Wait-time benchmarks for cardiovascular services and procedures

Submitted to the Canadian Wait Time Alliance
Submitted by the CCS Access to Care Working Group

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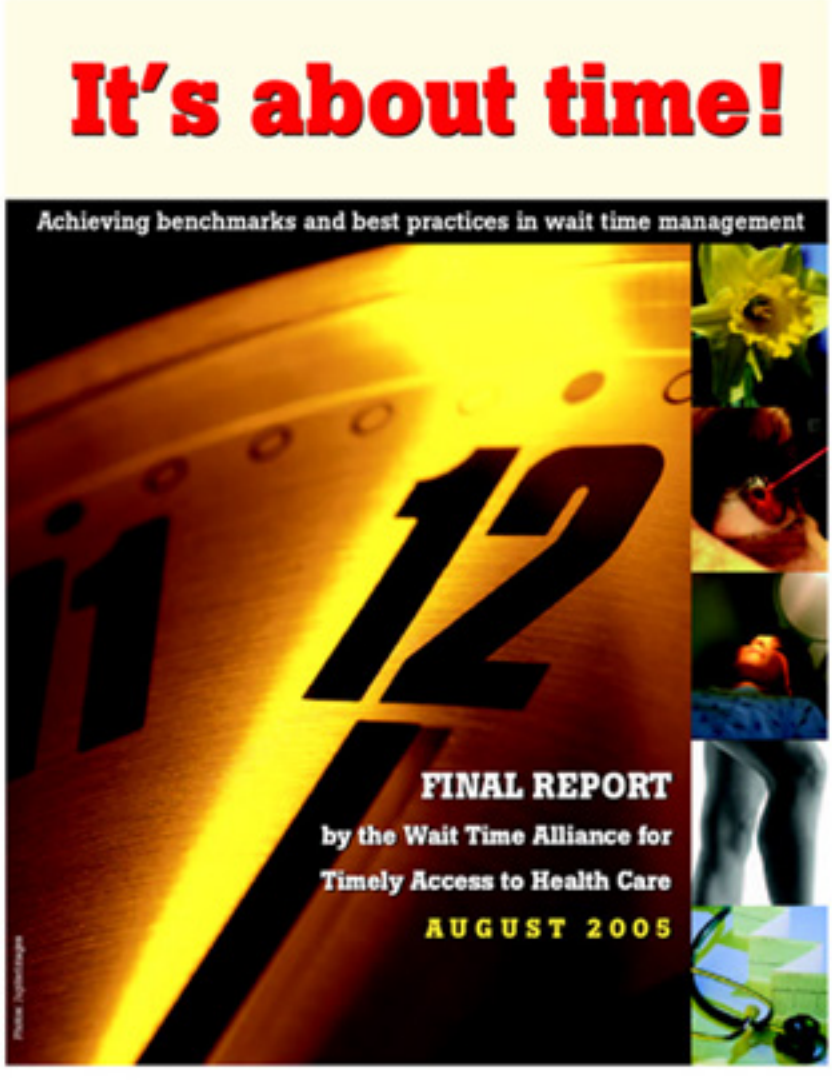

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Submitted to the Canadian Wait Time Alliance
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Final report
July 27, 2005

Executive summary

The Alliance for Timely Access (the Alliance) consists of the Canadian Medical Association (the CMA) and medical specialty societies representing the five priority areas identified by Canada's First Ministers to improve access to health services. The Alliance has undertaken to establish pan-Canadian wait times, drawing upon appropriate evidence and clinical expertise to establish reasonable benchmarks.

As a member of the Alliance, the Canadian Cardiovascular Society (CCS) was asked to develop wait-time benchmarks for key cardiac services and procedures. In response to that request, the CCS Access to Care Working Group established seven subgroups to develop wait-time benchmarks and urgency categories for the full continuum of adult cardiovascular services and procedures. This report is a consolidation of the final reports prepared by each of the subgroups. The individual subgroup reports will be made available on the CCS website (www.ccs.ca).

The CCS believes that wait lists are an acceptable, and in fact an essential, component of an efficient publicly-funded health care system, but unmanaged wait lists that do not reflect patient need could well be its death knell. The Canadian healthcare system desperately needs national standards and an effective approach to managing wait lists to ensure timely access to care.

Wait lists must be patient focused and based upon measurable encounters with the health system. Ideally, the wait time would be calculated from the onset of symptoms to treatment and rehabilitation. However, in cardiovascular medicine, there is no reliable way to identify the onset of symptoms from health records. Therefore, the measurable wait time begins at the point of first medical contact (e.g., visit to general practitioner or specialist, visit to an emergency room, hospital admission).

The wait time must incorporate access to the specialist, as well as access to the appropriate investigation, invasive or non-invasive. The wait time must include access to definitive treatments such as surgery and percutaneous interventions. Cardiovascular queues must also include newer diagnostic procedures such as electrophysiology testing, newer interventions such as radiofrequency ablation, and access to lifesaving pacemakers and implantable defibrillators. Recognizing that cardiovascular disease is a chronic disease, wait times must include access to chronic disease management programs such as heart failure clinics or rehabilitation and risk factor modification programs.

Prioritization must be need-based, with urgency of access based upon objective criteria aimed at minimizing potential morbidity and mortality on the wait list.

Scope of this report

This report focuses on timely access to cardiovascular services and procedures through the entire continuum of care from consultation and diagnosis to therapeutic procedures to rehabilitation. This approach is consistent with the patient's overall experience, reflecting the entire wait period for the patient from the onset of symptoms to treatment and to rehabilitation.

There are many different types of cardiovascular disease, including, for example:

- Coronary artery disease, when one or more of the coronary arteries are blocked,
- Valvular disease, when one or more of the valves of the heart are not working properly,
- Chronic heart failure, when the heart is unable to pump a sufficient amount of blood to meet the demands of the body,
- Arrhythmias, when there is a disturbance in the regular rhythm (too slow or too fast) of the heartbeat,
- Congenital heart disease, and
- Diseases of the myocardium, pericardium and great vessels.

Wait-time benchmarks are required for all diagnostic and therapeutic procedures required to treat the range of cardiac diseases. Therefore, the procedures covered in this report include cardiac catheterization, nuclear imaging, electrophysiology (EP)[1] studies, percutaneous coronary interventions (PCI), coronary artery bypass graft (CABG) surgery, valve surgeries, implantation of pacemakers and

implantable cardioverter defibrillators (ICDs), and percutaneous ablations.

Methodology

The CCS Access to Care Working Group established subgroups to develop wait-time benchmarks in seven areas of care. Each subgroup had between six and eight physicians representing various disciplines from across Canada.

To the degree possible, each of the subgroups used the following methodology:

- Identified and recruited appropriate specialists to participate in the subgroup, ensuring representation from the relevant medical subspecialties and respecting Canada's geography.
- Conducted a literature review on wait times and access to care.
- Conducted a review (if relevant) of existing clinical practice guidelines and wait time and access to care standards.
- Surveyed Canadian centres regarding current wait times.
- Developed and documented a consensus opinion on appropriate wait times.
- Established a secondary review panel (typically a Canadian stakeholder association) to provide additional input on the proposed pan-Canadian wait times.

Where little relevant literature was available, the subgroups ensured that the consensus-building process involved a broad and comprehensive stakeholder group. Forty-nine physicians and related healthcare experts participated as working members within the subgroups to build an initial consensus on wait-time benchmarks. Each subgroup developed a draft report documenting its research, analysis, consensus process and proposed wait time benchmarks. The subgroup's draft reports were provided to a total of six national societies and associations and individual specialists for a secondary review.

