la coordination d'équipes multidisciplinaires en soins cliniques et en recherche interinstitutionnelles et interprovinciales.

LA RÉPONSE DE LA SCC

La SCC est l'association professionnelle nationale des spécialistes et des chercheurs en santé cardiovasculaire au Canada. En 2002, lors de la séance sur les politiques publiques du congrès de la SCC, le sénateur Wilbert Keon a déclaré qu'une société professionnelle nationale comme la SCC devait jouer un rôle important, lequel consiste à élaborer des normes nationales pour l'accès aux soins cardiovasculaires pouvant être validées et adoptées ou adaptées par les provinces. Il a également noté que c'était le bon moment pour de telles initiatives, vu que les décideurs et le système de santé étaient confrontés à divers problèmes liés à l'accès aux soins et aux temps d'attente.

Une société professionnelle comme la SCC, dont les membres sont des spécialistes cardiovasculaires, est dans une position idéale pour amorcer une discussion à l'échelle nationale et formuler des commentaires sur les normes appropriées en matière d'accès aux soins à l'égard des services et des interventions en santé cardiovasculaire. Au printemps 2004, le conseil de la SCC a formé un groupe de travail sur l'accès aux soins, dont le mandat consistait à utiliser les meilleures données scientifiques et la meilleure information disponibles afin d'établir des catégories de triage raisonnables et des temps d'attente sécuritaires pour obtenir des services et des interventions fournis couramment en santé cardiovasculaire, et ce, au moyen d'une série de commentaires.

Ces commentaires résumeront les différences existant présentement dans les normes et les temps d'attente à travers le Canada, là où cette information est disponible. Ils résumeront aussi les données dont on dispose actuellement, se concentreront sur la relation existant entre les risques d'un effet indésirable et l'allongement des temps d'attente, et identifieront les lacunes dans les données existantes. Faisant appel aux meilleures données probantes et au consensus des spécialistes, chaque commentaire se prononcera d'abord sur la norme qui est médicalement acceptable pour l'accès aux soins pour le service ou l'intervention en santé cardiovasculaire. Les commentaires serviront aussi à faire appel aux chercheurs en santé cardiovasculaire afin de combler les lacunes de cet ensemble de connaissances et valider de manière plus poussée les temps d'attentes sécuritaires pour des profils spécifiques de risque de patients.

Les définitions des termes en matière d'accès aux soins utilisés dans les commentaires du Groupe de travail sur l'accès aux soins sont présentées dans le tableau 1.

CONCLUSIONS

Jamais dans l'histoire de la prestation des soins de santé au Canada, l'accès aux soins n'a-t-il constitué une priorité aussi urgente pour le public, les professionnels de la santé, les administrateurs et les décideurs. C'est le bon moment pour la SCC d'offrir son expertise dans le but d'établir des normes pour l'accès aux services et aux interventions en santé cardiovasculaire qui pourront s'appliquer à l'échelle du pays.

La série proposée de commentaires sur l'accès aux soins cardiovasculaires contribuera à l'élaboration de normes raisonnables pour garantir à la plupart des Canadiens qu'ils pourront recevoir les soins les plus appropriés dans un délai sûr et convenable, peu importe où ils résident. Les commentaires auront pour thème le traitement du bon patient au bon moment et proposeront des solutions intégrant les principes de transparence et d'imputabilité et ayant fait l'objet d'une vaste consultation. Notre objectif est de faciliter l'élaboration de normes nationales qui gagneront la confiance du public.

RÉFÉRENCES

1. Health Care in Canada Survey 2004. <http://www.mediresource.com/e/pages/hcc_survey/pdf/2004_hcic_rt.pps#767,2> (Version courante au 2 novembre 2005).
2. Sullivan P. New CMA data confirm access-to-care concerns rising. <http://www.cma.ca/index.cfm/ci_id/4470/la_id/1.htm> (Version courante au 2 novembre 2005).
3. Association médicale canadienne et Association des infirmières et infirmiers du Canada. *Maîtriser les files d'attente : vers une solution aux délais de prestation des soins*. Document de réflexion, juillet 2004. <http://www.cna-nurses.ca/CNA/documents/pdf/publications/Taming_Queue_f.pdf> (Version courante au 2 novembre 2005).
4. The Canadian Cardiovascular Society Workforce Project Steering Committee. Profile of the cardiovascular specialist physician workforce in Canada. Can J Cardiol 2002;18:835-52.
5. Standing Senate Committee on Social Affairs, Science and Technology. The Health of Canadians – The Federal Role: Final Report. Vol 6: Recommendation for Reform. Ottawa: Parliament of Canada, 2002.
6. Simpson CS, Hoffmaster B, Dorian P. Downward delegation of implantable cardioverter defibrillator decision-making in a restricted-resource environment: the pitfalls of bedside rationing. Can J Cardiol 2005;21:595-9.
7. *McInerney v. MacDonald*, [1992] 2 S.C.R. 138.
8. *Norberg v. Wynrib*, [1992] 2 S.C.R. 224.
9. *Law Estate v. Simice* [1994] B.C.J. No. (B.C.S.C.), aff'd [1995] B.C.J. No. 2596 (B.C.C.A.)
10. Cardiac Care Network of Ontario. Cardiac Care Within An Integrated System: The Cardiac Care Network of Ontario Perspective, le 6 février 1997. <http://www.ccn.on.ca/pdfs/ccn-w-int-sys-feb97.pdf> (Version courante au 2 novembre 2005).
11. The Canadian Cardiovascular Outcomes Research Team (CCORT). <http://www.ccort.ca/> (Version courante au 2 novembre 2005).

Treating the right patient at the right time: Access to specialist consultation and noninvasive testing

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The Council of the Canadian Cardiovascular Society commissioned working groups to examine issues of access to, and wait times for, various aspects of cardiovascular care. The present article summarizes the deliberations on targets for medically acceptable wait times for access to cardiovascular specialist evaluation and on the performance of noninvasive testing needed to complete this evaluation. Three categories of referral indications were identified: those requiring hospitalization due to substantial ongoing risk of mortality and morbidity; those requiring an expedited early review in an ambulatory setting; and, finally, a larger category in which delays of two to six weeks can be justified. The proposed wait time targets will provide guidance on the timeliness of care to busy clinicians charged with the care of patients with cardiovascular disease, help policy makers appreciate the clinical challenges in providing access to high-quality care, and highlight the critical need for a thoughtful review of cardiology human resource requirements. Wait time implementation suggestions are also included, such as the innovative use of disease management and special need clinics. The times proposed assume that available clinical practice guidelines are followed for clinical coronary syndrome management and for treatment of associated conditions, such as hypertension, diabetes, renal disease, smoking cessation and lipid disorders. Although media attention tends to focus on wait times for higher profile surgical procedures and high technology imaging, it is likely that patients face the greatest wait-related risk at the earlier phases of care, before the disease has been adequately characterized.

Key Words: *Access; Canadian Cardiovascular Society; Consultation; Noninvasive testing; Wait times*

Traiter le bon patient au bon moment : l'accès aux spécialistes et aux examens non effractifs

Le Conseil de la Société canadienne de cardiologie a demandé à des groupes de travail d'examiner les problèmes liés à l'accès aux soins cardiovasculaires ainsi qu'au temps d'attente. L'article présente un résumé des discussions sur l'établissement des cibles pour des délais d'attente médicalement acceptables en vue d'évaluations par des spécialistes en médecine cardiovasculaire ainsi que sur la réalisation d'examens non effractifs, nécessaires à la conduite de ces évaluations. Trois catégories d'indications ont été établies pour les renvois : hospitalisation nécessaire en raison d'un risque important et persistant de mortalité ou de morbidité; examens précoces, dans un bref délai, en service de soins ambulatoires; examens dans un délai acceptable de deux à six semaines (catégorie la plus importante). Les cibles proposées relativement aux délais d'attente guideront les cliniciens très occupés, chargés de traiter les patients cardiaques quant à la rapidité des soins, aideront les décideurs à évaluer l'ampleur des difficultés cliniques à offrir des soins de grande qualité, qui soient à la fois accessibles et feront ressortir avec acuité la nécessité absolue de procéder à un examen exhaustif des ressources humaines en cardiologie. On y trouvera également des suggestions sur la mise en œuvre des cibles relatives au temps d'attente, par exemple l'application novatrice de la prise en charge des maladies et les services de besoins particuliers. Les délais proposés supposent l'application des lignes directrices en matière de pratique clinique pour la prise en charge de syndromes coronariens cliniquement décelables et pour le traitement d'affections associées comme l'hypertension artérielle, le diabète, les maladies rénales, l'abandon du tabagisme et les dyslipidémies. Même si les médias ont tendance à porter leur attention sur les délais d'attente en vue d'interventions chirurgicales délicates et d'imagerie à la fine pointe de la technologie, les risques les plus grands liés à l'attente se situent plutôt au début du processus de soins, avant que la maladie ait été correctement diagnostiquée.

In 2004, the Council of the Canadian Cardiovascular Society formed a working group ('Working Group') to address issues of access to care for a wide range of cardiovascular services in Canada. The intention was not to define maximal limits of wait time acceptability. Rather, the goal was to propose targets for medically acceptable wait times that paid due regard to specific clinical indications and the time-related impact of disease on patients. Furthermore, these access reviews were to include practical implementation recommendations to promote reduced patient morbidity and mortality, and to minimize the personal, financial and work-related stress that can lead to care delays.

Although queues for bypass surgery and the potential impact of their delays have historically attracted the most access-related media attention, the greatest delay-related risk exists at an earlier stage in the care process, before the diagnosis and disease severity have been adequately characterized (1,2). The current report is directed to these very early stages of care, specifically, access to specialist consultation and the noninvasive testing strategies necessary to complete this timely

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TABLE 1
Medically acceptable wait times (MAWTs) for hospital-based referral and expedited consultation

Indication	Priority categories	MAWT	Comment on MAWT
Hospital-based referral and testing			
Acute coronary syndromes	Known or suspected STEMI or NSTEMI	–	These indications would be best facilitated by hospital-based evaluation and urgent referral
	Rest pain consistent with ischemia	–	
Arrhythmias	Hemodynamically significant or conduction disorder (including atrial fibrillation with rapid ventricular response)	–	
Heart failure	New onset of New York Heart Association class III or IV	–	
Endocarditis	Known or suspected	–	
Cardiac tamponade	–	–	
Aortic dissection	–	–	
Pulmonary embolism	Suspected or untreated known	–	
Assessment for urgent noncardiac surgery	–		
Embolism	With suspected cardiac source	–	
Postcardiac transplantation	With suspected rejection	–	
Syncope	With prior myocardial infarction or significant left ventricular dysfunction or aortic stenosis	–	
Prosthetic valve dysfunction	Suspected with hemodynamic compromise	–	
Hypertensive crisis	–	–	
Expedited consultation			
Atrial fibrillation	Initial onset without associated chest pain or hemodynamic compromise	Within 1 week	These indications are best dealt with in the emergency department setting
Supraventricular tachycardia	Symptomatic or hemodynamic instability	Within 1 week	
Ventricular tachycardia	Asymptomatic	Within 1 week	
Angina	Crescendo or initial onset without rest pain	Within 1 week	A rapid assessment chest pain clinic environment is particularly suited to this indication
Congestive heart failure	New onset or known with deterioration in patients with ischemic and nonischemic heart disease	Within 1 week	This indication should receive expedited handling by echocardiography laboratories whether ordered by primary care physicians or cardiologists*
Syncope	With structural heart disease	Within 1 week	–
	With electrocardiographic evidence for possible cause	Within 1 week	–

**See reference 2. NSTEMI Non-ST segment elevation myocardial infarction; STEMI ST segment elevation myocardial infarction*

consultative process. In addition, geographical and other sociocultural variables are likely to have a greater impact on access to specialist consultation than on access to highly centralized specific surgical and nonsurgical interventions, which may be proposed once the nature and extent of disease have been adequately characterized.

In this review process, a full electronic review of the literature was performed in a quest for guidance on the issue of specialist access. While clinical practice may be guided by published best clinical practices, there are little data available on timing aspects of care, except in the most acute cardiac conditions. For this reason, the specialist access timing recommendations contained herein are largely based on the expert opinions of the Working Group. Studies identified in literature reviews that bear on the general issues of access and noninvasive testing are cited herein.

HOSPITAL-BASED REFERRAL AND TESTING

Timely access to specialist referral and noninvasive assessment are generally available to patients directly admitted to hospital after presenting to an emergency department with acute symptoms of putative cardiac origin. Early specialist access in these cases may be motivated more by diagnostic uncertainty than by identifiable risk. There is, however, an important group of patients with referral indications who do require in-hospital care for the very real risk of death and disability that can persist even after initiation of definitive therapy. Preference for a hospital environment exists for these indications even though specialists may be available for outpatient assessment on short notice. The top portion of Table 1 ("Hospital-based referral and testing") lists these priority cardiac indications.

EXPEDITED CONSULTATION

The term 'expedited consultation' is applied when clinical circumstances require assessment and treatment within a matter of a few days, and not necessarily in the hospital setting. Such conditions are outlined in the lower portion of Table 1 ("Expedited consultation"). Although some cardiology specialist practices have the short-term flexibility to accommodate these referrals, most do not due to complex and variable professional demands. An expedited consultation request usually requires direct discussion between the referring doctor and the specialist to clarify the level of diagnostic certainty, the clinical need and the most appropriate course of action. Options for expedited consultation include the following:

- Assessment by a specialized multidisciplinary team, eg, for heart failure (3);

- Referral to another specialist who is able to accommodate the time target;
- Referral to a rapid assessment chest pain clinic; and
- Urgent specialist evaluation performed in an emergency department or suitable outpatient area.

Who is responsible for setting the level of referral urgency? The view is widely held that until a family physician verbally discusses a case with a specialist, a written or faxed consultation request is insufficient to transfer the responsibility for delay-related risk to the specialist. The Working Group encourages the practice of verbal exchanges between primary care physicians and specialists, particularly when compliance with the proposed wait times is not thought to be achievable.

OUTPATIENT SPECIALIST REFERRAL AND NONINVASIVE TESTING

Table 2 outlines the proposed medically acceptable wait times for less urgent but more common referral indications. The appropriate timing of indicated noninvasive testing is also provided.

A specialist assessment delay of one to two weeks or longer is reasonable for referral indications in this category. It is less clear which upper wait time limits should be placed on the lowest priority indications for specialist referral. Delays in the diagnosis of cardiac disease, and in the subsequent clarification of treatment options and prognosis, often impose profound psychosocial, professional and financial stress on patients quite independently of the risk of death and significant morbidity. There is no objective way to modify medically acceptable wait times to adequately reflect these concerns. For this reason, the strong opinion-based consensus emerged among the Working Group members that six weeks should be adopted as the absolute upper wait time target for lower urgency referral indications. Furthermore, the intervals proposed herein should include the performance of all noninvasive tests required to complete a consultation. The six-week limit would not apply to scheduled follow-up visits, patient-initiated risk factor assessments or medical review requests, or to job or insurance-related requests for a specialist opinion. Also, there may be exceptions to this six-week limit in the case of a primary specialist referral to a subspecialist. For instance, delays of up to three months may be appropriate when a general cardiologist has assessed a patient and then requests an electrophysiology consultation for certain indications.

PRECONSULTATION NONINVASIVE TESTING AND INFORMATION TRANSFER

Consultation efficiency is, in part, determined by effective prereferral screening and appropriate data exchange between the referring physician and the consultant. The minimum information accompanying new referrals should include the following:

- The details of the most recent cardiac investigations or procedures;
- Copies of the most recent cardiovascular consultations;
- The indication for reassessment, if a patient has been previously evaluated; and
- A current list of medications, noncardiac diseases and allergies.

For many referral indications, members of the Working Group believed that consultants would prefer to see, or at least discuss, the patient before arranging for noninvasive testing (other than basic blood work, electrocardiography and a chest x-ray), even at the cost of potentially delaying completion of the consultative process. Clearly, there are some exceptions to this. For patients with congestive heart failure (CHF)-related indications for specialty referral, increasing general practitioner access to echocardiography has been shown to result in improved diagnostic certainty and the adoption of treatment strategies more in keeping with treatment guidelines (4). On the other hand, the routine use of transthoracic echocardiography for indications such as assessment for noncardiac surgery is of limited value (5).

The potential does exist for unnecessary noninvasive tests to be performed during the specialist assessment waiting period in a well-meaning attempt by referring physicians to secure a more favourable queue position for their patients. The avoidance of unnecessary noninvasive testing in the preconsultation period would result in better access to testing by patients in need. Unnecessary testing may be minimized by more effective communication at the time of referral.

PRECONSULTATION TREATMENT

For patients with established cardiac disease, clinical practice guidelines are readily available for treatment of diabetes, hypertension and hyperlipidemia, as is the appropriate medical management after acute myocardial infarction, stable angina, atrial arrhythmia, heart failure and postintervention care. If these easy-to-follow guidelines were adhered to and smoking cessation strategies were initiated during the waiting period, the medical consequences of delays in specialist referral and testing would be reduced. Creative ways to achieve guideline compliance before consultation include the following:

- Encouraging primary care continuing medical education event organizers to include a discussion of all relevant clinical practice guidelines and a presentation of the wait time targets proposed herein;
- Encouraging regional primary care clinical practice guideline 'power users' to establish prereferral clinics;
- Encouraging the development of disease management programs, particularly for patients with ischemic heart disease, atrial fibrillation and CHF (3,6,7); and
- Asking cardiologists, on receipt of referral requests, to inform primary care physicians of the existence of relevant guidelines and how to access them.

ALTERNATIVES TO SPECIALIST REFERRAL

In regions with an inadequate number of cardiovascular specialists, general internists and even family physicians with additional training in cardiology have been called on to deal with the unmet demand for cardiac assessments. The quality of this alternative referral route is variable, but may not be the optimal strategy in some cases. For patients with CHF, cardiologists have been shown to exhibit a greater level of adherence to clinical practice guidelines than family physicians or internal medicine specialists (8-10). In addition, greater guideline compliance following cardiology referral is evident in elderly patients with acute coronary syndromes (11),

TABLE 2
Medically acceptable wait times (MAWTs) for outpatient referral and noninvasive testing

Indication	Priority categories	MAWT	Comment on MAWT	Indication-specific treatment-to-target recommendations	Noninvasive testing
Chest pain	Stable angina	4 weeks	The observation of strongly positive stress test results should lead to immediate telephone contact with the consultant because more urgent invasive testing may be indicated. This MAWT requires considerable discretion because there may be important modifiers based on patient anxiety levels and career implications	Acetylsalicylic acid, beta-blockers, lipid-lowering medications, nitrates	The MAWT should include performance of the tests below (exercise treadmill test, and exercise or pharmacological imaging study), when appropriate. Waits for regular or nuclear stress tests should not exceed two weeks because there are frequently personal and professional implications of prolonged waits once a stress test is proposed. • Exercise treadmill testing – for the chest pain indications (above), consultation is commonly initiated after the treadmill testing due to the presence of a positive test or confounding factors • Exercise or pharmacological imaging study (echocardiographic or nuclear). To be considered in the presence of exercise limitations, ECG abnormalities or other confounding factors
	Atypical chest pain	6 weeks	This limit may not always be appropriate in women because presenting symptoms of serious disease are frequently atypical. If a stress test has been performed with no evidence of ischemia, and risk factors have been appropriately modified, the need for consultation could be reassessed		
NYHA class I or II heart failure	Valvular heart disease With aortic stenosis With deterioration Without deterioration	 2–4 weeks 1–2 weeks 4 weeks	 Depending on level of symptoms Depending on clinical course –	Beta-blockers, ACE inhibitors, statins, acetylsalicylic acid	Echocardiography – there is evidence to support routine ordering of echocardiography by referring physicians with this indication. It should be performed before consultation and within one week of ordering the test
	Ischemic heart disease Known CHF without deterioration	4 weeks	This is a very common clinical problem effectively handled by many family physicians and internists		
	Nonischemic heart disease Known CHF without deterioration	6 weeks	–		
Dizziness or syncope	Recurrent syncope	–	Committee opinions vary widely because nature and consequences of symptomatic episodes must be factored in. Telephone discussion between referring physician and cardiologist is desirable. Often a simple review of the baseline ECG will give valuable diagnostic clues well before full assessment (eg, long QT, WPW, Brugada syndrome)	Identify potentially proarrhythmic medications Identify and treat electrolyte disorders Examine for orthostatic hypotension and institute precautionary measures before consultation	Considering urgency and range of diagnostic possibilities, no tests should be mandated before consultation, apart from an ECG. Tests are usually best left to the discretion of the cardiologist. The tests may include: • Ambulatory ECG (Holter or loop recorder) – MAWT: 2 weeks • Echocardiography – MAWT: 2 weeks • Stress test – after consultation, if needed • Tilt-table – after consultation, urgency to be determined
	Orthostatic hypotension	6 weeks	–		
Atrial fibrillation	Chronic or recurrent	6 weeks	More urgent consultation and treatment with uncontrolled rates	Anticoagulation (in all cases; if contraindication, this is indication for urgent telephone consultation) Rate control with beta-blockers, digoxin or calcium antagonists	Ambulatory ECG (Holter or loop recorder) – when diagnosis is suspected, but not confirmed. To be performed within the above 6-week MAWT total Echocardiography – evidence supporting routine prereferral testing is weak
Heart murmurs	Initial discovery – asymptomatic	6 weeks	–	Bacterial endocarditis prophylaxis for lesions prone to infection	Chest x-ray Echocardiography – not routinely needed before consultation. If it has been performed, the report should accompany referral
	Chronic – asymptomatic	6 weeks	–		

Continued on next page

TABLE 2 – continued
Medically acceptable wait times (MAWTs) for outpatient referral and noninvasive testing

Indication	Priority categories	MAWT	Comment on MAWT	Indication-specific treatment-to-target recommendations	Noninvasive testing
Assessment for noncardiac surgery*	Need for urgent noncardiac surgery	Before optimal surgical date	Such as cancer, unstable vascular disease, abdominal or orthopedic disease	–	Routine testing is not indicated before consultation
	Other	4 weeks	Planned nonurgent noncardiac surgery		
Palpitations	Intermittent supraventricular tachycardia documented	6 weeks	Hemodynamically stable and unsustained	–	Not routinely needed, but report should be faxed to cardiologist's office with referral request when event recording or echocardiography has been performed
	Other	6 weeks	–	–	
Pregnancy-related assessment	Prepregnancy risk assessment	6 weeks	Management and family counselling before or during pregnancy in adults with congenital heart disease or significant valvular heart disease can be complex and is often best managed through multidisciplinary specialized clinics	–	Apart from ECG, not indicated before consultation
	Pregnancy with known structural heart disease	2 weeks			
Nonspecific assessment requests	–	6 weeks	–	–	–

**Known coronary artery or structural heart disease. ACE Angiotensin-converting enzyme; CHF Congestive heart failure; ECG Electrocardiogram; NYHA New York Heart Association; WPW Wolff-Parkinson-White syndrome*

and it has been confirmed that cardiologists are more likely than general internists to promote more focused investigation strategies in patients with complex presentations (12).

Perhaps a more efficient alternative to asking physicians with less cardiovascular training to handle complex assessments is the adoption of regional disease management programs, with design and operations input from regional cardiology programs, and operating with published treatment algorithms that follow published clinical practice guidelines. Rapid assessment chest pain clinics, for example, have proven effective in expediting consultation with reduction in hospital admissions for patients with atypical pain syndromes (1,13,14).

The important issue of cardiology human resources is being separately addressed by the Canadian Cardiovascular Society. The Society has found a significant shortfall in the number of cardiovascular specialists, with 21% of consulting cardiologists reporting outpatient consultation waits of more than three months (15). In other jurisdictions, both nationally and internationally, this shortfall has been addressed by different methods. The Access to Specialist Group strongly recommends that these innovative methods be investigated, particularly the advanced access approaches involving regional multidisciplinary teams grounded in clinical practice guideline compliance. There is promise that these techniques may significantly reduce wait times, improve both patient and provider satisfaction, and reduce risk in patients awaiting consultation.

COMPLIANCE WITH WAIT TIME INTERVALS

The timelines proposed herein should be posted and readily available in the offices of cardiologists and referring physicians. It is hoped that the present dissemination will lead to their acceptance, adoption and adherence. No unifying solution was identified for a case in which regional circumstances prevented a cardiologist from complying with these timelines. It was believed, however, that specialists have an obligation to let referring doctors know whether they are unable to see a patient within the safe access target times outlined in the present paper. It is then the expectation that a physician-to-physician discussion should take place to better characterize the wait-related risk, and to explore investigation and treatment options.

A thorough evaluation is urgently needed in cardiology to address the training positions needed to develop an adequate number of subspecialty cardiologists. But apart from training and recruitment, are there other steps that can be taken to improve access to specialist referral? The Working Group identified three areas worthy of consideration. First, it is thought that a national discussion is overdue on the legal and professional obligations of specialists to perform more routine follow-up testing and consultation. For example, does a patient who has been successfully revascularized and is clinically stable after a myocardial infarction, with secondary prevention measures in place, need recurrent visits to the cardiovascular specialist, often with repeated follow-up echocardiography and treadmill testing? Will freeing our cardiology clinics from these 'walking well', by returning them to their primary caregivers, free space for more timely consultations for those in greatest need? The issue is complex because diligent specialists are not always confident that important issues such as medication and lifestyle modification are monitored adequately by primary care physicians, who are in short supply in many regions. Most specialists would agree, however, that the accumulated demands of 'old patients' and post-discharge care expectations render specialists progressively less available to patients who require new investigation the longer a cardiologist is in practice. Second, there may be ways that operations and scheduling efficiencies can be improved in individual and group practices, for example, through the use of new

electronic medical record and communication technology. Improved integration and transfer of clinical assessments and diagnostic testing information would expedite care and minimize morbidity. Finally, there should be a coordinated assault on the dearth of information available on the access to specialist problem. Governments, research organizations and clinical specialty groups should encourage innovation in service delivery models, including the prospective collection of meaningful outcome-focused data to inform policy, practice and funding.

CONCLUSIONS

The potential for significant delays exists at many points in the process of care after a patient develops clinically evident cardiac disease. It is likely that the patient is most vulnerable to important delay-related risk in the earliest phases before the cardiac illness has been adequately characterized. Indication-based, medically acceptable wait times are proposed for a broad range of referral indications, and suggestions are included as to how these times may be adopted in clinical practice. Where resources appear incompatible with these time limit suggestions, effective communication among physicians is needed to clarify risk and define appropriate care plans. Although it is hoped that the recommendations and targets proposed herein will reduce the magnitude of the specialty access problem, it is clear that a critical shortage in cardiology human resources exists and demands an urgent systematic review by professional societies, universities and health ministries.

REFERENCES

1. Natarajan MK, Mehta SR, Holder DH, et al. The risks of waiting for cardiac catheterization: A prospective study. CMAJ 2003;167:1233-40. (Errata in 2003;168:152 and 2003;168:1529).
2. Alter DA, Newman AM, Cohen EA, Sykora K, Tu JV. The evaluation of a formalized queue management system for coronary angiography waiting lists. Can J Cardiol 2005;21:1203-9.
3. McAlister FA, Stewart S, Ferrua S, McMurray JJ. Multidisciplinary strategies for the management of heart failure patients at high risk for admission: A systematic review of randomized trials. J Am Coll Cardiol 2004;44:810-9.
4. Francis CM, Caruana L, Kearney P, et al. Open access echocardiography in management of heart failure in the community. BMJ 1995;310:634-6.
5. Halm EA, Browner WS, Tubau JF, Tateo IM, Mangano DT. Echocardiography for assessing cardiac risk in patients having noncardiac surgery. Study of Perioperative Ischemia Research Group. Ann Intern Med 1996;125:433-41. (Erratum in 1997;126:494).
6. Smith LE, Fabbri SA, Pai R, Ferry D, Heywood JT. Symptomatic improvement and reduced hospitalization for patients attending a cardiomyopathy clinic. Clin Cardiol 1997;20:949-54.
7. Young W, Rewa G, Goodman SG, et al. Evaluation of a community-based inner-city disease management program for postmyocardial infarction patients: A randomized controlled trial. CMAJ 2003;169:905-10.
8. Baker DW, Hayes RP, Massie BM, Craig CA. Variations in family physicians' and cardiologists' care for patients with heart failure. Am Heart J 1999;138:826-34.
9. Bellotti P, Badano LP, Acquarone N, et al; OSCUR Investigators. Specialty-related differences in the epidemiology, clinical profile, management and outcome of patients hospitalized for heart failure; the OSCUR study. Oucome dello Scompenso Cardiaco in relazione all'Utilizzo delle Risore. Eur Heart J 2001;22:596-604.
10. Philbin EF, Weil HF, Erb TA, Jenkins PL. Cardiology or primary care for heart failure in the community setting: Process of care and clinical outcomes. Chest 1999;116:346-54.
11. Reis SE, Holubkov R, Zell KA, Edmundowicz D, Shapiro AH, Feldman AM. Unstable angina: Specialty-related disparities in implementation of practice guidelines. Clin Cardiol 1998;21:207-10.
12. Glassman PA, Kravitz RL, Petersen LP, Rolph JE. Differences in clinical decision making between internists and cardiologists. Arch Intern Med 1997;157:506-12.
13. Dougan JP, Mathew TP, Riddell JW, et al. Suspected angina pectoris: A rapid-access chest pain clinic. QJM 2001;94:679-86.
14. Reeder GS. Exercise testing in rapid-access clinics for assessment of chest pain. Lancet 2000;356:2116.
15. Higginson LA. Profile of the cardiovascular specialist physician workforce in Canada, 2004. Can J Cardiol 2005;21:1157-62.

Treating the right patient at the right time: Access to echocardiography in Canada

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The Canadian Cardiovascular Society is the national professional society for cardiovascular specialists and researchers in Canada. In the spring of 2004, the Canadian Cardiovascular Society Council formed the Access to Care Working Group ('Working Group') to use the best science and information available to establish reasonable triage categories and safe wait times for access to common cardiovascular procedures. The Working Group decided to publish a series of commentaries to initiate a structured national discussion on this important issue, and the present commentary proposes recommended wait times for access to echocardiography. 'Emergent' echocardiograms should be performed within 24 h, 'urgent' within seven days and 'scheduled' (elective) within 30 days. A framework for a solution-oriented approach to improve access is presented.

Traiter le bon patient au bon moment : l'accès à l'échocardiographie au Canada

La Société canadienne de cardiologie (SCC) est la société nationale de spécialistes et de chercheurs en cardiologie du Canada. Au printemps 2004, le conseil de la SCC a formé le groupe de travail sur l'accès aux soins (le « groupe de travail ») afin d'utiliser les meilleures données scientifiques et la meilleure information disponibles pour établir des catégories de triage raisonnables et des temps d'attente sécuritaires en vue d'accéder à des interventions cardiovasculaires courantes. Le groupe de travail a décidé de publier une série de commentaires afin d'amorcer des discussions nationales structurées sur ce sujet important. Le présent commentaire présente les temps d'attente recommandés pour accéder à l'échocardiographie. Les échocardiogrammes « impérieux » devraient être exécutés dans les 24 heures, les échocardiogrammes « urgents », dans les sept jours, et les échocardiogrammes « prévus » (non urgents), dans les 30 jours. Une structure en vue d'adopter une démarche orientée vers un meilleur accès est présentée.

Key Words: *Echocardiography, Health policy, Wait times*

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. At the Canadian Cardiovascular Congress Public Policy Session in 2002, Senator Wilbert Keon stated that an important role of a national professional organization such as the CCS is to develop national benchmarks for access to cardiovascular care that could be validated and adopted or adapted by the provinces.

Currently, national benchmarks, or targets, for access to care for echocardiography do not exist. Some provinces have established targets for certain frequent or visible cardiovascular procedures, such as coronary bypass surgery. However, a national consensus does not exist for wait time targets for many other diagnostic tests and cardiovascular services that form important components of a patient's journey to optimal outcomes. Furthermore, there are issues of regional disparities and little consensus on how to measure or approach the problem in various parts of this country.

Echocardiography is an excellent subject for a commentary. There is tremendous variability across Canada in the provision of this vital diagnostic tool. Some provinces allow privately purchased equipment and sonographers to perform the procedure, while others deliver the service in highly centralized, publicly funded facilities. Within the same provincial boundaries, great variability exists in wait times for this important imaging tool.

As a professional organization with a broad-based membership of cardiovascular experts, the CCS is ideally suited to initiate a national discussion and commentary on wait times and access to care issues as they pertain to the delivery of cardiovascular services across Canada.

The CCS Council formed an Access to Care Working Group ('Working Group') in the spring of 2004 to use the best science and information available to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The members of the Working Group elected to start the process with a series of commentaries, and because they consider access to the full breadth of cardiovascular services necessary for optimal cardiovascular care, commentary topics were selected to reflect this. The commentaries are intended to be a first step in the development of national targets. They summarize the current variability of benchmarks and wait times across Canada, where this information is available. Using best evidence and expert consensus, each commentary takes an initial position on what the optimal benchmark for access to care should be for a cardiovascular service or procedure.

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It is recognized that the benchmark wait times may not be achievable in the near term in many areas of Canada. However, establishing these targets is the crucial first step to building the systems and capacity required to improve access to this vital diagnostic tool. It cannot be overstated that echocardiography enables many other components of a patient's journey: it facilitates specialist consultation, and it is a vital tool to noninvasively assess patients with chronic cardiac conditions and judge the timing of invasive procedures, such as cardiac catheterization, and corrective or palliative percutaneous or surgical procedures.

