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 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 around 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

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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*The views expressed herein do not necessarily reflect official positions of the indicated affiliate organizations

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TABLE 1
Canadian Cardiovascular Society Access to Care Working Group definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Wait time</td>
<td>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.</td>
</tr>
<tr>
<td>Wait time indicator</td>
<td>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.</td>
</tr>
<tr>
<td>Medically acceptable wait time standard</td>
<td>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.</td>
</tr>
<tr>
<td>Wait time target</td>
<td>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.</td>
</tr>
<tr>
<td>Urgency</td>
<td>The extent to which immediate clinical action is required based on the severity of the patient's condition and considerations of expected benefit.</td>
</tr>
<tr>
<td>Urgency rating score</td>
<td>A score based on the clinical description of an individual patient's condition to determine the urgency for care.</td>
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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 their 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, more of them 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).

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.
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 (ACS) 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 less 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 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.

### Table 2

<table>
<thead>
<tr>
<th>Study</th>
<th>Setting</th>
<th>ISAR-COOL (n=410)</th>
<th>VINO (n=131)</th>
<th>FRISC II (n=2457)</th>
<th>TACTICS-TIMI 18 (n=2220)</th>
<th>RITA-3 (n=1810)</th>
</tr>
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<tr>
<td></td>
<td></td>
<td>One-year event rate (%)</td>
<td>Median time to cath</td>
<td>% angio ≤ target</td>
<td>Time to PCI</td>
<td>% PCI ≤ target</td>
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<tr>
<td></td>
<td></td>
<td>5.9*</td>
<td>2.4 h</td>
<td>88</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11.6*</td>
<td>86 h</td>
<td>0</td>
<td>NS</td>
<td>Not stated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.3†</td>
<td>6.2 h</td>
<td>8.6 h</td>
<td>NS</td>
<td>NS</td>
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<tr>
<td></td>
<td></td>
<td>22.4‡</td>
<td>61 d</td>
<td>55 d</td>
<td>NS</td>
<td>NS</td>
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<td></td>
<td></td>
<td>9.4§</td>
<td>4 d (2–6)</td>
<td>4 d (2–7)</td>
<td>NS</td>
<td>NS</td>
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<td></td>
<td></td>
<td>12.1¶</td>
<td>17 d (6–132)</td>
<td>17 d (5–132)</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.3§</td>
<td>96 h</td>
<td>94 h</td>
<td>NS</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.5§</td>
<td>10 h</td>
<td>94 h</td>
<td>NS</td>
<td>NS</td>
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<td></td>
<td></td>
<td>7.6§</td>
<td>97 h</td>
<td>94 h</td>
<td>NS</td>
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<td></td>
<td></td>
<td>8.3§</td>
<td>97 h</td>
<td>94 h</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>

**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
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 Interventional 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 TIMI risk score. ACS Acute coronary syndromes; CONS Conservative; D Death; INV Invasive; MI Myocardial infarction; NSTEMI Non-ST elevation myocardial infarction; UA Unstable angina

![Figure 2](http://example.com/fig2.png)

**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 syndromes; CONS Conservative; D Death; INV Invasive; MI Myocardial infarction; NSTEMI Non-ST elevation myocardial infarction; UA Unstable angina

Outcome (36). Table 3 provides an easily applied and understood 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 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 NSTEMI 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 dementia 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 NSTEMI.

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 elevation MI with a
TABLE 5
Canadian Cardiovascular Society Access to Care Working Group’s triage categories and suggested targets for completing revascularization

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

*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 ventricular; METs Metabolic equivalents; MI Myocardial infarction; NSTEMI Non-ST-segment elevation myocardial infarction; PCI Percutaneous coronary intervention; TIMI Thrombolysis in Myocardial Infarction)

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 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.

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