Table 1: Proposed upper limit for wait-time benchmarks for cardiovascular services and procedures by urgency category

	Upper limit of wait-time benchmarks			
Indication	**Emergent**	**Urgent**	**Semi-urgent**	**Non-urgent**
Initial specialist consultation	Immediate to 24 hours	1 week	4 weeks	6 weeks
Cardiac nuclear imaging	1 working day	3 working days		2 weeks
Diagnostic catheterization (cath)				
After STEMI[2]	Immediate to 24 hours	3 days	7 days	N/A
after NSTEACS[3]	Immediate to 48 hours	3 days	7 days	N/A
Stable angina	N/A	N/A	N/A	6 weeks
Stable valvular heart disease	N/A	N/A	14 days	6 weeks
Percutaneous coronary intervention (PCI):				
After STEMI*	Immediate	Immediate	Immediate	N/A
After NSTEACS†	Immediate	Immediate	Immediate	N/A
Stable angina	N/A	7 days	4 weeks	6 weeks
Coronary Artery Bypass Graft surgery (CABG):				
After STEMI*	Immediate to 24 hours	7 days	14 days	N/A
After NSTEACS†	Immediate to 48 hours	14 days	14 days	6 weeks
Valvular Cardiac Surgery	Immediate to 24 hours	14 days		6 weeks
Heart Failure services	Immediate to 24 hours	14 days	4 weeks	6 weeks
Electrophysiology:				
Referral to electrophysiologist		30 days		90 days
Pacemaker	Immediate to 3 days	14 days	30 days	6 weeks
EP testing and Catheter Ablation		14 days		3 months
ICD‡	Immediate to 3 days		8 weeks	
Cardiac Rehabilitation	Immediate§	7 days		30 days

* ST segment elevation myocardial infarction.

† Non-ST segment elevation acute coronary syndrome.

‡ Implantable cardioverter defibrillator.

§ Some patients are identified by the family or referring physician as being extremely depressed and possibly suicidal. Such patients should be managed by emergency or acute care psychiatry.

How the benchmarks should be interpreted

These benchmarks are *not* standards and are not to be interpreted as a line beyond which a healthcare provider or funder has acted with negligence. These benchmarks 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. These benchmarks do

not reflect current constraints on the capacity required to meet these benchmarks.

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 healthcare priority today. The physicians who contributed to this document believe that these benchmarks represent a goal towards which we should all be striving to improve access to care and public confidence in our wait list management for cardiovascular services.

Wait-time benchmarks

In Table 1, we present a summary of the wait-time benchmarks as proposed by the subgroups. The wait time shown in the table is the longest benchmark within a particular category. The reader is referred to the body of this report and the individual subgroup reports for a description of the urgency categories and a more detailed breakdown of wait times by indication.

In summary, the CCS feels that no person should have to wait longer than:

- Six weeks for an initial consultation with a cardiologist,
- Fourteen days for diagnostic cardiac nuclear imaging,
- Six weeks for a diagnostic catheterization (when the condition is stable), percutaneous coronary intervention (PCI) for stable conditions, coronary artery bypass graft (CABG) surgery for non-emergent cases, valvular cardiac surgery, pacemaker implant, or heart failure services,
- Twelve weeks for referral to an electrophysiologist, electrophysiologic testing or catheter ablation, and
- Thirty days to begin cardiac rehabilitation.

For the most part, the wait times were developed based only on medical evidence, the potential psychological impact on patients and clinical best practice. Limitations to achieving these benchmarks *have not* been explicitly incorporated into our proposed wait-time benchmarks. Therefore, these benchmarks are felt to be patient based and do not reflect current resource availability.

These wait times are intended as initial guidelines. They are not intended as to be punitive to individuals or processes that lack resources to perform within them. They should be considered as a first step in establishing pan-Canadian standards, based on existing evidence and consensus opinion. As a next step, these benchmarks should be validated through a broader consultation process with clinicians and patients.

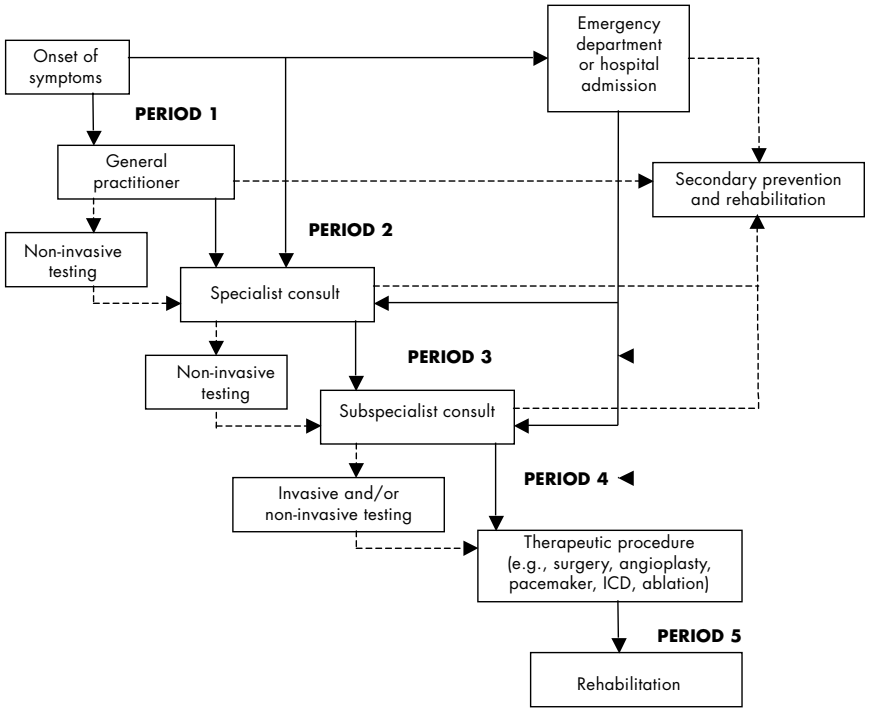
1.0 Introduction

The Alliance for Timely Access (the Alliance) consists of the Canadian Medical Association (the CMA) and medical specialty societies representing the five priority areas identified by Canada's First Ministers to improve access to health services. The Alliance has undertaken to establish pan-Canadian wait times, drawing upon appropriate evidence and clinical expertise to establish reasonable benchmarks.

As a member of the Alliance, the Canadian Cardiovascular Society (CCS) was asked to develop wait-time benchmarks for key cardiac services and procedures. In response to that request, the CCS Access to Care Working Group established seven subgroups to develop wait-time benchmarks and urgency categories for the full continuum of adult cardiovascular services and procedures. This report is a consolidation of the final reports prepared by each of the subgroups. The individual subgroup reports will be made available on the CCS website (www.ccs.ca).

With the recent Supreme Court of Canada decision suggesting Canadians have a right to timely access to care with-

Figure 1: Patient's waiting periods from onset of symptoms to rehabilitation



Total patient wait time = PERIOD 1 + 2 +3 + 4 + 5

in a publicly funded system or other options, this process has taken on even more meaning. The CCS believes that wait lists are an acceptable component of an efficient publicly-funded health care system, but unmanaged wait lists that do not reflect patient need could well be its death knell. The Canadian healthcare system desperately needs national standards for access to care and an effective approach to managing wait lists to ensure timely access to care.

While the First Ministers Agreement (*A 10-Year Plan to Strengthen Health Care*) identifies five initial areas of focus, we believe that this process can be the genesis of a broader policy approach to measuring, managing and monitoring Canadians' access to a range of health services.

1.1 Importance of managing the entire continuum of care

The report focuses on timely access to cardiovascular services and procedures through the entire continuum of care from consultation and diagnosis to therapeutic procedures to rehabilitation. This approach is consistent with the patient's overall experience, reflecting the entire wait period for the patient from the onset of symptoms to treatment and to rehabilitation.

The patient's journey from the initial onset of cardiac symptoms to rehabilitation is shown graphically in Figure 1. As shown in the figure, there are five major time intervals between the various access points to care and services. Each of these intervals is often made up of smaller waits. For example, the family physician may refer a patient to a cardiologist, but only after receiving test results. Any delay in receiving these tests extends the overall waiting period for the patient.