The authors of the present commentary emphasize that these benchmarks are not standards and are not to be interpreted as a line beyond which a health care provider or funder has acted with negligence. They have been derived by medical experts – cardiovascular specialist physicians – who, using the best evidence available, have determined acceptable wait times from a patient-advocate perspective. On the other hand, these benchmarks do not reflect current constraints on the capacity to achieve them. If current wait times were acceptable from the perspective of patients and policy makers, the development of wait time benchmarks for these services and procedures would not be a health care priority today. The physicians who contributed to the present document believe that these benchmarks represent a goal toward which we should strive to improve access to care and increase public confidence in our wait list management for cardiovascular services.

METHODS

The recommendations in the present commentary are based on:

- A literature review to identify published articles on medically acceptable wait times for echocardiography;
- A review of existing guidelines for echocardiography services;
- Discussions with representatives from various Canadian jurisdictions regarding existing wait times for echocardiography services; and
- A review of the CCS' recently developed wait time benchmarks for cardiovascular services and procedures, including the benchmarks for other diagnostic tests. The commentary was reviewed by the primary authors, who are cardiologists specialized in several disciplines. The final draft was sent to members of the executive of the Canadian Society of Echocardiography (CSE) for secondary review.

ROLE OF ECHOCARDIOGRAPHY IN CARDIOVASCULAR DIAGNOSIS

Transthoracic echocardiography is the primary noninvasive imaging modality for assessment of cardiac anatomy and function. As such, echocardiography plays an essential role in all facets of cardiovascular care. Multiple guidelines exist describing the indications for echocardiography to measure right and left ventricular function and hemodynamics, and to diagnose and assess valvular or pericardial abnormalities or congenital defects (1,2). Echocardiograms may be repeatedly performed to assess progression and prognosis of various cardiomyopathies, valvular stenosis or regurgitation, and to judge timing of more invasive diagnostic procedures or corrective interventions. To properly assess a patient's condition, in many, if not in most cases, it is appropriate for an echocardiogram to be performed before consultation with a cardiologist or before a procedure. This allows for a more informed consultation or a more focused invasive procedure.

LITERATURE ON WAIT TIMES FOR ECHOCARDIOGRAPHY

No studies evaluating patient outcomes related to wait times for echocardiography were identified. Obtaining data in this area should be a priority for health care system administrators, health care professionals and researchers.

One study (3) was identified that assessed the value of an open-access echocardiography laboratory. The study concluded that "the service was well used by general practitioners and led to advice to change management in more than two thirds of patients".

A number of provinces limit the provision of echocardiography to hospital-based imaging. Others allow publicly funded nonfacility-based echocardiography, whereby the capital and operating costs are borne by a clinic or physician. An area of potential research that would be extremely useful to health care planners is comparing modes of delivery of echocardiography with resultant wait times. Clearly, the major concerns of funders are appropriateness and overuse. It is important to determine a balance between appropriateness and timely patient access.

CURRENT WAIT TIMES FOR ECHOCARDIOGRAPHY

A recent survey in British Columbia reported a mean wait time of 10.7 ± 6.1 weeks for echocardiography, with a median wait time of 10 weeks for an outpatient echocardiogram (K Kingsbury, personal communication). In Nova Scotia, there is a high degree of centralization of specialists in a single tertiary care centre, the Queen Elizabeth II Health Sciences Centre, Halifax. In addition, the provision of echocardiography is limited to hospitals. In this model, the wait time for echocardiography is up to four weeks for urgent studies and more than 20 weeks for nonurgent studies in the two largest health care districts. However, the wait time for echocardiography is less than two weeks in the major regional hospitals that provide the procedure (BJ O'Neill, personal communication).

BENCHMARKS AND RATIONALE FOR THE PROVISION OF ECHOCARDIOGRAPHY

Echocardiography is an essential diagnostic tool in the continuum of patient care for acute and chronic cardiovascular conditions. It is required to exclude the diagnosis of significant pathology, or to reassure patients or physicians of a stable patient condition. It is used to risk-stratify patients and even to determine whether further investigations are required before a a patient undergoes a cardiac or noncardiac procedure. One can and should, therefore, set access targets for echocardiography based on the suggested access targets for specialist consultation and other important diagnostic cardiac imaging procedures or disease management services.

Previous recommendations by the CCS have suggested that no person should have to wait longer than:

- Six weeks for an initial consultation with a cardiologist (4);
- 14 days for diagnostic cardiac nuclear imaging (5);

- Six weeks for a diagnostic catheterization for patients in stable condition, percutaneous coronary intervention for patients in stable condition and coronary artery bypass graft surgery for nonemergent cases, valvular cardiac surgery, pacemaker implants or heart failure services (4,6-8);
- 12 weeks for referral to an electrophysiologist, electrophysiology testing or catheter ablation (7); or
- 30 days to begin cardiac rehabilitation (9).

In developing benchmarks for noninvasive testing (4) and nuclear cardiology (5), the Working Group considered the recommended target wait times in the context of other required cardiovascular services or procedures, and the patient factors that determine the risk of waiting. Thus, benchmarks for specialist consultation, prioritized on the basis of the acuity and risk of the patient's diagnosis or potential diagnosis, also are useful in prioritizing wait times for echocardiography.

Echocardiography, including stress studies, also provides information on the planning of cardiovascular care. As with nuclear imaging, for instance, if echocardiography is indicated in a patient before a consultation or procedure, the echocardiogram must be completed and interpreted before the target time. Therefore, in hemodynamically unstable patients with suspected certain cardiovascular conditions (eg, pericardial effusion with tamponade, mechanical complications postmyocardial infarction), echocardiography on an emergency basis is indicated. Echocardiography in less urgent situations should be provided within a timeframe such that the study is completed and interpreted before the benchmark for evaluation in that patient is reached.

We propose the following benchmarks for the provision of echocardiography in Canada:

- Emergent: as soon as possible, but within one day for all patients (may require transfer to a facility where 24/7/365 echocardiography is available);
- Urgent or semiurgent: within seven days; and
- Scheduled: within 30 days.

The above benchmarks refer to the period from the receipt of the request (either written or verbal for urgent or semiurgent cases) to the receipt of the final interpretation of the final echocardiographic report (or at least a preliminary report for urgent or semiurgent cases). These recommendations are summarized in Table 1.

TABLE 1
Recommended wait time benchmarks (in days) for echocardiography for patients with class 1 or 2 indications

Urgency category	Recommended wait time*
Emergent: hemodynamically unstable patients with suspected certain cardiovascular conditions (eg, pericardial effusion with tamponade, mechanical complications, postmyocardial infarction)	Within 1 day
Urgent/semiurgent: critically ill patients who do not meet the definition of emergent and patients with a condition that could deteriorate rapidly (eg, symptomatic aortic stenosis)	Within 7 days
Scheduled: All patients who do not fall into the previous categories (eg, assessment of murmurs in asymptomatic individuals, assessment of left ventricle mass)	Within 30 days

**From receipt of the request (either written or verbal for urgent and semiurgent cases) to the receipt of the final interpretation of the final echocardiographic report (or at least a preliminary report for urgent or semiurgent cases)*

APPROPRIATENESS

To ensure appropriate usage, the proposed wait time benchmarks for echocardiography should be applied only to class 1 and 2 indications, defined as follows (1):

- Class 1 (definite) indication: the indication is supported by results of clinical studies and/or general agreement and accepted clinical practice. The latter is based on the principle that the echocardiographic examination is known to have a positive impact on clinical practice.
- Class 2 (selective) indication: clinical study evidence is not available. The impact of echocardiographic examination in these situations is generally, but not universally, established or limited to specific clinical situations.

To ensure effective use of resources in echocardiography, education of ordering physicians cannot be understated. A reduction in the number of unnecessary studies will lead to shorter wait times for more urgently needed echocardiographic studies.

IMPLICATIONS FOR THE HEALTH CARE SYSTEM

Implementing the recommendations in the present document will likely require a substantial investment (time and money) in human resources, equipment and related infrastructure support to meet these targets.

We believe that all patients have the right to timely health care (within the benchmarks proposed) as well as high-quality echocardiography. Therefore, it is essential that all echocardiograms in Canada be performed and interpreted by individuals and in facilities that meet all CCS/CSE recommendations on the provision of echocardiography (1). We specifically recommend against providing echocardiography in any other setting until definitive data exist to confirm that the same quality can be assured.

We also believe that urban settings may benefit from a mix of facility-based (ie, hospital) and nonfacility-based (ie, office/clinic) echocardiography services within our publicly funded system, credentialed to meet the CCS/CSE standards to ensure quality. Quite simply, given the multiple competing demands for capital and human resources in large health care facilities, it is uncertain whether the recommended targets would be achievable using a model that only allows facility-based echocardiography services. However, this must be planned in an overall health care system approach to avoid loss of personnel that could aggravate access problems.

TABLE 2
Recommended level of echocardiography services depending on facility type

	TTE	Stress TTE	TEE
Noninstitutional facilities	+	–	–
Community hospitals	+/–	–	–
Regional hospitals	+	+/–	–
Tertiary hospitals	+	+	+

+ Should generally be available; – Should generally not be available; +/– Should only be available if volume and local expertise justifies; Stress TTE Exercise or pharmacological transthoracic two-dimensional echocardiography; TEE Transesophageal echocardiography

Echocardiography is highly dependent on the skills of the personnel performing and interpreting the studies. Sonographers are presently in extremely short supply and represent a major resource barrier for echocardiography access. Regardless of the mix of facility- and nonfacility-based laboratories within any jurisdiction, the dearth of sonographers is generally expected to be one of the main limitations to the access of echocardiographic services. Innovative methods will be required to attract and maintain our pool of sonographers, including funding to expand training sites, distance learning, financial enticement for training and retraining of those who already have a cardiology background, such as electrocardiogram technicians. Centres with special populations (eg, adult congenital heart disease, transplant centres, large cardiac surgery centres) require additional resources to support these activities and to continue to provide timely access to patients who present for regular specialist assessments as part of these centres' secondary care mandate.

Because injury in the workforce is a disincentive for many who want to enter the field of sonography, it is imperative that further research into the factors that cause repetitive strain injury be initiated, perhaps in concert with industry partners.

Another potential barrier to echocardiography in smaller settings is the lack of interpreting physicians who meet CCS/CSE credentialing standards, which means that innovative strategies may be required in these settings. Telehealth technologies and central support for sonographers, generalists or radiologists who obtain additional training in echocardiography from CCS/CSE-credentialed laboratories may improve access in rural areas of Canada and assure that the quality of the studies remains high.

RECOMMENDED LEVEL OF ECHOCARDIOGRAPHY BASED ON FACILITY TYPE

In Canada, cardiovascular care is most frequently centralized, thus, the specialist mix and services available differ depending on the institution and its available resources. This is not necessarily unacceptable, because it allows for the concentration of expertise and a critical mass of diagnostic testing in larger institutions. Unfortunately, there may be inconvenient distances involved that can be a barrier to access, but these are potentially solvable by technology (10). However, health care systems need to evolve to make these centralized services more available to patients in smaller communities and their community hospitals.

Currently, most provinces have developed intra- or extra-provincial or -territorial referral systems. They organize hospitals into community hospitals (which have a defined catchment population), regional hospitals (which provide a higher level of care and accept secondary referrals) and tertiary/quaternary hospitals (which provide the full array of cardiac services). We suggest that the level of echocardiography services that should be available in these settings varies according to the type of facility, which will clearly also relate to the echocardiographic expertise available. We acknowledge that each jurisdiction must assess its local situation, including human resource availability, to decide which level of service can or should be provided to meet the echocardiography wait time targets. Nevertheless, common waiting lists should be developed and managed to ensure equitable access to the most appropriate modality for the patient. It also means developing systems, such as telehealth technology (10) to support smaller communities and the patients living there, as well as the physicians practising there.

Traditionally, echocardiography has been performed as a transthoracic two-dimensional ultrasound (TTE) of the heart and adjacent great vessels. As such, TTE should be available at all regional hospitals and major community hospitals. Nonfacility-based echocardiography is available in larger cities of some provinces, and we would also support this model, provided that laboratories and operators meet minimum standards.

Although TTE remains the cornerstone of diagnostic cardiac ultrasound, transesophageal echocardiography (TEE) has become widely recognized as a valuable complementary tool (11). Compared with TTE, TEE offers superior visualization of posterior cardiac structures because of the close proximity of the esophagus to the posterior heart, the lack of intervening lung and bone, and the ability to use high-frequency imaging transducers, which afford superior spatial resolution. With TEE, in a mildly sedated patient, it is possible to discern varied conditions, from proximal aortic dissection to the exact etiology of valvular regurgitation, to better plan operative intervention. Clearly, these diagnostic procedures must be performed and interpreted by highly skilled and appropriately trained physicians and will only be available in major regional hospitals with appropriate cardiology expertise. Guidelines are available from both the Canadian (1) and American (2,11) echocardiography societies for training and appropriate indications for TEE. TEE should not, in our opinion, be offered outside of hospital facilities.

Other uses of the transthoracic technique include exercise or pharmacological stress echocardiography to assess myocardial viability or ischemia. Stress echocardiography can be used to demonstrate the presence of coronary disease (by showing inducible wall motion abnormalities), assess myocardial viability before revascularization, identify a 'culprit' lesion, risk-stratify patients with known or suspected disease, and stratify patients based on preoperative risk before noncardiac surgery. Stress echocardiography is a comparable diagnostic test with stress nuclear imaging in terms of diagnostic accuracy and prognostic value, and the choice of test is based largely on local availability and expertise (12-14). Because of the expertise required by sonographers and echocardiographers in performing stress echocardiography, this test should generally only be available at tertiary hospitals, but may be offered in regional hospitals with the appropriate training and expertise. These recommendations are summarized in Table 2.

SUMMARY

Echocardiography plays an essential role in all facets of cardiovascular care. We could not identify any studies evaluating the outcome of patients related to wait times for echocardiography. Obtaining data in this area should be a priority for health care system administrators and health care professionals. Currently, wait times should be based on factors such as patient acuity and risk of underlying disease, and the echocardiography should be performed in a timely enough fashion to allow specialist consultation or facilitate other important cardiovascular tests or procedures. The level of echocardiography services available (TTE, TEE, stress echocardiography) should depend on the type of health care facility. We recommend that all echocardiograms in Canada be performed and interpreted by individuals in facilities who meet all CCS/CSE recommendations on the provision of echocardiography.

We propose the following benchmarks for the provision of echocardiography in Canada in patients with CCS/CSE class 1 or 2 indications (2):

- Emergent: as soon as possible, but less than one day for all patients (may require transfer to a facility where 24/7/365 echocardiography is available);
- Urgent or semiurgent: within seven days; and
- Scheduled: within 30 days.

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REFERENCES

1. Sanfilippo AJ, Bewick D, Chan K, et al; Canadian Cardiovascular Society. Canadian Society of Echocardiography. Consensus Panel. Guidelines for the provision of echocardiography in Canada: Recommendations of a joint Canadian Cardiovascular Society/Canadian Society of Echocardiography Consensus Panel. Can J Cardiol 2005;21:763-80.
2. Cheitlin M, Alpert JS, Armstrong WF, et al. ACC/AHA guidelines for the clinical application of echocardiography. A report of the American College of Cardiology/American Heart Association task force on practice guidelines (committee on clinical application of echocardiography). Developed in collaboration with the American Society of Echocardiography. Circulation 1997;95:1686-744.
3. Francis CM, Caruana L, Kearney P, et al. Open access echocardiography in management of heart failure in the community. BMJ 1995;310:634-6.
4. Knudtson ML, Beanlands R, Brophy JM, Higginson L, Munt B, Rottger J; Canadian Cardiovascular Society Access to Care Working Group. Treating the right patient at the right time: Access to specialist consultation and noninvasive testing. Can J Cardiol 2006;22:819-24.
5. Gulenchyn KY, McEwan AJ, Freeman M, Kiess M, O'Neill BJ, Beanlands RS. Treating the right patient at the right time: Access to cardiovascular nuclear imaging. Can J Cardiol 2006;22:827-33.
6. Graham MM, Knudtson ML, O'Neill BJ, Ross DB; Canadian Cardiovascular Society Access to Care Working Group. Treating the right patient at the right time: Access to cardiac catheterization, percutaneous coronary intervention and cardiac surgery. Can J Cardiol 2006;22:679-83.
7. Simpson CS, Healey JS, Philippon F, et al; Canadian Cardiovascular Society Access to Care Working Group; Canadian Heart Rhythm Society. Universal access – but when? Treating the right patient at the right time: Access to electrophysiology services in Canada. Can J Cardiol 2006;22:741-6.
8. Ross H, Howlett J, Arnold JM, et al; Canadian Cardiovascular Society Access to Care Working Group. Treating the right patient at the right time: Access to heart failure care. Can J Cardiol 2006;22:749-54.
9. Dafoe W, Arthur H, Stokes H, Morrin L, Beaton L; Canadian Cardiovascular Society Access to Care Working Group on Cardiac Rehabilitation. Universal access: But when? Treating the right patient at the right time: Access to cardiac rehabilitation. Can J Cardiol 2006;22:905-11.
10. Hooper GS, Yellowlees P, Marwick TH, Currie PJ, Bidstrup BP. Telehealth and the diagnosis and management of cardiac disease. J Telemed Telecare 2001;7:249-56.
11. Pearlman AS, Gardin JM, Martin RP, et al. Guidelines for physician training in transesophageal echocardiography: Recommendations of the American Society of Echocardiography Committee for Physician Training in Echocardiography. J Am Soc Echocardiogr 1992;5:187-94.
12. Fleischmann KE, Hunink MG, Kuntz KM, Douglas PS. Exercise echocardiography or exercise SPECT imaging? A meta-analysis of diagnostic test performance. JAMA 1998;280:913-20.
13. Kim C, Kwok YS, Heagerty P, Redberg R. Pharmacologic stress testing for coronary disease diagnosis: A meta-analysis. Am Heart J 2001;142:934-44.
14. Olmos LI, Dakik H, Gordon R, et al. Long-term prognostic value of exercise echocardiography compared with exercise 201Tl, ECG, and clinical variables in patients evaluated for coronary artery disease. Circulation 1998;98:2679-86.

Treating the right patient at the right time: Access to cardiovascular nuclear imaging

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Cardiovascular nuclear medicine uses agents labelled with radioisotopes that can be imaged with cameras (single-photon emission tomography [SPECT] or positron emission tomography [PET]) capable of detecting gamma photons to show physiological parameters such as myocardial perfusion, myocardial viability or ventricular function. There is a growing body of literature providing guidelines for the appropriate use of these techniques, but there are little data regarding the appropriate timeframe during which the procedures should be accessed. An expert working group composed of cardiologists and nuclear medicine specialists conducted an Internet search to identify current wait times and recommendations for wait times for a number of cardiac diagnostic tools and procedures, including cardiac catheterization and angioplasty, bypass grafting and vascular surgery. These data were used to estimate appropriate wait times for cardiovascular nuclear medicine procedures. The estimated times were compared with current wait times in each province.

Wait time benchmarks were developed for the following: myocardial perfusion with either exercise or pharmacological stress and SPECT or PET imaging; myocardial viability assessment with either fluorodeoxyglucose SPECT or PET imaging, or thallium-201 SPECT imaging; and radionuclide angiography. Emergent, urgent and nonurgent indications were defined for each clinical examination. In each case, appropriate wait time benchmarks were defined as within 24 h for emergent indications, within three days for urgent indications and within 14 days for nonurgent indications.

Substantial variability was noted from province to province with respect to access for these procedures. For myocardial perfusion imaging, mean emergent/urgent wait times varied from four to 24 days, and mean nonurgent wait times varied from 15 to 158 days. Only Ontario provided limited access to viability assessment, with fluorodeoxyglucose available in one centre. Mean emergent/urgent wait times for access to viability assessment with thallium-201 SPECT imaging varied from three to eight days, with the exception of Newfoundland, where an emergent/urgent assessment was not available; mean nonurgent wait times varied from seven to 85 days. Finally, for radionuclide angiography, mean emergent/urgent wait times varied from two to 20 days, and nonurgent wait times varied from eight to 36 days. Again, Newfoundland centres were unable to provide emergent/urgent access.

The publication of these data and proposed wait times as national targets is a step toward the validation of these recommendations through consultation with clinicians caring for cardiac patients across Canada.

Key Words: *Myocardial perfusion; Myocardial viability; Positron emission tomography; Radionuclide imaging; SPECT; Ventricular function*

Traiter le bon patient au bon moment : l'accès à l'imagerie nucléaire cardiovasculaire

La médecine nucléaire cardiovasculaire utilise des substances marquées par des radioisotopes que des caméras (tomographie par émission de photon unique [TEPU]) ou des appareils de tomographie (tomographie par émission de positrons [TEP]) peuvent transformer en images par la détection de photons gamma pour montrer différents paramètres physiologiques comme la perfusion myocardique, la viabilité du myocarde ou le fonctionnement ventriculaire. On trouve de plus en plus, dans la documentation médicale, des lignes directrices sur l'utilisation appropriée de ces techniques, mais il existe peu de données sur le moment approprié du recours à ces techniques. Un groupe de travail composé de cardiologues et de spécialistes en médecine nucléaire a fait de la recherche dans Internet pour relever les délais d'attente actuels et les recommandations sur le sujet concernant différents examens de diagnostic et différentes interventions en cardiologie, notamment le cathétérisme cardiaque et l'angioplastie, ainsi que le pontage coronarien et la chirurgie vasculaire. Les données recueillies ont servi à évaluer des délais d'attente acceptables en vue d'interventions en médecine nucléaire cardiovasculaire. Les délais établis ont été comparés aux temps d'attente actuels dans chaque province.

Des points de repère quant aux délais d'attente ont été élaborés pour les examens suivants : la perfusion myocardique avec épreuve d'effort physique ou médicamenteuse et imagerie par TEPU ou TEP; l'évaluation de la viabilité du myocarde par TEPU ou TEP au fluorodésoxyglucose ou par TEPU au thallium 201, de même que l'angiographie isotopique. Des indications associées à différents degrés d'urgence : très urgent, urgent, non urgent, ont été établies pour chacun des examens cliniques. Dans les tous les cas, les points de repère en vue de délais d'attente acceptables ont été fixés comme suit : 24 h ou moins pour les indications très urgentes; 3 jours ou moins pour les indications urgentes et 14 jours ou moins pour les indications non urgentes.

Des écarts importants ont été observés entre les provinces en ce qui concerne l'accès à ces interventions. Par exemple, les temps d'attente

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moyens en vue d'une imagerie de perfusion myocardique dans les cas très urgents ou urgents variaient de 4 à 24 jours et ceux dans les cas non urgents, de 15 à 158 jours. L'accès à l'évaluation de la viabilité du myocarde était limité en Ontario seulement, et l'examen au fluorodésoxyglucose n'était offert que dans un centre. Les temps d'attente moyens en vue d'une évaluation de la viabilité du myocarde par TEPU au thallium 201 dans les cas très urgents ou urgents variaient de 3 à 8 jours, sauf à Terre-Neuve où il n'était pas possible d'offrir l'examen pour les indications très urgentes ou urgentes; les temps d'attente moyens dans les cas non urgents variaient de 7 à 85 jours. Enfin, les temps d'attente moyens en vue d'une angiographie isotopique dans les cas très urgents ou urgents variaient de 2 à 20 jours et ceux dans les cas non urgents, de 8 à 36 jours. Encore une fois, les centres de soins à Terre-Neuve ne pouvaient offrir l'examen dans les cas très urgents ou urgents. La publication des présentes données et des délais d'attente proposés comme cibles nationales constitue un pas vers la validation des recommandations formulées, dans le cadre d'une consultation, par des cliniciens soucieux du soin des patients cardiaques, partout au Canada.

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. At the Canadian Cardiovascular Congress Public Policy Session in 2002, Senator Wilbert Keon stated that an important role of a national professional organization such as the CCS is to develop national benchmarks for access to cardiovascular care. Currently, national benchmarks, or targets, for access to care for cardiovascular procedures or office consultations do not exist. As a professional organization with a broad based membership of cardiovascular experts, the CCS is ideally suited to initiate a national discussion and commentary on wait times and access to care issues as they pertain to the delivery of cardiovascular care in Canada.

The CCS Council formed the Access to Care Working Group ('Working Group') in the spring of 2004 to use the best science and information to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group elected to start the process with a series of commentaries. Each commentary is intended to be a first step in the development of national targets. The commentaries summarize the current variability of benchmarks and wait times across Canada, where the information is available. They also summarize the currently available data, particularly focusing on the relationship between the risk of adverse events as a function of wait time and on the identification of gaps in existing data. Using best evidence and expert consensus, each commentary takes an initial position on what the optimal benchmark for access to care should be for a cardiovascular service or procedure. The commentaries also call on cardiovascular researchers to fill the gaps in this body of knowledge and further validate safe wait times for patients at varying degrees of risk.

Cardiovascular nuclear medicine, or nuclear cardiology, uses agents labelled with radioisotopes that can be imaged with cameras capable of detecting gamma photons. These imaging techniques include single-photon emission computed tomography (SPECT) and positron emission tomography (PET). In contrast to most other forms of imaging, nuclear imaging tests show the physiological or biological function of the system being investigated, rather than its anatomy. In cardiology, nuclear imaging is most often used to examine myocardial perfusion, and ventricular function and/or viability (viable recoverable myocardial tissue).

There is a growing body of literature that provides guidelines for the appropriate use of diagnostic cardiovascular nuclear medicine techniques. The guidelines provide direction on the use of these technologies, but little data are available on the appropriate timeframe during which they should be accessed. The present paper summarizes the literature on the appropriate use of these imaging techniques and states the reported wait time data, where available, and synthesizes additional wait time information from expert opinion, comparing those with wait times that currently exist across the country. Some of these findings and recommendations were included collectively as a subdocument of the Canadian Association of Nuclear Medicine (CANM) submission to the Wait Time Alliance (WTA) with the focus on applications in cardiovascular disease (1).

METHODOLOGY

The Standards of Practice Committee of the CANM identified a list of established and new nuclear medicine procedures (1) used in the assessment of patients with atherosclerotic heart disease and other cardiac diseases. Procedures relevant to cardiovascular disease are listed in Table 1. The following resources were then searched for guidelines relating to the use of those procedures:

- The Canadian Medical Association Infobase Clinical Practice Guidelines <mdm.ca/cpgsnew/cpgs/index.asp>;
- American College of Radiology <www.acr.org>;
- The Royal College of Radiologists <www.rcr.ac.uk>;
- The American College of Cardiology <www.acc.org>;
- The CCS <www.ccs.ca>; and,
- American Society of Nuclear Cardiology <www.asnc.org>.

A review of the health technology assessments of the emerging technology of 18F-fluorodeoxyglucose (FDG) positron emission tomography (PET) imaging recently published in the Canadian Society of Nuclear Medicine newsletter *Photon* (2) has been incorporated into the main CANM report. Because FDG is also relevant in cardiovascular imaging, comments are included in the present cardiovascular nuclear imaging report. Of note, a joint position statement on advanced cardiac imaging from the CCS, the Canadian Association of Radiologists, the CANM and the Canadian Nuclear Cardiology Society is currently in preparation.

Information on wait time criteria for clinical procedures and treatments related to the nuclear medicine procedures in question was obtained from an Internet search using the term 'wait times for medical procedures'. Information regarding appropriate wait times was also obtained by consensus of the primary panel and review by the secondary panel members. Panel members consisted of experts in cardiology and/or nuclear imaging.

A search on the Internet for wait time target information yielded a number of sources that listed current wait times for access to various therapies, including cardiac catheterization, coronary artery bypass graft (CABG) surgery, cardiac angioplasty and vascular surgery. These data were also used to estimate appropriate wait times for related nuclear medicine procedures (3-8).

A survey of nuclear medicine facilities across Canada was performed by the CANM (1) to determine urgent and elective wait times for the list of procedures, including cardiovascular nuclear imaging.

TABLE 1
Wait time benchmarks for cardiac nuclear imaging by indication (in calendar days)

	Emergent	Urgent	Nonurgent
Myocardial perfusion – exercise or pharmacological stress (SPECT or PET)	1	3	14
Myocardial viability (FDG or thallium-201)	1	3	14
Radionuclide angiography	1	3	14

FDG Fluorodeoxyglucose; PET Positron emission tomography; SPECT Single-photon emission computed tomography

The information presented in the present commentary should be used to stimulate discussion among members of the CCS and administrators, and may prove to be useful in aiding with the development of a methodology to determine consensus wait times for cardiovascular nuclear medicine and other diagnostic procedures.

Classification of evidence

A number of systems have been used to classify levels of evidence (9-12). For cardiovascular nuclear imaging, guidelines from the American College of Cardiology/American Heart Association/American Society of Nuclear Cardiology (11) and the CCS (12) were reviewed and used as the basis for clinical indications of cardiac nuclear imaging. Comprehensive details of these indications are provided in these documents; however, the published guidelines do not provide recommendations for appropriate wait times.

Recommendation review: The present document was originally prepared as part of the nuclear medicine submission to the Canadian Medical Association-sponsored WTA and the Wait Times Working Group of the CANM. The document was then reviewed by the CCS Access to Care Working Group and the Nuclear Cardiology Wait Times Subgroup. From this primary document, the subgroup reviewed the established clinical indications (from guidelines of the American College of Cardiology/American Heart Association/American Society of Nuclear Cardiology and the CCS), which led to the determination of benchmarks for wait times for different cardiac imaging indications. The primary panel's findings and recommendations were then reviewed by a secondary panel of experts.

Wait times for cardiovascular nuclear imaging technologies

There is a dearth of data regarding recommended wait times for access to diagnostic technologies. Some data are posted to various Web sites that display current wait times for other diagnostic tests such as computed tomography and magnetic resonance imaging; Manitoba posts wait times for myocardial perfusion imaging (MPI) (methoxyisobutyl isonitrile stress test), which are examinations addressed in the present report (6). The present paper took the perspective that appropriate wait times are linked to the speed with which the information provided is required to plan or execute therapy. Wait times for imaging procedures must therefore be viewed in the clinical context in which the patient presents.

In each case, we selected the shortest recommended wait times among all indications as the target wait time for procedures to provide best clinical care. These times contrast with the target wait times noted in Appendix B of the WTA report (1). For example, for a patient with an acute coronary syndrome (ACS), a wait time of seven days (as classified for urgent cases in Appendix B of the report) would not be the best benchmark to provide optimal clinical care for an ACS.

In nonurgent cases, such as patients undergoing evaluation of chest pain to assess for ischemia, patients may begin a series of investigations and treatments that may include coronary angiography, percutaneous coronary intervention (PCI) and CABG surgery for which other wait times are recommended. There is evidence to support the use of a strategy whereby MPI is used to define the need for cardiac catheterization (11,13). It seems reasonable, therefore, to set wait times within those defined for access to cardiac catheterization by groups such as the Cardiac Care Network of Ontario (3) and by other Access to Care working groups (14,15). This methodology would result in a recommended wait time of zero to three days in urgent cases and 14 calendar days in nonurgent cases. It is recognized that these targets may not be achieved in several jurisdictions in Canada, but the committee agreed that they represented the benchmarks needed to ensure optimal outcomes. The targets await feedback from the medical community, government and patients.

Wait times in the WTA report (1) are stated in calendar days. The national CANM survey was conducted before the WTA report; therefore, the tables in the Appendix refer to working days. Otherwise, all wait times in the present report are indicated in calendar days.

RECOMMENDED WAIT TIMES AND THE RATIONALE

Recommended wait times were derived by a number of methods, and a rationale for each recommended wait time was developed. Table 1 summarizes the maximum recommended emergent, urgent and routine wait times for each indication (MPI, viability assessment and left ventricular function). The Appendix includes tables that list current wait times by province and compares these with the recommended times for each indication category.

MPI

MPI may be performed with exercise or pharmacological stress using SPECT or PET imaging. For accepted clinical indications (1,11,12), recommended wait times should be zero days for emergent cases, zero to three days for urgent cases and 14 calendar days for routine cases.

Urgent wait times apply in all conditions where the patient's clinical status dictates the need for diagnostic information to make urgent therapeutic decisions. For example, for patients with an ACS in whom nuclear imaging is indicated (11), testing is considered emergent or urgent to identify those patients who would benefit most by further invasive procedures, PCI or CABG surgery during their index hospitalization.

ACS: Clinical indications for MPI include the assessment of myocardial risk after documented or possible ACS, including unstable angina, non-ST segment elevation myocardial infarction, ST segment elevation myocardial infarction without revascularization, or residual disease (11,12). The Working Group considered indications in the setting of 'ACS as emergent or urgent' to identify those patients who would benefit most by further invasive procedures, specifically PCI with stent placement or CABG surgery, during their index hospitalization.

Coronary artery disease risk assessment and prognosis: MPI is clinically indicated for the diagnosis of patients with an intermediate likelihood of coronary artery disease (CAD)

TABLE 2
Nuclear medicine facilities by province

Province	Number of nuclear medicine facilities, n			Number of facilities reporting wait times, n (%)		
	Hospital	IHF	Total	Hospital	IHF	Total
Newfoundland	4	0	4	4 (100)	0	4 (100)
Nova Scotia	10	0	10	8 (80)	0	8 (80)
New Brunswick	6	0	6	3 (50)	0	3 (50)
Prince Edward Island	1	0	1	1 (100)	0	1 (100)
Quebec	49	2	51	27 (55)	0	27 (53)
Ontario	73	42	115	41 (56)	31 (74)	72 (62)
Manitoba	6	3	9	5 (83)	2 (66)	7 (77)
Saskatchewan	3	0	3	3 (100)	0	3 (100)
Alberta	13	10	23	11 (85)	6 (60)	17 (74)
British Columbia	22	1	23	18 (82)	1 (100)	19 (83)
Total	187	58	245	121	40	161 (66)

IHF Independent health facility

and/or for risk stratification in patients with intermediate or high likelihood of CAD.

