Canadian Cardiovascular Society
Leadership. Knowledge. Community.

Société canadienne de cardiologie
Communauté. Connaissances. Leadership.

THE CANADIAN CARDIOVASCULAR SOCIETY QUALITY INDICATORS E-CATALOGUE

QUALITY INDICATORS FOR HEART FAILURE

A CCS CONSENSUS DOCUMENT

V2

Version history:

- V1.1 September 4, 2013 (CCS_HF_QI_v1.1_E_DRAFT_forWeb_20130904)
- V2 January 6, 2015 (CCS_HF_QI_V2)

The Canadian Cardiovascular Society
222 Queen Street, Suite 1403
Ottawa, Ontario
Canada K1P 5V9
Email: healthpolicy@ccs.ca

BACKGROUND

The quality indicators outlined in this document have been selected through a national consensus process as the key quality indicators specific to Heart Failure (HF).

In addition, there is a complementary Heart Failure Data Dictionary Chapter comprising of HF related data elements and definitions. Visit ccs.ca for the latest data dictionary.

Contents

Quality Indicators

Daily Assessment Blood Chemistry: Electrolytes, BUN, Creatinine

The percentage of inpatients with a diagnosis of acute heart failure (HF) who receive electrolytes and renal function assessment as part of their daily assessment.

Numerator	Is a subset of the denominator: the number of patients in the denominator who are assessed for Sodium (Na), Potassium (K), BUN, and Creatinine daily.
Denominator	The number of patients with acute HF admitted to hospital receiving IV therapy for HF. Case selection window to be determined at time of analysis. **Exclusions**: • Patients who left before medical evaluation. • Patients with comfort care measures or declines blood work.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	EMR or Administrative databases, Hospitalization and Physician Billing databases for diagnoses (e.g. Discharge Abstract Database, Ambulatory Care Database, Physicians Claims Database), Provincial formularies for drug information (e.g. Blue Cross), paper charts or specific HF clinical databases.

Rationale

Evaluation of electrolytes and renal function are key components in the evaluation of acute HF and can influence its treatment. Renal failure is common in HF and is a known marker of prognosis. Various therapies (e.g. doses of IV diuretics, inotropes, and digitalis) will need to be adjusted according to the level of renal function. Hemodialysis or hemofiltration may be considered in cases of HF with concomitant severe renal failure. Severe hyperkalemia or hypokalemia may be associated with serious adverse consequences (arrhythmias) and therefore need to be treated rapidly. Hyponatremia identifies patients at higher risk.

Clinical Recommendation(s)

Daily assessment of renal function and electrolytes are essential to adjust doses of IV diuretics and K supplements if needed; or in view of hemodialysis in cases of severe renal failure; and to assess progress in patients receiving IV inotropes.

Method of Reporting

The reported statistic will be the proportion (n/d) or percent of qualifying HF patients receiving all 4 blood tests (Na, K, BUN, Creatinine), on daily basis, while receiving IV therapy. As an example, if 100 patients were admitted on IV Lasix and only 75 had all 4 blood tests measured each day while on IV Lasix then 75% would have been appropriately monitored.

Challenges to Implementation/Interpretation

None.

Chest X-Ray

The percentage of patients seen in the Emergency Department (ED) and/or admitted to hospital with acute heart failure (HF) who receive a chest X-Ray (CXR) as part of their initial evaluation.

Numerator	Is a subset of the denominator: the number of patients with CXR performed on the day of admission or the day following admission to hospital with acute HF.
Denominator	The number of patients seen in the ED and/or admitted to hospital with acute HF. Case selection window to be determined at time of analysis. **Exclusions**: • Patients who left before medical evaluation. • Patients who died before the test could be performed.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	EMR or Administrative databases, Hospitalization and Physician Billing databases for diagnoses (e.g. Discharge Abstract Database, Ambulatory Care Database, Physicians Claims Database), Provincial formularies for drug information (e.g. Blue Cross), paper charts or specific HF clinical databases.

Rationale

Evaluation of the CXR is a key component in the evaluation of acute HF and for the differential diagnosis of acute dyspnea. Some findings on the CXR may lead to modification of diagnosis and/or therapy (e.g. pericardial effusion, parenchymal infiltrates). Known markers of prognosis in HF can also be identified on the CXR (e.g. cardiomegaly).

Clinical Recommendation(s)

CCS HF Guidelines 2006 (Class IIb, Level of evidence C) and 2012 (Practical Tip) state that response to therapy should be reassessed < 2 hours after therapy initiation, and thus ideally, the CXR should be performed before this reassessment. According to these Guidelines, patient disposition should be decided < 8 hours after first medical contact. Such decisions should incorporate the initial CXR interpretation.

Method of Reporting

The reported statistic will be a proportion (n/d) or percent.

Challenges to Implementation/Interpretation

- Performing CXR and interpretation by a physician in a timely manner may be difficult in rural areas or during night shifts.

In-Hospital Use of Angiotensin Converting Enzyme Inhibitor (ACE-I) or Angiotensin Receptor Blocker (ARB)

The percentage of inpatients with a documented history of heart failure (HF) or newly diagnosed HF due to poor left ventricular (LV) systolic function who are prescribed an ACE-I or ARB during hospital stay and at hospital discharge, unless a contraindication or known drug intolerance exists.