Although there has been much focus on access to therapeutic procedures (e.g., surgery), the CCS strongly believes that **every access point on this continuum of care must have a wait-time benchmark** for the following reasons:

- Procedural wait times measure only one of the five waiting periods identified in the figure. The patient's experience is much longer than this single time interval. Often, the wait for a procedure is one of the shortest waits.
- Further, the typical measure for access to procedures is from the date the procedure is booked (i.e., the decision-to-treat date), and not necessarily the date of the first consultation with the subspecialist. The procedure may be delayed pending the results of other tests (e.g., cardiac catheterization, electrophysiology study).
- Some patients will be referred to more than one specialist. For example, for some cardiac arrhythmias, the patient will first see a family physician, then a cardiologist, who may then refer the patient to an electrophysiologist (i.e., a cardiologist who has further subspecialized in electrophysiology). The wait times to see each physician are additive.
- Any delay along the continuum can result in the patient's condition becoming more urgent while waiting. As a result, once the need for a procedure is finally identified, the remaining available wait time may be significantly shorter than it would have been with an earlier diagnosis.
- In extreme cases, the patient may short circuit the system by presenting at an emergency department. This tendency creates a reactive response to the patient's condition and can add an unnecessary burden to an already overtaxed emergency system.
- Figure 1 is meant to be representative of the process, but cannot represent all scenarios. For example, some patients may enter rehabilitation programs on referral from their family physician or prior to any definitive therapeutic procedure.

1.2 Importance of a programmatic or patient centered approach

There are many different types of cardiovascular disease, including, for example:

- Coronary artery disease, when one or more of the coronary arteries are blocked,
- Valvular disease, when one or more of the valves of the heart are not working properly,
- Chronic heart failure, when the heart is unable to pump a sufficient amount of blood to meet the demands of the body,
- Arrhythmia, when there is a disturbance in the regular rhythm (too slow or too fast) of the heartbeat,
- Congenital heart disease, and
- Diseases of the myocardium, pericardium and great vessels.

The urgency of these indications varies significantly; some that can be treated with life style changes or medication, while others are life-threatening and require emergency diagnosis and treatment.

Although cardiac surgery has received much attention over the past ten years or so, many cardiac indications do not require surgery, but do require other diagnostic and therapeutic procedures. The focus on cardiac surgery, while extremely important, must be expanded to these other procedures. Indeed, as shown in Table 1, for every CABG surgery performed, 225 electrocardiograms are performed.

The table also shows that, based on current indications, some services and procedures (e.g., implantable cardioverter defibrillators and rehabilitation services) are provided to only a small proportion of the population for whom the services are clinically indicated. Effectively managing a wait list for a particular cardiovascular service or procedure will cause increased demands elsewhere which also must be managed.

For example, more pacemakers and defibrillators will require more pacemaker and device clinic visits, more noninvasive cardiac testing and more heart failure clinic visits.

Given the breadth of cardiovascular medicine, the huge current and forecasted future demands in our aging population, wait-time benchmarks are required for all diagnostic and therapeutic procedures. Therefore, the procedures covered in this report include cardiac catheterization, nuclear imaging, electrophysiology (EP)[1] studies, percutaneous coronary interventions (PCI), coronary artery bypass graft (CABG) surgeries, valve surgeries, implantation of pacemakers and implantable cardioverter defibrillators (ICDs), and percutaneous ablations.

1.3 How the benchmarks should be interpreted

These benchmarks are *not* standards and are not to be interpreted as a line beyond which a healthcare provider or funder has acted with negligence. These benchmarks 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. These benchmarks do *not* reflect current constraints on the capacity required to meet these benchmarks.

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 healthcare priority today. The physicians who contributed to this document believe that these benchmarks represent a goal towards which we should all be striving to improve access to care and public confidence in our wait list management for cardiovascular services.

2.0 Methodology

The CCS Access to Care Working Group established subgroups to develop wait-time benchmarks in seven areas of care. Each subgroup had between six and eight physicians and recognized health care experts in the related field, representing various disciplines from across Canada. The members of the Working Group are identified in Appendix A. The membership of the seven subgroups is shown in Appendix B.

To the degree possible, each of the subgroups used the following methodology:

- Identified and recruited appropriate specialists to participate in the subgroup, ensuring representation from the affected medical subspecialties and respecting Canada's geography.
- Conducted a literature review on wait times and access to care.
- Conducted a review (if relevant) of existing clinical practice guidelines and wait time and access to care standards.
- Surveyed Canadian centres regarding current wait times.
- Developed and documented a consensus opinion on appropriate wait times.
- Established a secondary review panel (typically a Canadian stakeholder association) to provide additional input on the proposed pan-Canadian wait times.

In some areas, an extensive literature review had been undertaken recently, and the subgroup's efforts were limited to updating that work. For many cardiovascular indications (e.g., revascularization, implantation of pacemakers and ICDs, heart failure, rehabilitation), a sufficient body of

Table 1: Cardiovascular procedures, volumes and rates for 100,000 population, Canada

	No. of services provided	No. of patients indicated	No per 100,000 adult population	Comment
Electrocardiogram	5,017,200		15,999	2002/03 data*
Cardiac catheterization	131,277		419	2002/03 data†
Coronary angioplasty	44,946		143	2002/03 data†
CABG	22,167		71	2002/03 data†
Insertion of pacemaker	27,427		87	2002/03 data†
ICDs (actual)	2,300		74	2003/04 CCS estimate
ICDs (indicated)		92,000	296	2003/04 CCS estimate
Heart failure		500,000	1,610	2005/06 CCS estimate
Rehabilitation		750,000	2,415	2005/06 CCS estimate

*Canadian Institute for Health Information, National Grouping System Categories Report, Canada, 2002–2003.

†Some patients are identified by the family or referring physician as being extremely depressed and possibly suicidal. Such patients should be managed by emergency or acute care psychiatry.

evidence exists to support the development of wait-time benchmarks. For other areas, there was little or no relevant published literature to guide deliberations.

Where little relevant literature was available, the subgroups ensured that the consensus-building process involved a broad and comprehensive stakeholder group. Forty-nine physicians and related health care experts participated as working members within the subgroups to build an initial consensus on wait-time benchmarks.

Each subgroup developed a draft report documenting its research, analysis, consensus process and proposed wait-time benchmarks. The subgroup's draft reports were provided to a total of six national societies and associations and individual specialists for a secondary review. See Appendix C for a list of participating organizations and specialists.

For the most part, the wait times were developed based only on medical evidence, the potential psychological impact on patients and clinical best practice. Limitations to achieving these benchmarks *have not* been explicitly incorporated into our proposed wait-time benchmarks. Therefore, these benchmarks are felt to be patient based and do not reflect current resource availability.

These wait times are intended as guidelines, many of which were developed by consensus and require validation. They will require time to achieve what for many jurisdictions will be ambitious targets. They are not intended to be punitive to individuals or processes that lack resources to perform within them.

These benchmarks are intended to be applied only to clinically-indicated procedures. For all services and procedures, we have determined an urgency category to differentiate the level of risk between clinical conditions. We recognize that it is difficult for a patient to understand that any cardiovascular service is not urgent. The category labels used in this document are not intended to belittle the importance of or need for any procedure. The labels are simply used to distinguish between categories of more or less risk. We feel strongly that the term "elective" is pejorative and, as such, outdated in a patient-centered model of care. The term non-urgent is used in place of the older terminology.

The wait-time benchmarks contained in this report are a first step in establishing pan-Canadian standards, based on existing evidence and consensus opinion. As a next step, these benchmarks should be validated through a broader consultation process with clinicians and patients.

3.0 Wait-time benchmarks

In the following sections, we present wait-time benchmarks for the following services and procedures:

- Diagnostic services and procedures, including:
  - Specialist consultations and non-invasive testing, and
  - Nuclear cardiology.
- Therapeutic services and procedures for the following indications:
  - Acute coronary syndrome (ACS),
  - Coronary artery disease,
  - Valvular disease,
  - Heart failure, and
  - Arrhythmia.
- Cardiac Rehabilitation.