When a patient is seen in the outpatient setting with symptoms suggestive of ischemic heart disease, the degree of urgency depends on the stability of the patient's symptoms. In those with stable cardiac disease in whom nuclear imaging is indicated (6,11-13,15), the nonurgent wait times noted in Table 1 are considered reasonable.

Risk stratification before noncardiac surgery: MPI is indicated for diagnosis and/or risk stratification before noncardiac surgery, when the surgery is nonemergent, and when cardiac revascularization may be indicated or when identification of increased cardiac risk may alter plans for surgery (11,12). In these circumstances, the appropriate wait time would be dictated by the usual wait time for the noncardiac surgery. These wait times may range from one to nine months (4-7), and thus, a minimum wait time for MPI of 14 calendar days within the specified timeframe seems acceptable.

Myocardial viability assessment

Both rest-redistribution thallium-201 imaging and 18F-FDG PET (or SPECT) imaging (combined with either SPECT or PET rest MPI) may be used to define viable myocardial tissue that has the potential for functional improvement if revascularization is undertaken. PET techniques appear to have greater accuracy, and in particular, greater sensitivity (11,16). The randomized Canadian PET and Recovery following Revascularization-2 (PARR2) trial, which has recently concluded recruitment, is expected to provide a more definitive assessment of these techniques in approximately two years. Both techniques are currently recommended as Class I investigations at Evidence Level B (1,11,12).

Myocardial viability assessment can also be emergent or urgent in critically ill patients with heart failure when decisions need to be made rapidly as to whether a revascularization procedure is indicated. Most cases of viability assessment are semiurgent or nonurgent investigations. However, data from previous Canadian studies indicate that there is increased mortality when revascularization is delayed more than five weeks after significant viability is defined (17). Therefore, investigation and prescription of a treatment plan needs to be completed promptly. Hence, a benchmark of within 14 days was determined.

TABLE 3
Factors contributing to prolonged wait times or lack of access to services, as reported by 161 facilities

Province	Insufficient operating funds	Technical staff vacancies (number of FTE)	Physician staff vacancies (number of FTE)	Equipment shortage (number of instruments)	Lack of access to PET and FDG*
Newfoundland	3	4 (7)	2 (2)	4 (4)	X
Nova Scotia	0	2 (0.8)	0	3 (7)	X
New Brunswick	1	0	0	1 (1)	X
PEI	0	1 (1)	0	1 (1)	X
Quebec	13	13 (6)	3 (4)	7 (13)	
Ontario	9	16 (15)	3 (4)	22 (40)	
Manitoba	3	3 (6)	1 (1)	0	
Saskatchewan	1	2 (4)	0	3 (11)	X
Alberta	2	1 (2)	1 (1)	3 (8)	
British Columbia	5	3 (4)	2 (0.6)	7 (12)	
Total	37	45 (45.8)	12 (12.6)	51 (97)	

**X indicates that service is not available. FDG Fluorodeoxyglucose; FTE Full time equivalent; PEI Prince Edward Island; PET Positron emission tomography*

Radionuclide angiography

For ventricular function assessment with radionuclide angiography, appropriate wait times are again best defined by the clinical presentation. The assessment of ventricular function before consideration of a potentially cardiotoxic chemotherapy agent in cancer treatment may also be considered urgent (ie, within three working days of the specified timeframe) and may be required before instituting the chemotherapy regimen. Routine wait times (14 days) would be appropriate for a patient being considered for a prophylactic implantable cardioverter defibrillator.

CANM SURVEY RESULTS

Table 2 demonstrates the distribution of facilities that provided data toward the present report. Completeness of reporting varied substantially from province to province.

Factors affecting availability of nuclear medicine procedures

Facilities were asked to identify factors that contributed to prolonged wait times or the lack of access to service; Table 3 summarizes those responses. For both technical staff vacancies and physician vacancies, the number of facilities reporting a vacancy is given first, followed by the total number of vacant positions in brackets. No distinction was made between cardiac- and noncardiac-related services.

Two dominating factors emerged from this review: the inadequacy of the equipment base and the inability to offer PET services. Lack of access to PET services does not preclude viability imaging and MPI, because they may be performed by SPECT imaging methods. However, the lack of access to FDG and PET does limit access to the more accurate viability and MPI methods that PET is able to provide.

Equipment: Variability in wait times could be caused by varying availability of equipment or maintenance of equipment from jurisdiction to jurisdiction. The recent Canadian Institute for Health for Information report entitled, "Medical Imaging in Canada 2004" (18) provides some data on the number of nuclear medicine cameras reported per million people for each province (referred to as 'rate'). These rates range

TABLE 4
Comparison of numbers of nuclear medicine facilities as determined from the CIHI (18) CANM survey (1)

	CIHI database			CANM survey		
Province	Hospital	IHF	Total	Hospital	IHF	Total
Newfoundland	4	0	4	4	0	4
Nova Scotia	10	0	10	10	0	10
New Brunswick	6	0	6	6	0	6
PEI	1	0	1	1	0	1
Quebec	47	1	48	49	2	51
Ontario	66	4	70	73	42	115
Manitoba	6	0	6	6	3	9
Saskatchewan	3	0	3	3	0	3
Alberta	13	4	17	13	10	23
British Columbia	22	1	23	22	1	23
Total	178	10	188	187	58	245

CANM Canadian Association of Nuclear Medicine; CIHI Canadian Institute for Health Information; CNSC Canadian Nuclear Safety Commission; IHF Independent health facility; PEI Prince Edward Island

from a low of 14.5 in Prince Edward Island to a high of 27.8 in Nova Scotia, with a Canadian mean of 19.5. The report, however, identified the difficulties that the survey had in obtaining information from independent health facilities (IHFs). This has almost certainly resulted in a significant error in the calculation of the instrumentation rate in Ontario, where only four of the 48 IHFs reported information. As seen in Table 4, IHFs comprise a significant proportion of imaging facilities.

FDG imaging: The full CANM report and its appendixes (1) provide a more complete discussion of the situation with respect to this technology, and it is at various stages of being introduced to practice and availability in Quebec, Ontario, Manitoba, Alberta and British Columbia. Because of the short half-life of the radionuclide product (109 min), it must be produced in facilities near the imaging site. Access to FDG imaging technology (SPECT or PET) is limited for most Canadian patients due to limited and variable provincial strategies to fund its added cost (available in almost all countries in the European union, Australia and the United States [19-24]) and the regulatory requirements imposed by the Biologics and Genetic Therapies Directorate of Health Canada; further details are discussed in the main CANM document. Currently, service providers and governments are working together to resolve these issues in several jurisdictions.

DISCUSSION AND CONCLUSIONS

Wait times

Canadians have unequal access to nuclear medicine procedures such as cardiovascular imaging. Substantial variability exists from province to province and within each province. No nuclear medicine procedures are available in Canada's three territories.

Data collected to date are not sufficient to analyze the reasons for this variability. No attempt has been made to assess varying demand for service as a cause for variation in wait time.

The creation of wait time targets and a standardized collection of wait time information should provide an incentive for regional health authorities to allocate appropriate resources to reduce wait times.

Limitations in the use of wait times as a measure of system efficiency

A list of wait times is an indication of the capacity in the system present before data were collected. The expansion of operating hours by the addition of technical staff or improved efficiency resulting from the replacement of older equipment can have a dramatic effect on wait times. It is important to track whether wait times for any one procedure or therapy are increasing, decreasing or stable. Most wait time data currently available are not displayed in this format, although direct discussion with facilities providing services demonstrates that they are aware of the importance of monitoring wait time changes.

When analysis of wait times is applied to diagnostic testing as opposed to therapies, several confounding factors emerge. Clinicians and their patients expect that diagnostic data will be available to them quickly enough that they will be able to create and implement a treatment plan in an acceptable timeframe. For example, it is generally accepted that CABG surgery should be carried out in an expeditious manner. However, appropriate assessment before consideration of surgery may require several weeks and may include cardiology consultation, noninvasive testing and coronary angiography. Thus, wait times in cardiac care must be determined by a physician's assessment of urgency based on a patient's clinical presentation and findings of other test results. System wait times must report the patient's total wait time for the service, be that revascularization or access to a disease management program such as a heart failure clinic.

Alternative diagnostic methods may be more invasive or costly (eg, coronary angiography versus MPI for the diagnosis of CAD). When the risk of waiting for the most appropriate diagnostic test exceeds the risk of an alternative but less appropriate testing and treatment strategy, the physician, in consultation with the patient, would choose the latter. Thus, adding the collection of data regarding inappropriate use of technologies (noninvasive and invasive) would provide a more complete picture of 'bottlenecks' in the system and their impact.

PET is an emerging technology in Canada, despite its acceptance as a clinical tool in most Organisation for Economic Cooperation and Development countries. With no or limited access to this technology, wait times are unavailable in most jurisdictions.

Collection of data

The collection of data for the present report was difficult and time consuming (and as yet, incomplete), but this need not be the case. The majority of nuclear medicine departments and nuclear cardiology laboratories use or will use their institution's radiology information system (RIS) to book studies, and create and issue reports. Increasingly, the RIS drives the creation of imaging work lists on each imaging modality and links to a picture archival and retrieval system to provide a comprehensive data set that is used internally within the institution to manage the program. Parameters such as urgent and routine wait times, and time from booking to examination completion, completion to reporting and reporting to transcription may be monitored. It should be possible to routinely collect those data from selected studies to monitor both wait times and wait time trends.

Unfortunately, data held within the RIS are frequently collected according to province-specific fee schedules and are not directly comparable from jurisdiction to jurisdiction. For

example, an MPI study (imaging only) in Ontario may be represented by four fee codes, but the identical study in Alberta may be represented by one fee code. Although these schedules are linked to a federal workload measurement system, that system is unable to provide wait list information. The creation of a Canada-wide procedure listing, which could be linked to province-specific fee schedules, would enable the routine collection of these data.

The Working Group recommended that the collection and posting of wait time data in each jurisdiction for a specific list of procedures should be automated through the use of each facility's information system. This would require the creation of a common procedures list across the country for the selected procedures.

Data from IHFs

The report entitled, "Medical Imaging in Canada 2004" (18) highlights the difficulties in obtaining information from IHFs; the CANM survey was able to obtain more representative data. The absence of data from independent health facilities results in difficulties of data interpretation. If wait time management is to be successful, those independent facilities that receive funding from the provincial government should be obligated, as a condition of licensing, to provide statistical information, including wait times and information regarding instrumentation. Complete information is crucial to the better management of health care delivery. It was the recommendation of the Working Group that all facilities receiving public funding should be obligated to provide information regarding wait times, and resource information such as staffing, equipment type, numbers and age as a condition of operation.

RECOMMENDATIONS FOR WAIT TIMES IN CARDIOVASCULAR NUCLEAR IMAGING

The wait times proposed in the present report are recommended as national targets for cardiovascular nuclear imaging procedures. These national targets should be validated through a process of consultation with clinicians and patients, and whenever possible, through the use of objective outcome data.

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APPENDIX

The national Canadian Association of Nuclear Medicine survey was conducted before the final nomenclature of the Wait Time Alliance (WTA) was determined. The survey used the terms 'urgent' and 'routine'.

The survey reported data in working days; however, the final report of the WTA chose calendar days, which were used elsewhere in the present report.

Survey terms	WTA nomenclature	Recommended wait times
Urgent	Emergent/urgent	1 day/0–3 days
Routine	Nonurgent	14 calendar days (10 working days)

Procedure: Myocardial perfusion imaging – exercise or pharmacological stress SPECT or PET

	Urgent wait times (working days)		Routine wait times (working days)	
Province	Mean	Range	Mean	Range
Newfoundland	Not available on urgent basis		146	75–200
Nova Scotia	4	1–7	28	7–56
New Brunswick	6	1–14	57	42–90
Prince Edward Island	15	15	15	15
Quebec	24	1–300	97	5–810
Ontario	5	1–28	20	1–110
Manitoba	6	2–14	158	84–252
Saskatchewan	10	7–10	91	10–222
Alberta	7	1–35	31	9–60
British Columbia	5	1–14	33	2–120

Procedure: Myocardial viability – fluorodeoxyglucose

Newfoundland	NA	NA	NA	NA
Nova Scotia	NA	NA	NA	NA
New Brunswick	NA	NA	NA	NA
Prince Edward Island	NA	NA	NA	NA
Quebec	NR	NA	NA	NA
Ontario	3	3	42	42
Manitoba	NA	NA	NA	NA
Saskatchewan	NA	NA	NA	NA
Alberta	NA	NA	NA	NA
British Columbia	NA	NA	NA	NA

Procedure: Myocardial viability – thallium-201

Newfoundland	Not available on urgent basis		85	75–95
Nova Scotia	4	1–7	30	5–56
New Brunswick	3	1–3	16	2–42
Prince Edward Island	NA	NA	NA	NA
Quebec	4	1–7	20	1–100
Ontario	3	1–14	8	1–28
Manitoba	6	3–9	7	5–9
Saskatchewan	8	3–15	12	7–15
Alberta	5	1–7	20	5–60
British Columbia	6	1–10	15	9–30

Procedure: Radionuclide angiography

Newfoundland	Not available on urgent basis		36	20–50
Nova Scotia	3	1–7	10	4–21
New Brunswick	3	1–7	15	1–30
Prince Edward Island	20	20	20	20
Quebec	8	1–120	21	1–180
Ontario	3	1–14	9	1–30
Manitoba	2	1–7	12	2–35
Saskatchewan	2	1–3	11	7–14
Alberta	2	1–7	8	2–21
British Columbia	3	1–14	12	2–28

NA Not available; NR Not reported; PET Positron emission tomography; SPECT Single-photon emission computed tomography

REFERENCES

1. Wait Time Alliance for Timely Access to Health Care. It's about time! Achieving benchmarks and best practices in wait time management. Final report by the Wait Time Alliance for Timely Access to Health Care. <www.ccs.ca/download/advocacy/issues/CCS_wait_times_e.pdf> (Version current at July 11, 2006).
2. Canadian Society of Nuclear Medicine. Photon. <csnm.medical.org/Photon_Winter_2004.pdf> (Version current at July 17, 2006).
3. Patient Access to Care: Cardiac Catheterization, March 31, 2006. Cardiac Care Network of Ontario. <www.ccn.on.ca/index.cfm?fuseaction=ts&tm=17&ts=126&tsb=0> (Version current at July 11, 2006).
4. Government of British Columbia Ministry of Health. Surgical wait times. <www.healthservices.gov.bc.ca/waitlist/> (Version current at July 11, 2006).
5. Alberta Government. Alberta Waitlist Registry. <www.ahw.gov.ab.ca/waitlist/> (Version current at July 11, 2006).
6. Manitoba Health. Manitoba wait time information. <www.gov.mb.ca/health/waitlist/index.html> (Version current at July 10, 2006).
7. Saskatchewan Surgical Care Network. Wait time information. <www.sasksurgery.ca/wait-list-info.htm> (Version current at July 11, 2006).
8. Cardiac Care Network of Ontario. <www.ccn.on.ca/> (Version current at July 11, 2006).
9. Levels of evidence and grades of recommendations: A comparison of guideline developer's evidence taxonomies. <gacguidelines.ca/article.pl?sid=03/01/29/1642226&mode=thread> (Version current at July 11, 2006).
10. American College of Radiology. ACR Appropriatenesss Criteria. <www.acr.org/ac_pda> (Version current at July 11, 2006).
11. ACC/AHA/ASNC Guidelines for the clinical use of cardiac radionuclide imaging. A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. <www.acc.org/clinical/guidelines/radio/index.pdf> (Version current at July 11, 2006).
12. Tanser P. 2000 revision of the Canadian Cardiovascular Society 1997 Consensus Conference on the Evaluation and Management of Chronic Ishemic Heart Disease. Can J Cardiol 2000;16:1513-36.
13. Mowatt G, Vale L, Brazzelli M, et al. Systematic review of the effectiveness and cost-effectiveness, and economic evaluation, of myocardial perfusion scintigraphy for the diagnosis and management of angina and myocardial infarction. Health Technol Assess 2004;8:1-270.
14. O'Neill BJ, Brophy JM, Simpson CS, et al; Canadian Cardiovascular Society Access to Care Working Group. General commentary on access to cardiovascular care in Canada: Universal access, but when? Treating the right patient at the right time. Can J Cardiol 2005;21:1272-6.
15. Graham MM, Knudtson ML, O'Neill BJ, Ross DB. Treating the right patient at the right time: Access to cardiac catheterization, percutaneous coronary intervention and cardiac surgery. Can J Cardiol 2006;22:679-83.
16. Bax JJ, Poldermans D, Elhendy A, Boersma E, Rahimtoola SH. Sensitivity, specificity, and predictive accuracies of various noninvasive techniques for detecting hibernating myocardium. Curr Probl Cardiol 2001;26:141-86.
17. Beanlands RS, Hendry PJ, Masters RG, deKemp RA, Woodend K, Ruddy TD. Delay in revascularization is associated with increased mortality rate in patients with severe left ventricular dysfunction and viable myocardium on fluorine 18-fluorodeoxyglucose positron emission tomography imaging. Circulation 1998;98(19 Suppl):II51-6.
18. Canadian Institute for Health Information. Medical Imaging in Canada 2004. <secure.cihi.ca/cihiweb/products/Medical_Imaging_in_Canada_2004_e.pdf> (Version current at July 11, 2006).
19. Medical Services Advisory Committee. Positron emission tomography. <www.health.gov.au/internet/msac/publishing.nsf/Content/ref02-1/$FILE/msacref02.pdf> (Version current at July 17, 2006).
20. Adams E, Asua J, Olasagasti JC, Erlichman M, Flynn K, Hurtado-Saracho I. Positron emission tomography: Experience with PET and synthesis of the evidence. <www.inahta.org/Reports.asp?name=Content11%2Fpublikationer%2F9%2Fpet%2Epdf> (Version current at July 11, 2006).
21. Robert G, Milne R. Positron emission tomography: Establishing priorities for health technology assessment. <www.ncchta.org/fullmono/mon316.pdf> (Version current at July 11, 2006).
22. Laupacis A, Paszat L, Hodgson D, Benk V. Health technology assessment of positron emission tomography (PET) – A systematic review. ICES Investigative Report. <www.ices.on.ca/file/Health_Technology_Assessment-PET_May-2001.pdf> (Version current at July 11, 2006).
23. Adams E, Flynn K. Positron emission tomography. Descriptive analysis of experience with PET in VA: A Systematic review update of FDG-PET as a diagnostic test in cancer and Alzheimer's disease. <www.va.gov/vatap/pubs/PET_1999.pdf> (Version current at July 11, 2006).
24. Dussault FP, Nguyen VH, Rachet F. Positron emission tomography in Québec. <www.google.com/u/aetmis?q=positron+emission+tomography+in+quebec&domains=aetmis.gouv.qc.ca&sitesearch=aetmis.gouv.qc.ca> (Version current at July 11, 2006).

Treating the right patient at the right time: Access to cardiac catheterization, percutaneous coronary intervention and cardiac surgery

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The Canadian Cardiovascular Society Access to Care Working Group was formed with a mandate to use the best science and information available to establish reasonable triage categories and safe wait times for common cardiovascular services and procedures through a series of commentaries. The present commentary discusses the rationale for access benchmarks for cardiac catheterization and revascularization procedures for patients with stable angina, and access benchmarks for cardiac catheterization and surgery for patients with valvular heart disease. Literature on standards of care, wait times and wait list management was reviewed. A survey of cardiac centres in Canada was performed to develop an inventory of current practices in identifying and triaging patients. The Working Group recommends the following medically acceptable wait times for access to cardiac catheterization: 14 days for symptomatic aortic stenosis and six weeks for patients with stable angina and other valvular disease. For percutaneous coronary intervention in stable patients with high-risk anatomy, immediate revascularization or a wait time of 14 days is recommended; six weeks is recommended for all other patients. The target for bypass surgery in those with high-risk anatomy or valve surgery in patients with symptomatic aortic stenosis is 14 days; for all others, the target is six weeks. All stakeholders must affirm the appropriateness of these standards and work continuously to achieve them. There is an ongoing need to continually reassess current risk stratification methods to limit adverse events in patients on waiting lists and assist clinicians in triaging patients for invasive therapies.

Key Words: *Access to care; Angiography; Angioplasty; Bypass; Valve surgery; Wait times*

Traiter le bon patient au bon moment : l'accès au cathétérisme cardiaque, à l'intervention coronaire percutanée et à la chirurgie cardiaque

Le mandat du groupe de travail d'accès aux soins de la Société canadienne de cardiologie est d'utiliser les données scientifiques et l'information les plus probantes pour établir des catégories de triage raisonnables et des temps d'attente sécuritaires afin d'obtenir des interventions et des services courants en santé cardiovasculaire, au moyen d'une série de commentaires. Le présent commentaire porte sur le principe d'établir des points de référence pour l'accès au cathétérisme cardiaque et aux interventions de revascularisation chez les patients atteints d'angine stable, de même qu'au cathétérisme cardiaque et aux interventions chirurgicales chez ceux qui souffrent d'une cardiopathie valvulaire. On a analysé les publications sur les normes de soins, les temps d'attente et la gestion des listes d'attente. On a aussi effectué un sondage auprès des centres de cardiologie du Canada pour mettre sur pied un inventaire des pratiques courantes en vue de repérer et de trier les patients. Le groupe de travail recommande les temps d'attente médicalement acceptables suivants pour accéder à un cathétérisme cardiaque : 14 jours en cas de sténose aortique symptomatique et six semaines pour les patients atteints d'angine stable ou d'une autre maladie valvulaire. Pour ce qui est de l'intervention coronaire percutanée chez les patients stables dont l'anatomie les rend très vulnérables, une revascularisation immédiate ou un temps d'attente de 14 jours est recommandé; cette attente peut passer à six semaines pour tous les autres patients. Le temps d'attente avant de subir un pontage chez les patients dont l'anatomie les rend très vulnérables ou avant de subir une chirurgie valvulaire chez ceux qui souffrent de sténose aortique symptomatique est de 14 jours, tandis que tous les autres patients peuvent attendre jusqu'à six semaines. Tous les intervenants doivent préconiser la pertinence de ces normes et toujours travailler pour les respecter. Il est nécessaire de réévaluer constamment les méthodes actuelles de stratification des risques pour limiter les événements indésirables chez les patients sur les listes d'attente et pour aider les cliniciens à procéder au triage des patients en prévision de thérapies effractives.

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. Currently, national standards or targets for access to care for cardiovascular procedures or office consultations do not exist. While some provinces have established targets for some cardiovascular procedures, to date there has not been a national consensus on wait time targets, issues of regional disparities or even on how to quantify the problem.

The CCS Council formed an Access to Care Working Group ('Working Group') in the spring of 2004 to use the best science and information in establishing reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group elected to start the process with a series of commentaries. Each commentary is intended to be a first step in the development of national targets. The commentaries summarize the current variability of standards and wait times across Canada, where this information is available. They also summarize currently available data, particularly focusing on the relationship between the risk of adverse events as a function of wait time, as well as on the

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identification of gaps in existing data. Using best evidence and expert consensus, each commentary takes an initial position on what the optimal target for access to care should be for the cardiovascular service or procedure based on clinically determined risk to the patient without the intervention. The commentaries also call on cardiovascular researchers to fill the gaps in this body of knowledge and to further validate safe wait times for patients at varying degrees of risk.

The objective of the present commentary is to examine wait times for cardiac catheterization and revascularization procedures for patients with stable angina, and wait times for cardiac catheterization and cardiac surgery for patients with valvular heart disease.

CARDIAC CATHETERIZATION PROCEDURE RATES IN CANADA

Data from a Canada-wide survey of all cardiac catheterization facilities (1) revealed that between 1997 and 2002, catheterization rates have increased in all provinces. Nova Scotia and Alberta have the highest crude (unadjusted) cardiac catheterization rates (555.2 and 553.2 per 100,000, respectively), while Ontario had the greatest increase in rate over this five-year period (from 338.9 to 509.6 per 100,000). While there is some speculation that an ideal cardiac catheterization rate exists, we actually know very little about what this rate could be. The Cardiac Care Network of Ontario, in their Consensus Panel on Target Setting (2004), projected an appropriate catheterization rate of 623 per 100,000 in 2005, rising to 728 per 100,000 in 2008 (2). An important purpose of cardiac catheterization is to identify patients with severe coronary artery disease in whom a survival advantage has been demonstrated with revascularization procedures. One potential way to search for an optimal rate is to determine whether there is a population rate of cardiac catheterization beyond which the yield of high-risk anatomy does not rise. Using a detailed clinical registry that captures all patients undergoing cardiac catheterization in Alberta (Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease [APPROACH]), annual population rates of cardiac catheterization and the corresponding yield of high-risk anatomy cases in each of Alberta's 17 health regions for eight separate years (1995 to 2002) were calculated. For both sexes, increased regional rates for cardiac catheterization were linearly associated with an increasing yield of high-risk coronary anatomy, with no evidence of a plateau in yield when more procedures were performed. One additional high-risk patient would be identified for every 2.5 additional cardiac catheterization procedures in men and for every 3.7 additional procedures in women, suggesting that Alberta's population rates of 638.1 per 100,000 men and 314.1 per 100,000 women are too low to optimally detect high-risk individuals. Given that Alberta is a 'high rate' province (in terms of utilization of cardiac catheterization), these findings have potential national implications for target setting for cardiac catheterization and subsequent revascularization procedures (3).

ACCESS TO CARDIAC CATHETERIZATION FOR PATIENTS WITH STABLE ANGINA

Most of the increase in cardiac catheterization rates seen in Canada over the past few years relates to the acceptance of the use of early cardiac catheterization for patients with acute coronary syndromes. A full discussion of access to care for this important group of patients can be found in a separate commentary (4). For patients with stable angina, the event rate appears to be very low over time (5-7). However, even for this stable group of patients, there are risks associated with queuing for cardiac catheterization, although most reports of adverse events are physician estimates or small retrospective studies (8-13). In a systematic prospective assessment of a central cardiac catheterization wait list registry in Hamilton, Ontario, Natarajan et al (14) found that major adverse cardiac events occurred in 1.6% of outpatients who waited a median of 60 days for the procedure. Predictors of adverse events included age and ejection fraction of less than 35%, and one-half of these events occurred within 35 days of referral.

ACCESS TO PERCUTANEOUS CORONARY INTERVENTION

From 1997 to 2002, data from the same survey of catheterization facilities (1) revealed that percutaneous coronary intervention (PCI) rates increased in all provinces except Newfoundland. The overall rates were highest in Quebec (155.5 per 100,000) and Alberta (150.6 per 100,000), with Prince Edward Island (94.6 per 100,000) and Ontario (85.6 per 100,000) having the lowest rates. The actual practice of PCI also varies greatly from province to province. For example, in Alberta and Quebec, close to 90% of PCI procedures are performed on an ad hoc basis, regardless of patient urgency. Therefore, the wait time for PCI is actually that of cardiac catheterization. Procedures that are deferred or staged multivessel interventions are generally booked within one to two weeks. In contrast, in Nova Scotia, PCI is evaluated much the same as potential coronary artery bypass graft surgery (CABG) patients, with performance on an exercise stress test providing the cut-off point for wait times. Urgent patients capable of less than 2 metabolic equivalents or those with exercise-induced hypotension wait two weeks. Those who can achieve between 2 and 5 metabolic equivalents wait two to four weeks. All other patients are considered elective and have a wait time of between four and six weeks. In Ontario, approximately 56% of PCI procedures are done on an ad hoc basis; however, many catheterization facilities in Ontario do not offer PCI procedures, and scheduled PCI is the norm rather than the exception in these cases, with a median wait time of less than 30 days for outpatients (2).

Few data are available that thoroughly assess the risks of adverse cardiac events while awaiting elective PCI procedures. Chester et al (15) described an event rate of 17% in 180 patients with stable angina, with a median wait time of eight months. Bengston et al (16) found that the risk of death or acute myocardial infarction was highest in older patients, those with diabetes mellitus and those with a lower ejection fraction. There are also data suggesting that intervention on chronic total occlusions is less successful with an interval wait time of more than 12 weeks (17). However, these studies were conducted in the era of less aggressive medical therapy and therefore may not reflect current event rates. Contemporaneous data are sadly lacking and should therefore be a focus of research attention.

Obviously, ad hoc PCI and scheduled procedures each have their advantages and disadvantages. Ad hoc procedures provide 'one-stop shopping' with one vascular access and no additional wait time. However, diagnostic angiograms may be cancelled due to long procedures, and there is heavy use of overtime pay for staff. Scheduled procedures provide the

advantage of ensuring that all necessary equipment is available and allow for the smooth flow of other cases through the catheterization laboratory, but they require an additional waiting period and a second vascular access. PCI rates themselves are in a state of flux, as drug-eluting stent technology impacts the ability to perform more complex coronary interventions. Each centre's unique approach to providing both type of revascularization and subsequent access to PCI must be taken into consideration when developing triage categories and maximum acceptable wait times for stable outpatients.

ACCESS TO CABG

The significant variation in procedure rates across Canadian provinces and health regions, while potentially reflecting differences in the relative health of the populations in these regions, is likely also related to regional and provincial differences in practice patterns and funding. Although PCI rates have increased over time, a corresponding increase in the rates of CABG procedures has not been seen, and provinces with high PCI rates tend to have lower CABG rates (1). Second only to Nova Scotia, Ontario has the next highest CABG rate in Canada. However, CABG rates in all provinces are approximately 30% lower than surgical volumes in the United States, particularly in the elderly. It is possible that perceived excessive wait times for surgery in the past have led to increased utilization of PCI (2). Indeed, surgical volumes have remained largely flat since 2000. It is difficult to predict whether this slowing of CABG growth volumes will continue, accelerate or be overwhelmed by the population at risk for coronary artery disease.

The issue of management of patients waiting for cardiac surgery, specifically CABG, has received considerable public, government and research attention.

In a universally accessible, publicly funded system with limited resources, a wait list is necessary for efficient use of those resources; it is not, in itself, a sign of problems, nor does it necessarily lead to suboptimal outcomes. Complete elimination of a surgical wait list would be exceedingly expensive and inefficient, and it would not necessarily be associated with improved results. However, for a wait list to not be detrimental to individual patients' outcomes, a number of principles must be adhered to:

1. Triage categories must be determined based on the risk of wait to an individual patient, based on the best available science.

2. Once triaged to a specific category, a patient's care should be provided on a 'first come, first served' basis. Discretionary queue reassignment should not occur.

3. Because most triaging systems rely heavily on patient-reported symptoms, there must be ongoing monitoring of patients on the wait list and recategorizing of those whose symptoms have changed.

4. The wait list management system and current wait times must be transparent and visible to the medical profession and the public. Both referring sources and patients should be informed if the preferred surgeon's wait time is longer than that of other available surgeons, so the patient can make an informed decision on the choice of surgeon.

5. The length of wait times must be monitored so that appropriate adjustments can be made in capacity. In many jurisdictions, CABG volume is reasonably stable, allowing for the provision of consistent annual funding and human resource planning. This also accommodates slower periods, such as during summer months. Thus, patients will not be significantly disadvantaged by the time of year when they present.

Notwithstanding the above principles, it is important to appreciate that an efficient use of resources dictates that the weekly surgical 'mix' of cases includes patients from all triage categories, not just the most ill or urgent. This ensures that the system does not develop bottlenecks in intensive care or long-term care facilities, which may occur if only very ill patients underwent surgery, and ensures that patients waiting at home are moving up the queue.

There is a considerable amount of literature describing the risk factors associated with adverse events while waiting for CABG. Complications are noted to occur fairly early in the waiting period, usually within acceptable institutional wait times (18-20). Indeed, in a report of over 5800 patients awaiting CABG in Sweden, Rexius et al (21) noted that the risk of death on the wait list increases significantly with time (11% per month). Risk scores have therefore become an important tool in patient assessment and queuing for cardiac surgery.

Each region in Canada has its own system for wait list management. In some cases, it has been standardized across an entire province due to the single-centre provision of services (Nova Scotia) or the development of a province-wide program (Ontario). As with PCI, each region needs to develop (and in many cases has developed) their own system that suits their particular circumstances.

The most highly developed and best known risk stratification system for patients awaiting CABG is the Cardiac Care Network's Urgency Rating Score (URS), which has been in existence since 1990. It stratifies patients into one of four categories to determine the recommended maximum wait time. The URS was developed by a consensus panel of cardiovascular experts, including community and academic cardiologists and surgeons, using the available literature and their clinical judgment to determine seven factors (CCS class, extent of coronary disease, ejection fraction, ischemic risk as determined by noninvasive testing, comorbidities, recent myocardial infarction and previous CABG) that most strongly influence the need for surgery and the risk of waiting (2). Nova Scotia uses a similar system although it relies more heavily on the results of functional testing to categorize patients waiting for surgery into one of four categories (18). Alberta has adopted the Ontario URS calculator, but has chosen to have only three categories for nonemergent surgery. The Réseau québécois de cardiologie tertiaire (Quebec Tertiary Cardiac Network) has designed a prioritization system based on functional class and noninvasive testing, with a maximum wait time of three months (22). While these and other scoring systems allow for careful triage of patients, they have not been shown to eliminate wait list mortality or morbidity (18). Additionally, some investigators have found difficulties with the Ontario URS and the many other scores that have been developed (23,24). This is a major focus of research, and the refinement of existing scores and development of new risk stratification methods are ongoing (25).

