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# CARDIAC REHABILITATION


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Research Director, CV Rehab, UHN



# AMI Bundle

**Is Diagnosis Non Cardiac?**  Yes **IF YES Do Not Complete Remainder of Form**

PHYSICIAN RX AT DISCHARGE FROM CCU/SDU/ICU/OTHER CARE AREA	
<b>ASA</b>	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy <input type="checkbox"/> Active bleeding <input type="checkbox"/> Warfarin <input type="checkbox"/> Other
<b>Beta Blocker</b>	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy <input type="checkbox"/> Bradycardia <input type="checkbox"/> LV failure <input type="checkbox"/> SBP < 90 mm Hg <input type="checkbox"/> PR-interval > 0.24 sec. <input type="checkbox"/> Active asthma/reactive airways disease <input type="checkbox"/> Other
<b>ACE Inhibitor/ARB</b> Echo done <input type="checkbox"/> Yes <input type="checkbox"/> No LVEF $\leq$ 40% <input type="checkbox"/> Yes <input type="checkbox"/> No	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy or intolerance <input type="checkbox"/> Mod. Or severe AS <input type="checkbox"/> Creatinine >200 $\mu$ mol/L <input type="checkbox"/> Not Indicated <input type="checkbox"/> SBP <100 mmHg <input type="checkbox"/> Bilateral renal artery stenosis <input type="checkbox"/> K <sup>+</sup> >4.5 mmol/L <input type="checkbox"/> Other
<b>Lipid Lowering Medication</b>	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> At Target Level <input type="checkbox"/> Intolerance <input type="checkbox"/> CK > 10 x upper limit <input type="checkbox"/> ALT/AST > 3 x upper limit <input type="checkbox"/> Other
<b>Clopidogrel</b>	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Allergy or intolerance <input type="checkbox"/> Not indicated <input type="checkbox"/> Other
<b>Nitroglycerine PRN</b>	Ordered on D/C: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not?
<b>Nicotine Replacement Therapy</b> Given as inpatient <input type="checkbox"/> Yes <input type="checkbox"/> No	Ordered on D/C: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not? <input type="checkbox"/> Non-smoker <input type="checkbox"/> Allergy or intolerance <input type="checkbox"/> Refused <input type="checkbox"/> Other cessation medication given Smoking Cessation Counseling given <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Cardiac Rehab</b>	Ordered: <input type="checkbox"/> Yes <input type="checkbox"/> No If not, why not?
<b>Diagnosis</b>	<input type="checkbox"/> STEMI <input type="checkbox"/> NSTEMI <input type="checkbox"/> Angina <input type="checkbox"/> CABG <input type="checkbox"/> Other



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## Cardiac Rehabilitation

Outpatient CR has the following major components:

1. Medical assessment
    - exercise testing
  2. Exercise training
    - Supervised on site, community, or home-based
  3. Education and counseling
  4. Risk factor modification
- Varies by program and patient needs
  - Average duration: 4-6 months

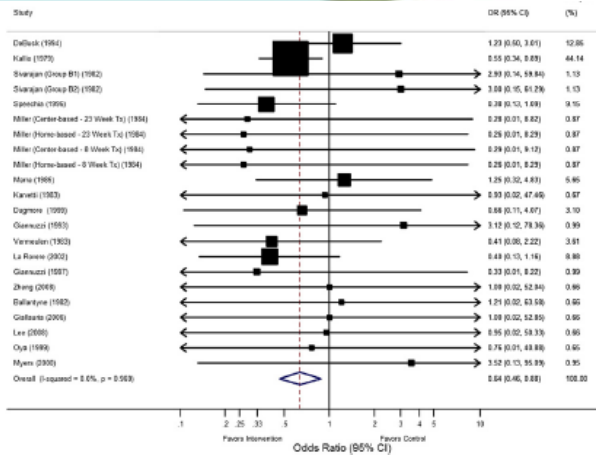
Stone et al., 2001; Thompson, 2002;



## Chronic Disease Mgmt



## 2011 Meta-Analysis in MI Pts – 36% lower cardiac death



Forest plot of effect of exercise-based CR on cardiac mortality. Data were pooled using random effects models. Exercise-based CR significantly reduces cardiac mortality among MI survivors.