These wait times are only one part of an effective wait-list management system. We believe that the following principles should guide the development and use of any wait list system to ensure timely care for individual patients:

1. Triage categories must be determined based on the risk of waiting to that 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 treatment and surveillance of patients on the waitlist and re-categorizing of those whose symptoms have changed.
4. The waitlist management system and current wait times must be transparent and visible to both the medical profession and the public. Both referring sources and the patients should be informed if the preferred specialist's wait time is longer than waits for other available specialists so they can make an informed decision regarding the choice of specialist.
5. The length of waiting times must be monitored so that appropriate adjustments can be made in capacity.
6. To safely move patients from the "in-house" category to "urgent outpatient", there must be access to necessary supporting infrastructure in the community.

With the rapid development of cardiac magnetic resonance (MR) and CT scanning, similar clarity on waiting times (and indications) will soon be required for these new and expensive diagnostic procedures.

Notwithstanding the above principles, it is important to appreciate that efficient use of resources dictates that the weekly procedural mix of cases includes patients from all triage categories, not just the most ill or urgent. This is essential to ensure that the system does not develop bottlenecks in intensive care or long-term care facilities that might occur if only very ill patients received services and procedures and to ensure that patients waiting at home are moving up the queue.

[1]A list of the acronyms used in this report is provided at the end of the document.

3.1 Diagnostic services and procedures

Access to diagnostic services is vitally important to determine the nature and urgency of the patient's condition. Only after an initial assessment has been performed can the physician determine what services are actually needed, and how long the patient can comfortably wait.

3.1.1. Access to specialist consults and non-invasive tests

The initial diagnosis is typically made (or confirmed) through consultation with a specialist (i.e., cardiologist or general internist), with the support of non-invasive diagnostic tests (e.g., echocardiograph, stress test). Many of these tests can be ordered by either the general practitioner (GP) or the specialist.

The subgroups took the perspective that appropriate waiting times for diagnostic services and procedures are linked to the speed with which the information provided is required to plan or execute therapy. For example, myocardial perfusion imaging (MPI) may be used to determine which patients presenting with unstable coronary syndromes should be advanced urgently for cardiac catheterization. If urgent catheterization should be carried out within eight days, then wait times for urgent MPI must be shorter than eight days for the test to be appropri-

Table 2: Wait-time benchmarks for hospital-based referral and expedited consultation

Indication	Priority categories	Benchmark	Comment on benchmark
Hospital-based referral and testing			
Acute coronary syndromes	Known or suspected STEMI or NSTEMI		
	Rest pain consistent with ischemia		
Arrhythmias	Hemodynamically significant		
Heart Failure	New onset Class III or IV		
Endocarditis	Known or suspected		
Cardiac tamponade			
Aortic dissection			
Pulmonary embolism	Suspected or known but untreated		
Emergent assessment for non-cardiac surgery			
Embolism	With suspected cardiac source		
Post-cardiac transplantation	With suspected rejection		
Syncope	With prior myocardial infarction or significant left ventricular dysfunction or aortic stenosis		
Prosthetic valve dysfunction	Suspected with hemodynamic compromise		These indications would be best facilitated by hospital-based evaluation and urgent referral.
Hypertensive crisis			
Expedited consultation			
Atrial fibrillation	Initial onset without associated chest pain and without hemodynamic compromise.	Within 1 week. If time of onset is clear, assessment and possible cardioversion is ideally performed within 48 hours.	These indications are best dealt with in the emergency department as this setting is needed for parenteral drug administration and electrical cardioversion
Supra-ventricular 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	Rapid assessment chest pain clinic is helpful.
CHF	New onset or known with deterioration (ischemic and non-ischemic heart disease)	Within 1 week	Heart function clinics useful in this setting. Early echocardiography by primary care.
Syncope	With structural heart disease, family history of sudden death and Wolff Parkinson White Syndrome or other ECG evidence for possible cause	Within 1 week	

ately used. In each case we have selected the shortest wait times among all indications as the wait-time benchmark for procedures to provide best clinical care.

The CCS subgroup identified three general urgency levels for access to these services:

- Hospital-based referral and testing, where the indications would be best facilitated by hospital-based evaluation and urgent referral. See Table 2 for a list of indications.
- Expedited consultation, including some indications that are best dealt with in an emergency room setting. See Table 2 for a list of indications and associated wait times.
- Outpatient referral. See Table 3 (see page 76) for a list of indications and associated wait times.

The subgroup members felt that all expedited consultations should occur within one week of referral. A consensus opinion emerged that six weeks should be the absolute limit for referral waiting times for the lowest priority indications, including performance of exercise treadmill testing, nuclear imaging and echocardiography, as shown in Table 3.

3.1.2 Nuclear Imaging

Cardiovascular nuclear medicine or nuclear cardiology uses agents labelled with radioisotopes that can be imaged with cameras capable of detecting the gamma photons. These 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 the anatomy. In cardiology, nuclear imaging is most often used to examine myocardial perfusion, ventricular function and/or viability.

The Canadian Association of Nuclear Medicine (CANM) is also a member organization of the Alliance and has submitted benchmarks for nuclear imaging. The CCS, through one of its subgroups, reviewed the CANM's document and confirmed the wait times for nuclear cardiology.

Table 4: Wait-time benchmarks for cardiac nuclear imaging, by indication, days

	Emergent	Urgent	Non-urgent
Myocardial perfusion – Exercise or pharmacologic - SPECT or PET	0	3	14
Myocardial Viability – FDG or thallium	1	3	14
Radionuclide Angiography (RNA)	1	3	14

Note: 0 means within 24 hours of the referring physician's recommended date of the test.

The CANM chose perfusion imaging and FDG imaging as its benchmarks; therefore, these benchmarks were also used for the CCS report. The wait times for cardiac nuclear imaging are zero to one day for emergent cases, up to three days for urgent cases, and up to 14 days for routine tests, as shown in Table 4.

In non-invasive cardiac imaging, appropriate waiting times are linked to the speed with which the information provided is required to plan or execute other diagnostic tests including angiography and therapies such as PCI and CABG. Wait times, therefore, may contrast with the wait times noted in Radiological Sections for Diagnostic Imaging. [2] Wait times for non-invasive cardiac imaging must be viewed in the clinical context in which the patient presents.

Urgent wait times apply in all conditions where the patient's clinical status dictates the need for diagnostic information in order to make urgent therapeutic decisions. For example, in patients with acute coronary syndromes in whom nuclear imaging is indicated[3], testing is considered emergent or urgent in order to identify those patients who would benefit most by further invasive procedures, PCI or CABG during their index hospitalization.

In out-patients with stable cardiac disease in whom nuclear imaging is indicated[3,4] for diagnosis or risk stratification, non-urgent wait times are reasonable.

Myocardial viability assessment (FDG or thallium imaging) can also be emergent or urgent in critically ill patients with heart failure where decisions need to be made rapidly as to whether a revascularization procedure is indicated. Most cases of viability assessment are semi-urgent or non-urgent 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. Therefore, investigation and prescription of a treatment plan needs to be completed promptly. Hence a benchmark of **within 14 days** has been determined.

For ventricular function assessment with radionuclide angiography (RNA), appropriate wait times are again best defined by the clinical presentation. In the assessment of pre-chemotherapy, assessment may also be considered urgent (i.e., within three working days of the specified timeframe), required before instituting chemotherapy regimens.