TABLE 1
Canadian Cardiovascular Society Access to Care Working Group's suggested targets for cardiac catheterization (cath) and revascularization for patients with stable angina or valvular heart disease

	Cath target	PCI target	Surgery target
Stable angina	6 weeks		
High-risk anatomy		Immediate or 14 days	14 days
All others		6 weeks	6 weeks
Symptomatic aortic stenosis	14 days	N/A	14 days
All other valvular	6 weeks	N/A	6 weeks

N/A Not applicable; PCI Percutaneous coronary intervention

While most investigators have noted that postoperative outcomes are not influenced by wait times (18,21), poorer health-related quality of life, with decreased social and physical functioning before and after surgery, has been described in patients waiting longer than three months for CABG (26). In addition, some data suggest that the actual size of the wait list and the number of emergency operations that occur in the week during which a patient is first referred influence individual delay for surgery (27), suggesting new areas of opportunity to improve resource planning.

ACCESS TO CARDIAC CATHETERIZATION AND CARDIAC SURGERY FOR PATIENTS WITH VALVULAR DISEASE

There are relatively little data on the risk of waiting for patients with valvular heart disease. Certainly, acute lesions with hemodynamic compromise, such as endocarditis, acute aortic insufficiency due to aortic dissection or acute mitral insufficiency due to papillary muscle infarction, are considered urgent and are dealt with appropriately. In patients with stable valvular lesions, the major risks are attributed to those with symptomatic aortic stenosis. Natarajan et al (14) identified this lesion as an independent predictor of adverse events while awaiting outpatient cardiac catheterization. Investigators have also identified aortic valvular disease as a predictor of adverse events while on a wait list for cardiac surgery (21), and data from Ontario suggest that patients waiting for valve surgery are at significantly higher risk of death than those waiting for isolated CABG (28). New triaging guidelines for safer queuing of patients with valvular disease are required, and indeed, aortic disease is now being incorporated into newly proposed risk scores (25).

WORKING GROUP RECOMMENDATIONS FOR MEDICALLY ACCEPTABLE WAIT TIMES FOR ACCESS

The Working Group advocates the development of national standards for formal risk stratification and timely access to diagnostic cardiac catheterization, revascularization procedures and valve surgery. Each jurisdiction would have to develop provincial, territorial or regional management plans for patients with stable angina or valvular heart disease. These should be supported and endorsed by providers, institutional or health authority administrations and boards, and by provincial and territorial ministries of health. Adherence to these standards should be regularly reported to those responsible for delivery of care, as well as to the general public, as a report card.

A summary of recommended access targets is presented in Table 1. Patients with stable angina and stable valvular disease, other than symptomatic aortic stenosis, should undergo cardiac catheterization within six weeks. Patients who subsequently require scheduled PCI should wait no longer than six weeks for this additional procedure. Those with stable angina but with high-risk anatomy identified at the time of cardiac catheterization should have ad hoc PCI if facilities for this are available, or wait no longer than 14 days. Because of the identified risk for patients with symptomatic aortic stenosis, cardiac catheterization should be performed within 14 days.

The recommendations for cardiac surgery are predicated on the concept that a six-month waiting list (provided it is not growing) requires the same resources to manage the weekly surgical volume as does a six-week wait. Once a list is reduced to six weeks, the throughput remains the same. It is also more resource-efficient to have a shorter waiting timeframe because there would be fewer emergency room visits and admissions for patients on the wait list. With the risk of adverse events reduced, there is no need for very complex triage systems. Therefore, patients with stable angina should undergo CABG within six weeks. Those with high-risk anatomy identified at the time of catheterization should have a maximum wait time of 14 days. An acceptable wait time for valve surgery is six weeks, again, with the exception of patients with symptomatic aortic stenosis, who should undergo surgery within 14 days.

CONCLUSIONS

The public system must ensure that satisfactory resources are in place to deal with this important group of patients. All stakeholders involved in the care of these patients must affirm the appropriateness of these standards and work continuously to achieve them. A transparent access report card needs to be developed and reported publicly. It should include not only the ability to meet access standards, but also measures of referral rates from referring institutions or districts to ensure equitable access from these noninvasive centres.

The Working Group believes that the process of care and standards outlined above is a reasonable extrapolation of literature. There is an ongoing need to continually reassess current risk stratification methods to limit adverse events in patients on waiting lists and assist clinicians in triaging patients for invasive therapies. Nevertheless, we feel that these are reasonable national access targets to assure that most Canadians will receive the most appropriate care within the most appropriate timeframe.

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REFERENCES

1. Faris PD, Grant FC, Galbraith PD, Gong Y, Ghali WA; Canadian Cardiovascular Outcomes Research Team. Diagnostic cardiac catheterization and revascularization rates for coronary heart disease. Can J Cardiol 2004;20:391-7.
2. Cardiac Care Network of Ontario. Consensus Panel on Target Setting – final report and recommendations. <www.ccn.on.ca/pdfs/Cons_Panel_Target_Setting_FRR.pdf> (Version current at May 15, 2006).
3. Graham MM, Ghali WA, Faris PD, et al; APPROACH Investigators. Population rates of cardiac catheterization and yield of high-risk coronary artery disease. CMAJ 2005;173:35-9.
4. O'Neill BJ, Brophy JM, Simpson CS, et al; Canadian Cardiovascular Society Access to Care Working Group. Treating the right patient at the right time: Access to care in non-ST segment elevation acute coronary syndromes. Can J Cardiol 2005;21:1149-55.
5. Juul-Moller S, Edvardsson N, Jahnmatz B, Rosen A, Sorensen S, Omblus R. Double-blind trial of aspirin in primary prevention of myocardial infarction in patients with stable chronic angina pectoris. The Swedish Angina Pectoris Aspirin Trial (SAPAT) Group. Lancet 1992;340:1421-5.
6. Poole-Wilson PA, Lubsen J, Kirwan BA, et al; A Coronary disease Trial Investigating Outcome with Nifedipine gastrointestinal therapeutic system investigators. Effect of long-acting nifedipine on mortality and cardiovascular morbidity in patients with stable angina requiring treatment (ACTION trial): Randomised controlled trial. Lancet 2004;364:849-57.
7. Daly CA, De Stavola B, Sendon JL, et al; Euro Heart Survey Investigators. Predicting prognosis in stable angina – results from the Euro heart survey of stable angina: Prospective observational study. BMJ 2006;332:262-7.
8. Ryan TJ. International comparisons of waiting times for cardiovascular procedures: A commentary on the long queue. J Am Coll Cardiol 1995;25:564-6.
9. Bengston A, Herlitz J, Karlsson T, Hjalmarson A. The epidemiology of a coronary waiting list. A description of all the patients. J Intern Med 1994;235:263-9.
10. Morris AL, Roos LL, Brazauskas R, Bedard D. Managing scarce services. A waiting list approach to cardiac catheterization. Med Care 1990;28:784-92.
11. Alter DA, Basinski AS, Cohen EA, Naylor CD. Fairness in the coronary angiography queue. CMAJ 1999;161:813-7.
12. Singh N, Gupta M, Fell D, Gangbar E. Impact and inequity of inpatient waiting times for advanced cardiovascular services in community hospitals across the greater Toronto area. Can J Cardiol 1999;15:777-82.
13. Rosanio S, Tocchi M, Cutler D, et al. Queuing for coronary angiography during severe supply-demand mismatch in a US public hospital: Analysis of a waiting list registry. JAMA 1999;282:145-52.
14. Natarajan MK, Mehta SR, Holder DH, et al. The risks of waiting for cardiac catheterization: A prospective study. CMAJ 2002;167:1233-40.
15. Chester M, Chen L, Kaski JC. Identification of patients at high risk for adverse coronary events while awaiting routine coronary angioplasty. Br Heart J 1995;73:216-22.
16. Bengston A, Karlsson T, Hjalmarson A, Herlitz J. Complications prior to revascularization among patients waiting for coronary artery bypass grafting and percutaneous transluminal coronary angioplasty. Eur Heart J 1996;17:1846-51.
17. Koch KT, Piek JJ, David GK, Mulder K, Peters RJ, Lie KI. Does a waiting time for elective coronary angioplasty affect the primary success rate? Heart 1997;77:432-6.
18. Ray AA, Buth KJ, Sullivan JA, Johnstone DE, Hirsch GM. Waiting for cardiac surgery: Results of a risk-stratified queuing process. Circulation 2001;104(Suppl 1):I92-8.
19. Koomen EM, Hutten BA, Kelder JC, Redekop WK, Tijssen JG, Kingma JH. Morbidity and mortality in patients waiting for coronary artery bypass surgery. Eur J Cardiothorac Surg 2001;19:260-5.
20. Cesena FH, Favarato D, Cesar LA, de Oliveira SA, da Luz PL. Cardiac complications during waiting for elective coronary artery bypass graft surgery: Incidence, temporal distribution and predictive factors. Eur J Cardiothorac Surg 2004;25:196-202.
21. Rexius H, Brandrup-Wognsen G, Oden A, Jeppsson A. Mortality on the waiting list for coronary artery bypass grafting: Incidence and risk factors. Ann Thorac Surg 2004;77:769-74.
22. Morin JE. Le Reseau Quebecois de Cardiologie Tertiaire/Quebec Tertiary Cardiac Network. Can J Cardiol 2004;20:94-7.
23. Geissler HJ, Holzl P, Marohl S et al. Risk stratification in heart surgery: Comparison of six score systems. Eur J Cardiothorac Surg 2000;17:400-6.
24. Cesena FH, Favarato D, Cesar LA, de Oliveira SA, da Luz PL. Ontario score and cardiac risk during waiting for elective coronary bypass grafting. Int J Cardiol 2005. (In press)
25. Rexius H, Brandrup-Wognsen G, Nilsson J, Oden A, Jeppsson A. A simple score to assess mortality risk in patients waiting for coronary artery bypass grafting. Ann Thorac Surg 2006;81:577-82.
26. Sampalis J, Boukas S, Liberman M, Reid T, Dupuis G. Impact of waiting time of the quality of life of patients awaiting coronary artery bypass grafting. CMAJ 2001;165:429-33.
27. Sobolev B, Levy A, Hayden R, Kuramoto L. Does wait-list size at registration influence time to surgery? Analysis of a population-based cardiac surgery registry. Health Serv Res 2006;41:23-39.
28. Morgan CD, Sykora K, Naylor CD. Analysis of deaths while waiting for cardiac surgery among 29,293 consecutive patients in Ontario, Canada. Heart 1998;79:345-9.

Treating the right patient at the right time: Access to care in non-ST segment elevation acute coronary syndromes

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In 2004, the Canadian Cardiovascular Society formed an Access to Care Working Group with a mandate to use the best science and information available to establish reasonable triage categories and safe wait times for common cardiovascular services and procedures through a series of commentaries. The present commentary discusses the rationale for access benchmarks for urgent cardiac catheterization and revascularization, including hospital transfer in the setting of non-ST segment elevation acute coronary syndromes. The literature on standards of care, wait times, wait list management and clinical trials was reviewed. A survey of all cardiac catheterization directors in Canada was performed to develop an inventory of current practices in identifying and triaging patients. The Working Group recommended the following medically acceptable wait times for access to diagnostic catheterization and revascularization in patients presenting with acute coronary syndromes: for diagnostic catheterization and percutaneous coronary intervention, the target should be 24 h to 48 h for high-risk, three to five days for intermediate-risk and five to seven days for low-risk patients; for coronary artery bypass graft surgery, the target should be three to five days for high-risk, two to three weeks for intermediate-risk and six weeks for low-risk patients. All stakeholders must affirm the appropriateness of these standards and work continuously to achieve them. However, some questions remain about what are the best clinical risk markers to delineate the triage categories and the utility of clinical risk scores to assist clinicians in triaging patients for invasive therapies.

Key Words: *Access to care; Acute coronary syndromes; Myocardial infarction; Wait lists*

Traiter le bon patient au bon moment : l'accès aux soins en cas de syndromes coronariens aigus sans surélévation du segment ST

En 2004, la Société canadienne de cardiologie a formé un groupe de travail d'accès aux soins mandaté à utiliser les meilleures données scientifiques et la meilleure information disponibles pour fixer des catégories de triage raisonnables et des listes d'attente sécuritaires en vue d'obtenir des services et interventions courants en santé cardiovasculaire, au moyen d'une série de commentaires. Le présent commentaire porte sur la justification d'établir des points de référence pour l'accès à un cathétérisme cardiaque et à une revascularisation d'urgence, y compris un transfert hospitalier en cas de syndromes coronariens aigus sans surélévation du segment ST. Les publications sur les normes de soins, les temps d'attente, la prise en charge des listes d'attente et les essais cliniques ont été analysés. Un sondage auprès de tous les directeurs du cathétérisme cardiaque au Canada a été envoyé afin d'obtenir l'inventaire des pratiques courantes pour repérer et trier les patients. Le groupe de travail a recommandé les temps d'attente médicalement acceptables suivants pour que les patients atteints de syndromes coronariens aigus aient accès à un cathétérisme cardiaque diagnostique et à une revascularisation : En cas de cathétérisme diagnostique et d'intervention coronaire percutanée, l'objectif devrait être de 24 heures à 48 heures pour les patients très vulnérables, de trois à cinq jours pour les patients moyennement vulnérables et de cinq à sept jours pour les patients peu vulnérables, tandis qu'en cas de pontage aortocoronarien, l'objectif devrait être de trois à cinq jours en présence d'un risque élevé, de deux à trois semaines en présence d'un risque moyen et de six semaines en présence d'un faible risque. Tous les intervenants doivent confirmer la pertinence de ces normes et constamment chercher à les respecter. Cependant, certaines questions demeurent au sujet de ce qui représente les meilleurs indicateurs de risque clinique pour délimiter les catégories de triage et l'utilité des indices de risque clinique afin d'aider les cliniciens à trier les patients en prévision d'une thérapie effractive.

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. In 2002, at the Canadian Cardiovascular Congress Public Policy Session, Senator Wilbert Keon stated that an important role of a national professional organization, such as the CCS, would be to develop national standards for access to cardiovascular care that could be validated and adopted or adapted by the provinces. Further, he noted that this was the right time for such initiatives, given that policy-makers and the health care system are grappling with access and waiting time issues.

A professional organization such as the CCS, with its broad-based membership of cardiovascular experts, is ideally positioned to initiate a national discussion and commentary on appropriate standards for access to care for cardiovascular services and procedures. In spring 2004, the CCS Council formed an Access to

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TABLE 1
Canadian Cardiovascular Society Access to Care Working Group definitions

Term	Definition
Wait time	For consultations, the time elapsed between referral by the family physician and the first consult with the specialist; for diagnostic tests, the time elapsed between decision to delivery of service; for therapeutic procedures (including surgeries), the time elapsed between the decision to treat and the procedure
Wait time indicator	Standardized measure of wait time for a given health service that is comparable across jurisdictions and provides an accurate picture of wait times for a cohort of patients
Medically acceptable wait time standard	Threshold wait time for a given health service and level of severity beyond which the best available evidence and clinical consensus indicate that patient health is likely to be adversely affected. Such guidelines are intended to supplement, not replace, the physician's clinical judgment
Wait time target	A target wait time for a given health service that may be equal to or exceed the medically acceptable wait time for a given proportion of patients. A wait time target is in effect for a given period of time and is a step along the continuum to achieving the medically acceptable wait time for all patients
Urgency	The extent to which immediate clinical action is required based on the severity of the patient's condition and considerations of expected benefit
Urgency rating score	A score based on the clinical description of an individual patient's condition to determine the urgency for care

Care Working Group with a mandate to use the best science and information available to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures through a series of commentaries.

These commentaries will summarize the current variability of standards and wait times across Canada, where this information is available. They will also summarize the available data, particularly focusing on the relationship between the risk of an adverse event and the wait time, and identify gaps in existing data. By using best evidence and expert consensus, each commentary will take an initial position on what the optimal standard for access to care ought to be for the cardiovascular service or procedure. Each commentary will be a first step in developing national targets by creating a summary of the available data and by calling on cardiovascular researchers to take action to fill the gaps in this body of knowledge.

The terms used by the Access to Care Working Group are defined in Table 1.

The Access to Care Working Group decided to select non-ST segment elevation acute coronary syndromes (NSTEACS), and, in particular, access to urgent cardiac catheterization and revascularization, as the subject of one of its commentaries. The reason for choosing NSTEACS was that it is one of the most common causes of hospitalization, and several recent, large randomized trials have been published reporting the benefit of early access to cardiac catheterization and revascularization for patients. In addition, Canada's centralized cardiac catheterization facilities system means that if more patients are to be transferred for catheterization and revascularization, then any administrative and organizational hurdles to this delivery of optimal care must be identified and addressed.

REVIEW OF THE LITERATURE AND A NATIONWIDE SURVEY OF ACCESS AND ACCESS STANDARDS

The Working Group conducted a review to identify published literature on the issues surrounding access to care for revascularization procedures, including standards of care, wait times, wait list management and clinical trials. The review included searches on PREMEDLINE, MEDLINE, EMBASE and HealthSTAR covering North America, Europe and Australia from 1995 to 2004.

The Working Group also surveyed all cardiac catheterization directors in Canada to develop an inventory of current practices in identifying and triaging patients. Each centre was also asked to provide its wait lists for hospital transfers, diagnostic cardiac catheterization, percutaneous coronary intervention (PCI) and coronary artery bypass graft (CABG) surgery, and to provide its target wait times for these procedures if they existed.

ACCESS TO EARLY CARDIAC CATHETERIZATION

Traditionally, prioritization for access to revascularization has used functional testing or anatomical subsets determined by coronary angiography, and has largely focused on access to cardiac surgery to determine medically acceptable wait times (1,2). In Canada, procedural capacity is concentrated in regional referral centres. This poses a challenge to timely revascularization for a large proportion of the Canadian population. Many reports have shown a clear relationship between the supply of diagnostic cardiac catheterization facilities and the likelihood of undergoing cardiac catheterization (2,3). For instance, admission to an invasive hospital and geographical proximity to cardiac catheterization facilities are important factors in determining the likelihood of undergoing an invasive cardiac procedure (3). Even in the United States, the relationship between the supply and geographical proximity of cardiac catheterization laboratories is closely correlated to per capita cardiac catheterization rates and revascularization rates (4,5). In addition, in the United States, where access to cardiac catheterization laboratories is much greater, the CRUSADE Registry has shown that only two-thirds of patients with ST segment depression or positive biochemical markers undergo cardiac catheterization, and fewer than one-half of these catheterizations are performed within 48 h (6). Patients who underwent early catheterization were younger, the majority were male and white, and they were more likely to be admitted to a subspecialty cardiology service and less likely to have heart failure or renal insufficiency. Thus, low-risk patients are often preferentially selected for intervention rather than those at higher risk, who would be the most likely to benefit. This phenomenon has previously been observed in the selection of patients for revascularization following thrombolysis for acute myocardial infarction (MI) (7).

TABLE 2
Recent trials regarding aggressive management in non-ST segment elevation acute coronary syndromes

Study	ISAR-COOL (n=410)		VINO (n=131)		FRISC II (n=2457)		TACTICS-TIMI 18 (n=2220)		RITA-3 (n=1810)	
Setting	Two German centres		Single centre, Czech Republic		Multicentre, Scandinavia		Multicentre, North America		Multicentre, United Kingdom	
One-year event rate (%)	5.9*	11.6*	6.3†	22.4†	9.4‡	12.1‡	7.3§	9.5§	7.6¶	8.3¶
Cath target	<6 h	3–5 d	<24 h	Rest pain	<7 d	Rest pain	<48 h	Rest pain	<72 h	Rest pain
PCI target	<6 h		<24 h	ECG changes	<7 d	ECG changes	<48 h	ECG changes		ECG changes
CABG target			21–28 d	+ GXT	<10 d	+ GXT		+ GXT		+ GXT
Median time to cath	2.4 h	86 h	6.2 h	61 d	4 d (2–6)	17 d (6–132)	22 h	50 h	2 d	
% angio ≤ target	88	0	NS	NS	96	10	97	51	97	16
Time to PCI	NS	NS	8.6 h	55 d	4 d (2–7)	17 d (5–132)	25 h	93 h	3 d	
% PCI ≤ target	NS	NS	47	3	94	20	41	24	35	7
Time to CABG	NS	NS	34 d	86 d	7 d (5–13)	28 d (10–139)	89 h	144 h	22 d	
% CABG ≤ target	NS	NS	NS	NS	82	13	20	13	12	4

*For each study, the first column shows the results for the aggressive treatment arm of the named trial and the second column shows the delayed or more conservative treatment arm. The end points varied among the studies: *30-day death and nonfatal myocardial infarction (MI) event rate; †Six-month death and nonfatal MI event rate; ‡Death and nonfatal MI event rate; §Six-month death, nonfatal MI event rate and hospitalization for unstable angina; ¶Death, nonfatal MI or refractory angina at four months. Angio Angiography; CABG Coronary artery bypass graft; Cath Catheterization; d Days; ECG Electrocardiograph; FRISC II Fragmin and fast Revascularization during InStability in Coronary artery disease trial; GXT Graded exercise test; ISAR-COOL Intracoronary Stenting with Antithrombotic Regimen Cooling-Off study; NS Not stated; PCI Percutaneous coronary intervention; RITA-3 Randomized Intervention Trial of unstable Angina; TACTICS-TIMI 18 Treat Angina with Aggrastat and Determine Cost of Therapy with an Invasive or Conservative Strategy-Thrombolysis in Myocardial Infarction 18; VINO Value of First Day Angiography/Angioplasty In Evolving Non-ST Segment Elevation Myocardial Infarction: An Open Multicenter Randomized Trial*

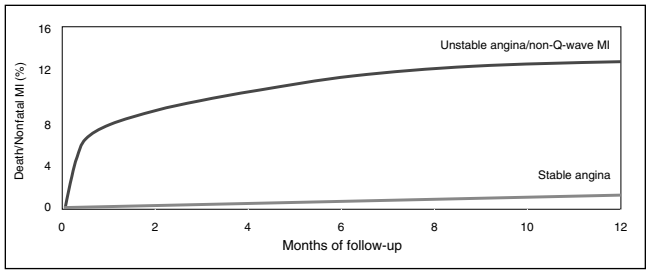

Figure 1) *Differences in event rates between patients with an acute coronary syndrome and patients with stable angina. MI Myocardial infarction. Data from references 12 and 13*

In the United Kingdom, an 'inverse care law' often is associated with locations that are geographically remote from cardiac catheterization centres (2,3,8-10). The inverse care law refers to decreased regional access with increasing distance to cardiac catheterization and bypass surgery centres. This is often despite the fact that these remote districts often have higher disease burdens than the districts closer to the cardiac catheterization facilities.

In the United Kingdom, at least for stable angina, access to specialists, particularly interventionalists, and patients' attitudes about the likelihood that they will benefit from invasive investigation are the main factors decreasing referral from areas geographically remote from the invasive regional hospital. Certainly, in Canada, patients admitted to hospitals with invasive facilities are far more likely to undergo cardiac catheterization than are those admitted to institutions with no cardiac catheterization facilities (11). Although there were no differences in 'hard' end points, such as death or MI, Alter et al (11) have shown large differences in time to revascularization (12 days for those admitted to an invasive hospital versus 48 days for those who were not) resulting in fewer readmissions and fewer hospital bed days.

HAZARD OF QUEUING FOR REVASCULARIZATION

Stable angina has a very low event rate over time (12). On the other hand, many registries of patients with acute coronary syndromes (ACSs) have shown a very large early hazard that levels off after three months (13-15). Figure 1 shows the typical differences in event rates between patients with an ACS and those with stable angina. It is this early hazard that prompted investigators to investigate the potential utility of routine early intervention in NSTEACS.

Many reports have analyzed the events on the wait lists for cardiac surgery, but far fewer have examined the risks of delay for PCI (16-24). Events on the surgical queue tend to occur unpredictably and often within the first 30 days after being placed in the queue. Most of these reports suggest a 1% to 2% mortality, a 3% to 4% risk of nonfatal MI and a 20% to 25% risk of rehospitalization with a cardiac event. Predictors of events in these reports include increasing age, low ejection fraction, higher angina or heart failure class, or clinical diagnosis of unstable angina. At least two series show that when left ventricular (LV) ejection fraction is severely reduced and there is evidence of viable myocardium, waiting longer than 30 days for cardiac surgery results in much greater mortality and much less recovery of LV function (25,26). This is important in this population because several registries have suggested that the presence of heart failure is associated with a lower likelihood of undergoing cardiac catheterization (27).

SUMMARY OF TRIALS OF ROUTINE EARLY INVASIVE MANAGEMENT

Earlier trials of more aggressive management in NSTEACS failed to show a clear benefit of a routine early invasive strategy (28,29). More recent trials are shown in Table 2 (30-34). Although these more recent trials have some methodological problems (eg, the Fragmin and fast Revascularization during InStability in Coronary artery disease [FRISC II] trial required 3 mm ST depression to cross over from the usual intervention to the aggressive early intervention arm), these trials have shown a consistent reduction in the risk of nonfatal MI and rehospitalization with acute coronary events, perhaps due to recent improvements in interventional techniques and adjunctive therapies.

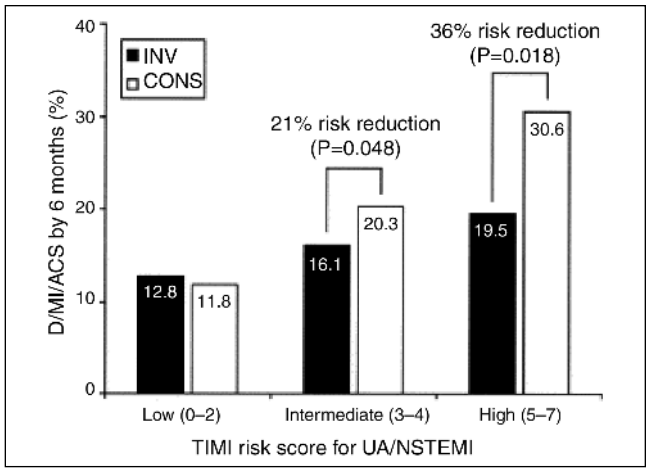

Figure 2) *Gradient of benefit observed in the Treat Angina with Aggrastat and Determine Cost of Therapy with an Invasive or Conservative Strategy-Thrombolysis in Myocardial Infarction 18 (TACTICS-TIMI 18) study with an early invasive strategy depending on TIMI risk score. ACS Acute coronary syndrome; CONS Conservative; D Death; INV Invasive; MI Myocardial infarction; NSTEMI Non-ST segment elevation MI; UA Unstable angina*

Target times to revascularization in these trials may assist in establishing triage standards for access to these strategies in Canada. Targets times to revascularization have been as short as 6 h in the Intracoronary Stenting with Antithrombotic Regimen Cooling-Off (ISAR-COOL) study and as long as seven days in the FRISC II trial. The median time to PCI was 8.6 h in the Value of First Day Angiography/Angioplasty In Evolving Non-ST Segment Elevation Myocardial Infarction: An Open Multicenter Randomized Trial (VINO) study, 25 h in the Treat Angina with Aggrastat and Determine Cost of Therapy with an Invasive or Conservative Strategy-Thrombolysis in Myocardial Infarction 18 (TACTICS-TIMI 18) study, three days in the Randomized Intervention Trial of unstable Angina (RITA)-3 and four days in the FRISC II trial. Target times to CABG in the early aggressive strategy varied from as short as less than 90 h in the TACTICS-TIMI 18 study and seven days in the FRISC II trial, to as long as 22 days in RITA-3 and 34 days in the VINO study. Those who underwent an early revascularization strategy within 48 h in the United States CRUSADE Registry also had a significant reduction in death and MI (6).

POTENTIAL ROLE OF CLINICAL RISK SCORES

Within the early invasive strategy, there is a gradient of benefit determined by the magnitude of risk factors for adverse outcomes such that identifying high-risk patients should be a clinical priority (35). Figure 2 indicates the gradient of benefit observed in the TACTICS-TIMI 18 study with an early invasive strategy depending on the TIMI risk score. Thus, the benefits of an early invasive strategy are greatest in patients at the highest risk. The benefits persist in intermediate-risk patients but with less absolute and relative risk reductions. However, a routine early invasive strategy offers little advantage in terms of mortality or nonfatal infarction to those in the lowest risk categories.

In addition to the trials of early routine intervention, several other trials of medical interventions outline the risk factors that indicate the patients at greatest risk of an adverse outcome (36). Table 3 provides an easily applied and understood

TABLE 3
Risks of adverse outcomes

Recommendations for risk stratification
Risk assessment should be precise, reliable and, preferably, easily and rapidly available at low cost. The following methods are recommended:
A Markers of thrombotic risk (ie, acute risk)
Recurrence of chest pain
ST segment depression
Dynamic ST segment changes
Elevated concentration of cardiac troponins
Thrombus on angiography (known only after angiography)
B Markers of underlying disease (ie, long-term risk)
B1 Clinical markers
Age
History of previous myocardial infarction, coronary artery bypass graft surgery, diabetes, congestive heart failure, hypertension
B2 Biological markers
Renal dysfunction (elevated creatinine or reduced creatinine clearance)
Inflammatory markers, C-reactive protein elevation, fibrinogen elevation (not widely available at this time)
B3 Angiographic markers
Left ventricular dysfunction
Extent of coronary artery disease
Level of evidence for all markers: A

Adapted from reference 37

list of risks (37). Subdividing risks according to the likely underlying pathophysiology helps to define those patients who would likely benefit from earlier, more timely intervention because of a high thrombotic risk versus those who would likely benefit from revascularization in an intermediate time frame because of disease burden.

Several clinical risk scores have been developed to help clinicians quickly define the risk of patients under their care (35,38,39). Such clinical risk scores are able to identify patients with a higher probability of impaired LV function, greater angiographic extent of coronary artery disease or thrombus burden. However, few studies have directly validated the application of clinical risk scores to clinical practice guidelines or, for instance, to assist in decision-making around selection and timing of transfer to tertiary cardiac care centres (40). This would be useful to study systematically.

Arguably, the most useful clinical risk score available to clinicians is the TIMI risk score, optimized to predict death, recurrent MI and recurrent ischemia, and now available as a downloadable file for hand-held pocket organizers (35). The TIMI risk score takes into account seven clinical variables, as shown in Table 4. The TIMI risk score can be complemented by several cues, such as spontaneous or provokable chest pain, particularly with ST segment shifts, evidence of heart failure or hypotension. In addition, use of a computerized risk score may allow the development of objective means to evaluate the triage category and whether medically acceptable wait times adjusted to the risk of the patient are being met.

SURVEY OF ACCESS FOR PATIENTS WITH ACS

The Working Group sent a survey to all catheterization laboratory directors in Canada to collect data on wait time standards and performance against these standards. Twenty-two

TABLE 4
Seven clinical variables of the Thrombolysis in Myocardial Infarction (TIMI) risk score

Characteristic	Points
Historical	
Age ≥65 years	1
≥3 risk factors for coronary artery disease	1
Known coronary artery disease (stenosis ≥50%)	1
Acetylsalicylic acid use in past seven days	1
Presentation	
Recent (≤24 h) severe angina	1
ST segment deviation ≥0.5 mm	1
Increase in cardiac markers	1
Risk score = total points	(0–7)

of 39 laboratories responded to the survey, for a response rate of 56%. Responses were received from centres in every province that have advanced cardiac services and from many of the largest centres in Canada.

The survey responses showed that there are no consistent definitions for urgency, making it difficult to compare access to revascularization services across jurisdictions and impossible to make generalizations across Canada. Outside of Ontario and Quebec, only a few of the larger centres regularly collect and report wait time data. Only three centres reported that they have wait time standards for patients being transferred from another hospital.

Most centres reported that they recognize the urgency associated with patients with ACS, assign an appropriate priority through a formal or informal triage process, and provide the needed diagnostic and therapeutic services for this patient population on a timely basis. In general, patients with ACS are given a higher priority for access to procedures on the basis of any of the following factors:

- The urgency ratings recognize ACS as an urgent condition (eg, Quebec's *Système de gestion de l'accès aux services* recognizes this indication explicitly).
- Patients with ACS are often inpatients, and inpatients typically have a higher priority for these procedures.
- Informal triage processes that rely on physician judgement generally recognize the urgency for patients with ACS. For example, some centres allocate the 'next available slot' to patients with ACS needing a procedure.
- There was little evidence that any centre risk-stratifies patients for urgency of transfer, or that centres formally track transfer wait times or have systems to ensure appropriate triage of patients with NSTEACS from their catchment area.

ACCESS TO CARE WORKING GROUP RECOMMENDATIONS FOR MEDICALLY ACCEPTABLE WAIT TIMES FOR ACCESS FOR PATIENTS WITH ACS

On the basis of its review of the literature and the cross-Canada survey, the CCS Access to Care Working Group advocates the development of national standards for formal risk stratification and timely access to diagnostic cardiac catheterization and revascularization. Each jurisdiction will have to develop provincial, territorial or regional management plans for patients with ACS that will, for instance, include navigation plans. Centres with invasive facilities should develop standards for access to revascularization for patients in their catchment area. These should be supported and endorsed by providers, institutional or health authority administrations and boards, and provincial and territorial ministries of health. Adherence to these standards should be regularly reported to those responsible for delivery of care, as well as to the general public as a report card. To assure that the highest risk patients are referred in a more timely fashion than lower risk patients, a clinical practice guideline, with a built-in urgency risk score, should be developed. This would allow family doctors and generalists caring for these patients to use the guideline to reduce variability in referral. Ideally, computerized triage scores would help referring physicians identify intermediate- and high-risk patients and help tertiary care centres triage them in an appropriately risk-adjusted queue.