Lawler et al., AHJ 2011 Oct



**ACC/AHA 2007 Guidelines for the Management of Patients With Unstable Angina/Non ST-Elevation Myocardial Infarction: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non ST-Elevation Myocardial Infarction) Developed in Collaboration with the American College of Emergency Physicians, the Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons Endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine**

Jeffrey L. Anderson, Cynthia D. Adams, Elliott M. Antman, Charles R. Bridges, Robert M. Califf, Donald E. Casey, Jr, William E. Chavey, II, Francis M. Fesmire, Judith S. Hochman, Thomas N. Levin, A. Michael Lincoff, Eric D. Peterson, Pierre Theroux, Nanette Kass Wenger, R. Scott Wright, Sidney C. Smith, Jr, Alice K. Jacobs, Cynthia D. Adams, Jeffrey L. Anderson, Elliott M. Antman, Jonathan L. Halperin, Sharon A. Hunt, Harlan M. Krumholz, Frederick G. Kushner, Bruce W. Lytle, Rick Nishimura, Joseph P. Ornato, Richard L. Page, and Barbara Ricgel  
*J. Am. Coll. Cardiol.* 2007;50:e1-e157; originally published online Aug 6, 2007; doi:10.1016/j.jacc.2007.02.013

should consider instituting processes that encourage referral of appropriate patients to cardiac rehabilitation/secondary prevention programs (for example, the use of standardized order sets that facilitate this, such as the AHA "Get with the Guidelines" tools). In addition, it is important that referring health care practitioners and cardiac rehabilitation teams communicate in ways that promote patient participation. Of

JACC 50(7): e100



**TABLE 2** Reasons for Non-participation\*

	Pre-intervention	Post-intervention
	(n = 69)	(n = 34)
Not referred	54 (78%)	0
Transportation	9 (13%)	4 (12%)
Financial	3 (4%)	4 (12%)
Not feeling well	7 (10%)	7 (21%)
Too busy	2 (3%)	3 (9%)
Safety	– (0)	– (0)
Not interested	8 (12%)	26 (76%)
Exercising on own	6 (9%)	6 (18%)

\*Patients could cite more than one reason. As there were no differences across age groups, overall data are displayed.

Pasquali, S. K. et al. (2001). *Am J Cardio*, 88(12), 1415-1416.



Canadian Journal of Cardiology 27 (2011) 192-199

#### Society Position Statement

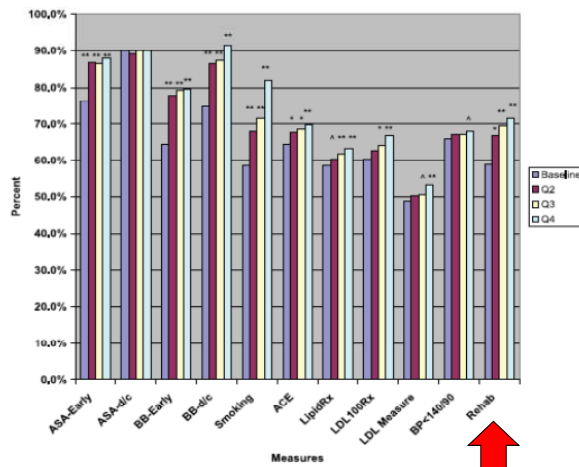
### Systematizing Inpatient Referral to Cardiac Rehabilitation 2010: Canadian Association of Cardiac Rehabilitation and Canadian Cardiovascular Society Joint Position Paper

Sherry L. Grace, PhD (Chair),<sup>a</sup> Caroline Chessex, MD, FRCPC (Co-Chair),<sup>b</sup>  
 Heather Arthur, PhD,<sup>c</sup> Sammy Chan, MD,<sup>d</sup> Cleo Cyr, RN, BN, MHS,<sup>e</sup> William Dafoe, MD,<sup>f</sup>  
 Martin Juneau, MD,<sup>g</sup> Paul Oh, MD,<sup>h</sup> and Neville Suskin, MBChB<sup>i</sup>