Further discussion and details can be obtained in the CANM submission to the Wait Time Alliance[5] and the report from the CCS Cardiac Nuclear Medicine subgroup report.[6]

3.2 Therapeutic services and procedures

Once an initial diagnosis has been made regarding the underlying cause of the patient's cardiovascular symptoms,

Table 3: Wait-time benchmarks for outpatient referral and non-invasive testing

Indication	Priority categories	Benchmark	Comment on benchmark	Indication-specific treatment-to-wait-time benchmark	Non-invasive testing
Chest Pain	Stable angina	4 weeks	Strongly-positive stress non-invasive test usually requires more urgent invasive testing. Wait time also depends upon professional and psycho-social factors.	ASA Beta blockers Lipid lowering medications Nitrates	Wait time should include the performance of non-invasive tests. Exercise or pharmacological imaging study should be considered in the presence of exercise limitations, resting ECG abnormalities or other confounding factors.
	Atypical chest pain	6 weeks	This limit may not always be appropriate in women for presenting symptoms of serious disease are frequently atypical.		
Class I or II Heart Failure	Valvular heart disease			Beta blockers ACE inhibitors Statins ASA	Echocardiography – With this indication, there is evidence to support routine ordering of echocardiography by primary care physicians. This should be performed prior to consultation and within one week of ordering the test.
	With aortic stenosis	2–4 weeks	Depending upon level of symptoms		
	With deterioration	1–2 weeks	Depending upon clinical course		
	Without deterioration	4 weeks			
	Cardiomyopathy without deterioration in status				
	Ischemic	4 weeks	Common clinical problem effectively handled by many family physicians and internists.		
	Non-ischemic	6 weeks			
Dizziness or syncope	Recurrent syncope	Early phone call to consultant to develop plan	Committee opinions vary widely as nature and consequences of symptomatic episodes must be factored in.	Identify potentially pro-arrhythmic medications Identify and treat electrolyte disorders. Examine for orthostasis. Institute precautionary measures. Examine for orthostatic hypotension and institute precautionary measures prior to consultation	ECG to be sent with consult. Tests are often best left until after the first direct patient contact with the cardiologist.
	Orthostatic hypotension	6 weeks			

Table 3: Wait-time benchmarks for outpatient referral and non-invasive testing (continued)

Indication	Priority Categories	Benchmark	Comment on Benchmark	Indication-specific treatment-to-wait-time benchmark	Non-invasive testing
Atrial Fibrillation	Persistent or paroxysmal	6 weeks	Urgent consultation needed with uncontrolled rates	Anticoagulation (except age < 65 with no other stroke risks); if contraindicated, urgent telephone consultation needed. Rate control with calcium channel blockers or beta blockers	Ambulatory ECG only when diagnosis is suspected but not confirmed. Wait time – within total 6 week consult period Echocardiography – Evidence supporting routine pre-referral testing is weak.
Heart murmurs	First discovery (asymptomatic) or chronic and	6 weeks		Bacterial endocarditis prophylaxis for lesions prone to infection	Chest X-Ray Echocardiography not routinely needed before consultation.
Assessment for non-cardiac surgery*	Urgent surgery with known CAD or structural heart disease	Before optimal surgical date	E.g., cancer, unstable vascular disease, abdominal or orthopedic disease		Routine testing is not indicated prior to consultation
	Other	4 weeks	Non-urgent non-cardiac surgery		
Palpitation	Including documented episodic supra-ventricular tachycardia	6 weeks	In the absence of worrisome co-morbidities (e.g., syncope or presyncope, LV dysfunction, family history of sudden death)		Attempt symptom-rhythm correlation while waiting for referral and forward results when available.
	Other	6 weeks			
Pregnancy-related assessment	Pre-pregnancy 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 prior to consultation
	Pregnancy with known structural heart disease	2 weeks			
Non-specific assessment requests	Referrals not motivated by symptoms or where length of wait is unlikely to add to patient risk or anxiety.	10 weeks	These referrals are those motivated by the family history or other risk factor in absence of symptoms.	*It is assumed that identifiable risk factors would be modified during the wait time.*	

*Known coronary artery or structural heart disease.

the appropriate therapeutic procedure is recommended. The diagnoses that have been examined as part of this work include:

- Acute coronary syndrome (i.e., unstable angina or heart attacks),
- Coronary artery disease (i.e., blockage of one or more coronary arteries),
- Valvular disease,
- Heart failure, and
- Arrhythmias.

For each of these indications, we provide a short description of the disease, the prescribed therapeutic procedures, and the wait-time benchmarks.

3.2.1 Acute coronary syndrome (ACS) — STEMI

Acute coronary syndromes (ACS), myocardial infarction and unstable angina, are amongst the most common causes of hospitalization. ACS is subdivided on the basis of initial presenting ECG into ST elevation (STEMI) and non ST segment elevation acute coronary syndromes (NSTEACS). NSTEACS are further divided by presence of biochemical markers of myocardial necrosis into unstable angina or, if

Table 5: Wait-time benchmarks for after STEMI, by indication

Urgent indication for transfer/cath/PCI	Target cath/PCI	Benchmark cath/PCI±	Benchmark CABG§
In candidates for primary* or rescue** PCI.	< 90 minutes	90 minutes	< 2 hours
% within benchmark	90%	90%	90%
In cardiogenic shock who are candidates for revascularization.	< 90 minutes	12-18 hours	< 2 hours
% within benchmark	Varies¥	Varies	90%
In candidates for surgical repair of ventricular septal rupture or severe mitral regurgitation (MR).	< 90 minutes	12-18 hours	< 2 hours
% within benchmark	Varies	Varies	90%
In patients with persistent ischemic symptoms, hemodynamic and/or electrical instability.	< 90 minutes	12-18 hours	<2 hours
% within benchmark	Varies	Varies	90%
In patients where there is objective evidence of recurrent myocardial infarction (MI).	< 90 minutes	12 hours	< 2 hours
% within benchmark	Varies	Varies	90%
In patients with moderate or severe spontaneous myocardial ischemia during recovery from STEMI.	< 24 hours	< 24 hours	<24 hours
% within benchmark	90%	90%	90%
In patients with provocable myocardial ischemia during recovery from STEMI.¶	< 3 days	5 days	< 7 days
% within benchmark	90%	90%	90%
In patients with LV ejection fraction (LVEF) ≤ .40	< 3 days	5 days	< 7 days
CHF, or serious ventricular arrhythmias.¶			
% within benchmark	90%	90%	90%
In patients who had clinical heart failure during the acute episode but subsequently demonstrated well preserved LV function.¶	< 3 days	5 days	< 7 days
% within benchmark	90%	90%	90%
Non-urgent coronary angiography might be considered as part of an invasive strategy after fibrinolytic therapy particularly anterior MI or aborted or near aborted MI.+	< 3 days	5 days	< 14 days
% within benchmark	90%	90%	90%

± Wait time for cath/PCI represents the timeframe in which the evidence suggests the intervention is felt to be beneficial. All evidence supports the best outcomes occur when the optimal targets are achieved.

§ Wait time for CABG is additional wait time after cardiac catheterization

* Primary PCI implies choice of angioplasty as reperfusion therapy in acute ST segment elevation myocardial infarction (STEMI). The target for primary PCI as preferred reperfusion strategy for AMI is 90% < 90 minutes. When primary angioplasty cannot be reasonably made available within Wait time, then medical jurisdictions should employ every means possible to administer thrombolysis in as timely a manner as possible including in the prehospital setting.

** Rescue PCI implies use of angioplasty when there is evidence of reperfusion failure following fibrinolysis.

¥ Target Time is dependent upon geographic availability of the service but should be minimized to achieve the target benchmark as closely as possible.

+ Aborted MI was defined as maximal CK ≤ 2x upper limit of normal combined with typical evolutionary ECG changes. Near aborted MI is defined as maximal CK ≥ 2x upper limit of normal but elevation considered considerably less than expected given extent of ST elevation on presenting ECG.

biomarker positive, non ST segment myocardial infarction (NSTEMI).

Wait-time benchmarks for revascularization after STEMI are shown in Table 5 and for after NSTEACS in Table 6. In addition to the benchmarks, the table also provides target wait times for cath and PCI. In this context, the target wait times are the ideal times to achieve optimal results. The benchmark wait-times in this table represent acceptable times given external constraints (e.g., geography).