Invasive centres may choose to use rapid transfer beds, rapid triage services within cardiac catheterization units themselves or other bed management strategies. Noninvasive centres are also required to assist in the overall functioning of the tertiary care cardiac catheterization and revascularization referral system by appropriately assessing risk of patients presenting with ACS. Trials assessing the role of routine early invasive management of patients with ACS have excluded patients with major comorbidities. Therefore, referring hospitals must take primary responsibility for the assessment of realistic benefits of invasive therapies in patients, for instance, who are frail, or who have other major debilitating illnesses or other competing causes for death (dialysis dependency, metastatic malignancy or dementing illness). Referring centres must provide pertinent information with respect to comorbidities and factors that affect safe completion of cardiac catheterization (eg, presence of significant peripheral vascular disease or previous CABG). To ensure optimal flow of patients to the tertiary cardiac centre, referring hospitals must make every effort to repatriate their patients as quickly as possible from the invasive centre. It would not be unreasonable to establish a repatriation standard to home hospitals of 24 h to 48 h to facilitate the cardiac triage system. In short, each province and region must develop a comprehensive system for rapid diagnosis, risk stratification and triage of patients with NSTEACS.

A summary of risk categories and target times for revascularization is given in Table 5. High-risk patients with ACS should undergo urgent cardiac catheterization as soon as possible and certainly within 24 h to 48 h of recognition of their clinical situation. These patients will be identified as having a TIMI risk score of 5 to 7 or clinical features, such as persistent or recurrent chest pain with electrocardiographic changes, heart failure, hypotension, arrhythmias, or a moderate or high troponin rise. If these patients cannot reach the cardiac catheterization laboratory within 4 h, they would benefit from a small peptide glycoprotein IIb/IIIa inhibitor, such as tirofiban or eptifibatide. Usually, PCI should take place at the same sitting as an ad hoc procedure with the goal of complete revascularization. Patients requiring CABG should be scheduled within three to five days.

Intermediate-risk patients with a calculated TIMI risk score of 3 to 4 or recognized as having non-ST segment elevation MI

TABLE 5
Canadian Cardiovascular Society Access to Care Working Group's triage categories and suggested targets for completing revascularization

	Access to cardiac cath and PCI target	CABG target
High risk	24 h to 48 h	3 to 5 days
TIMI risk score of 5 to 7		
Persistent or recurrent chest pain		
Dynamic ECG changes with chest pain		
CHF, hypotension, arrhythmias with chest pain		
Moderate or high (>5 ng/mL) troponin rise		
Age >75 years*		
Intermediate risk	3 to 5 days	2 to 3 weeks
TIMI risk score of 3 to 4		
NSTEMI with small troponin rise (>1 to <5 ng/mL)		
Worst ECG T-wave inversion or flattening		
Significant LV dysfunction (EF <40%)		
Previous documented CAD, MI, CABG or PCI		
Low risk†	5 to 7 days	6 to 8 weeks
TIMI risk score of 1 to 2		
Age <65 years		
No or minimum troponin rise (<1.0 ng/L)		
No further chest pain		
Inducible ischemia ≥7 METs workload		

**Assumes no major comorbidity that would compete for mortality (eg, advanced malignancy, end-stage renal failure, advanced irreversible heart failure, frailty; †Low-risk patients should undergo further risk assessment by using noninvasive testing, and only those with evidence of inducible ischemia should be revascularized. Revascularization for symptom burden also indicated based on existing standards for stable coronary artery disease (CAD). CABG Coronary artery bypass graft; cath Catheterization; CHF Congestive heart failure; ECG Electrocardiograph; EF Ejection fraction; LV Left venticular; METs Metabolic equivalents; MI Myocardial infarction; NSTEMI Non-ST segment elevation myocardial infarction; PCI Percutaneous coronary intervention; TIMI Thrombolysis in Myocardial Infarction*

with a small troponin rise, no hemodynamic compromise, no or mild electrocardiographic changes (T-wave inversion), evidence of significant LV dysfunction, previous documented coronary artery disease, or previous MI or CABG operation should undergo cardiac catheterization within three to five days. They should also normally undergo an ad hoc PCI at the time of their diagnostic procedure. Patients who require CABG surgery should have their operation scheduled within two to three weeks.

Low-risk ACS patients may be recognized by a low TIMI risk score (1 to 2) or clinically as younger patients (younger than 65 years) with no or only modest troponin increases and no further chest discomfort. Unless there are recurrent unstable symptoms, these patients can still be managed with a 'watchful waiting' strategy and undergo noninvasive assessment. Those with positive noninvasive studies or inducible angina should undergo angiography within five to seven days. PCI can take place at the same sitting or can be scheduled electively for six to eight weeks, as should CABG, if indicated. If inducible ischemia occurs at a low level (less than 4 metabolic equivalents), or with hypotension or evidence of LV dilation with exercise, the patient should be upgraded to at least an intermediate risk.

OLDER PATIENTS

Besides geographical proximity, age is the other major reason for not being referred for cardiac catheterization (41-43). Subgroup analysis from TACTICS-TIMI 18, which excluded patients with significant comorbid illnesses, indicated a gradient of benefit, with the most elderly benefiting the most from an early invasive strategy (43). For instance, with the cohort younger than 65 years, the number needed to treat at six months was 250 compared with only nine in those enrolled who were older than 75 years of age. Under the age of 65 years, only four deaths or MIs were prevented per 1000 patients treated compared with 48 per 1000 treated in the 65 to 75 age group, and 108 deaths or MIs prevented in those older than 75 years. Thus, age alone should not be a contraindication to an early invasive strategy, although patients with significant comorbidities that will limit their life may not benefit from routine early invasive management strategies.

CONCLUSIONS

NSTEACS require a rapid triage system, and the public system must ensure that satisfactory resources are in place to allow the urgent transfer of these patients for rapid diagnosis and management. All stakeholders involved in the care of these patients – payer, administrators, referring physicians and tertiary care physicians – must affirm the appropriateness of these standards and work continuously to achieve them. Interventionalists need to make themselves available for consultation and continuing health education to primary care practitioners and generalists to emphasize appropriate indications for referral of patients with NSTEACS. A transparent access report card needs to be developed and reported publicly. It should include not only the ability to meet access standards but also measures of referral rates from referring institutions or districts to ensure equitable access from these noninvasive centres. These referring institutions should also have repatriation standards for the return of patients once their invasive therapies are completed.

The Access to Care Working Group believes that the process of care and standards outlined above are a reasonable extrapolation of the literature. There remain unanswered questions, particularly around what are the best clinical risk markers to delineate the triage categories of high risk, intermediate risk and low risk. In addition, how useful are clinical risk scores in assisting clinicians in triaging patients for invasive therapies? Nevertheless, we feel that these are reasonable standards to assure that most Canadians, regardless of where they present, will receive the most appropriate care within the most appropriate time frame.

REFERENCES

1. Naylor CD, Sykora K, Jaglal SB, Jefferson S. Waiting for coronary artery bypass surgery: Population-based study of 8517 consecutive patients in Ontario, Canada. Lancet 1995;346:1605-9.
2. Black N, Langham S, Petticrew M. Coronary revascularization: Why do rates vary geographically in the UK? J Epidemiol Community Health 1995;49:408-12.
3. Bowling A, Bond M, McKee D, et al. Equity in access to exercise tolerance testing, coronary angiography, coronary artery bypass grafting by age, sex and clinical indications. Heart 2001;85:680-6.
4. Wennberg D, Dickens J Jr, Soule D, et al. The relationship between the supply of cardiac catheterization laboratories, cardiologists and the use of invasive cardiac procedures in northern New England. J Health Serv Res Policy 1997;2:75-80.
5. Gregory PM, Malka ES, Kostis JB, Wilson AC, Akora JK, Rhoads GG. Impact of geographic proximity to coronary revascularization services on service utillization. Med Care 2000;38:45-57.
6. Bhatt DL, Roe MT, Peterson ED, et al; CRUSADE Investigators. Utilization of early invasive management strategies for high-risk

patients with non-ST-segment elevation acute coronary syndromes: Results from the CRUSADE Quality Improvement Initiative. JAMA 2004;292:2096-104.
7. Pilote L, Miller DP, Califf RM, Rao JS, Weaver WD, Topol EJ. Determinants of the use of coronary angiography and revascularization after thrombolysis for acute myocardial infarction. N Engl J Med 1996;335:1198-205.
8. Ben-Shlomo Y, Chaturvedi N. Assessing equity in access to health care provision in the UK: Does where you live affect your chances of getting a coronary artery bypass graft? J Epidemiol Community Health 1995;49:200-4.
9. Hippisley-Cox J. Inequities in access to coronary angiography and revascularization: The association of deprivation and location of primary care services. Br J Gen Pract 2000;50:449-54.
10. Langham S, Basnett I, McCartney P, et al. Addressing the inverse care law in cardiac services. J Public Health Med 2003;3:202-7.
11. Alter DA, Tu JV, Austin PC, Naylor CD. Waiting times, revascularization modality, and outcomes after acute myocardial infarction at hospitals with and without on-site revascularization facilities in Canada. J Am Coll Cardiol 2003;42:410-9.
12. Juul-Moller S, Edvardsson N, Jahnmatz B, Rosen A, Sorensen S, Omblus R. Double-blind trial of aspirin in primary prevention of myocardial infarction in patients with stable chronic angina pectoris. The Swedish Angina Pectoris Aspirin Trial (SAPAT) Group. Lancet 1992;340:1421-5.
13. FRagmin and Fast Revascularization during In Stability in Coronary artery disease Investigators. Long-term low-molecular-mass heparin in unstable coronary-artery disease: FRISC II prospective randomised multicentre study. Lancet 1999;354:701-7. (Erratum in 1999;354:1478)
14. The PURSUIT Trial Investigators. Inhibition of platelet glycoprotein IIb/IIIa with eptifibatide in patients with acute coronary syndromes. N Engl J Med 1998;339:436-43.
15. Anand SS, Yusuf S, Pogue J, Weitz JI, Flather M. Long-term oral anticoagulant therapy in patients with unstable angina or suspected non-Q-wave myocardial infarction: Organization to assess strategies for ischemic syndromes (OASIS) pilot study results. Circulation 1998;98:1064-70.
16. Bengtson A, Karlsson T, Hjalmarson A, Herlitz J. Complications prior to revascularization among patients waiting for coronary artery bypass grafting and percutaneous transluminal coronary angioplasty. Eur Heart J 1996;17:1846-51.
17. Henpiny Yue Cesena F, Favarato D, Machado Cesar LA, de Oliveira SA, da Luz PL. Cardiac complications during waiting for elective coronary artery bypass graft surgery: Incidence, temporal distribution predictive factors. Eur J Cardiothorac Surg 2004;25:192-202.
18. Chester M, Chen L, Kaski JC. Identification of patients at high risk for adverse coronary events while awaiting routine coronary angioplasty. Br Heart J 1995;73:216-22.
19. Doogue M, Brett C, Elliot JM. Life and death on the waiting list for coronary bypass surgery. N Z Med J 1996;110:26-30.
20. Jackson NW, Doogue MP, Elliot JM. Priority points and cardiac events while waiting for coronary bypass surgery. Heart 1999;81:367-73.
21. Koch KT, Piek JJ, David GK, Mulder K, Peters RJG, Lie KI. Does a waiting time for elective coronary angioplasty affect the primary success rate? Heart 1997;77:432-6.
22. Koonen EM, Hutten BA, Kelder JC, Redekop WK, Tijssen AGP, Kingma JH. Morbidity and mortality waiting for coronary bypass surgery. Eur J Cardiothorac Surg 2001;19:260-5.
23. Plomp J, Redekop WK, Dekker FW, et al. Death on the waiting list in the Netherlands in 1994 and 1995. Heart 1999;81:593-7.
24. Rexius H, Brandrup-Wognsen G, Oden A, Jeppsson A. Mortality on the waiting list for coronary artery bypass grafting: Incidence and risk factors. Ann Thorac Surg 2004;77:769-75.
25. Beanlands RSB, Hendry PJ, Masters RG, deKemp RA, Woodend K, Ruddy TD. Delay in revascularization is associated with increased mortality rate in patients with severe left ventricular dysfunction and viable myocardium on fluorine 18-fluorodeoxyglucose positron emission tomography imaging. Circulation 1998;98:II53-6.
26. Bax JJ, Schinkel AFL, Boersma E, et al. Early versus delayed revascularization in patients with ischemic cardiomyopathy and substantial viability: Impact on outcome. Circulation 2003;108(Suppl II):II39-42.
27. Haim M, Battler A, Behar S, et al. Acute coronary syndromes complicated by symptomatic and asymptomatic heart failure: Does current treatment comply with guidelines? Am Heart J 2004;147:859-64.
28. The TIMI IIIB Investigators. Effects of tissue plasminogen activator and a comparison of early invasive and conservative strategies in unstable angina and non-Q-wave myocardial infarction. Results of the TIMI IIIB Trial. Circulation 1994;89:1545-56.
29. Boden WE, O'Rourke RA, Crawford MH, et al. Outcomes in patients with acute non-Q-wave myocardial infarction randomly assigned to an invasive as compared with a conservative management strategy. N Engl J Med 1998;338:1785-92.
30. Neumann FJ, Kastrati A, Pogatsa-Murray G, et al. Evaluation of prolonged antithrombotic pretreatment ("cooling-off" strategy) before intervention in patients with unstable coronary syndromes: A randomized controlled trial. JAMA 2003;290:1593-9.
31. Spacek R, Widimsky P, Straka Z, et al. Value of first day angiography/angioplasty in evolving non-ST-segment elevation myocardial infarction: An open multicenter randomized trial. The VINO Study. Eur Heart J 2002;23:230-8.
32. The FRISC II Investigators. Invasive compared with non-invasive treatment in unstable coronary artery disease: FRISC II perspective randomized multi centre study. Lancet 1999;354:708-15.
33. Cannon CP, Weintraub WS, Demopoulos LA, et al. TACTICS (Treat Angina with Aggrastat and Determine Cost of Therapy with an Invasive or Conservative Strategy)-Thrombolysis in Myocardial Infarction 18 Investigators. Comparison of Early Invasive and Conservative Strategies in Patients with Unstable Coronary Syndromes Treated with Glycoprotein II-B III-A Inhibitor Tirofiban. N Engl J Med 2001;344:1879-87.
34. Fox KA, Poole-Wilson PA, Henderson RA, et al; Randomized Intervention Trial of unstable Angina Investigators. Interventional versus conservative treatment for patients with unstable angina or non-ST-elevation myocardial infarction: The British Heart Foundation RITA 3 randomised trial. Lancet 2002;360:743-51.
35. Sabatine MS, Antman EM. The thrombolysis in myocardial infarction risk score in unstable angina/non-ST-segment elevation myocardial infarction. J Am Coll Cardiol 2003;41(4 Suppl S):89S-95S.
36. Boden WE. "Routine invasive" versus "selective invasive" approaches to non-ST-segment elevation acute coronary syndromes management in the post-stent/platelet inhibition era. J Am Coll Cardiol 2003;41(4 Suppl S):113S-22S.
37. Bertrand ME, Simoons ML, Fox KAA, et al; for The Task Force on the Management of Acute Coronary Syndromes of the European Society of Cardiology. Management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Eur Heart J 2002;23:1809-40.
38. Boersma E, Pieper KS, Steyerberg EW, et al. Predictors of outcome in patients with acute coronary syndromes without persistent ST-segment elevation. Results from an international trial of 9461 patients. The PURSUIT Investigators. Circulation 2000;101:2557-67.
39. Eagle KA, Lim MJ, Dabbous OH, et al; GRACE Investigators. A validated prediction model for all forms of acute coronary syndrome: Estimating the risk of 6-month postdischarge death in an international registry. JAMA 2004;291:2727-33.
40. Morrow DA. New insight into clinical risk scores for patients with acute coronary syndromes. Am Heart J 2004;146:754-6.
41. Giugliano RP, Camargo CA, Lloyd-Jones DM, et al. Elderly patients receive less aggressive medical and invasive management of unstable angina: Potential impact of practice guidelines. Arch Intern Med 1998;58:1113-20.
42. Barakat K, Kennon S, Wilkinson P, Ranjadayalan K, Timmis AD. Selection bias in management of unstable angina. J R Coll Physicians Lond 2000;34:179-84.
43. Bach RG, Cannon CP, Weintraub WS, et al. The effect of routine, early invasive management on acute outcome for elderly patients with non-ST-segment elevation acute coronary syndromes. Ann Intern Med 2004;141:186-95.

Treating the right patient at the right time: Access to heart failure care

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Heart failure affects over 500,000 Canadians, and 50,000 new patients are diagnosed each year. The mortality remains staggering, with a five-year age-adjusted rate of 45%. Disease management programs for heart failure patients have been associated with improved outcomes, use of evidence-based therapies, improved quality of care, and reduced costs, mortality and hospitalizations.

Currently, national benchmarks and targets for access to care for cardiovascular procedures or office consultations do not exist. The present paper summarizes the currently available data, particularly focusing on the risk of adverse events as a function of wait time, as well as on the identification of gaps in existing data on heart failure. Using best evidence and expert consensus, the present article also focuses on timely access to care for acute and chronic heart failure, including timely access to heart failure disease management programs and physician care (heart failure specialists, cardiologists, internists and general practitioners).

Key Words: *Access; Heart Failure; Wait times*

Traiter le bon patient au bon moment : l'accès aux soins pour l'insuffisance cardiaque

L'insuffisance cardiaque touche plus de 500 000 Canadiens, et 50 000 nouveaux patients sont diagnostiqués chaque année. Le taux de mortalité demeure énorme, avec un taux ajusté selon l'âge de 45 % après cinq ans. Les programmes de prise en charge des patients atteints d'insuffisance cardiaque s'associent à une amélioration des issues, au recours à des thérapies probantes, à une amélioration de la qualité de vie et à une diminution des coûts, de la mortalité et des hospitalisations.

Pour l'instant, il n'existe pas de points de référence nationaux et de cibles d'accès aux interventions cardiovasculaires ou aux consultations en cabinet. Le présent article résume les données disponibles, et est axé sur le risque d'événements indésirables découlant des temps d'attente, ainsi que sur le dépistage des lacunes dans les données sur l'insuffisance cardiaque. Au moyen des meilleures données probantes disponibles et du consensus de spécialistes, le présent article porte également sur l'accès rapide aux programmes de prise en charge de l'insuffisance cardiaque et aux soins de médecins (spécialistes de l'insuffisance cardiaque, cardiologues, internes et omnipraticiens).

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. In 2002, at the Canadian Cardiovascular Congress Public Policy Session, Senator Wilbert Keon stated that an important role of a national professional organization such as the CCS is to develop national benchmarks for access to cardiovascular care that could be validated and adopted or adapted by the provinces. Currently, national benchmarks and targets for access to care for cardiovascular procedures or office consultations do not exist. While some provinces have established targets for access to some cardiovascular procedures, a national consensus does not exist for wait time targets, for issues of regional disparities, or even for how to measure or approach the problem. The CCS, as a professional organization with a broad-based membership of cardiovascular experts, is ideally suited to initiate a national discussion and commentary on wait times and access to care issues as they pertain to the delivery of cardiovascular care in Canada.

The CCS Council formed an Access to Care Working Group (the 'Working Group') in spring 2004 in an effort to use the best science and information to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group has elected to start the process with a series of commentaries. The Working Group considers access to the full breadth of cardiovascular services necessary for optimum cardiovascular care, and commentaries were selected to reflect that breadth. Each commentary is intended to be a first step in a process to establish national targets. These commentaries summarize the current variability of benchmarks and wait times across Canada,

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where this information is available. They also summarize the currently available data, particularly focusing on the risk of adverse events as a function of wait time, as well as on the identification of gaps in existing data. Using best evidence and expert consensus, each commentary takes an initial position on what the optimal benchmark for access to care should be for the cardiovascular service or procedure. The commentaries also call upon cardiovascular researchers to fill the gaps in this body of knowledge and to further validate safe wait times for patients at varying degrees of risk.

The present report focuses on timely access to care for both acute and chronic heart failure (HF), and includes timely access to HF disease management programs (DMPs) and physician care (HF specialists, cardiologists, internists and general practitioners). Access to device therapies is addressed by Simpson et al in the access to electrophysiology commentary (pages 52-57). HF is defined as the inability of the heart to pump a sufficient amount of blood to meet the demands of the body at normal filling pressures. HF affects approximately 500,000 Canadians, and 50,000 new patients are diagnosed each year. The prevalence of HF rises with increasing age such that 1% of Canadians over 65 years of age and 4% of Canadians over 70 years of age have HF (1). Because the Canadian population is aging, the prevalence of HF and HF hospitalizations will continue to increase (2). The median survival for chronic HF patients is 1.7 years for men and 3.2 years for women, with a five-year age-adjusted mortality of 45% based on the time period between 1990 and 1999 (3). HF remains the diagnosis that most commonly brings a patient to hospital for medical admission. In addition, readmission rates are 25% to 59% within six to 12 months of hospital discharge (4-7). HF is a chronic disease with frequent acute exacerbations; as such, HF patients are complex, resource intensive and frequently require access at multiple levels within the health care system.

DMPs provide multidisciplinary intensive therapy for patients with HF, including optimal proven drug therapies, investigation, education and monitoring (eg, targeted home visits, phone, fax, clinic, Internet), and provide support to patients, physicians and other health care providers (8,9). DMPs appear to have the greatest impact in high-risk HF patients (10). Care of HF in such programs is associated with reduced hospital admissions (detectable within 30 days of initiation), reduced length of stay and improvement in clinical outcomes (11,12).

In addition, with the exception of one study (predominantly HF outpatients without recent hospitalization) (13), the majority of studies have shown that comprehensive DMPs are cost effective for the high-risk HF population. In addition, DMPs are associated with improved use of evidence-based therapies, including those that use angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, beta-blockers and spironolactone. Two meta-analyses (14,15) have demonstrated a mortality benefit with DMPs for patients at high risk for admission and those recently discharged from hospital. A more recent meta-analysis (16) confirmed a reduction in mortality and hospitalizations in HF patients managed through a DMP. In a randomized study (17), home-based interventions that involved nurses specially trained for HF reduced rehospitalization rates. A specially trained and supervised nurse intervention approach may be more accessible to outlying communities. It is not clear which method of DMP is optimal, although several common features are seen in studies reported to decrease adverse outcomes. These include repeated assessments, inclusion of family or caregivers in the treatment plan, proactive education, clear predischarge planning with set follow-up plans, persistent and repeated medication review with follow-up monitoring for potential adverse effects, including blood work, and implementation of evidence-based therapies. Minimal components include a physician experienced in HF care and an additional health care practitioner (usually but not always a nurse with expertise in HF management and follow-up).

These results are achieved by implementing and following clinical practice guidelines to improve utilization rates of evidence-based medical therapies and increase patient adherence with therapy. The most common causes of admission for HF are medication and dietary nonadherence, thus further underscoring the importance of DMPs (18). HF DMPs are often located in centralized, tertiary care facilities – a system that can impact the availability to all Canadians. Many communities that are unable to provide full DMPs instead provide nurse educator support and social services. Within Canada, the Improving Cardiovascular Outcomes in Nova Scotia (ICONS) study has demonstrated a reduction in mortality and hospitalization rates for HF patients managed via an HF DMP compared with those discharged to community care (Dr Jon Howlett, personal communication). The Montreal Heart Institute showed that intervention with a DMP was associated with lower rehospitalization rates and improved quality of life (19). Differential hospitalization rates in areas with versus those without DMPs require further research, especially in light of the geographical challenges that exist within the Canadian context.

With the increasing number of HF hospitalizations projected over the next decade, and given the aging baby boomer population, it is likely that there will be a progressive increase in the number of patients with HF that require hospitalization, evaluation, therapy and follow-up. Given this projected demographic deluge of patients with HF, it is imperative to address access to care and determine who should be providing that care. Underutilization of proven HF therapies is well described; hence, not only is access to care critical, but access to health care professionals and DMPs with HF expertise is vital. Hence, any administrative and organizational obstacles to the delivery of optimal care must be identified and addressed. It is important to develop medically defined target wait times and the system requirements for disease management for patients in each objectively defined risk category (Table 1).

It is also important that patient transfers between institutions for the purpose of access be included in the access and wait time benchmarks. Finally, these benchmarks and targets should be based on need and not on current resource availability.

METHODOLOGY

Published reports of outcomes for patients with HF in a variety of clinical scenarios and those outlining risk factors for hospital readmission were reviewed. In the case of chronic HF following hospitalization, published meta-analyses of randomized, controlled clinical trials were abstracted for outcome data, and descriptions of the interventions were applied (20-25). These data were collated, and the timing of intervention was documented. For HF following acute myocardial infarction (MI), posthospital discharge event rates were noted. Finally, observational data from the ICONS database were abstracted and event rates (adjusted for multiple

TABLE 1
Wait time benchmarks for the evaluation of heart failure (HF) patients by a health care provider

Triage category	Access target	Examples	Evidence	Health care provider
Emergent (very high risk)	<24 h	• Acute severe myocarditis		HF specialist, cardiologist
		• Cardiogenic shock		
		• Transplant evaluation – acutely unstable patient		
		• First episode of acute pulmonary edema		
		• Acute cardiac valvular regurgitation		
Urgent (high risk)	<2 weeks	• Progressive HF		HF specialist, DMP, cardiologist
		• New diagnosis of HF – unstable, decompensated		
		• Postmyocardial HF	Clinical trials	
		• New progression to AHA/ACC Class D		
		• Posthospitalization discharge heart failure	ICONS data, disease management data	
Semiurgent	<4 weeks	• AHA/ACC Class C		HF specialist, DMP, cardiologist, internist
		• New diagnosis of HF – stable, compensated		
Scheduled	<6 weeks	• Chronic HF management		FP, internist, cardiologist, DMP or HF specialist
	<12 weeks	• AHA/ACC Class A and B		

Consideration should be given to having semiurgent (internist) and nonurgent (general practitioner) HF patients initially assessed and managed by an internist, general practitioner or other HF-trained health care practitioner (eg, advanced practice nursing). It is critical that current Canadian Cardiovascular Society Consensus Conference Recommendations on the diagnosis and management of HF patients be widely disseminated and implemented by health care providers that treat HF patients. Emergent (HF specialist) and urgent consultation should be assessed by an HF specialist and/or a cardiologist as available. American Heart Association/American College of Cardiology (AHA/ACC) Class A: At high risk for heart failure but without structural heart disease or symptoms of HF; AHA/ACC Class B: Structural heart disease but without signs or symptoms of HF; AHA/ACC Class C: Structural heart disease with prior or current symptoms of HF; AHA/ACC Class D: Refractory HF requiring specialized interventions (26). DMP Disease management program; FP Family physician/general practitioner; ICONS Improving Cardiovascular Outcomes in Nova Scotia

potentially confounding variables) were noted (Dr Jon Howlett, personal communication). For chronic HF, event rates and treatment protocols for death and hospitalization were noted from the publications of recent trials. Expert opinion was applied to determine reasonable follow-up times for patients with stable, chronic HF of varying degrees.

The current literature on clinical practice guidelines was also reviewed (26,27). Predicted times to heart failure evaluation were extracted from epidemiological data showing increasing mortality with increasing wait times. Where these times were not explicit in the cardiovascular medical literature, they were developed through clinical expert consensus. The Expert Consensus Panel was composed of the Canadian Cardiovascular Consensus Conference Primary Panel on the Diagnosis and Management of Heart Failure (see Appendix). The Working Group's purpose was to develop benchmarks for appropriate wait times. These benchmarks were then sent out to a secondary panel for wider validation. This expert opinion and consensus is reported below.

RESULTS

There were three meta-analyses of randomized trials and one review assessing DMP approaches to HF care (9,14-16). Studies included older and younger patients, patients following hospitalization, and the full spectrum of HF, including patients with severe HF. Interventions usually included predischarge teaching, with specific reference to medication training and identification of potential barriers to adherence. Following discharge, interventions invariably began within two weeks and consisted of telephone calls, home visits or clinic visits. Thereafter, visits ranged from weekly to monthly. End point evaluations ranged from three to 18 months of follow-up. Overall, there was a 30% reduction in death and rehospitalization rates, and the curves tended to separate very early.

Following high-risk MI (defined as MI complicated by left ventricular dysfunction and/or clinical HF), the event rate curve was hyperbolic, with a very high event rate in the first month following discharge, and linear rates thereafter (28-30). Furthermore, the one-year mortality of these patients was 12%, despite contemporary therapy, including revascularization and the use of beta-blockers, acetylsalicylic acid, statins and angiotensin-converting enzyme inhibitors. Thus, patients with post-MI HF should be treated as high risk, similar to patients with new-onset HF or those recently hospitalized due to HF.

Analysis of the data from the ICONS study showed that event curves clearly separated within 10 to 15 days, indicating an almost immediate effect of disease management interventions (Dr Jon Howlett, personal communication).

In clinical trials involving chronic, stable HF, most protocols mandated increased visit frequency (every two to four weeks) during titration of any medication, with follow-up at least monthly for blood testing for the first three months. Most follow-up in the maintenance phase (after drugs titrated) occurred every three to four months. In any event when instability occurred (symptoms or otherwise), a visit within one week was warranted with either the family doctor or a health care professional from a DMP.

RECOMMENDATIONS

For a list of recommended wait time benchmarks for the evaluation of HF patients, please see Table 1. In emergency situations (ie, very high risk – transplant or mechanical circulatory support evaluation, acute valvular rupture, cardiogenic shock, acute myocarditis, first episode of acute pulmonary edema), patients should undergo an initial evaluation within 24 h of presentation by an HF specialist, or by a cardiologist when an HF specialist is unavailable. If the patient presents to a hospital that lacks cardiology or HF expertise, then arrangements should be made for urgent evaluation by a cardiology or HF specialist, especially if the patient is eligible for transplant or mechanical circulatory support.

The urgent HF patient is defined as being at high risk for hospitalization or mortality, specifically post-MI patients with

symptomatic HF, HF with an unstable disease course or worsening symptoms; those with functional New York Heart Association class III/IV symptoms; those requiring an emergency room visit and receiving intravenous diuretics; those with several hospitalizations (two or more) within the past year; and those with recently diagnosed HF. The initial intervention for high-risk patients should include predischarge planning, followed by postdischarge contact by phone, clinic visit or home visit within two weeks, or referral to a DMP or a specialist or internist appointment within two weeks. Not all recently diagnosed HF patients require a comprehensive DMP; however, those patients defined as high risk should be referred to a DMP. In terms of lower-risk, newly diagnosed HF patients, further study is required to elucidate which patients will derive the greatest benefit from a DMP.

In the lower-risk HF patient with milder, stable outpatient symptoms not requiring an emergency room visit or hospital admission, an initial evaluation by a general practitioner, internist or specialist, or a DMP is warranted within four weeks, with follow-up monthly for at least three months, and then every three to 12 months thereafter (Consensus opinion).

For patient follow-up, titration of established medications should occur with visits at least monthly, although these visits should ideally occur at two-week intervals. At all visits, assessment of potential side effects or complications of therapy should occur.

CONCLUSIONS

For high-risk patients, multidisciplinary, specialized HF DMPs that educate patients to enhance self-care activities, apply up-to-date, evidence-based best medical therapies, and provide follow-up monitoring by specially trained staff, should be available and used. This type of intervention is cost-neutral to cost-saving and is associated with reduced mortality (pooled data), reduced HF and all-cause hospitalizations, improved adherence to evidence-based therapies (via prescribing practices and patient adherence) and improved quality of life. Where specialized HF DMPs are not available, referral to cardiovascular specialists with an interest in HF is recommended, and telephone intervention, including telephone follow-up or telemonitoring, enhanced communication with a primary care physician or educational programs designed to enhance patient self-care activities, may be considered (14).

Implementation of the proposed wait time benchmarks will have profound implications for Canada's publicly funded health care system. This is particularly true at all levels within cardiology and the interdisciplinary groups that treat HF patients. More patients will be referred urgently to the HF DMPs located within a local community, regional or tertiary care centre. Patients may require repatriation back to their community or regional hospital, and this will affect both equipment and personnel. Information transfer and electronic health records would greatly facilitate this process. Such a multidisciplinary approach will involve recruitment and training of personnel. Given that 90% of patients with HF are being treated by primary care practitioners, it is imperative to consider how to incorporate elements of HF DMPs into the multidisciplinary chronic disease management strategies in these settings (31).

Given that approximately 50,000 new patients are diagnosed with HF each year, and that there are presently 500,000 HF patients, it is imperative that processes and resources are put in place to ensure comprehensive and timely access to care for the HF population. In addition to established DMP and HF specialists, there is also a need for collaborative care with community internists and family practitioners, nurse-delivered HF care and other novel approaches, including telehealth technologies.