- Systematic Inpatient Referral:
  - All indicated patients are identified
  - Less wait time to commence CR




## Impact of AHA Get With The Guidelines-CAD Program on Quality of Care



- N=45,988 pts from 92 US hospitals
- Significant increase (12.7%) in referral to CR following GWG pathway implementation ( $p < 0.0001$ )

LaBresh, K. A., Fonarow, G. C., Smith, S. C., Jr, Bonow, R. O., Smaha, L. C., Tyler, P. A., et al. (2007). Improved treatment of hospitalized coronary artery disease patients with the get with the guidelines program. *Critical Pathways in Cardiology*, 6(3), 98-105.





**ORIGINAL INVESTIGATION**

### Effect of Cardiac Rehabilitation Referral Strategies on Utilization Rates

*A Prospective, Controlled Study*

Sherry L. Grace, PhD; Kelly L. Russell, MSc; Robert D. Reid, PhD, MBA; Paul Oh, MD, FRCPC; Sonia Anand, MD, PhD, FRCPC; James Rush, PhD; Karen Williamson, PhD; Milan Gupta, MD; David A. Alter, MD, PhD, FRCPC; Donna E. Stewart, MD, FRCPC; for the Cardiac Rehabilitation Care Continuity Through Automatic Referral Evaluation (CARE) Investigators

**Table 3. Cardiac Rehabilitation (CR) Referral, Enrollment, and Participation Rates by Referral Strategy**

Referral Strategy	Patients, No. (%)			Prescribed CR Sessions Attended of Those Referred, Mean (SD), %
	Referred	Enrolled	No. Enrolled of Those Referred	
Usual (2 wards)	94 (32.2)	83 (29.1)	71 (78.0)	83.4 (28.1)
Liaison only (6 wards)	284 (59.0)	239 (50.9)	228 (83.2)	83.2 (27.2)
Automatic only (3 wards)	382 (70.1)	321 (60.7)	310 (84.2)	83.6 (27.0)
Combined automatic and liaison (5 wards)	396 (85.3)	335 (74.0)	329 (85.7)	81.9 (27.2)
<b>Total</b>	<b>1156 (64.9)<sup>a</sup></b>	<b>978 (56.3)<sup>a</sup></b>	<b>938 (84.0)</b>	<b>82.9 (27.2)</b>

<sup>a</sup>  $P < .001$ .

*Arch Intern Med.* 2011;171(3):235-241

## AHA/ACC/AACVPR Canadian Cardiovascular Society

# Performance Measures

**Referral Order to an Early Outpatient Cardiac Rehabilitation/Secondary Prevention Program:**  
(Order applies to patients [18 years of age and older] with cardiovascular disease)

**ALERT:** This order set does not apply to patients who are deemed ineligible for cardiac rehabilitation/secondary prevention programs, including those in long-term nursing home placement for more than 60 days, homebound patients, or patients with severe dementia.

**Intervention requested:**  Order early outpatient cardiac rehabilitation referral (Phase II).

**Primary Diagnosis During this Hospitalization: (Select All That Apply)**

<input type="checkbox"/> Angina	<input type="checkbox"/> Coronary Artery Disease (CAD)
<input type="checkbox"/> Percutaneous Coronary Intervention (PCI)	<input type="checkbox"/> Heart Transplant
<input type="checkbox"/> Myocardial Infarction (MI)	<input type="checkbox"/> Valve
<input type="checkbox"/> Coronary Artery Bypass Graft (CABG) Surgery	<input type="checkbox"/> Other: _____

Prescriber's Signature: \_\_\_\_\_ Prescriber's Pager#: \_\_\_\_\_  
 Prescriber's Printed Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**Referral Process:**