3.2.2 NSTEACS (see table 6)

3.2.3 Coronary artery disease

Coronary artery disease (CAD) is caused by the buildup of cholesterol-containing plaques in the walls of the arteries that supply the heart muscle (myocardium). Patients do not generally experience symptoms until 70% or more of the artery is obstructed. Ischemia occurs when the amount of oxygen supplied to the myocardium is insufficient for optimal function, and any damage to the heart muscle can be reversed when oxygen supply is again adequate. Infarction (i.e., heart attack) occurs when the heart muscle suffers irreversible damage from such a blockage which usually has progressed to 100%.

The diagnosis of coronary artery disease is typically confirmed with a cardiac catheterization (cath). Depending on the results of this invasive cardiac test, the patient may require revascularization by either percutaneous coronary intervention (PCI) or coronary artery bypass graft (CABG) surgery.

Due to public perception that patients were waiting too long for cardiac care (especially CABG), this area of cardiac care has received a considerable amount of attention relative to other indications. Most cardiac surgeries are CABG; the second most common cardiac surgery is for valvular disease. In some cardiac surgeries, the patient requires both CABG and valve surgery combined in one operation.

Wait-time benchmarks for cardiac catheterization and PCI are shown in Table 7 and for CABG in Table 8.

3.2.4 Valvular heart disease

Valvular heart disease occurs when one or more of the valves of the heart are not working properly. Valves may not open completely (stenosis). They may close incompletely (insufficiency). For example, the aortic valve can be affected by a range of diseases that cause it to become leaky or stuck partially closed (i.e., stenotic). Aortic valve replacement currently requires open heart surgery. Valve surgery is performed at the same time as CABG if there are coexisting blockages.

Wait-time benchmarks for valvular surgery are shown in Table 9.

Table 6: Wait-time Benchmarks for after NSTEACS, by indication

Risk category	Wait-time benchmark	
	For cardiac cath and PCI	For CABG
High risk TIMI Risk Score 5-7, Or Persistent or recurrent chest pain Dynamic ECG changes with chest pain CHF, hypotension, arrhythmias with C/P Moderate or high (>5ng/ml) Troponin Rise	90% within 24-48 hours	90% within 24-48 hours
Intermediate risk TIMI Risk Score 3-4, Or NSTEMI with small troponin rise (>1<5ng/ml) Worst ECG T wave inversion or flattening Significant LV dysfunction (EF<40%) Previous documented CAD, MI or CABG, PCI	90% within 3-5 days	90% within 1-2 weeks
Low risk TIMI Risk Score 1-2, Or Age < 65 years No or minimum troponin rise (<1.0ng/ml) No further Chest Pain Inducible ischemia ≤ 7 MET's workload	90% within 5-7 days	90% within 6 weeks

3.2.5 Heart failure (HF)

Chronic heart failure (CHF) is the inability of the heart to pump a sufficient amount of blood to meet the demands of the body. Heart failure is categorized according to the side of the heart (i.e., left versus right heart failure), or whether the problem originates during contraction (systolic heart failure) or relaxation (diastolic).

Chronic HF affects approximately 500,000 Canadians with 50,000 new cases diagnosed per year. The prevalence of HF increases with age such that 1% of Canadians over age 65 and 4% of Canadians over age 70 have HF. In Canada, HF is reaching epidemic proportions with an age-adjusted mortality of 106/100,000, which is greater

than the combined age-adjusted mortality for AIDS and breast cancer.

Wait-time benchmarks for heart failure are shown in Table 10. During the waiting period, it is critically important that the clinical practice guidelines are adhered to.

3.2.6 Arrhythmias

A cardiac arrhythmia is a disturbance in the regular rhythm of the heartbeat. There are two major classes of cardiac arrhythmias:

- Bradycardia: This is a heart rhythm which beats too slowly. Treatment may involve the implant of a pacemaker.
- Tachycardia: This is a heart rhythm which is too fast. Conditions range from the entirely benign to the instantly fatal. Treatment strategies include pharmacotherapy, radiofrequency ablation, and implantable cardioverter defibrillator (ICD) implants.

An electrophysiology (EP) consultation can be obtained for various arrhythmia diagnoses or symptoms. It can be prescribed from a general practitioner, an internist, a cardiologist or cardiac surgeon. After the EP assessment, additional tests can be ordered to support a precise diagnosis or to decide on the final treatment. These special tests will have to be performed according to the outpatient waiting list for each test. At the end, the cumulative waiting time is the total elapsed time from the initial EP reference to the final decision to proceed to an EP study, ablation, pacemaker or ICD implant.

Wait-time benchmarks for an electrophysiology consultation are shown in Table 11.

Permanent pacemaker implantation may be done on either an urgent or semi-urgent basis (i.e., the patient is an inpatient who requires the implant of a permanent pacemaker before the patient can be safely discharged from hospital); or on a non-urgent or elective basis. Most patients requiring pacemakers have sinus node dysfunction, atrial fibrillation with a slow ventricular response, or atrioventricular node disease.

Typically, urgent and semi-urgent patients (non-elective) 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, or dyspnea. Adverse events include falls with injury, the development of heart failure, and sudden death.

Wait-time benchmarks for pacemakers are shown in Table 12.

Electrophysiologic studies and catheter ablation are central to the contemporary management of many cardiac arrhythmias. Newer ablation techniques using advanced mapping systems are emerging that permit improved management of previously untreatable arrhythmic conditions.

Catheter ablation is a first-line treatment for many cardiac arrhythmias, including supra-ventricular tachycardia (SVT), atrial flutter and idiopathic forms of ventricular tachycardia (VT). These procedures are routinely performed on an outpatient basis, with very few complications and, in contrast to most pharmacological and surgical therapies in medicine, are typically *curative*.

Wait-time benchmarks for electrophysiologic testing and catheter ablations are shown in Table 13.

The implantable cardioverter defibrillator (ICD) is accepted as the dominant direct therapy for the primary prevention of sudden death in patients with a demon-

Table 7: Wait-time benchmarks for cardiac catheterization and PCI

Urgency category	Cath	PCI
STEMI Primary PCI, Rescue PCI, Shock, Complications Recurrent ischemia Provocable ischemia/CHF	 Immediate —18 hours 24 hours 3 days	 Immediate
NSTEMI High risk Intermediate risk Low risk	 24–48 hours 3–5 days 5–7 days	 Immediate
Stable angina	6 weeks	High risk — 1 week Semi-urgent — 4 weeks Others — 6 weeks
Stable valvular heart disease High risk (Critical AS)	6 weeks 2 weeks	N/A

Table 8: Wait-time benchmarks for CABG

Urgency category	Target	Benchmark
Emergency (unrelenting cardiac compromise unresponsive to all therapy except surgery)	< 90 minutes	< 4 hours
In house urgent (unable to be discharged due to need for intravenous nitroglycerine, heparin, or intra-aortic balloon pump (IABP))	1 day	7 days
Urgent outpatient	7 days	14 days
Non-urgent outpatient	6 weeks	6 weeks

Table 9: Wait-time benchmarks for valvular cardiac surgery

Urgency category	Target	Benchmark
Emergency (unrelenting cardiac compromise unresponsive to all therapy except surgery for valvular complications of endocarditis, aortic dissection, myocardial infarction and trauma)	< 4 hours	< 1 day
Aortic Stenosis – critical with symptoms	14 days	14 days
Non-urgent Outpatient – all others	6 weeks	6 weeks

strated propensity to, or considered to be at high risk for, life-threatening ventricular tachyarrhythmias. Prevention of sudden death in patients with a history of life-threatening ventricular tachyarrhythmias is termed secondary prevention.

Most patients who have experienced an episode of a life-threatening ventricular tachyarrhythmia are admitted to hospital. In the absence of identification of a reversible or transient cause for the ventricular tachyarrhythmia and in the absence of prohibitive comorbiditites, most such patients will receive an ICD during the index hospitalization. These patients should receive their secondary prevention ICD within three working days of the decision to proceed. Most patients identified as being an appropriate candidate for treatment with a primary prevention ICD are outpatients.