APPENDIX
Canadian Cardiovascular Society Consensus Conference recommendation on heart failure 2006 – Diagnosis and management primary panel members

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APPENDIX – continued
Canadian Cardiovascular Society Consensus Conference recommendation on heart failure 2006 – Diagnosis and management primary panel members

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REFERENCES

1. Naylor CD, Slaughter PM, eds. Cardiovascular Health and Services in Ontario: An ICES Atlas. Toronto: Institute for Clinical Evaluative Sciences, 1999:16-49.
2. Johansen H, Strauss B, Arnold JM, Moe G, Liu P. On the rise: The current and projected future burden of congestive heart failure hospitalization in Canada. Can J Cardiol 2003;19:430-5.
3. Levy D, Kenchaiah S, Larson MG, et al. Long-term trends in the incidence of and survival with heart failure. N Engl J Med 2002;347:1397-1402.
4. McMurray JJ, Stewart S. Epidemiology, aetiology, and prognosis of heart failure. Heart 2000;83:596-602.
5. Rodriguez-Artalejo F, Guallar-Castillon P, Banegas Banegas JR, del Rey Calero J. Trends in hospitalization and mortality for heart failure in Spain, 1980-1993. Eur Heart J 1997;18:1771-9.
6. Jaagosild P, Dawson NV, Thomas C, et al. Outcomes of acute exacerbation of severe congestive heart failure: Quality of life, resource use, and survival. SUPPORT Investigators. The Study to Understand Prognosis and Preferences for Outcomes and Risks of Treatments. Arch Intern Med 1998;158:1081-9.
7. Lee DS, Mamdani MM, Austin PC, et al. Trends in heart failure outcomes and pharmacotherapy: 1992 to 2000. Am J Med 2004;116:581-9.
8. Atienza F, Anguita M, Martinez-Alzamora N, et al; PRICE Study Group. Multicenter randomized trial of a comprehensive hospital discharge and outpatient heart failure management program. Eur J Heart Fail 2004;6:643-52.
9. Gustafsson F, Arnold JM. Heart failure clinics and outpatient management: Review of the evidence and call for quality assurance. Eur Heart J 2004;25:1596-604.
10. DeBusk RF, Miller NH, Parker KM, et al. Care management for low-risk patients with heart failure: A randomized, controlled trial. Ann Intern Med 2004;141:606-13.
11. Rich MW, Beckham V, Wittenberg C, Leven CL, Freedland KE, Carney RM. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. N Engl J Med 1995;333:1190-5.
12. Fonarow GC, Stevenson LW, Walden JA, et al. Impact of a comprehensive heart failure management program on hospital readmission and functional status of patients with advanced heart failure. J Am Coll Cardiol 1997;30:725-32.
13. Galbreath AD, Krasuski RA, Smith B, et al. Long-term healthcare and cost outcomes of disease management in a large, randomized, community-based population with heart failure. Circulation 2004;110:3518-26.
14. McAlister FA, Stewart S, Ferrua S, McMurray JJ. Multidisciplinary strategies for the management of heart failure patients at high risk for admission: A systematic review of randomized trials. J Am Coll Cardiol 2004;44:810-9.
15. Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR. Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure: A meta-analysis. JAMA 2004;291:1358-67. (Erratum in 2004;292:1022).
16. Roccaforte R, Demers C, Baldassarre F, Teo KK, Yusuf S. Effectiveness of comprehensive disease management programmes in improving clinical outcomes in heart failure patients. A meta-analysis. Eur J Heart Fail 2005;7:1133-44.
17. Stewart S, Marley JE, Horowitz JD. Effects of a multidisciplinary, home-based intervention on unplanned readmissions and survival among patients with chronic congestive heart failure: A randomised controlled study. Lancet 1999;354:1077-83.
18. Michalsen A, Konig G, Thimme W. Preventable causative factors leading to hospital admission with decompensated heart failure. Heart 1998:80;437-41.
19. Ducharme A, Doyon O, White M, Rouleau JL, Brophy JM. Impact of care at a multidisciplinary congestive heart failure clinic: A randomized trial. CMAJ 2005;173:40-5.
20. Hjalmarson A, Goldstein S, Fagerberg B, et al. Effects of controlled-release metoprolol on total mortality, hospitalizations, and well-being in patients with heart failure: the Metoprolol CR/XL Randomized Intervention Trial in congestive heart failure (MERIT-HF). MERIT-HF Study Group. JAMA 2000;283:1295-302.
21. Packer M, Coats AJ, Fowler MB, et al; Carvedilol Prospective Randomized Cumulative Survival Study Group. Effect of carvedilol on survival in severe chronic heart failure. N Engl J Med 2001;344:1651-8.
22. Pfeffer MA, Swedberg K, Granger CB, et al; CHARM Investigators and Committees. Effects of candesartan on mortality and morbidity in patients with chronic heart failure: The CHARM-Overall programme. Lancet 2003;362:759-66.
23. Bardy GH, Lee KL, Mark DB, et al; Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT) Investigators. Amiodarone or an implantable cardioverter-defibrillator for congestive heart failure. N Engl J Med 2005;352:225-37.
24. Bristow MR, Saxon LA, Boehmer J, et al; Comparison of Medical Therapy, Pacing, and Defibrillation in Heart Failure (COMPANION) Investigators. Cardiac-resynchronization therapy with or without an implantable defibrillator in advanced chronic heart failure. N Engl J Med 2004;350:2140-50.
25. Cleland JG, Daubert JC, Erdmann E, et al; Cardiac Resynchronization-Heart Failure (CARE-HF) Study Investigators. The effect of cardiac resynchronization on morbidity and mortality in heart failure. N Engl J Med 2005;352:1539-49.
26. Arnold JM, Liu P, Demers C, et al; Canadian Cardiovascular Society. Canadian Cardiovascular Society consensus conference recommendations on heart failure 2006: Diagnosis and management. Can J Cardiol 2006;22:23-45. (Erratum in 2006;22:271).
27. Hunt SA; American College of Cardiology; American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). J Am Coll Cardiol 2005;46:e1-82. (Erratum in 2006;47:1503-05).
28. Pfeffer MA, Braunwald E, Moye LA, et al. Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction. Results of the survival and ventricular enlargement trial. The SAVE Investigators. N Engl J Med 1992;327:669-77.
29. White HD, Aylward PE, Huang Z, et al; VALIANT Investigators. Mortality and morbidity remain high despite captopril and/or Valsartan therapy in elderly patients with left ventricular systolic dysfunction, heart failure, or both after acute myocardial infarction: Results from the Valsartan in Acute Myocardial Infarction Trial (VALIANT). Circulation 2005;112:3391-9.
30. Dickstein K, Kjekshus J; OPTIMAAL Steering Committee of the OPTIMAAL Study Group. Effects of losartan and captopril on mortality and morbidity in high-risk patients after acute myocardial infarction: The OPTIMAAL randomised trial. Optimal Trial in Myocardial Infarction with Angiotensin II Antagonist Losartan. Lancet 2002;360:752-60.
31. Lee DS, Tran C, Flintoft V, Grant FC, Liu PP, Tu JV; Canadian Cardiovascular Outcomes Research Team/Canadian Cardiovascular Society Heart Failure Quality Indicator Panel. CCORT/CCS quality indicators for congestive heart failure care. Can J Cardiol 2003;19:357-64.

Universal access – but when? Treating the right patient at the right time: Access to electrophysiology services in Canada

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The Canadian Cardiovascular Society Access to Care Working Group has published a series of commentaries on access to cardiovascular care in Canada. The present article reviews the evidence for timely access to electrophysiology services. Using the best available evidence along with expert consensus by the Canadian Heart Rhythm Society, the panel proposed a series of benchmarks for access to the full scope of electrophysiology services, from initial consultation through to operative procedures. The proposed benchmarks are presented herein.

Key Words: *Access to care; Arrhythmias; Electrophysiology; Health policy*

L'accès universel, mais quand ? Le traitement du bon patient au bon moment : L'accès aux services d'électrophysiologie au Canada

Le groupe de travail de l'accès aux soins de la Société canadienne de cardiologie a publié une série de commentaires sur l'accès aux soins cardiovasculaires au Canada. Le présent article analyse les données probantes relatives à l'accès rapide aux services d'électrophysiologie. Au moyen des meilleures données probantes disponibles et du consensus de spécialistes de la *Canadian Heart Rhythm Society*, le groupe a proposé une série de points de référence pour l'accès à l'ensemble des services d'électrophysiologie, de la première consultation jusqu'au protocole opératoire. Les points de références proposés sont exposés aux présentes.

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. In 2002, at the Canadian Cardiovascular Congress Public Policy Session, Senator Wilbert Keon stated that an important role of a national professional organization such as the CCS is to develop national benchmarks for access to cardiovascular care that could be validated and adopted or adapted by the provinces. Further, he noted that the time was right for such initiatives because policymakers and other stakeholders in the health care system are now in the process of addressing access and wait time issues.

Currently, there are no national benchmarks or targets for access to care for cardiovascular procedures, office consultations or rehabilitation. While some provinces have established targets for some cardiovascular procedures, no national consensus exists regarding wait time targets, the problem of regional disparities or the mechanisms to address these important issues. A professional organization such as the CCS, with its broad-based membership of cardiovascular experts, is ideally suited to initiate a national discussion and commentary on wait times and access to care issues as they pertain to the delivery of cardiovascular care in Canada.

The CCS Council formed an Access to Care Working Group (the 'Working Group') in the spring of 2004 in an effort to use the best science and current information available to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group has elected to start the process with a series of commentaries. Each commentary is intended to be a first step in a process to encourage the development of national targets. Where information is available, the commentaries summarize the current variability of benchmarks and wait times across Canada. They also summarize the contemporary data, particularly focusing on the relationship between the risk of adverse events as a function of wait time, while identifying gaps in existing data. Using best evidence and expert consensus, each commentary takes an initial position regarding the optimal benchmark for access to care for specific cardiovascular services and procedures. The commentaries also call upon cardiovascular researchers to fill the gaps in this body of knowledge to

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further validate safe wait times for patients at varying degrees of risk.

THE ACCESS ISSUE – ELECTROPHYSIOLOGY SERVICES

Cardiac electrophysiology (EP) is a subspecialty of cardiology that deals primarily with heart rhythm disorders. There are approximately 90 EP specialists in Canada, and nearly all major university medical centres have a full EP program. Some secondary level EP services, such as pacemaker implantation and follow-up, are still performed by non-EP physicians, including cardiac, general and vascular surgeons. In addition, some cardiac surgeons have established advanced expertise in the surgical management of arrhythmias.

As is the case with all of cardiovascular care, EP services in Canada span the continuum of care, from initial consultation, and diagnostic and therapeutic procedures, to follow-up. Full and timely access to EP services continues to be a challenge, owing to the rapid growth in indications and eligible patients (outstripping available funding in many cases), as well as to the fact that most full EP services are restricted to large, university-affiliated centres. Finally, knowledge and technology are advancing very rapidly in cardiac EP, creating a needs-resources mismatch.

In recent years, the implantable cardioverter defibrillator (ICD) has been definitively shown to reduce mortality in patients with significant left ventricular (LV) dysfunction, making an estimated 92,000 Canadians nominally eligible for this treatment (1). More recently, cardiac resynchronization therapy (CRT) has been shown not only to reduce symptoms and hospitalizations secondary to congestive heart failure, but also to independently reduce mortality (2). Finally, spectacular advances in the understanding of the pathophysiology of atrial fibrillation (AF) (the most common, sustained arrhythmia, affecting tens of thousands of Canadians) has led to advances in catheter ablation therapy, which offers, for the first time, a potential cure for an increasing number of AF patients (3). All of these and other advances have created new and somewhat unique pressures on electrophysiologists and other providers of these services in an environment where rapid growth outstrips resources. Yesterday's emerging technologies are rapidly becoming today's standard of care. AF ablation, the use of three-dimensional noncontact mapping technology and CRT therapy have all gone from the drawing board to common clinical practice in less than five years, but only a fraction of the eligible population has benefited to date. Major challenges related to access to these newer procedures and therapies are on the immediate horizon.

ACCESS TO EP CONSULTATION

An EP consultation may be sought for a number of different diagnoses or symptom complexes, ranging from troublesome but benign palpitation and recurrent syncope to malignant arrhythmias. Consultation may be requested by a general practitioner, an internist, a cardiologist or a cardiac surgeon. In many cases, referrals to an electrophysiologist may be made by physicians who themselves have received the consultation through one or even two other physician 'layers'. Many weeks or months may go by from the time a patient presents to his or her primary caregiver with the initial complaint until they make their way through a series of referrals to the electrophysiologist. This is not to say, of course, that unstable, urgent or emergent patients are made to wait for appropriate care. Such patients typically present to the emergency department, where they are stabilized and risk-stratified. In some cases, electrophysiologists may be consulted urgently or emergently by the emergentologist (eg, for electrical storm), but it is usually the case that emergencies are dealt with by first responders (paramedics in the field) or by family physicians, emergency room physicians, internal medicine specialists or general cardiologists. Electrophysiologists are more often involved in the care plan once patients have been stabilized and are no longer in immediate danger, although an increasing number of centres have established a '24/7' EP on-call schedule to deal with some of these emergent and urgent problems.

Significant differences have been shown in wait times among hospitals (4) and between countries (5,6) for various 'non-EP' cardiac consultations. It is logical to assume that the same situation would apply to EP consultations as well. There are no strict guidelines or recommendations in the literature for 'acceptable' wait times to obtain an EP consultation. Many factors can influence access to secondary or tertiary cardiology care, but it has been demonstrated that wait times are longer in academic medical centres, in larger communities and for physicians with certification in cardiology, with wait times varying between four and nine weeks (7). Anecdotally, it is known that many patients in Canada wait much longer than this to see an electrophysiologist.

After the initial EP assessment, additional tests may be ordered to refine the diagnosis or to help determine a treatment plan. For example, an assessment of LV function (echocardiography, nuclear medicine) or a test of ischemic burden (eg, treadmill, thallium^{201} scintigraphy, dobutamine echocardiography, etc) may be performed before a decision is made to recommend an ICD. An ambulatory rhythm monitor may be required to characterize paroxysmal arrhythmias or the ventricular response rate in AF before decisions are made about pharmacological or catheter ablation therapy. Echocardiography with tissue Doppler imaging for LV dysynchrony may be required before recommending CRT. Each of these specialized tests is usually performed as an outpatient procedure, and, accordingly, the timing of these tests is subject to the dynamics of outpatient waiting lists. In the final analysis, the cumulative wait time from initial consultation to the application of the definitive treatment may be considerable, adding weeks or even months to the patient's 'wait experience', which is in addition to the conventionally defined 'wait time' for the procedure itself.

Finally, we know that when a scoring system or 'rating' is applied to stratify patient risk while on a waiting list, specialist practitioners can assess the relative priority of patients, allowing for a greater delay for those with less acute need (8). This may be particularly relevant in EP, as practitioners become focused on procedures like ICDs, which reduce mortality, while allowing patients referred for, say, catheter ablation for a nonlethal but troublesome arrhythmia (such as supraventricular tachycardia [SVT]) to wait for much longer periods of time.

Benchmark for wait times to obtain an EP consultation

Wait time benchmarks for initial EP consultation are shown in Table 1. When a patient is referred for an expert opinion in EP (outpatient consultation), delays vary depending on the assessment of risk faced by the patient, as determined by the information provided in the referral letter. For example, patients

TABLE 1
Wait time benchmarks for initial electrophysiology consultation

Emergent or urgent patients	Refer to ER or electrophysiologist on call
Patients with structural heart disease (eg, ejection fraction less than 40%, bundle branch block, hypertrophic cardiomyopathy, congenital heart disease, family history of sudden cardiac death or inherited heart disease) referred for symptoms, such as syncope, that could potentially be associated with a risk of morbidity or mortality	30 days
Patients referred for consideration of implantation of an implantable cardioverter defibrillator (primary prevention) and/or a cardiac resynchronization therapy device	30 days
Patients electively referred for an electrophysiologist's opinion (eg, palpitations, supraventricular tachycardia, syncope without structural heart disease or other medical conditions)	90 days

ER Emergency room

with supraventricular arrhythmias carry a very low risk of mortality compared with patients with structural heart disease referred because of a syncopal episode. It is common practice for patients with a worrisome risk factor profile (LV ejection fraction less than 40%, bundle branch block, hypertrophic cardiomyopathy, congenital heart disease, family history of sudden cardiac death, inherited heart disease, pre-excited AF) who are referred for syncope to be seen earlier than patients without this high-risk profile. Because additional tests or procedures are often required before a decision can be made on the treatment plan, the authors suggest that a maximum delay of 30 days before consultation should apply for these high-risk patients; otherwise, the additional delay necessitated by the need for further testing will lead to an increase in the total wait time for any definitive procedure or treatment. The clinical judgement of the referring physician is critically important here because there may be instances when an even more timely consultation is required. Urgent and emergent situations should ordinarily be routed through the emergency department.

For patients referred for an elective opinion (eg, palpitation not yet diagnosed, SVT, syncope without structural heart disease), a maximum wait time for referral to consultation of 90 days should apply. While waiting may pose little or no risk to life or limb, it is recognized that these symptoms can cause considerable morbidity.

ACCESS TO EP STUDIES AND CATHETER ABLATION

EP studies and catheter ablation are central to the contemporary management of many cardiac arrhythmias. Newer ablation techniques have emerged using advanced mapping systems that have improved the management of previously untreatable conditions. Timely access to these procedures reduces patient morbidity, decreases medical costs and, in some cases, is life-saving. Cohort studies, clinical trials, cost analyses and a Canadian Health Technology assessment provide the best estimate of the effectiveness of these procedures and, together with guidelines from other jurisdictions, permit the determination of reasonable wait times. Wait time benchmarks for EP studies and catheter ablation are shown in Table 2.

TABLE 2
Wait time benchmarks for electrophysiology studies and catheter ablation

Patient acuity	Wait time benchmark
High-risk patients (eg, Wolff-Parkinson-White syndrome with rapid atrial fibrillation or syncope, high-risk arrhythmias with congenital heart disease or significant left ventricular dysfunction)	2 weeks
Low-risk patients (eg, supraventricular tachycardia or atrial fibrillation with structurally normal hearts)	3 months

Standard EP studies and catheter ablation

Catheter ablation is the first-line treatment for many cardiac arrhythmias, including SVT, atrial flutter (AFL) and for some cases of idiopathic ventricular tachycardia. These procedures are routinely performed on an outpatient basis, with very few complications (9) and, in contrast to most pharmacological and surgical therapies in medicine, are typically curative. As such, catheter ablation dramatically reduces recurrences (10), reduces the subsequent need for medication or hospital visits, improves patient quality of life (11) and is highly cost-effective. In fact, catheter ablation for SVT is among a select group of medical interventions that are economically 'dominant' over alternative therapies – meaning that it is less costly and results in improved patient outcomes (12). A detailed Canadian assessment of catheter ablation (13), commissioned by the Canadian Coordinating Office for Health Technology Assessment, confirmed the cost-effectiveness of this treatment.

Given the nonlethal nature of most arrhythmias treated with catheter ablation, the primary determinants of an acceptable wait time are recurrence rate, patient morbidity, resource use and costs, and standards of other Canadian jurisdictions. In one study of patients with highly symptomatic SVT (12), 83% of untreated patients had a documented recurrence of arrhythmia within 90 days. Because recurrences are associated with decreased patient quality of life (10) and increased health care costs (11), and are almost completely preventable with timely access to catheter ablation (10), an acceptable wait time of not more than three months for catheter ablation would be appropriate, as has been proposed in some provinces (14).

For some cardiac arrhythmias, timely access to EP studies and catheter ablation may be life-saving. Patients in this category include those with Wolff-Parkinson-White syndrome who have rapid AF or syncope, those with certain arrhythmias resulting from congenital heart disease, and those with LV dysfunction who are at risk for, or who currently have, documented ventricular arrhythmias. While sudden arrhythmic death is an uncommon consequence of untreated Wolff-Parkinson-White syndrome, it is particularly devastating in these typically young patients with curable disease (15). Patients with congenital heart disease and certain high-risk arrhythmias may also have a preventable mortality risk with early intervention. In patients with ventricular dysfunction and syncope or significant arrhythmias, EP studies are able to identify a subset of patients with a one-year mortality rate of 23% (16) who could benefit from an implantable defibrillator, while also identifying

a large group of patients who could be managed appropriately without a defibrillator. Prompt access to EP studies and catheter ablation for these potentially high-risk conditions may prevent avoidable death. As such, a shorter acceptable waiting period of two weeks is justified.

ACCESS TO PACEMAKER SERVICES

Permanent pacemakers are commonly implanted in many Canadian centres. In 1993, the number of new implants in Canada was estimated to be 268 per million population (17). From April 2004 to March 2005, 20,053 pacemakers were implanted in Canada (18), or approximately 670 per million population. Please see Table 3 for a list of wait time benchmarks for pacemakers.

Permanent pacemaker implantation may be performed on an urgent or semiurgent basis (the patient is an inpatient who requires the implant of a permanent pacemaker before they can be safely discharged from hospital), or on a scheduled or elective basis. Most patients requiring pacemakers have sinus node dysfunction, AF with a slow ventricular response or atrioventricular conduction disease. Typically, urgent and semiurgent patients (nonelective) are admitted to hospital either because their bradyarrhythmia has been symptomatic or because there is concern that the patient is at high risk for the development of an adverse event. Symptoms may include presyncope, syncope, fatigue, chest pain or dyspnea. Adverse events include falls with injury, the development of heart failure and sudden death.

Evidence regarding the impact of wait times for pacemakers on safety is sparse. However, one Canadian study (19) found a correlation between wait times for nonelective cases and adverse events, many of which were related to temporary transvenous pacing (TTVP). The study further found that rates of adverse events were lower in the centre with shorter wait times (8% versus 33%; P<0.00001), even though the rate of TTVP was the same. Adverse events included TTVP failure causing presyncope or syncope, pneumothorax, torsade de pointes ventricular tachycardia, infection and pulmonary embolism. The longer wait times (4.5±3.0 days versus 1.9±1.6 days; P=0.0001) in the centre with the higher rate of adverse events were attributed to the fact that pacemakers were implanted in an operating room (OR) and were therefore subject to delays and cancellations due to other competing priorities. A dedicated implant facility, such as a procedure room or an EP laboratory, facilitated more timely implants as well as shorter overall lengths of stay (3.0±5.5 days versus 8.9±5.7 days; P=0.0001). The study also found that patients who were transferred in from another inpatient facility for a pacemaker implantation waited longer than patients who were primarily admitted to the implanting centre – a difference not found in the centre with a dedicated implant facility. Finally, in both centres, patients with an adverse event had longer wait times than those without. A subsequent follow-up study (20) found that when the centre in the original study moved implants to the EP laboratory from the OR, wait times and complication rates were dramatically reduced, and the disparity in wait times and outcomes between 'transfer' patients and 'nontransfer' patients disappeared. Another Canadian study (21) in 2000 also supported the safety of an EP laboratory implant strategy. Study investigators found that EP laboratory implants were as safe as OR implants, but that wait times were reduced in the EP laboratory environment.

TABLE 3
Wait time benchmarks for cardiac device therapy

Pacemakers	Wait time benchmark
Urgent/semiurgent* pacemaker with TTVP	Immediate to 3 days
Urgent/semiurgent* pacemaker with no TTVP	3 days
Scheduled pacemaker, with high risk of syncope	2 weeks
Scheduled pacemaker, with lower risk of syncope	6 weeks
Implantable cardioverter defibrillators	
Secondary prevention	Immediate to 3 days
Primary prevention	8 weeks
Cardiac resynchronization therapy devices	
All cardiac resynchronization therapy devices	6 weeks

**Defined, in the judgment of a physician, as a patient who cannot safely leave the hospital until a permanent pacemaker is implanted. TTVP Temporary transvenous pacemaker*

Safe wait times for scheduled (elective) implants have not been evaluated in the literature. Patients who do not require admission for their bradyarrhythmia are generally at low risk; however, they are usually very symptomatic and would therefore benefit from shorter wait times. Because waiting with a temporary pacing wire in situ appears to be strongly associated with adverse events, permanent pacemaker implantation should be accomplished as quickly as possible (immediate to three days). Those in hospital waiting for pacemaker implantation should wait no longer than three days. Low-risk outpatients should wait no more than six weeks, and higher-risk outpatients should wait no more than two weeks.

ACCESS TO ICD SERVICES

Access to ICDs was addressed separately by the Working Group in a previously published paper (22); the reader is referred to this paper for a complete review on access to ICDs in Canada.

ICDs are broadly classified as being either for 'secondary prevention' or 'primary prevention'. Secondary prevention devices are implanted in patients who have survived a cardiac arrest or a dangerous ventricular tachyarrhythmia. Primary prevention patients are those who are deemed to belong to a high-risk group shown to benefit from the prophylactic implant of an ICD, even though a life-threatening arrhythmia has not yet occurred.

Historically, patients who require a secondary prevention device are admitted to hospital and remain in hospital until the device can be implanted. There may be medical reasons for delay, including recovery from the index event, but there are more frequently administrative and economic reasons for delay, including the unavailability of devices due to budgetary restrictions, limitations on OR or EP laboratory time, or other procedures competing for implanting physicians' time. Ideally, once a patient is deemed fit for the implant, the procedure should be accomplished with a maximum wait time of a pacemaker (ie, three days).

To derive a justifiable wait time for primary prevention ICDs for patients not in hospital, the authors applied the principles currently applied to patients on the waiting list for coronary artery bypass graft (CABG) surgery. The benchmark for

total waiting list mortality for patients awaiting CABG surgery in Ontario is 0.5%. It seems reasonable that the preventable waiting list mortality for patients awaiting a primary prevention ICD should also not exceed 0.5%. Although there are no real-world registry data regarding ICD waiting list mortality, the Multicenter Automatic Defibrillator Implantation Trial II (MADIT II) (23) provides a means by which to predict the preventable mortality for each unit of time that passes without an ICD in situ because the mortality curves of the 'ICD' and 'no ICD' populations in the study diverge. This study of patients with coronary disease and reduced ejection fraction compared ICD therapy with optimal medical therapy. Based on these data, and presuming a linear risk, the non-ICD-treated patient with a 'MADIT II' indication would face a 0.8% monthly risk of mortality. However, given that this is a high-risk population, slightly less than two-thirds of these deaths would be classified as 'unavoidable' (ie, they would have occurred even if the ICD had been implanted). Therefore, the preventable mortality risk is about 0.3% per month. Accordingly, to achieve the goal of subjecting patients on the ICD waiting list to a preventable mortality of no more than 0.5% per month, the wait time should not exceed seven or eight weeks. Of course, such a standard would need to be prospectively tested and verified in a 'real-world' registry, but the principle of a wait time benchmark tied to waiting list mortality would seem to be unassailable, given the history of widespread acceptance of the same strategy for CABG surgery waiting list management.

ACCESS TO CRT PACEMAKERS AND ICDs

Resynchronization (biventricular) pacemakers have been recommended in the CCS/Canadian Heart Rhythm Society position paper on ICDs in Canada (24) as a class IIa recommendation, and by the more recent CCS position paper on heart failure treatment (25) as a class I indication. Eligible patients are those with severe (New York Heart Association [NYHA] class III or IV) symptomatic heart failure, prolonged QRS duration (over 120 ms) and poor LV function (LV ejection fraction 35% or less). Using similar criteria, the European Heart Society 2005 update on heart failure management (26) also suggests a class I recommendation for resynchronization therapy for such patients.

A decade of clinical trials, including large, randomized, blinded, multicentre clinical trials, have convincingly demonstrated that biventricular pacing, in appropriately selected patients, improves exercise function and clinical well-being, reduces heart failure symptoms, leads to objective improvement in ventricular function (reduced ventricular size, improved systolic function and reduced mitral regurgitation), and reduces cardiac and heart failure-related hospitalizations during follow-up (27,28). As a result, this therapy is rapidly becoming mainstream for patients with systolic heart failure who receive optimal pharmacological therapy if their QRS duration is over 120 ms, and if NYHA class III or IV symptoms are present. The recently published Cardiac Resynchronization-Heart Failure (CARE-HF) study (2), supported by a trend observed in the Comparison of Medical Therapy, Pacing, and Defibrillation in Heart Failure (COMPANION) study (29) and a meta-analysis of previously published trials of resynchronization pacing (without an ICD) in heart failure patients (30), suggested that CRT may afford a mortality benefit independent of other therapies.

The issue of which patients should receive a biventricular pacemaker combined with an ICD versus a biventricular pacemaker alone remains unresolved. Furthermore, the issue of whether a biventricular pacemaker combined with an ICD provides greater mortality benefit than an ICD alone is also unresolved, and it is now the subject of multicentre, randomized clinical trials, including the Canadian-led Resynchronization/defibrillation for Advanced heart Failure Trial (RAFT).

Although it is likely that CRT prolongs life, it must be emphasized that even if CRT has not definitively been proven to prolong life, it is a well-documented, established, effective and widely used therapy for the purpose of improving quality of life in patients with severe heart failure.

Recommendations regarding wait times for CRT

There are no published benchmarks regarding the maximum appropriate wait time for CRT. Unlike the considerations involving wait times for ICD therapy (for which estimates of sudden, preventable death while on a waiting list can be obtained), it is not possible to accurately estimate preventable mortality while waiting for a CRT device. Nonetheless, estimates regarding morbidity while on the waiting list can be obtained. Patients with NYHA class III or IV heart failure symptoms are, by definition, disabled from moderately active physical functioning, have demonstrably poor quality of life and are at high risk for hospitalization (approximately 5% per month for the first three months, with a cumulative hospitalization rate of 45% after an average 24-month follow-up in the control arm of the CARE-HF trial [2]).

As in the case of highly symptomatic patients with angina requiring cardiac revascularization, it is reasonable to propose that wait times for cardiac resynchronization be no longer than six weeks. This would correspond to less than a 10% incidence of rehospitalization for heart failure while waiting for the procedure. In addition, such patients would have no more than a 0.5% likelihood of unexpected deaths from sudden cardiac causes during the six-week waiting period, which may have been prevented with combined CRT and ICD therapy, when the latter is also used. Please see Table 3 for a list of wait time benchmarks for ICDs and CRT.

CONCLUSIONS

While reliable data to accurately assess the morbidity and mortality attributable to the lack of access to cardiac EP and to wait times for EP services are sparse, some estimates can be inferred from clinical trial data. These data, taken together with expert consensus, have led to the development of the recommended wait times offered in the present article. Major challenges in access to EP services in Canada lie on the immediate horizon as promising new therapies with the potential to improve and prolong the lives of thousands of Canadians continue to rapidly enter the mainstream.

REFERENCES

1. Simpson CS, Hoffmaster B, Dorian P. Downward delegation of implantable cardioverter defibrillator decision-making in a restricted-resource environment: The pitfalls of bedside rationing. Can J Cardiol 2005;21:595-9.
2. Cleland JG, Daubert JC, Erdmann E, et al; Cardiac Resynchronization-Heart Failure (CARE-HF) Study Investigators. The effect of cardiac resynchronization on morbidity and mortality in heart failure. N Engl J Med 2005;352:1539-49.

3. Stabile G, Bertaglia E, Senatore G, et al. Catheter ablation treatment in patients with drug-refractory atrial fibrillation: A prospective, multi-centre, randomized, controlled study (Catheter Ablation For The Cure Of Atrial Fibrillation Study). Eur Heart J 2006;27:216-21.
4. Naylor CD, Levinton CM, Wheeler S, Hunter L. Queueing for coronary surgery during severe supply-demand mismatch in a Canadian referral centre: A case study of implicit rationing. Soc Sci Med 1993;37:61-7.
5. Hippisley-Cox J, Pringle M. Inequalities in access to coronary angiography and revascularisation: The association of deprivation and location of primary care services. Br J Gen Pract 2000;50:449-54.
6. Carroll RJ, Horn SD, Soderfeldt B, James BC, Malmberg L. International comparison of waiting times for selected cardiovascular procedures. J Am Coll Cardiol 1995;25:557-63.
7. Massel D. Access to an outpatient cardiology consultation in southwestern Ontario. Can J Cardiol 1999;15:879-83.
8. Naylor CD, Levinton CM, Baigrie RS. Adapting to waiting lists for coronary revascularization. Do Canadian specialists agree on which patients come first? Chest 1992;101:715-22.
9. Vora AM, Green MS, Tang AS. Safety and feasibility of same day discharge in patients undergoing radiofrequency catheter ablation. Am J Cardiol 1998;81:233-5.
10. Bathina MN, Mickelsen S, Brooks C, Jaramillo J, Hepton T, Kusumoto FM. Radiofrequency catheter ablation versus medical therapy for initial treatment of supraventricular tachycardia and its impact on quality of life and healthcare costs. Am J Cardiol 1998;82:589-93.
11. Marshall DA, O'Brien BJ, Nichol G. Review of economic evaluations of radiofrequency catheter ablation for cardiac arrhythmias. Can J Cardiol 2003;19:1285-304.
12. Sintetos AL, Roark SF, Smith MS, McCarthy EA, Lee KL, Pritchett EL. Incidence of symptomatic tachycardia in untreated patients with paroxysmal supraventricular tachycardia. Arch Intern Med 1986;146:2205-9.
13. Yee R, Connolly S, Noorani H. Clinical review of radiofrequency catheter ablation for cardiac arrhythmias. Can J Cardiol 2003;19:1273-84.
14. La Gestion De L'acces Aux Services En Cardiologie Tertiare. In: College des medecins du quebec et Reseau Quebecois de cardioloie tertiaire, November 2003.
15. Klein GJ, Bashore TM, Sellers TD, Pritchett EL, Smith WM, Gallagher JJ. Ventricular fibrillation in the Wolff-Parkinson-White syndrome. N Engl J Med 1979;301:1080-5.
16. Mittal S, Iwai S, Stein KM, Markowitz SM, Slotwiner DJ, Lerman BB. Long-term outcome of patients with unexplained syncope treated with an electrophysiologic-guided approach in the implantable cardioverter-defibrillator era. J Am Coll Cardiol 1999;34:1082-9.
17. Goldman BS, Nishimura S, Lau C. Survey of Cardiac Pacing in Canada (1993). Can J Cardiol 1996;12:573-8.
18. Crysler Report on the Canadian Cardiovascular Market, 2005.
19. Simpson CS, Fisher MA, Curtis MJ, et al. Correlation of waiting time with adverse events in patients admitted for nonelective permanent pacemaker implantation. Can J Cardiol 1998;14:817-21.
20. Leung WM, Simpson CS, Abdollah H, Ropchan GV, Brennan FJ. Effect of a dedicated implant facility on waiting times and morbidity in patients requiring pacemakers. Pacing Clin Electrophysiol 2003;26:S145.
21. Molin F, Page P, Daoust L. Implantation of permanent pacemakers in the electrophysiology laboratory: What it has changed in a general teaching hospital. Can J Cardiol 2000;16:871-5.
22. Simpson CS, O'Neill BJ, Sholdice MM, et al. Canadian Cardiovascular Society commentary on implantable cardioverter defibrillators in Canada: Waiting times and access to care issues. Can J Cardiol 2005;21(Suppl A):19A-24A.
23. Moss AJ, Zareba W, Hall WJ, et al; Multicenter Automatic Defibrillator Implantation Trial II Investigators. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. N Engl J Med 2002;346:877-83.
24. Tang AS, Ross H, Simpson CS, et al. Canadian Cardiovascular Society/Canadian Heart Rhythm Society position paper on implantable cardioverter defibrillator use in Canada. Can J Cardiol 2005;21(Suppl A):11A-18A.
25. Arnold JM, Liu P, Demers C, et al; Canadian Cardiovascular Society. Canadian Cardiovascular Society consensus conference recommendations on heart failure 2006: Diagnosis and management. Can J Cardiol 2006;22:23-45.
26. Krum H. The Task Force for the diagnosis and treatment of chronic heart failure of the European Society of Cardiology. Guidelines for the diagnosis and treatment of chronic heart failure: Full text (update 2005). Eur Heart J 2005;26:2472.
27. Al-Khatib SM, Sanders GD, Mark DB, et al. Implantable cardioverter defibrillators and cardiac resynchronization therapy in patients with left ventricular dysfunction: Randomized trial evidence through 2004. Am Heart J 2005;149:1020-34.
28. Ellenbogen KA, Wood MA, Klein HU. Why should we care about CARE-HF? J Am Coll Cardiol 2005;46:2199-203.
29. Bristow MR, Saxon LA, Boehmer J, et al; Comparison of Medical Therapy, Pacing, and Defibrillation in Heart Failure (COMPANION) Investigators. Cardiac-resynchronization therapy with or without an implantable defibrillator in advanced chronic heart failure. N Engl J Med 2004;350:2140-50.
30. Bradley DJ, Bradley EA, Baughman KL, et al. Cardiac resynchronization and death from progressive heart failure: A meta-analysis of randomized controlled trials. JAMA 2003;289:730-40.