1. Patient's primary cardiovascular provider, or designate, to carry out.
2. Impress upon the patient the importance of early outpatient cardiac rehabilitation (see script).
3. Arrange for inpatient cardiac rehabilitation contact prior to dismissal.
4. CR contact to:
  - a. Discuss with patient the choices of cardiac rehabilitation programs in his/her home area and have patient select a program.
  - b. Provide patient with information about the selected cardiac rehabilitation program
  - c. With patient consent, call the receiving cardiac rehabilitation program, chosen by patient, requesting that the program contact the patient at home to arrange the first appointment.
  - d. Document the name of the cardiac rehabilitation program in the hospital discharge summary with copies of the appropriate enclosures.
  - e. With patient consent, send hospital discharge summary and other appropriate information to the CR program (could include surgical report, angiogram report, electrocardiogram, inpatient CR evaluation, etc.)

**Suggested Script for Description of Cardiac Rehabilitation Program:**  
 Cardiac rehabilitation is important for patients like you who are recovering from a heart problem. Health care professionals work in cardiac rehabilitation programs and assist you with getting the treatments you need to get stronger and healthier, like exercise, healthy eating habits, and medications. Cardiac rehabilitation has been shown to help people with heart problems live longer and have better life enjoyment than people who do not go to cardiac rehabilitation. Insurance companies generally cover cardiac rehabilitation, but if you are not sure about your insurance coverage, you should talk with your insurance company or with the cardiac rehabilitation program staff.

Figure 2. Example of a referral tool for an inpatient to an outpatient CR program. Tool to be considered for use with the Cardiac Rehabilitation/Secondary Prevention Performance Measurement Set A. Adapted with permission from Zarling et al.<sup>17</sup> CR, cardiac rehabilitation/secondary prevention program.

AACVPR/ACC/AHA 2007 performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services  
 Thomas RJ, King M, Lui K, Oldridge N, Piña IL, Spertus J, Bonow RO, Estes NA 3rd, Goff DC, Grady KL, Hinkler AR, Masud TF, Radford MJ, Rumsfeld JS, Whitman GR; AACVPR; ACC; AHA; American College of Chest Physicians; American College of Sports Medicine; American Physical Therapy Association; Canadian Association of Cardiac Rehabilitation; European Association for Cardiovascular Prevention and Rehabilitation; Inter-American Heart Foundation; National Association of Clinical Nurse Specialists; Preventive Cardiovascular Nurses Association; Society of Thoracic Surgeons.

# Randomized Trials

Table 1 Studies evaluating interventions to improve uptake.

Study	Study type, patients, country	Intervention	Intervention	Comparison	Significance
<b>Uptake</b>					
<i>Randomized controlled trials</i>					
Wyer <i>et al.</i> (2001b)	Randomized controlled trial, 87 MI patients, UK	Letters based on theory of planned behaviour (Ajzen & Madden 1986) designed to increase attendance at cardiac rehabilitation	86%	57%	p < 0.0025
Hillebrand <i>et al.</i> (1995)	Randomized controlled trial, 94 MI patients, Germany	Following inpatient cardiac rehabilitation patients had four telephone and at home conversations with social worker over 6 month period	57%	27%	p < 0.005
Jolly <i>et al.</i> (1999)	Cluster randomized controlled trial, 67 general practices, 597 MI and angina patients, UK	Liaison nurse encourages patients to see practice nurse after discharge and supports practice nurses. Patient held record card to prompt and guide follow-up	42%	24%	p < 0.001

Beswick *et al.*, J Adv Nursing, 2005; Davies *et al.*, Cochrane Review





# MEASUREMENT

13

## Numerator Definition:

- The number of eligible AMI patients who are referred to cardiac rehabilitation at the time of hospital discharge.