Because the purpose of ICD therapy is to prevent sudden death in patients at high-risk of experiencing a life-threatening ventricular tachyarrhythmia, patients who are waiting to receive ICD therapy are at risk of death that would likely have been prevented had the ICD therapy been provided in a timely fashion. To date, there are no published reports detailing the risk of death among patients waiting to receive an ICD.

Wait-time benchmarks for ICDs are shown in Table 14.

Table 10: Wait-time benchmarks for heart failure, by indication

Triage category	Examples	Standard	Professional health care provider
Emergent	Acute severe myocarditis Cardiogenic shock Transplant evaluation — acutely unstable patient First episode of Acute Pulmonary Edema Acute cardiac valvular regurgitation	<24 hours	Heart failure specialist (HFS), Disease management program (DMP)
Urgent	New diagnosis of HF — unstable, decompensated Progressive Heart Failure Post MI heart failure New progression to AHA/ACC class D* Post hospitalization discharge heart failure	< 1 week < 2 weeks < 2 weeks < 2 weeks < 2 weeks	HFS, DMP, Cardiologist
Semi urgent	AHA class C† New diagnosis of HF — stable, compensated	< 4 weeks	HFS, DMP, Cardiologist, Internist
Non urgent	Chronic HF management AHA class A‡ and B§	< 6 weeks < 6 weeks	GP, Internist, Cardiologist, DMP or HFS

* AHA/ACC class D Patients with advanced structural heart disease and marked symptoms of HF at rest despite maximal medical therapy and who require specialized interventions.

† AHA/ACC class C Patients who have current or prior symptoms of HF associated with underlying structural heart disease. Dyspnea or fatigue due to left ventricular systolic dysfunction; asymptomatic patients who are undergoing treatment for prior symptoms of HF.

‡ AHA/ACC class A Patients at high risk of developing HF because of the presence of conditions that are strongly associated with the development of HF. Such patients have no identified structural or functional abnormalities of the pericardium, myocardium, or cardiac valves and have never shown signs or symptoms of HF. Systemic hypertension; coronary artery disease; diabetes mellitus; history of cardiotoxic drug therapy or alcohol abuse; personal history of rheumatic fever; family history of cardiomyopathy.

§ AHA/ACC class B Patients who have developed structural heart disease that is strongly associated with the development of HF but who have never shown signs or symptoms of HF. Left ventricular hypertrophy or fibrosis; left ventricular dilatation or hypocontractility; asymptomatic valvular heart disease; previous myocardial infarction.

Table 11: Wait-time benchmarks for an electrophysiology consultation

Urgency category	Benchmark
Emergent	Refer to Emergency Room or to EP on duty
Patients with syncope and structural heart disease (e.g., ejection fraction less than 40%), bundle branch block, hypertrophic cardiomyopathy, congenital heart disease, family history of sudden cardiac death, inherited heart disease)	30 days
Patients referred for consideration of an ICD implantation (primary prevention) and/or cardiac resynchronization therapy (CRT) device	30 days
Patients electively referred for an electrophysiologist opinion (e.g., palpitation, supraventricular tachycardia, syncope without structural heart disease, or other medical conditions)	90 days

3.3 Rehabilitation

Cardiovascular disease (CVD) is a chronic disease, one that can be controlled and not, at present, 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. Core elements of CR programs include management of cardiac risk factors, education, individualized exercise programs, nutrition counseling, and psychosocial and vocational counseling.

It is important to clarify the difference between patients who are able to access cardiac rehabilitation services (i.e., a referral is made but they may have to wait to participate in a program, which represents approximately 20% of all eligible patients) and those who are not able to access such services (i.e., no referral is made, which represents approximately 80% of all eligible patients).

Wait-time benchmarks for urgent and semi-urgent cardiac rehabilitation are shown in Table 15 and for outpatient cardiac rehabilitation in Table 16.

Elective referral patients are those who are stable at the time of assessment and who can wait for cardiac rehabilitation without experiencing any significant adverse events. The wait time will likely vary according to the diagnostic category.

The notes below reflect some of the issues that may relate to each diagnostic category. The 'ideal time' reflects some of the guidelines used by various programs and reflects the time when optimal benefits should accrue. The 'benchmark time' has been set by the expert committee as that time where most of the benefits should be available.

(1) Physical issues (sternotomy) may prevent these patients from beginning exercise earlier, but all other aspects of cardiac rehabilitation (CR) could start immediately.
(2) These patients tend to return to work and 'normal duties' shortly after the procedure.
(3) These patients likely need to be seen earlier as there may be more significant medical, vocational and social decisions required.
(4) If the cardiac rehabilitation team is seeing the patient for early mobilization post transplant, then the patient needs to be seen as soon as possible. Often these patients may be from out of town.
(5) Urgency likely reflects the psychosocial sequelae.

Table 12: Wait-time benchmarks for pacemakers

Urgency category	Benchmark
Single and dual Chamber Pacemakers	
Urgent/semi-urgent* with TTVP	1 working day
Urgent/semi-urgent* with no TTVP	3 working days
Non-urgent, with high risk of syncope	14 days
Non-urgent, with lower risk of syncope	30 days
Resynchronization (biventricular) pacemakers	
With or without a defibrillator	6 weeks

TTVP= temporary transvenous pacemaker

*In the judgment of the physician, the patient cannot safely leave the hospital until a permanent pacemaker is implanted.

Table 13: Wait-time Benchmarks for electrophysiologic testing and catheter ablation

Urgency category	Benchmark
Patients with the Wolff-Parkinson-White syndrome who have rapid atrial fibrillation or syncope	2 weeks
Patients with high-risk arrhythmias due to congenital heart disease or inherited arrhythmia diseases.	
Patients with left ventricular dysfunction who are at risk for, or who have documented, ventricular arrhythmias.	
All indications not noted above	3 months

Table 14: Wait-time Benchmarks for implantable cardioverter defibrillators (from decision to proceed)

Urgency category	Benchmark
Patients meeting established criteria to receive an ICD who have had a life-threatening episode of ventricular tachycardia (VT)/ventricular fibrillation (VF) for **secondary prevention** of sudden death.	Within 3 working days
Patients meeting established criteria to receive an ICD who have not had a life-threatening episode of VT/VF for **primary prevention** of sudden death.	Within 8 weeks

Table 15: Wait-time benchmarks for cardiac rehabilitation, urgent and semi-urgent patients

Urgency category	Target	Benchmark
Urgent patients Would show marked deterioration in medical or psychological state if not treated within a very short time frame.	Within 24 hrs*	Within 1–3 days
Semi-urgent Need to be seen within an earlier time frame or they would likely not receive rehabilitation, or significant deterioration (either physical or mental) might occur with any delay.	24–48 hours	1 week (depending on circumstances)

*Some patients are identified by the family or referring physician as being extremely depressed and possibly suicidal. Such patients should be managed by emergency or acute care psychiatry.

4.0 Considerations

Human Resource Issues

This document outlines appropriate wait times for cardiac patients. We cannot currently achieve and maintain these standards in Canada because of the current shortage of physicians, nurses and technologists trained in many subspecialties (e.g., HF, interventional cardiology, electrophysiology, echocardiography) in Canada.

The increased requirement for human resource requirements is driven by two major factors:

- In many of these professions, we are already experiencing a shortage of needed health care professions, which is causing bottlenecks and unacceptably long wait times for care. We desperately need trained professionals to help clear the backlog and to ensure that the wait lists do not climb again after they have been reduced to an acceptable level.
- For many of these services and procedures (e.g., heart failure clinics, ICDs), the current utilization rate is well below the appropriate rate based on current evidence, which means that many patients who are indicated for this care are not receiving it. Achieving a more appropriate utilization rate will require a significant investment in human resources, as well as in physical resources and supporting infrastructure.