Canadian Cardiovascular Society commentary on implantable cardioverter defibrillators in Canada: Waiting times and access to care issues

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The Canadian Cardiovascular Society is the national professional society for cardiovascular specialists and researchers in Canada. In the spring of 2004, the Canadian Cardiovascular Society Council formed an Access to Care Working Group in an effort to use the best science and information to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group has elected to publish a series of commentaries to initiate a structured national discussion on this very important issue.

Access to treatment with implantable cardioverter defibrillators is the subject of the present commentary. The prevalence pool of potentially eligible patients is discussed, along with access barriers, regional disparities and waiting times. A maximum recommended waiting time is proposed and the framework for a solution-oriented approach is presented.

Key Words: *Health policy; Implantable cardioverter defibrillator; Sudden death; Waiting times*

Commentaire de la Société canadienne de cardiologie sur les défibrillateurs internes à synchronisation automatique au Canada : La question des délais d'attente et de l'accès aux soins

La Société canadienne de cardiologie est la société professionnelle nationale des spécialistes et des chercheurs en santé cardiovasculaire du Canada. Au printemps 2004, le conseil de la Société canadienne de cardiologie a formé un groupe de travail sur l'accès aux soins dans un effort pour faire appel aux meilleures données scientifiques et à la meilleure information en vue de mettre sur pied des catégories de triage raisonnables et des délais d'attente sécuritaires à l'égard de l'accès à des services et interventions cardiovasculaires courants. Le groupe de travail a choisi de publier une série de commentaires pour entreprendre un débat national structuré sur cet enjeu capital.

L'accès au traitement par défibrillateur interne à synchronisation automatique fait l'objet du présent commentaire. Le bassin de prévalence des patients potentiellement admissibles est abordé, ainsi que les obstacles à l'accès, les disparités régionales et les délais d'attente. Un délai d'attente maximal recommandé est proposé, et la structure d'une démarche axée sur les solutions est présentée.

The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. In 2002, at the Canadian Cardiovascular Congress Public Policy Session, Senator Wilbert Keon stated that an important role of a national professional organization (such as the CCS) is to develop national standards for access to cardiovascular care that could be validated, and adopted or adapted by the provinces. Furthermore, he noted that because policy-makers and other stakeholders in the health care system currently grapple with access and waiting time issues, the time is right for such initiatives.

Currently, there are no national standards or targets for access to care for cardiovascular procedures or office consultations. While some provinces have established targets for some cardiovascular procedures, no national consensus exists regarding waiting time targets, issues of regional disparities or even how to approach the problem. A professional organization such as the CCS, with its broad-based membership of cardiovascular experts, is ideally suited to initiate a national discussion and commentary on waiting times and access to care issues as they pertain to the delivery of cardiovascular care in Canada.

In spring 2004, the CCS Council formed an Access to Care Working Group in an effort to use the best science and information to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group has elected to start the process with a series of commentaries. Each commentary is intended to be a first step in a process to encourage the development of national targets. The commentaries summarize the current variability of standards and wait times across Canada, where this information is available. They also summarize the currently available data, particularly focusing on the relationship between the risk of adverse events as a function of waiting time, as well as on the identification of gaps in existing data. Using the best evidence and expert consensus, each commentary takes an initial position on what the optimal standard for access to care ought to be for the cardiovascular service or procedure. The commentaries also serve to call upon cardiovascular

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researchers to fill in the gaps of this body of knowledge and to further validate safe wait times for patients at varying degrees of risk.

The safety and efficacy of the implantable cardioverter defibrillator (ICD) have been firmly established in both secondary prevention (1) and primary prevention (2,3) trials. The CCS/Canadian Heart Rhythm Society position paper on ICD use in Canada by Tang et al (4) recognized the strength of the evidence and defined high-risk patient populations with class I and class II indications for ICD implantation, acknowledging that clinical judgment still has a large role to play in decision-making at the individual patient level. Given the large number of potentially eligible patients, concern has been expressed by physicians, administrators and government officials regarding the economic and care-delivery implications of more widespread ICD use, particularly in the primary prevention population. Can we afford to implant ICDs in all eligible patients? Do we have an adequate infrastructure for implantation and follow-up? How can we manage the anticipated growth in demand for ICDs? Fundamental questions about resource allocation, individual and collective fairness, equitable access and acceptable waiting times are entangled in these issues. Defining and understanding the barriers to access to care are the first steps in the process of developing a framework for the resolution of these difficult and complex problems.

The ICD, arguably more than any other treatment, illustrates the access to care issue most starkly. First, it is a device that aborts sudden death; hence, it follows that longer waits would probably be associated with a higher mortality risk. Second, the indications for ICDs are rapidly expanding, creating a need/resource mismatch. Third, the 'high technology' that the ICD represents serves to confine the treatment to highly specialized centres, making regional disparities in care delivery a concern. Finally (largely because the indications are relatively new), most jurisdictions in Canada do not have databases to track waiting times, regional variations, outcomes or other care-delivery variables. Thus, stakeholders find themselves making resource allocation decisions and care-delivery decisions in a virtual data vacuum.

What is the prevalence pool of potentially eligible patients?

One of the first and most obvious barriers to ICD access results from our perception of the size of the eligible primary prevention population, or the prevalence pool. This creates a seemingly daunting challenge and leads many to conclude that efforts to even begin to address the treatment of the prevalence pool may be futile; however, it must be remembered that there is a latency period before new therapies reach their full potential. Even relatively simple therapies, like angiotensin-converting enzyme inhibitors for ischemic left ventricular dysfunction, beta-blockers for postmyocardial infarction patients and statin therapy, have taken years to even partially penetrate their target populations.

Nonetheless, it remains instructive to speculate on the size of the potentially eligible ICD population. Many quick and approximate calculations of the potentially eligible primary prevention population have been proposed for the population of the United States; thus, it is possible to make some extrapolations to the Canadian population, recognizing that the estimates are based on many presumptions. The following is one representative example.

In December 2004, based on American census data and the Resource Utilization Among Congestive Heart Failure (REACH) study (5), Bernstein and associates (6) estimated that of five million American citizens with heart failure, 2.4 million have systolic dysfunction and 1.4 million of these have a left ventricular ejection fraction of 30% or less; furthermore, of these 1.4 million, 950,000 are thought to be on the basis of ischemic heart disease. They further subtracted 23% to account for exclusion of patients with disqualifying comorbidities (ie, they likely would not be considered candidates for an ICD because competing comorbidities would render the ICD less effective in reducing overall mortality). By their estimation, this would leave 725,000 Americans potentially eligible for a "Class I-indicated" (by Canadian standards [4]) prophylactic ICD.

TABLE 1
Model of plausible growth of new implantable cardioverter defibrillator implants in Canada: Prevalence of treated and untreated patients*

	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09
Total prevalence	92,000	95,700	99,400	103,100	106,800	110,500
Treated	7000	9100	11,690	15,021	19,019	23,617
Untreated	85,000	86,600	87,710	88,079	87,781	86,883
New implants	2300	2800	3500	4500	5500	6500
New implants per million	72	88	110	141	172	204

**Presumes 4% annual growth of the eligible population and 10% annual mortality of the treated group. Calculations do not incorporate replacement devices, which would be expected to add an additional 15% per year (at steady state) presuming the longevity of a pulse generator to be seven to eight years. FY Fiscal year*

To calculate an equivalent Canadian estimate, one must adjust for the fact that Canada has an older population. In the 2000 census, the American population was 282.1 million, with 9.2% between 55 and 64 years of age and 11.9% over 65 years of age. In Canada in 2002, the population was 31.9 million, with 10.7% between 55 and 64 years of age and 12.8% 65 years of age and over. Therefore, if we can presume that the vast majority of ICD-eligible Americans are over 55 years of age, then 725,000 ICD-eligible Americans would constitute 1.22% of the population over 55 years of age. Given that 23.5% of Canadians are over 55 years of age (7.5 million people), this would make the total Canadian prevalence pool approximately 92,000 people (1.22% × 7.5 million people).

As one might expect, the annual growth of the number of eligible patients is estimated to be only a fraction of the prevalence pool, illustrating the relative magnitude of the prevalent need versus the incident need. There have been ongoing efforts to further risk stratify the population of ICD candidates; however, this could significantly affect these calculations by reducing the size of the potential prevalence pool. There is currently considerable interest in defining a population within the population at risk that derives most or all of the benefit from ICDs.

As indicated earlier, it is unrealistic to expect complete and immediate penetrance into the eligible population. Table 1 depicts one realistic and plausible scenario for growth over the next several years, taking into consideration a slowly increasing acceptance of the primary prevention treatment strategy by the referral community as well as infrastructure limitations. This model starts with the presumption that there are 7000 Canadians currently living with an ICD. It further presumes that patients with an ICD have a 10% annual mortality, that the eligible population grows by 4% each year and that the number of

implants performed each year increases relatively uniformly. The model shows that if by fiscal year 2008/2009, 6500 new devices are implanted annually (up from the 2300 implanted in fiscal year 2003/2004), the rate of new implants would increase from 72 per million to 204 per million and the prevalence of treated patients would increase from 7000 to 23,617. The percentage of the eligible population that is treated would increase from 7.6% to 21.4% over five years – far from complete penetrance, but certainly a significant improvement. Of course, efforts to more precisely define the population at risk could have a significant impact on these calculations, as would the funded volumes and the predicted incidence of the number of eligible patients. This model is offered only as a reasonable starting point for discussion rather than as a recommendation or prediction.

From an economic feasibility standpoint, it is worthwhile pointing out that, presuming total charges of $25,000 per device implant, this degree of growth (to 6500 devices implanted annually) would represent only about 0.1% of Canada's $130 billion health care budget, and would be the equivalent of only 13% of the amount spent on wholesale purchases of statin drugs from Canadian drugstores between December 2003 and November 2004 ($1.24 billion) (7). Framed in these terms, investing in the most effective treatment for sudden death (one of the leading causes of death in Canada) appears very reasonable. The value per dollar also appears to be favourable in the primary prevention population, with three recent analyses calculating the cost-effectiveness to be in the range of $30,000 to $50,000 per life year gained (8-10).

'Culture of under-referral' and other potential barriers

The barriers to identification and referral of patients, and to implantation of ICDs, are not comprehensively understood but potentially include the following:

- there are not enough specialists to evaluate the eligible patients;
- physicians do not accept the randomized data;
- physicians do not accept the CCS recommendations;
- there is a perception that the therapy is not cost-effective;
- physicians feel the therapy is unavailable, so they do not bother referring;
- there is a perception that the risks outweigh the benefits;
- there is a perception that the waiting lists are so long that referring is not worthwhile, and that patients will suffer during the delay due to unfulfilled expectations, angst from a life put on hold and the new knowledge that they are at risk;
- electrophysiologists exercise bedside rationing of the resources in fixed-resource environments;
- patients who are offered an ICD elect not to proceed with the implant; and
- patients who are on waiting lists but do not receive the therapy (implanting centre runs out of funds, patient dies on waiting list, etc).

A recent study of Canadian physicians' attitudes toward ICDs (11) has shed some light on the "culture of under-referral". This survey of Canadian cardiologists and electrophysiologists presented physicians with typical scenarios of potential ICD-indicated patients. For a patient with an indication for ICD implantation based on the Multicenter Automatic Defibrillator Implantation Trial II (MADIT-II) study, 43% of referring cardiologists cited excessive wait times for initial consultation, evaluation and implant as the greatest impediment to referral. An additional 36% listed cost or cost-efficacy as the primary impediment to referral. Therefore, while excessive wait times for ICDs play a major role in the reluctance to refer patients, physicians' concerns about cost and cost-efficacy may be interpreted to mean that they are playing a 'stewardship' or 'societal advocate' role in the allocation of the ICD resource.

Regional disparity

Wilson et al (12) and Gillis (13) have reported on what appears to be rather marked regional variations in ICD implant rates per million population in Canada. In 2003, the implant rates were reported to have varied from 29 per million in Prince Edward Island to 134 per million in Newfoundland and Labrador (13). Saskatchewan, New Brunswick and Prince Edward Island, which have no implanting centres, had the lowest implant rates, suggesting that geographical proximity to an implanting centre may be a critical determinant of access. Even within a single province, significant regional differences in implant rates may exist. It is unclear whether more implanters and implanting centres would reduce these disparities, or whether there is room for maximizing implant capacity at the existing centres.

Waiting times

Once a referring physician decides that any particular patient should be referred for an ICD implant, that patient moves from the anonymous, nebulous prevalence pool onto a list that can be potentially quantified and analyzed. This patient enters the first of several phases of assessment, each with its own associated waiting time (Figure 1). Initially, the referring physician must make arrangements for the patient to meet with an ICD implanter, usually a cardiac electrophysiologist. This often takes several weeks and sometimes several months. There may be an intermediate-level referral as well, from the primary care physician to an internist or cardiologist, or from an internist to a cardiologist. Once the patient is seen by the implanting physician, further tests, such as another assessment of left ventricular function, an electrophysiology study, a noninvasive test of ischemic burden or a coronary angiogram, may be necessary either to properly assess the patient's candidacy or to complete the preoperative workup. Depending on the nature of the additional testing that needs to be performed, several more weeks may be added to the wait. Once ICD candidacy is established, there is another waiting period until the device can be implanted (the majority of primary prevention ICDs are implanted electively and as outpatients). In total, patients can wait many months from referral to implant.

There is no national registry of ICDs, and thus far all of the implant data come from industry. Currently, there is no way to determine how markedly different implant rates, funding formulas and referral dynamics may influence wait times and outcomes for patients who are on ICD waiting lists. Within Canada, there are strikingly different models. For example, in Nova Scotia, there are no fixed budgets for ICDs – physicians are free to implant devices as deemed necessary. In British Columbia, budgets are set based on estimated demand, but

implantations at the two electrophysiology centres are performed as clinically indicated. In Ontario and Quebec, however, fixed budgets have created a recurrent boom and bust cycle where implant rates slow down or stop as the end of the fiscal year draws near. Manual, unverified data from the Cardiac Care Network (CCN) of Ontario, for example, suggest that waits for ICDs in Ontario are not only getting longer, but that they vary dramatically from centre to centre (CCN Arrhythmia Management Working Group, personal communication). In the current fiscal year, most Ontario implanting centres reached their funded volumes in January, and at least one implanting centre has taken the rather extraordinary decision to completely shut down their ICD program until the new fiscal year begins. This only serves to further compound the waiting list problem because waiting list patients continue to accrue.

Given that the therapeutic target (ventricular arrhythmias) is one that is frequently fatal, any strategy that allows for prolonged waiting times for ICD implantation must be regarded as potentially perilous; however, without a comprehensive waiting list monitoring strategy, events that may occur on the waiting list remain abstract, amorphous and speculative. As a result, the path of least resistance for Ministries of Health is to allocate funding based primarily on economics rather than on the basis of need or even safety.

Several organizations in Canada are now tracking wait times for some cardiac procedures. Access to coronary artery bypass grafting (CABG), cardiac catheterization and percutaneous coronary intervention in Ontario, for example, are meticulously tracked to ensure that all patients have appropriate and equitable access (14). All of the wait list management organizations aim to maintain waiting list mortality below a certain standard. According to CCN data, the CABG wait list mortality in Ontario has been maintained at well below 0.5% (the benchmark) since 1997, a mark accomplished through the implementation of an urgency rating score (URS) system and the establishment of recommended maximum waiting times (RMWT) (14) that are specific to each URS. The mortality rate on the waiting list has become the central measure of success of the entire waiting list strategy.

CCS Access to Care Working Groups' RMWT for ICD

Although arrhythmia management procedures (including ICD implants) are not yet tracked in a similar fashion, it seems reasonable that the waiting time principles that are applied to patients on the waiting list for CABG could also apply to patients on the waiting list for ICDs. It seems reasonable to start with the premise that the preventable waiting list mortality should not exceed 0.5% (the benchmark for total waiting list mortality for patients awaiting CABG in Ontario is 0.5%). Although we have no real world registry data regarding ICD wait list mortality, the MADIT-II study (15) provides a means to predict what the preventable mortality would be for each unit of time that passes without an ICD in situ because the mortality curves of the ICD and non-ICD populations in the study diverge. Based on these data and presuming linear risk, the non-ICD treated patient with a MADIT-II indication would face a 0.8% monthly risk of mortality; however, given that this is a high-risk population, slightly less than two-thirds of these deaths would be classified as unavoidable (ie, they would have occurred even if the ICD had been implanted). Therefore, the preventable mortality risk is approximately 0.3% per month. Accordingly, if our goal is to subject patients on the ICD waiting list to a preventable mortality of no more than 0.5% per month, the waiting time should not exceed seven to eight weeks. Of course, such a standard would need to be prospectively tested and verified in a real world registry, but the principle of a waiting time benchmark tied to waiting list mortality seems to be unassailable given the history of success of the same strategy for CABG wait list management.

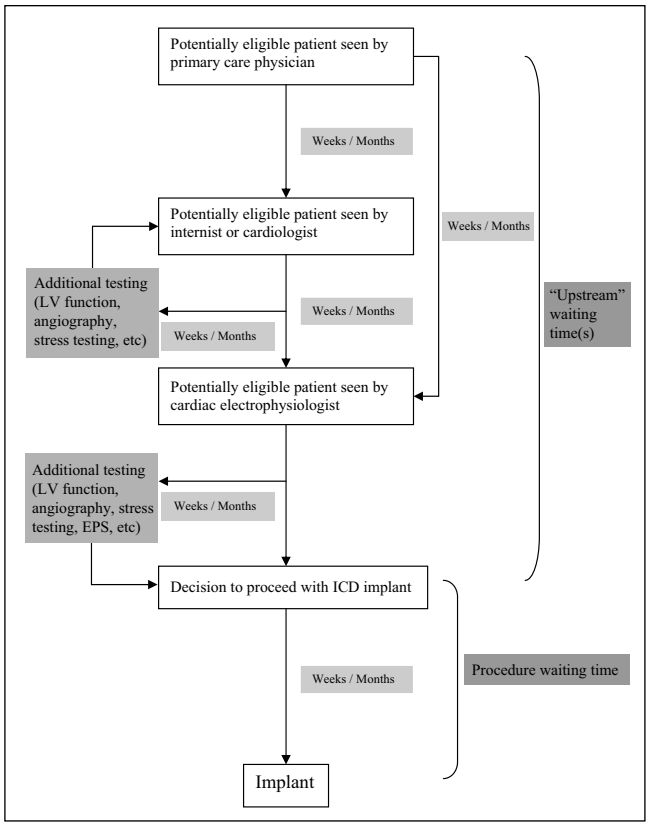

Figure 1) *From referral to implant – potential bottlenecks in implantable cardioverter defibrillator (ICD) care delivery. EPS Electrophysiology study; LV left ventricular*

SOLUTIONS

The solution to these access to care barriers can be addressed through the framework of the 10-point plan established by the Canadian Medical Association discussion paper "The Taming of the Queue" (16), which addresses the broader wait time issue.

Set priorities through broad consultation

ICD use for the primary prevention of sudden death has now been firmly established as a safe, cost-effective treatment that significantly reduces mortality in defined populations. Because sudden death is a leading cause of death in Canada, ICD therapy must be one of the considered priorities when funding allocations are being established. At the same time, investigators must continue to seek to further refine the highest-risk populations within the groups that have been shown to benefit.

Address patient/public expectations through transparent communications

Patient satisfaction is improved when confidence in the integrity of a waiting list management system is established.

Full transparency and public accountability for the decisions taken are needed.

Address immediate gaps in health human resources and system capacity

Efforts must be made to plan for the future by assessing the capacity for growth at each existing implant centre and the ability to add new centres in provinces that currently implant ICDs. The potential positive impact of new implant centres in provinces like New Brunswick and Saskatchewan on implant rate disparity should be studied. It should not be considered acceptable for any institution or any jurisdiction to deny or delay access on the basis of artificially imposed fiscal quotas.

Improve data collection through investments in information systems

A well-constructed ICD waiting list and implant registry that links institutions and provinces must be established. A relatively small investment (relative to the size of the ICD budget) is all that is required to allow the creation of a data collection system that will enable us to plan and deliver care with confidence.

Develop wait time benchmarks through clinical and public consensus

A URS and RMWT can be developed, tested, verified and implemented in a relatively short period of time if the resources become available. The establishment of a benchmark is a crucial first step to earn public confidence and to establish fair access for those on the waiting list. Based on existing but admittedly limited data, the Access to Care Working Group consensus suggests a maximum seven to eight week wait once it has been determined an ICD is indicated.

Strengthen accountability by way of public reporting

ICD wait times and clinically relevant outcomes by centre should be in the public domain. ICD per capita implant rates should also be monitored and reported as a measure of completeness of potential referrals from each province, region or health district.

Maximize efficiencies by aligning incentives properly

ICD funding formulas must be reformed to move toward activity-based funding rather than fixed budgets that artificially constrain service delivery. Working within practice guidelines, and fully accountable for their clinical decisions, physicians should be empowered to make care delivery decisions at the level of the individual patient on the basis of need and consensus-determined eligibility.

Address upstream and downstream pressures by investing in the continuum of care

Pressure points in the entire ICD care continuum should be considered equally. Barriers to access to initial consultation are as important as the actual ICD waiting list. Adequate resources for ICD follow-up must also be ensured in any growth management strategy.

Expand interjurisdictional care options by enhancing portability provisions

Patients who are remote from an ICD implant centre (including out of province) would benefit from enhancements to interprovincial reciprocal billing agreements as well as from a streamlining of processes that allow care to be delivered outside the usual care area. The interprovincial agreement for reimbursement for medical services must be revamped immediately to allow for complete reimbursement, especially for costly medical procedures, such as ICDs. Appropriate future use of transtelephonic or Internet monitoring systems should be encouraged for patients in remote locations.

Commit to adoption of best practices through enhanced research and collaboration

Canada's electrophysiology community has a long history of productive collaborative research relationships that have contributed significantly to the body of electrophysiology literature. The new Canadian Heart Rhythm Society, representing Canada's electrophysiologists, will play an important role in the coordination of interinstitutional and interprovincial research and clinical care relationships.

CONCLUSIONS

Fears of a potentially large prevalence pool, concerns about the economical implications of more widespread ICD use and a perception that waiting times are too long appear to be contributing to a culture of under-referral of potentially eligible ICD patients in Canada. For patients who are referred and selected for ICD implantation, reliable data regarding waiting times, outcomes and regional disparities are scarce, and thus severely constrain efforts to establish the means to ensure timely and equitable access.

Solutions to the problem should incorporate principles of transparency, accountability and broad consultation. A national ICD registry and a comprehensive waiting list strategy are urgently needed to help guide resource allocation decisions. Declarations of the true need for ICDs would encourage needs-based funding decisions rather than purely economically driven funding decisions. In a single payer publicly funded system, it is no longer acceptable for any institution or any jurisdiction to deny or to delay access on the basis of artificially imposed fiscal quotas. Relatively small investments in information systems that enable interinstitutional and interjurisdictional linkage would provide the means to establish a fair system of ICD resource allocation and access to care that is worthy of the public's confidence and trust.

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REFERENCES

1. Connolly SJ, Hallstrom AP, Cappato R, et al. Meta-analysis of the implantable cardioverter defibrillator secondary prevention trials. AVID, CASH and CIDS studies. Antiarrhythmics vs implantable defibrillator study. Cardiac arrest study Hamburg. Canadian implantable defibrillator study. Eur Heart J 2000;21:2071-8.
2. Lee DS, Green LD, Liu PP, et al. Effectiveness of implantable defibrillators for preventing arrhythmic events and death: A meta-analysis. J Am Coll Cardiol 2003;41:1573-82.
3. Bardy GH. SCD-HeFT: The sudden cardiac death in heart failure trial. <http://sicr.org/scdheft_results_acc_lbcc.pdf> (Version current at January 1, 2005).
4. Tang AS, Ross H, Simpson CS, et al. Canadian Cardiovascular Society/Canadian Heart Rhythm Society position paper on implantable cardioverter defibrillator use in Canada. Can J Cardiol 2005;21(Suppl A):11A-18A.

5. McCullough PA, Philbin EF, Spertus JA, et al. Confirmation of a heart failure epidemic: Findings from the Resource Utilization Among Congestive Heart Failure (REACH) study. J Am Coll Cardiol 2002;39:60-9.
6. Nudell BM. CRM: Confirmation of a 1.1 million Patient Pool for ICDs. Bernstein Research Call. New York: Sanford C Bernstein and Co, 2004:1-9.
7. IMS Health, Canadian Compuscript 2004. Canadian Drug Store and Hospital Purchasing Audit 2004.
8. The Technology Assessment Unit of the McGill University Health Centre. Use of the Implantable Cardiac Defibrillator (ICD) at the McGill University Health Centre (MUHC). <http://upload.mcgill.ca/tau/icd.pdf> (Version current at January 4, 2005).
9. Blue Cross and Blue Shield Assoc, Technology Assessment Program, 2004;109:1-25.
10. Implantable defibrillators cost-effective for many heart failure patients. <http://www.dukehealth.org/HealthPortals/heart/news/8273> (Version current at March 1, 2005).
11. Dorian P, Mangat I, Korley V. Do Canadian cardiologists agree with arrhythmia guidelines? Heart Rhythm 2004;1S:S33.
12. Wilson S, Kadwell S, Kane C, Crysler J. Variations in utilization of implantable cardioverter defibrillators across Canada. Can J Cardiol 2004;20:147D.
13. Gillis AM. Referring patients for consideration of device treatment of sudden cardiac death and heart failure: Incorporating evidence-based therapies within the Canadian health care system. Can J Cardiol 2005;21(Suppl A):25A-30A.
14. Cardiac Care Network of Ontario. <http://www.ccn.on.ca/access.html> (Version current at January 3, 2005).
15. Moss AJ, Zareba W, Hall WJ, et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. N Engl J Med 2002;346:877-83.
16. Canadian Nurses Association. The taming of the queue. <http://cna-aiic.ca/CNA/documents/pdf/publications/Taming_Queue_e.pdf> (Version curent at January 3, 2005).

Universal access: But when? Treating the right patient at the right time: Access to cardiac rehabilitation

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The Canadian Cardiovascular Society formed an Access to Care Working Group ('Working Group') in the spring of 2004. The mandate of the group was to use the best science and information to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The present commentary presents the rationale for benchmarks for cardiac rehabilitation (CR) services. The Working Group's search for evidence included: a full literature review of the efficacy of CR, and the factors affecting access and referral to CR; a review of existing guidelines for access to CR; and a national survey of 14 CR programs across Canada undertaken in May 2005 to solicit information on referral to, and wait times for, CR. The Working Group also reviewed the results of The Ontario Cardiac Rehabilitation Pilot Project (2002) undertaken by the Cardiac Care Network of Ontario, which reported the average and median wait times for CR.

Some international agencies have formulated their own guidelines relating to the optimal wait time for the onset of CR. However, due to the limited amount of supporting literature, these guidelines have generally been formed as consensus statements. The Canadian national survey showed that few programs had guidelines for individual programs.

The Cardiac Care Network of Ontario pilot project reported that the average and median times from a cardiac event to the intake into CR were 99 and 70 days, respectively. The national survey of sampled CR programs also revealed quite remarkable differences across programs in terms of the length of time between first contact to first attendance and to commencement of exercise. Programs that required a stress test before program initiation had the longest wait for exercise initiation. Some patients need to be seen within a very short time frame to prevent a marked deterioration in their medical or psychological state. In some cases, early intervention and advocacy may reduce the risk of loss of employment. Or, there may be profound disturbances in the patient's family as a result of the cardiac event. For other patient groups, preferable wait times vary from one to 30 days, and acceptable wait times vary from seven to 60 days. All cardiovascular disease patients require core aspects of CR services. Patients who would derive benefit from formal CR programs should be provided the opportunity, given the proven efficacy and cost effectiveness of CR.

Key Words: *Access, Cardiac rehabilitation, Wait times*

L'accès universel, mais quand ? Le traitement du bon patient au bon moment : L'accès à la réadaptation cardiaque

La Société canadienne de cardiologie a formé un groupe de travail sur l'accès aux soins (le « groupe de travail ») au printemps 2004. Le groupe était mandaté pour utiliser l'information et les connaissances scientifiques de pointe afin d'établir des catégories raisonnables de triage et des temps d'accès sécuritaires pour accéder aux services et interventions courants en santé cardiovasculaire. Le présent commentaire aborde la raison d'être des normes en services de réadaptation cardiaque (RC). Les recherches du groupe de travail afin de trouver des données probantes incluaient une analyse bibliographique complète de l'efficacité de la RC et des facteurs influant sur l'accès à la RC et l'aiguillage vers la RC. Une analyse des lignes directrices en place pour accéder à la RC et une enquête nationale de 14 programmes de RC au Canada entreprise en mai 2005 pour solliciter de l'information sur l'aiguillage vers la RC et les temps d'attente pour obtenir ces services. Le groupe de travail a également examiné les résultats du projet pilote de réadaptation cardiaque de l'Ontario (2002) entrepris par le *Cardiac Care Network* de l'Ontario, qui faisait état des temps d'attente moyens et médians pour obtenir des services de RC.

Certains organismes internationaux ont formulé leurs propres lignes directrices sur le temps d'attente optimal avant d'entreprendre une RC. Cependant, en raison du nombre limité de publications complémentaires, ces lignes directrices sont généralement présentées sous forme d'ententes consensuelles. L'enquête nationale canadienne démontre que peu de programmes sont dotés de lignes directrices pour des programmes individuels.

D'après le projet pilote du *Cardiac Care Network* de l'Ontario, les temps d'attente moyen et médian d'un événement cardiaque au début de la RC était de 99 jours et de 70 jours, respectivement. L'enquête nationale de programmes de RC échantillonnés révélait des différences remarquables entre les programmes pour ce qui est du délai entre le premier contact et la première participation, puis le début des exercices. Les programmes où il fallait effectuer une épreuve à l'effort avant de commencer étaient reliés au temps d'attente le plus long avant le début des exercices. Certains patients doivent être vus très rapidement pour éviter une détérioration marquée de leur état médical ou psychologique. Dans certains cas, une intervention rapide et de la défense d'intérêts peuvent réduire le risque de perte d'emploi. La famille du patient peut également être très perturbée par l'événement cardiaque. Pour les autres groupes de patients, le temps d'attente préférable varie de un jour à 30 jours, et le temps d'attente acceptable varie de sept jours à 60 jours. Tous les patients atteints d'une maladie cardiovasculaire ont besoin des principaux aspects des services de RC. Les patients qui tireraient profit de programmes officiels de RC devraient avoir l'occasion d'y avoir accès, compte tenu de l'efficacité démontrée et de la rentabilité de la RC.

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The Canadian Cardiovascular Society (CCS) is the national professional society for cardiovascular specialists and researchers in Canada. In 2002, at the Canadian Cardiovascular Congress Public Policy Session, Senator Wilbert Keon stated that an important role of such organizations is to develop national benchmarks for access to cardiovascular care that could be validated and adopted or adapted by the provinces. Further, he noted that the time was right for such initiatives, as policy makers and other stakeholders in the health care system grapple with access and wait time issues.