## Denominator Exclusions:

- Patients less than 18 years of age
- Patients transferred **out to** another acute care hospital and are not transferred back within 24hrs
- Patients who expired
- Patients who left against medical advice
- Patient refused referral
- Non-dysphoric psychiatric conditions
  - i.e. advanced stage dementia



## TOOLS





## Pt Flow to CR

- Develop awareness of, and relationships with, CR programs in your region
- Develop processes in your unit so that referral is seamless and systematic
  - Convey the message to all staff around you that CR is a key part of the continuum of care
- Endorse the benefits of CR to your patients



TO IDENTIFY A PROGRAM  
NEAR YOU:

[http://www.cacr.ca/information\\_for\\_public/program\\_directory.cfm](http://www.cacr.ca/information_for_public/program_directory.cfm)

# AMI Bundle

**In Diagnosis Non Cardiac?**  Yes **If YES Do Not Complete Remainder of Form**

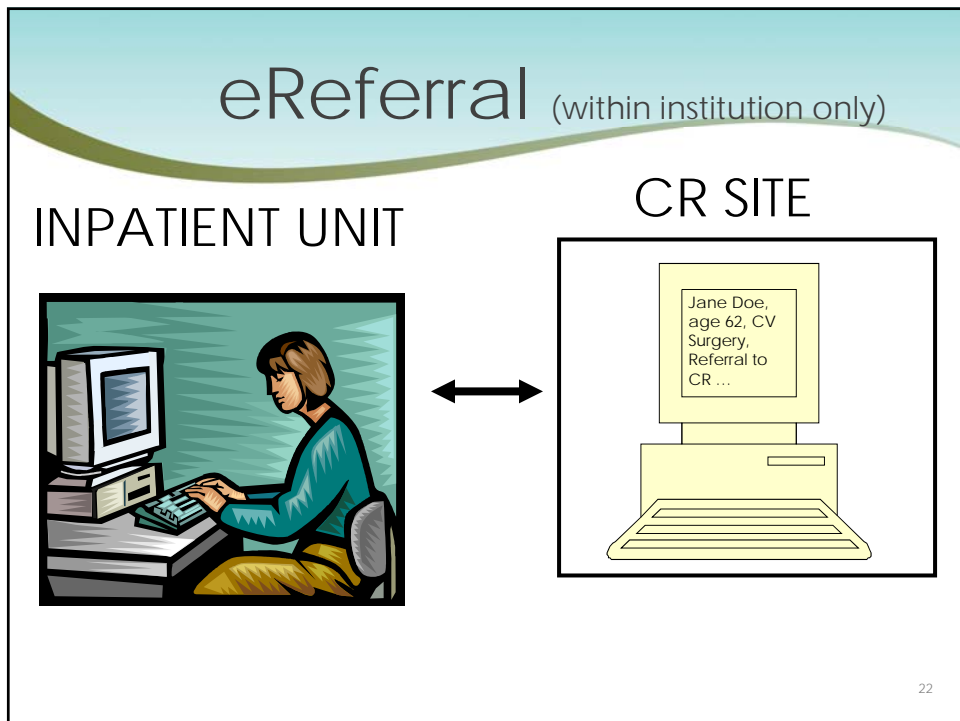
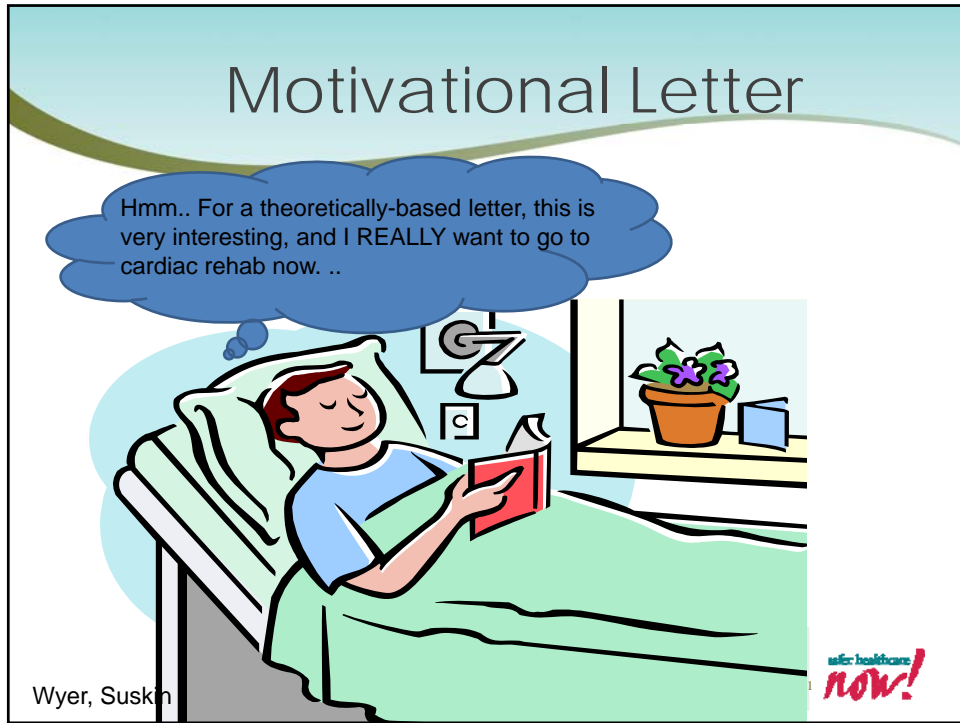
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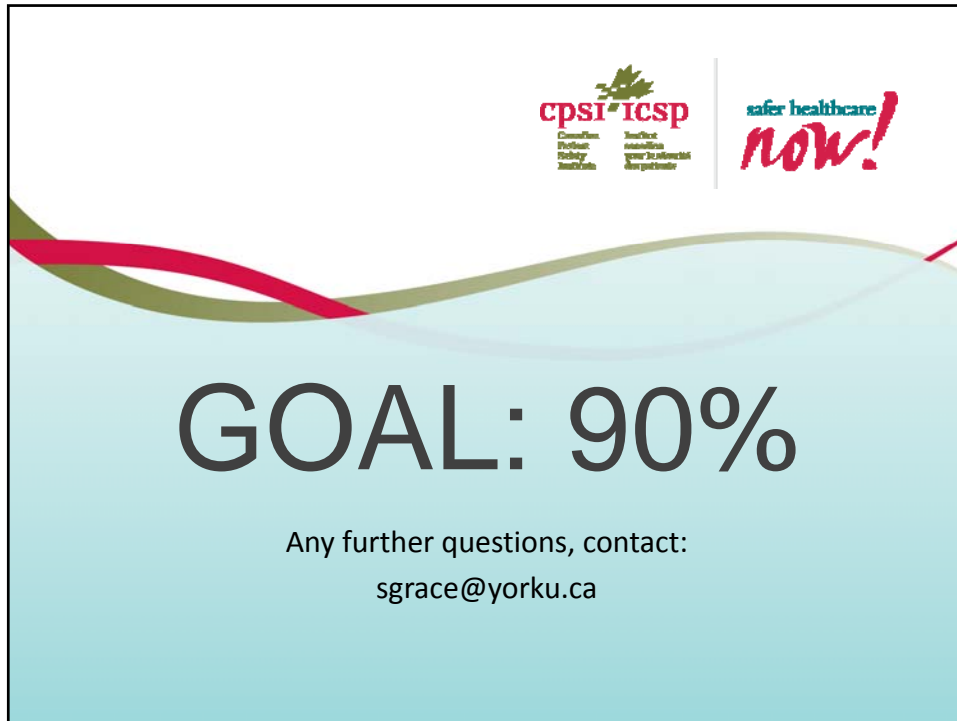
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## Liaison Referral Strategy: PT, NP, RN, Peer at Bedside





A graphic with a white top section and a light blue bottom section. A wavy line in shades of green and red separates the two sections. In the top right, there are two logos: 'cpsl icsp' with a leaf icon and 'safer healthcare now!' in red script. The text 'GOAL: 90%' is centered in the blue section, with contact information below it.

**cpsl icsp**  
Canadian Patient Safety Institute  
Canadian Patient Safety Institute

safer healthcare  
*now!*

# GOAL: 90%

Any further questions, contact:  
[sgrace@yorku.ca](mailto:sgrace@yorku.ca)