Impact on other medical or non-medical services

These benchmarks have profound implications at all levels within cardiology and the interdisciplinary teams that treat our patients:

- After their procedure, many patients will require repatriation to their community or regional hospitals, which will affect both equipment and personnel requirements.
- The multidisciplinary requirements of disease management program for heart failure patients will involve significant recruitment and training of health care professionals.
- Information transfer and electronic health records will greatly facilitate this process.

At present, urgent and semi-urgent patients are directed to the emergency room for quick assessment and treatment. Successful implementation of these wait-time benchmarks might result in a reduced demand for emergency room services.

Effects if not followed

With diagnostic procedures, when the risk of waiting for the most appropriate diagnostic test exceeds the risk of an alternative though less appropriate testing and treatment strategy, the physician, in consultation with the patient, will chose the latter. Adding the collection of data regarding inappropriate use of technologies would provide a more complete picture of "bottlenecks" in the system and their impact.

Suggestions to meet benchmarks

The collection and posting of wait time data in each jurisdiction for a specific list of services and procedures should be automated through the use of each facility's information system. This will require the creation of a common procedures list across the country for the selected procedures to allow system management and inter-jurisdictional comparisons against benchmarks. This information will also help to identify areas with surplus capacity (if any) to assist more constrained centres to achieve the wait-time benchmarks.

All facilities that receive 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.

Most provinces and health regions will find these benchmarks challenging without patient-focused programs at a local, as well regional and provincial level. They will require detailed planning and integration of providers at primary, secondary and tertiary/quarternary levels. Systems will have to explore innovative models of care and physician remuneration models that allow such integrated multidisciplinary triage and care to occur. Wait lists must be managed, and patients in the queue still need to be managed and monitored for any signs of deterioration.

Table 16: Wait-time benchmarks for outpatient cardiac rehabilitation

	Waiting time (event to program entry)			
Diagnostic Category	**Ideal***	**Preferable†**	**Benchmark‡**	**Notes**
CABG/Valvular disease	21 days	21–30 days	30 days	(1)
PTCA	2 days	2–7 days	7–30 days	(2)
MI/CHF/Stable and unstable angina	7 days	7–30 days	30 days	(3)
Heart transplantation	4 days	4–10 days	10–30 days	(4)
Arrhythmias	1–7 days	7–30 days	30 days	(5)

* There would be no adverse effects of waiting, and optimal benefit of CR intervention should be possible.

† It is not anticipated that there would be significant adverse events, and most, if not all, of the benefits can be achieved.

‡ This time frame recognizes the reality of the present waiting lists. Given that patients do show improvement and that any increase in the referral pool could delay even these times, it is felt that these times are acceptable.

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Appendix A: CCS Access to Care Working Group Members

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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

Appendix B: Subgroup Members

Access to Care in Emergent and Urgent Situations
Blair O'Neill, MD (chair), Halifax, Nova Scotia
Eric Cohen, MD, Toronto, Ontario
Stephen Fremes, MD, Toronto, Ontario
Michelle Graham, MD, Edmonton, Alberta
Greg Hirsh, MD, Halifax, Nova Scotia
Merril Knudtson, MD, Calgary, Alberta
David Ross, MD, Edmonton, Alberta

Access to Specialist Consultation and Non-invasive Testing
Merril Knudtson, MD (co-chair), Calgary, Alberta
John Rottger, MD (co-chair), Pincer Creek, Alberta
Jay Brophy, MD, Montreal, Quebec
Lyall Higginson, MD, Ottawa, Ontario
Bruce Josephson, MD, Halifax, Nova Scotia
Brad Munt, MD, Vancouver, British Columbia

Access to Nuclear Cardiology
Rob Beanlands, MD (chair), Ottawa, Ontario
Michael Freeman, MD, Toronto, Ontario
Karen Gulenchyn; MD, Hamilton, Ontario
Marla Kiess, MD, Vancouver, British Columbia

Access to Revascularization Procedures
David Ross, MD (co-chair), Edmonton, Alberta
Michelle Graham, MD (co-chair), Edmonton, Alberta
Eric Cohen, MD, Toronto, Ontario
Stephen Fremes, MD, Toronto, Ontario

Merril Knudtson, MD, Calgary, Alberta
Blair O'Neill, MD, Halifax, Nova Scotia
Jack Tu, MD, PhD Toronto, Ontario

Access to Electrophysiology Services

Chris Simpson, MD, (chair) Kingston, Ontario
Paul Dorian, MD, Toronto, Ontario
Martin Green. MD, Ottawa, Ontario
Jeff Healey, MD, Hamilton, Ontario
Brent Mitchell, MD, Calgary, Alberta
Francois Phillippon, MD, Ste. Foy, Quebec
John Sapp, MD, Halifax, Nova Scotia
Larry Sterns, MD, Edmonton, Alberta
Raymond Yee, MD, London, Ontario

Access to Heart Failure Clinics

Heather Ross, MD (chair), Toronto, Ontario
Malcolm Arnold, MD, London, Ontario
Israel Belenkie, MD, Calgary, Alberta
Catherine Demers, MD, Hamilton, Ontario
Paul Dorian, Toronto, Ontario
Nadia Gianetti, MD, Montreal, Quebec
Haissam Haddad, MD, Ottawa, Ontario
Jonathan Howlett MD, Halifax, Nova Scotia
Andrew Ignaszewski, MD, Vancouver, British Columbia
Philip Jong, MD, Toronto, Ontario
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Jean Rouleau, MD, Montreal, Quebec
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Access to Cardiac Rehabilitation

Bill Dafoe, MD (chair), Edmonton, Alberta
Heather Arthur, Ph.D., Hamilton, Ontario
Louise Beaton, Ottawa, Ontario
Louise Morrin, Ste. Foy, Quebec
Helen Stokes, Ph.D., Edmonton, Alberta

Appendix C: Secondary Review Participating Organizations

Access to Care in Emergent and Urgent Situations

Canadian Association of Interventional Cardiologists (CAIC)
Canadian Society for Cardiac Surgeons (CSCS)

Access to Specialist Consultation and Non-invasive Testing

Canadian Cardiovascular Society (CCS) invited 20 community cardiologist members to review the report

Access to Revascularization Procedures

Canadian Cardiovascular Society (CCS) invited 20 community cardiologist members to review the report

Access to Nuclear Cardiology

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 Heart Failure Clinics

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

Access to Electrophysiology Services
Canadian Heart Rhythm Society

Access to cardiac Rehabilitation

Canadian Association of Cardiac Rehabilitation

List of abbreviations

ACC	American College of Cardiology
ACS	Acute coronary syndrome
AF	Atrial fibrillation
AHA	American Heart Association
AMI	Acute myocardial infarction
CABG	Coronary artery bypass graft surgery
CAD	Coronary artery disease
CANM	Canadian Association of Nuclear Medicine
CCS	Canadian Cardiovascular Society
CHF	Chronic heart failure
CMA	Canadian Medical Association
CNS	Clinical nurse specialist
CR	Cardiac rehabilitation
CRT	Cardiac resynchronization therapy
DMP	Disease management program
ECG	Electrocardiogram
EP	Electrophysiology or Electrophysiologist
ER	Emergency Room
FDG	Fluorodeoxyglycose
GP	General practitioner
HF	Heart failure
HFS	Heart failure specialist
ICD	Implantable cardioverter defibrillator
LV	Left ventricle
MD	Medical doctor, physician
MI	Myocardial infarction
MPI	Myocardial perfusion imaging
NP	Nurse practitioner
NSTEACS	Non-ST segment elevation acute coronary syndrome
PCI	Percutaneous coronary intervention
PET	Positron emission tomography
SPECT	Single photon emission computed tomography
STEMI	ST segment elevation myocardial infarction
TTVP	Temporary trans-venous pacing
VF	Ventricular fibrillation
VT	Ventricular tachycardia