Currently, there are no national benchmarks or targets for access to care for cardiovascular procedures, office consultations or rehabilitation. While some provinces have established targets for some cardiovascular procedures, no national consensus exists regarding wait time targets, issues of regional disparities or even on how to approach the problem. A professional organization such as the CCS, with its broad-based membership of cardiovascular experts, is ideally suited to initiate a national discussion and commentary on wait times and access to care issues as they pertain to the delivery of cardiovascular care in Canada.

The CCS Council formed an Access to Care Working Group ('Working Group') in the spring of 2004, whose mandate was to use the best science and information to establish reasonable triage categories and safe wait times for access to common cardiovascular services and procedures. The Working Group elected to start the process with a series of commentaries. Each commentary is intended to be a first step in a process to encourage the development of national targets. The commentaries summarize the current variability of benchmarks and wait times across Canada, the currently available data regarding the relationship between wait times and the risk of adverse events, and the identification of gaps in existing data. Using best evidence and expert consensus, each commentary takes an initial position on what the optimal benchmark for access to care should to be for a cardiovascular service or procedure. The commentaries also call on cardiovascular researchers to fill the gaps in this body of knowledge and to further validate safe wait times for patients at varying degrees of risk.

WHAT IS CARDIAC REHABILITATION?

The present commentary raises issues related to cardiac rehabilitation (CR). The Canadian Association of Cardiac Rehabilitation (CACR) defines CR as "the enhancement and maintenance of cardiovascular health through individualized programs designed to optimize physical, psychological, social, vocational, and emotional status. This process includes the facilitation and delivery of secondary prevention through risk factor identification and modification in an effort to prevent disease progression and recurrence of cardiac events" (1).

Cardiovascular disease (CVD) is a chronic disease that can be controlled, but at present, cannot be cured. In today's environment of less invasive interventions and shorter hospital lengths of stay, the needs of patients with chronic CVD are not fully addressed by acute care alone. Good chronic disease management and secondary prevention have become essential elements in contemporary cardiac care. Cardiac prevention and rehabilitation services are effective and efficient channels for the delivery of care designed to stabilize, minimize or reverse the progression of the atherosclerotic disease process (2). Regular interactions with CR professionals that focus on optimizing function and prevention, attention to treatment guidelines and CR behavioural interventions promote good disease management practices.

It is important to appreciate the terms 'CR services' versus 'CR programs'. 'CR services' refers to the totality of interventions that contribute to the eventual outcome. Examples of a CR service may include an education class while in hospital, a visit to the family doctor to discuss vocational issues, or evaluation and treatment at a lipid clinic. However, most health care practitioners equate CR with formalized programs. CR programs deliver such services in a structured format and include a medical assessment, education, exercise training, risk factor modification and psychosocial support. For the present discussion, it was assumed that CR refers to formal CR programs.

METHODOLOGY

The Working Group's search for evidence included:

- a full literature review of the efficacy of CR, and factors affecting access and referral to CR;
- a review of existing guidelines for access to CR; and
- a national survey of 14 CR programs across Canada in May 2005 to solicit information on referral to and wait times for CR.

The Working Group also reviewed the results of The Ontario Cardiac Rehabilitation Pilot Project (2002) undertaken by the Cardiac Care Network of Ontario (CCN), which reported average and median wait times for CR.

The draft version of the present report was sent to the Board of Directors of the CACR for secondary review and the final document was then reviewed and ratified by the primary panel.

RESULTS

Efficacy of CR

CR is an evidence-based intervention that has been shown to reduce both morbidity and mortality. Comprehensive multifactorial rehabilitation and prevention programs have been shown to slow or partially reduce the progression of coronary atherosclerosis (3,4). Meta-analyses of studies performed in the 1970s and 1980s revealed a significant reduction in total and cardiac mortality following participation in CR (5,6). While the application of these analyses in today's contemporary care environment of major advances in patient management and adjunctive cardioprotective drugs is being questioned, results from a 2003 meta-analysis (7) based on 48 randomized trials and over 4000 more recent subjects support the findings of the earlier systematic reviews. Exercise-based CR, compared with usual medical care, resulted in reductions in total mortality of 27% (95% CI 0.54 to 0.98) and cardiac mortality of 26% (95% CI 0.57 to 0.96). Furthermore, a recent randomized controlled trial of patients with single-vessel disease compared a 12-month CR program with percutaneous coronary intervention (PCI). The CR group demonstrated superior event-free survival (87%) and exercise capacity compared with the PCI group (70%) (P=0.023). The CR outcomes were also accomplished at a lower cost than PCI (8).

Gains in function and quality of life are also realized by participation in CR. Exercise-based CR has been shown to increase peak oxygen uptake by 11% to 36%, with the greatest improvement in the most deconditioned individuals (9). In a contemporary study of post-PCI patient (10), exercise training was found to increase functional capacity, improve lipid profiles,

enhance quality of life and reduce recurrent cardiac events compared with controls. Exercise training also demonstrated anti-ischemic effects, improving both symptom and ischemic thresholds (11,12). Resistance training has been integrated in CR within the past 10 years and resulted in improved muscular strength and ability to carry out daily tasks (13).

Exercise training and lifestyle counselling can favourably modify blood pressure (14,15), serum triglyceride levels, high-density lipoprotein cholesterol (16-18), insulin sensitivity and glucose homeostasis (19). Psychosocial problems, such as depression and anxiety, are negatively associated with prognosis. Although studies to date have failed to document the prognostic benefits of behavioural-based therapies, they do point to improvements in symptoms of depression and reduced feelings of social isolation (20).

Based on this level of evidence, CR is recommended for most, if not all, patients with documented CVD (1).

Access and referral to CR

Despite the documented benefits of CR and the fact that practice guidelines recommend that CR be offered to all patients with CVD, there are inconsistencies in referral practices that generally result in inequality in referral and access to CR (21,22). It has been found that an enhanced referral rate to CR is associated with:

- a discharge diagnosis of acute myocardial infarction (AMI) (21,23);
- coronary artery bypass graft (CABG) surgery (21,23);
- age younger than 65 years (21,23);
- male sex (23-25);
- hyperlipidemia (23);
- presence of comorbidities (26); and
- previous participation in CR (21).

Patients with CVD, prior CABG surgery, peripheral arterial disease, stable angina or an ejection fraction of less than 30% are less likely to be referred (23).

Patient, physician and health care system-related factors have been found to contribute to inconsistent referral practices (23,24,26,27). A recent study (27) of a random sample of primary care physicians, cardiologists and cardiovascular surgeons in Ontario found four main factors associated with physician referral:

- beliefs about the benefits of CR;
- patient characteristics (eg, motivation);
- awareness of CR sites and the referral process; and
- referral norms (eg, physician perception that their colleagues generally refer their patients to CR and departmental systems).

It has been suggested that an automatic referral process, in which a CR referral is generated as a standard order from electronic records for all eligible patients, results in increased referrals and reduced disparities in access (28-31). Research by Labresh et al (31) found that a 'Web-based patient management tool', which was piloted in 24 hospitals in the United States and included an automatic referral for eligible patients, increased CR referral from 34% to 73% over a 10 to 12 month period (31). Similarly, Grace et al (30) found that automatic electronic referral to a CR site nearest home compared with usual referral resulted in 43% of eligible patients enrolling in CR, an additional 23% to 28% enrolment over that commonly reported in literature. In addition, the automatic referral process resulted in consistent participation regardless of the indication of referral (30,32,33).

Preliminary research that identified enabling factors (eg, social support, benefits and barriers of exercise, proximity and time), rather than predisposing factors (eg, sex, age, education, comorbid conditions), as significant predictors of CR enrolment in cardiac patients automatically referred to CR, lends further support to the potential of automatic referral in improving access to CR (29). The main potential downfall to automatic referral, however, is that through increasing referral rates, CR programs may exceed capacity, resulting in longer wait times for CR. Future efforts will be directed toward the identification of the cardiac subpopulations likely to gain the most from a referral to CR.

Existing wait time guidelines for CR

A few international agencies have formulated their own guidelines relating to the optimal time for the onset of CR. However, due to the limited amount of supporting literature, these guidelines have generally been formed as consensus statements.

"The National Service Framework for Coronary Heart Disease" (34), published in the United Kingdom in 2000, recommends that patients should commence structured exercise sessions that meet their individually assessed needs four weeks after an acute cardiac event, unless contraindicated. In contrast, the 2004 National Heart Foundation of Australia and the Australian Cardiac Rehabilitation Association "Recommended Framework for Cardiac Rehabilitation" (35) states that programs should commence on discharge from hospital. Similarly, the New Zealand 2002 "Heart Foundation Best Practice Evidence-based Guideline: Assessment and Management of Cardiovascular Risk" (36) recommends that outpatient CR should commence from one or two weeks up to 12 weeks post-discharge. The American Heart Association, the American Association of Cardiovascular and Pulmonary Rehabilitation and the European Society of Cardiology provide no formal guidelines as to when CR should commence.

Very few programs in the Working Group's national survey reported having guidelines for wait times for their own program. Table 1 presents the guidelines mentioned in the survey and the number of programs that supported each guideline.

AMI and PCI

There is no evidence to indicate specifically when patients should commence CR to derive the most benefit following an AMI and PCI. With respect to the exercise portion of CR, the American College of Sports Medicine's clinical exercise guidelines (37) state that submaximal exercise testing may be performed as early as four to six days after an AMI and symptom-limited tests at more than 14 days after AMI. The guidelines report that low-level exercise testing provides sufficient data to make recommendations about the patient's ability to safely perform activities of daily living and serves as a guide for early ambulatory therapy (37).

There are no data to indicate the optimal time of the commencement of CR after a PCI. Future studies could evaluate the

TABLE 1
Summary of self-determined wait time guidelines for cardiac rehabilitation programs included in the Access to Care Working Group survey and the number of surveyed programs

Component	Program guideline	Programs surveyed	Program guideline	Programs surveyed	Program guideline	Programs surveyed	Program guideline	Programs surveyed	Program guideline	Programs surveyed
Receipt of referral to first contact	3 days	3	2 weeks	1	≤3 weeks	1	<4 weeks	2	13 weeks	1
First contact to first attendance	1 week	1	≤3 weeks	3	2–4 weeks	1				
First contact to stress test	1 week	1	≤3 weeks	3	4 weeks	2				
Stress test to exercise program	≤1 week	2	3 days	1						
Event to exercise program	6–8 weeks	1	13 weeks	1						
First attendance to other services	≤1 week	2	≤3 weeks	1	<3 months	1				

Access to Care Working Group survey of 14 centres across Canada, May 2005 (personal communication)

effects of exercise on left ventricular (LV) functioning to ensure optimal recovery. An observational study (38) that looked at the time course of LV function recovery after primary PCI in patients with AMI demonstrated that improvement of LV parameters (LV function and volume) becomes apparent only seven days postprocedure, reaching statistical significance at 30 days, and progressively increases until the third month after reperfusion in patients on whom PCI was performed within 4 h from symptom onset. No significant improvement is seen after this time.

For stent implant, it takes several days for the femoral puncture site to heal and approximately one to three weeks for endothelium to cover a bare metal stent; however, coated stents may require nine to 12 months for complete healing. However, there is no evidence for increased risk from moderate exercise during this time (36). It is suggested that in this population, the ideal wait time for CR is two weeks from angioplasty, and an acceptable time is within the first 30 days.

CABG surgery

Exercise is normally limited during the early weeks after CABG surgery until there is adequate healing of the sternotomy and surgical incisions, but low-level activities (eg, walking) can usually begin 48 h following surgery with gradual progression (36). Two surgical consensus papers (39,40) have reviewed the influence of perioperative and early postoperative factors on the timing of CR. The authors concluded that CR may commence two to four weeks following CABG surgery and valvular procedures in patients with normal and slightly reduced LV function, four to six weeks following cardiac transplantation or in patients with congenital heart disease, and one to two weeks following less invasive heart surgery. Complete wound healing after the conventional trans-sternal approach usually takes six weeks. Therefore, certain activities, such as uncontrolled mobility of the shoulders and arms, and lifting loads heavier than 10 kg, should be avoided (39,40).

Current referral rates

A survey of a sample of CR programs within Canada revealed that most sites receive referrals automatically from surgical and nonsurgical hospital units (Table 2). Caution must be taken in the interpretation of these results, because this sample may not be applicable to all CR programs in Canada. One program reported that although CR referral is automatic, privacy and patient confidentiality legislation prevents hospital staff from contacting a patient unless that patient has provided consent in hospital. Unfortunately, this appears to defeat the purpose of automatic referral, because only those who feel ready to make the decision about CR while in hospital provide consent.

Many programs also receive manual referrals from physicians, allied health care professionals and patients. Programs in Quebec and Saskatoon reported using a systematic referral process in which unit nurses deliver CR pamphlets and referral forms to all eligible patients before discharge from hospital. This system allows for two-way communication between health care professionals and patients regarding CR referral; however, additional staffing and short hospital stays may limit the ability to reach all eligible patients.

According to the surveyed programs, initiation of automatic referral in Ontario and systematic booklet delivery in Quebec have increased CR referrals; however; no formal data were captured in the survey.

Current wait times for CR

The Working Group identified two sources of wait time data for CR – one was specific to Ontario and one was national:

- The CCN Ontario Cardiac Rehabilitation Pilot Project. The pilot project reported that the average and median times from cardiac event to intake into CR were 99 and 70 days, respectively (41). The type of referring clinician and the location of the referral was shown to have an impact on the timeliness of access (Table 3). Furthermore, the average and median times from receipt of the patient referral to intake were 40 and 31 days, respectively (41). The factors that appear to be most responsible for the delays are referral generation and processing, initiation of patient contact following referral receipt and CR intake session coordination.
- National survey of wait times. The survey of sampled CR programs in May 2005 revealed quite remarkable differences across programs in length of time between first contact to first attendance and commencement of exercise (Table 4). Those programs that rely on stress testing before exercise program initiation or do not have private stress testing facilities reported the longest wait time for exercise initiation.

RECOMMENDATIONS

For the present discussion, it was assumed that a wait time is that period from an acute event until formal entry into the CR program.

Recommended wait time benchmarks

Given the documented efficacy of CR and the relative low cost for the intervention, the panel thought that the preferable wait

TABLE 2
Cardiac rehabilitation program referral process, referral numbers and percentage of patients enrolled in the past year to programs included in the Access to Care Working Group survey

Program	Referral process	Patients referred to this program in past year (n)	Patients enrolled in program from total referred (%)*
A	Automatic (since November 2004)	1850	51
B	Automatic for STEMI patients (past year), physician for all others	1419	60–70
C	80% directly from the inpatient area, automatic through surgical patient care map, referral on care flow sheet for catheterization laboratory	1250	95
D	Hospital physician and general practitioner	1249	79.2
E	Automatic through acute myocardial infarction care map, physician for surgical and angina patients. CRP needs patient permission to contact postdischarge	1082	40
F	Automatic	1000†	79
G	Automatic through cardiac care map (on- and off-service)	900	66
H	Automatic for acute myocardial infarction and CABG surgery through care map, physician and self for CHF and others. CRP needs patient permission to contact postdischarge	565	95
I	Automatic for nonsurgical, physician and self manual systematic. Nurse delivers discharge pamphlet and referral (since September 2003)	450	65
J	Allied health care professional, hospital physician and general practitioner, self	450	80
K	Automatic for acute coronary syndrome pathway, physician and self for all others	407	50
L	Allied health care professionals, nurse or physician	360	87.5
M	Predominantly self, as well as physician and allied health care professionals	310	95–100
N	Manual systematic. Nurse delivers discharge pamphlet and referral	275	95–100
Average		826	74

*Access to Care Working Group survey of 14 centres across Canada, May 2005 (personal communication). *Reasons for not attending a program include travel distance, lack of interest or change in medical status; †Approximated. CABG Coronary artery bypass graft; CHF Chronic heart failure; CRP Cardiac rehabilitation professional; STEMI ST elevation myocardial infarction*

TABLE 3
Wait times from event to referral, and event to intake by location of referral

Location of referral	Event to referral (days)		Event to intake (days)	
	Mean	Median	Mean	Median
Inpatient unit	13.3	6	59.1	49
Cardiac diagnostics	64.6	42	71.6	48
Outpatient clinic	82.1	47	125.5	90
Physician's office	98.2	49	138.2	91
Average			98.6	69.5

Data taken from reference 41

time could encompass one to 30 days, depending on the disease category and presenting issues.

Some patients need to be seen within a very short timeframe to prevent a marked deterioration in their medical or psychological state. The acute care health care team would treat most of these conditions; however, it is conceivable that CR may be the first point of contact. In some cases, the required resource (eg, a vocational counsellor or psychologist) may be a specific member of the CR team.

It is recommended that patients who are severely depressed see a psychiatrist or psychologist for assessment and treatment. Depressed patients will not benefit from a traditional CR program until there is some resolution of these symptoms. However, a concomitant exercise program in addition to appropriate treatment for the depression may be useful.

Although not common, some patients may be immobilized by fear of any physical activity. Patients from any diagnostic group may experience this fear; however, it is more commonly seen in those patients with an implantable cardioverter defibrillator who have experienced repetitive discharges.

In some cases, early intervention and advocacy may reduce the risk of loss of employment. Or, there may be profound disturbances in the patient's family as a result of the cardiac event. In this situation, early intervention by a social worker or psychologist is required.

Elective referral patients are those who are stable at the time of assessment and who can wait for CR without experiencing any significant adverse events. The wait time will likely be closer to 30 days, according to the diagnostic category, as shown in Table 5.

Acceptable wait times vary from seven to 60 days, depending on the patient category and need. The ideal standard is to have all patients enter programs within the preferable time period. This would allow early intervention and optimal treatment of risk factors. Nevertheless, considerable literature shows that patients can continue to derive benefit within the acceptable wait time duration.

The above benchmarks are based on the assumption that patients have received initial guidance on physical activity and other risk factors, such as smoking cessation, before starting a formal CR program. It is important to intervene with patients before discharge from hospital to lay the groundwork for subsequent behaviour change interventions. The inpatient CR team or representatives from the outpatient CR program may provide this intervention. One of the concerns often voiced by patients on discharge following AMI or PCI is their lack of understanding as to what they can do. This issue needs to be systematically addressed in this patient population.

TABLE 4
Cardiac rehabilitation wait times at cardiac centres across Canada, May 2005

		Length of time (days)					
Program	Program type	Receipt of referral to first contact	First contact to first attendance	First contact to stress test	Stress test to commencement of exercise program	First contact to exercise program	First attendance to other services (eg, dietician)
A	Onsite	<5	57	67	38	105	106
	Home program	<5	66	83	14–21	97–104	115
B		5 to contact patient	1–25	36	7	43	<7
C		21 (surgical)	28 (surgical)	14	28	42	One-on-one: 42
		7 (nonsurgical)	7 (nonsurgical)				Group: 14
D		3	28	35–42	2	37–44	7
E		1	<28	<28	<7	<35	14–21
F		<2	Variable	28 (PCI)	2–21		14–21
				56 (MI or CABG)			
G		7	21–28	Variable	0 (start after first contact)	28–35	28–42
H		7–14	7–14	14–21	1–2	15–22	<30
I	Prerehabilitation	<2	<5	–	–	<5	<14
	Regular	5	<14	7–14	<7	14–21	7–14
J	Onsite	14–28	91	28–91	<7	35–98	<7
	Home program	14–28	14–28	28	<7	<35	<7
K		14–21	14–21	Variable	<7	21–28	14
L		150	7–14	7–14	0 (start after first contact)	7–14	<5
M		7–14	7–14	–	–	7–14	28–56
N		Variable	7	7	1	8	<7
Average		17.5	26.3	34	9.4	37.1	36.1

Access to Care Working Group survey of 14 centres across Canada, May 2005 (personal communication). CABG Coronary artery bypass graft surgery; MI Myocardial infarction; PCI Percutaneous coronary intervention

TABLE 5
Recommended wait time benchmarks for elective cardiac rehabilitation by diagnosis in days

Diagnostic category	Preferable	Acceptable
CABG/valvular disease*	21–30	30–60
Percutaneous coronary intervention†	2–7	7–60
MI/CHF/stable and unstable angina‡	7–30	30–60
Heart transplantation§	4–10	10–60
Arrhythmias¶	1–30	30–60

**Physical issues (sternotomy) may prevent these patients from beginning exercise earlier, but all other aspects of cardiac rehabilitation could start immediately; †These patients tend to return to work, and 'normal duties' shortly after the procedure; ‡These patients likely need to be seen earlier because there may be more significant medical, vocational and social decisions required. §If the cardiac rehabilitation team is seeing the patients for early mobilization post-transplant, they need to be seen as soon as possible. Often these patients may be from out of town; ¶Urgency likely reflects the psychosocial sequelae (see above discussions). 'Acceptable' time reflects the overall median wait time of 69 days seen in The Ontario Cardiac Rehabilitation Pilot Project undertaken by the Cardiac Care Network of Ontario. It is assumed that this wait time represents an acceptable wait time because patients improved during this study, and this time reflected a real-world experience with a large cohort of patients; CABG Coronary artery bypass graft surgery, CHF Chronic heart failure; MI Myocardial infarction; 'Preferable' time reflects the wait time in some of the guidelines used by various programs*

CONCLUSIONS

Despite the established benefits and strong participation recommendations, CR enrolment rates are disappointingly low across Canada, typically limited to 15% to 30% of eligible patients (1). This chronic underuse of CR is a major issue that needs to be addressed in strategies aiming to improve access to cardiac care.

The factors contributing to limited or delayed participation are multifactorial and include referral issues (failure to refer eligible patients, strength of endorsement by physician or health care provider, and time lag between event and referral), program issues (geographical and scheduling limitations, and program model not suited to needs of patient) and capacity issues (lack of services in some areas and lack of capacity in existing programs).

Improvements to referral processes to include systematic prompt referral of all eligible patients, and a clear message from the health care team that CR is an essential and standard component of cardiac care, will lead to increased referral and participation rates. Program delivery models that are consistent with contemporary cardiac care and meet the needs of a wide array of patients need to be developed and evaluated. In addition to the traditional onsite programs, these may include regional models, Internet or other home-based programs, and tailored interventions. Existing capacity must also be examined and new investment in CR service expansion may be required to deliver an appropriate level of services in some regions for this patient population.

All CVD patients require core aspects of CR services. Patients who would derive benefit from formal CR programs should be provided the opportunity, given the proven efficacy and cost effectiveness of CR. The criteria for the best candidates for CR need to be further defined. For those patients referred to CR, optimal program entry would be within the 'preferable' timeframe of up to 30 days.

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REFERENCES

1. Canadian Association of Cardiac Rehabilitation. Canadian Guidelines for Cardiac Rehabilitation and Cardiovascular Disease Prevention, 2nd edn. Winnipeg, 2004.
2. Leon AS, Franklin BA, Costa F, et al; American Heart Association; Council on Clinical Cardiology (Subcommittee on Exercise, Cardiac Rehabilitation, and Prevention); Council on Nutrition, Physical Activity, and Metabolism (Subcommittee on Physical Activity); American Association of Cardiovascular and Pulmonary Rehabilitation. Cardiac rehabilitation and secondary prevention of coronary heart disease: An American Heart Association scientific statement from the Council on Clinical Cardiology (Subcommittee on Exercise, Cardiac Rehabilitation, and Prevention) and the Council on Nutrition, Physical Activity, and Metabolism (Subcommittee on Physical Activity), in collaboration with the American Association of Cardiovascular and Pulmonary Rehabilitation. Circulation 2005;111:369-76.
3. Haskell WL, Alderman EL, Fair JM. Effects of intensive multiple risk factor reduction on coronary atherosclerosis and clinical cardiac events in men and women with coronary artery disease. The Stanford Coronary Risk Intervention Project (SCRIP). Circulation 1994;89:975-90.
4. Niebauer J, Hambrecht R, Velich T. Attenuated progression of coronary artery disease after 6 years of multifactorial risk intervention: Role of physical exercise. Circulation 1997;96:2534-41.
5. O'Connor GT, Buring JE, Yusuf S. An overview of randomized trials of rehabilitation with exercise after myocardial infarction. Circulation 1989;80:234-44.
6. Oldridge NB, Guyatt GH, Fischer ME. Cardiac rehabilitation after myocardial infarction. Combined experience of randomized clinical trials. JAMA 1988;260:945-50.
7. Taylor RS, Brown A, Ebrahim S, et al. Exercise-based rehabilitation for patients with coronary heart disease: Systematic review and meta-analysis of randomized controlled trials. Am J Med 2004;116:682-92.
8. Hambrecht R, Walther C, Mobius-Winkler S, et al. Percutaneous coronary angioplasty compared with exercise training in patients with stable coronary artery disease: A randomized trial. Circulation 2004;109:1371-8.
9. Ades PA. Cardiac rehabilitation and secondary prevention of coronary heart disease. N Engl J Med 2001;345:892-902.
10. Belardinelli R, Paolini I, Cianci G, Piva R, Georgiou D, Purcaro A. Exercise training intervention after coronary angioplasty: The ETICA trial. J Am Coll Cardiol 2001;37:1891-900.
11. Sebrechts CP, Klein JL, Ahnve S, Froelicher VF, Ashburn WL. Myocardial perfusion changes following 1 year of exercise training assessed by thallium-201 circumferential count profiles. Am Heart J 1986;112:1217-26.
12. Ehsani AA, Heath GW, Hagberg JM, Sobel BE, Holloszy JO. Effects of 12 months of intense exercise training on ischemic ST-segment depression in patients with coronary artery disease. Circulation 1981;64:1116-24.
13. Pollock ML, Franklin BA, Balady GJ, et al. AHA Science Advisory. Resistance exercise in individuals with and without cardiovascular disease: Benefits, rationale, safety, and prescription: An advisory from the Committee on Exercise, Rehabilitation, and Prevention, Council on Clinical Cardiology, American Heart Association; Position paper endorsed by the American College of Sports Medicine. Circulation 2000;101:828-33.
14. Fagard RH. Exercise characteristics and the blood pressure response to dynamic physical training. Med Sci Sports Exerc 2001;33(6 Suppl):S484-92.
15. Pescatello LS, Franklin BA, Fagard R, Farquhar WB, Kelley GA, Ray CA; American College of Sports Medicine. American College of Sports Medicine position stand. Exercise and hypertension. Med Sci Sports Exerc 2004;36:533-53.
16. Leon AS, Sanchez OA. Response of blood lipids to exercise training alone or combined with dietary intervention. Med Sci Sports Exerc 2001;33(6 Suppl):S502-15.
17. Durstine JL, Grandjean PW, Davis PG, Ferguson MA, Alderson NL, DuBose KD. Blood lipid and lipoprotein adaptations to exercise: A quantitative analysis. Sports Med 2001;31:1033-62.
18. Kraus WE, Houmard JA, Duscha BD. Effects of the amount and intensity of exercise on plasma lipoproteins. N Engl J Med 2002;347:1483-92.
19. Kelley DE, Goodpaster BH. Effects of exercise on glucose homeostasis in Type 2 diabetes mellitus. Med Sci Sports Exerc 2001;33(6 Suppl):S495-501.
20. Berkman LF, Blumenthal J, Burg M, et al; Enhancing Recovery in Coronary Heart Disease Patients Investigators (ENRICHD). Effects of treating depression and low perceived social support on clinical events after myocardial infarction: The Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) Randomized Trial. JAMA 2003;289:3106-16.
21. Johnson N, Fisher J, Nagle A, Inder K, Wiggers J. Factors associated with referral to outpatient cardiac rehabilitation services. J Cardiopulm Rehabil 2004;24:165-70.
22. Blackburn GG, Foody JM, Sprecher DL, Park E, Apperson-Hansen C, Pashkow FJ. Cardiac rehabilitation participation patterns in a large, tertiary care center: Evidence for selection bias. J Cardiopulm Rehabil 2000;20:189-95.
23. Norris CM, Jensen LA, Galbraith PD, et al. Referral rate and outcomes of cardiac rehabilitation after cardiac catheterization in a large Canadian city. J Cardiopulm Rehabil 2004;24:392-400.
24. Grace SL, Abbey SE, Shnek ZM, Irvine J, Franche RL, Stewart DE. Cardiac rehabilitation II: Referral and participation. Gen Hosp Psychiatry 2002;24:127-34.
25. Ades PA, Waldmann ML, Polk DM, Coflesky JT. Referral patterns and exercise response in the rehabilitation of female coronary patients aged greater than or equal to 62 years. Am J Cardiol 1992;69:1422-5.
26. Jackson L, Leclerc J, Erskine Y, Linden W. Getting the most out of cardiac rehabilitation: A review of referral and adherence predictors. Heart 2005;91:10-4.
27. Grace SL, Evindar A, Abramson BL, Stewart DE. Physician management preferences for cardiac patients: Factors affecting referral to cardiac rehabilitation. Can J Cardiol 2004;20:1101-7.
28. Daly J, Sindone AP, Thompson DR, Hancock K, Chang E, Davidson P. Barriers to participation in and adherence to cardiac rehabilitation programs: A critical literature review. Prog Cardiovasc Nurs 2002;17:8-17.
29. Grace SL, Evindar A, Kung TN, Scholey PE, Stewart DE. Automatic referral to cardiac rehabilitation. Med Care 2004;42:661-9.
30. Grace SL, Evindar A, Kung T, Scholey P, Stewart DE. Increasing access to cardiac rehabilitation: Automatic referral to the program nearest home. J Cardiopulm Rehabil 2004;24:171-4.
31. LaBresh KA, Ellrodt AG, Gliklich R, Liljestrand J, Peto R. Get with the guidelines for cardiovascular secondary prevention: Pilot results. Arch Intern Med 2004;164:203-9.
32. Smith KM, Harkness K, Arthur HM. Predicting cardiac rehabilitation enrollment: The role of automatic physician referral. Eur J Cardiovasc Prev Rehabil 2006;13:60-6.
33. Cortes O, Arthur HM. Determinants of referral to cardiac rehabilitation programs in patients with coronary artery disease: A systematic review. Am Heart J 2006;151:249-56.
34. United Kingdom Department of Health. National service framework for coronary heart disease – Modern standards and service models. <www.dh.gov.uk/assetRoot/04/05/75/26/04057526.pdf> (Version current at August 11, 2006).
35. National Heart Foundation of Australia and Australian Cardiac Rehabilitation Association. Recommended Framework for Cardiac Rehabilitation. <www.heartfoundation.com.au/downloads/CR_04_Rec_Final.pdf> (Version current at August 11, 2006).
36. New Zealand Guidelines Group. Evidence-based practice guideline: Cardiac rehabilitation. <www.nzgg.org.nz/guidelines/0001/cardiac_rehabilitation.pdf> (Version current at August 11, 2006).
37. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription, 6th edn. Baltimore: Lippincott Williams & Wilkins, 2000.
38. Sheiban I, Fragasso G, Rosano GM, et al. Time course and determinants of left ventricular function recovery after primary angioplasty in patients with acute myocardial infarction. J Am Coll Cardiol 2001;38:464-71.
39. Dubach P, Myers J, Wagner D. Optimal timing of phase II rehabilitation after cardiac surgery. The cardiologist's view. Eur Heart J 1998;19(Suppl O):O35-7.
40. Carrel T, Mohacsi P. Optimal timing of rehabilitation after cardiac surgery: The surgeon's view. Eur Heart J 1998;19(Suppl O):O38-41.
41. Cardiac Care Network, The Ontario Cardiac Rehabilitation Pilot Project – Report and Recommendations, September 2002. <www.ccn.on.ca/pdfs/Rehab-Pilot-Project-Sep2002.pdf> (Version current at August 11, 2006).

APPENDIX A

Subgroup Members

General Commentary on Access to Care
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Secondary Review Participating Organizations

Access to Specialist Consultation and Noninvasive Testing
Canadian Cardiovascular Society (CCS) invited 20 community cardiologist members to review the report.

Access to Echocardiography
Canadian Society of Echocardiography (CSE)

Access to Cardiovascular Nuclear Imaging
Canadian Association of Nuclear Medicine (CANM)
Peter Bogaty MD, Ste Foy, Quebec
Ross A Davies MD, Ottawa, Ontario
Terrence D Ruddy MD, Ottawa, Ontario
Gerry Wisenberg MD, London, Ontario

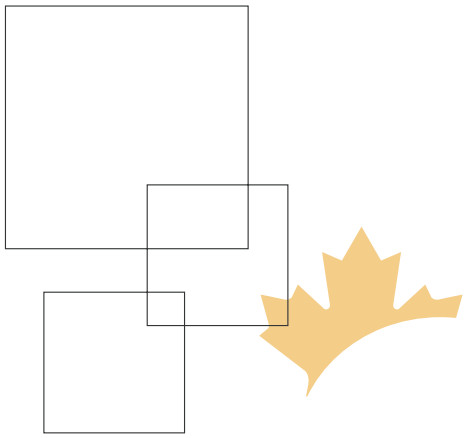
Access to Cardiac Catheterization, Percutaneous Coronary Intervention and Cardiac Surgery
Canadian Cardiovascular Society (CCS) invited 20 community cardiologist members to review the report.

Access to Care in Non-ST Segment Elevation Acute Coronary Syndromes
Canadian Association of Interventional Cardiologists (CAIC)
Canadian Society for Cardiac Surgeons (CSCS)

Access to Heart Failure Care
CCS Secondary Panel for the Diagnosis and Management of Heart Failure Consensus Conference

Access to Electrophysiology Services
Canadian Heart Rhythm Society (CHRS)

Access to Cardiac Rehabilitation
Canadian Association of Cardiac Rehabilitation (CACR)



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