Numerator	Is a subset of the demoninator: the number of patients in the denominator who are prescribed ACE-I or ARB during hospital stay and at hospital discharge.
Denominator	The number of patients admitted to hospital with a documented history of HF or newly diagnosed HF. **Inclusions**: • With a documented left ventricular ejection fraction (LVEF) < 40% • A qualitative assessment of "severe" or "moderately severe" LV systolic dysfunction • Discharged alive from hospital. • Prior testing is acceptable for documentation purposes. Case selection window to be determined at time of analysis. **Exclusions**: • Patients who left before medical evaluation. • Documented patient refusal to take these medications. • Documented serum creatinine > 220 umol/L or increase in serum Creatinine with initiation of ACE-I or ARB of over 50% of baseline. • Documented serum potassium > 5.5 mmol/L • Documented systolic BP < 90 mmHg, symptomatic hypotension or history of falls possibly related to hypotension. • Contraindication to ACE-I or ARB. • Known allergy or intolerance (for any reason) to ACE-I or ARB. • History of angioedema (may still consider introduction of ARB in monitored setting). • Known bilateral clinically important renal artery stenosis. • Severe aortic stenosis. • Pregnancy.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	EMR or Administrative databases, Hospitalization and Physician Billing databases for diagnoses (e.g. Discharge Abstract Database, Ambulatory Care Database, Physicians Claims Database), Provincial formularies for drug information (e.g. Blue Cross), paper charts or specific HF clinical databases.

Rationale

These medications are known to improve morbidity and mortality for eligible patients with HF and poor LV systolic function. While evidence for morbidity and mortality reduction is based upon long-term studies, more recent data show that a higher rate of usage at hospital separation is associated with greater long-term usage, and less morbidity in the intermediate term.

Clinical Recommendation(s)

- CCS HF Guidelines 2006, Class I, Level of evidence C.
- CCS HF Guidelines 2008, Class I, Level of evidence C.
- CCS HF Guidelines 2012, Strong Recommendation, High Quality of Evidence.

Method of Reporting

The reported statistic will be a proportion (n/d) or percent.

Challenges to Implementation/Interpretation

- In-hospital imaging for LVEF identification as well as documentation of intolerances will be the primary barrier.

Assessment of Left Ventricular Function

The percentage of patients with a documented history or a diagnosis of heart failure (HF) seen in the Emergency Department (ED) and/or admitted to hospital for HF who receive an assessment of LV function within 18 months BEFORE admission date or within 30 days from ED visit.

Numerator	Is a subset of the denominator: the number of patients in the denominator who receive an assessment of LV function by quantitative imaging modality (e.g. Echocardiogram or Cardiac MRI or MUGA) within 18 months from admission date or within 30 days from ED visit.
Denominator	The number of patients with a documented history or a diagnosis of HF seen in the ED and/or admitted to hospital. Case selection window to be determined at time of analysis. **Exclusions**: • Patients who left before medical evaluation. • Documented reason for no requirement for LV assessment (palliative care, hospice care, contraindication to appropriate test such as Echocardiogram or Cardiac MRI). • Known and documented LVEF assessment with a documented reason for not repeating the test.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	EMR or Administrative databases, Hospitalization and Physician Billing databases for diagnoses (e.g. Discharge Abstract Database, Ambulatory Care Database, Physicians Claims Database), Provincial formularies for drug information (e.g. Blue Cross), paper charts or specific HF clinical databases.

Rationale

Evaluation of LV function is fundamental for decisions on diagnosis, prognosis, therapy and referral. Assessment is widely available, low-risk and usually re-assessed over time for response to therapy, with a change in clinical status or before other modality of treatment.

Clinical Recommendation(s)

- CCS HF Guidelines 2006, Class I, Level of evidence C.
- CCS HF Guidelines 2012, Strong Recommendation, Moderate Quality of Evidence.

Method of Reporting

The reported statistic will be proportion (n/d) or percent.

Challenges to Implementation/Interpretation

- In-hospital imaging identification is likely easy, however, outpatient imaging either before or after hospitalization may be challenging in some jurisdictions.
- Tracking whether LV function was previously completed or post-discharge – would need to link various data sources.

Documentation of 30 Day Re-Admission Rate

The percentage of documented heart failure (HF) patients who are re-admitted within 30 days post-discharge.

Numerator	Is a subset of the denominator: the number of HF patients with an unplanned readmission for any causes within 30 days after initial discharge date.
Denominator	The number of patients with a primary diagnosis of HF discharged alive from hospital. Case selection window to be determined at time of analysis. **Exclusions**: • Those discharged to a nursing home or short-term rehabilitation facility or other chronic care facility. • Those who died outside of hospital within 30-days from initial discharge • Those who left against medical advice (self sign-out patients) • All patients readmitted for elective procedure.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	EMR or Administrative databases, Hospitalization and Physician Billing databases for diagnoses (e.g. Discharge Abstract Database, Ambulatory Care Database, Physicians Claims Database), Provincial formularies for drug information (e.g. Blue Cross), paper charts or specific HF clinical databases.

Rationale

The importance of close follow up and transition of care is to prevent early re-admission.

Clinical Recommendation(s)

CCS HF Guidelines 2010, Class I, Level of evidence A.

Method of Reporting

The reported statistic will be per patient as proportion (n/d) or percent.

Challenges to Implementation/Interpretation

- Tracking to make sure all the patients discharged from hospital are followed up.
- Requires linking the hospital records with those in the community.

Patient Education

The percentage of heart failure (HF) patients and family members who receive at least one session of education regarding HF management. (Education may have been conducted either in-hospital, in the clinic or via telehealth).

Numerator	Is a subset of the denominator: the number of patients in the denominator who have had at least one education session (in-hospital, in clinic or telehealth) on HF management within 4 weeks of discharge from hospital.
Denominator	The number of HF patients. Case selection window to be determined at time of analysis. **Exclusions**: • Palliative Care patients. • HF patients who may be expected to be cured (e.g. post ACS with revascularization).
Method of Calculation	Numerator / Denominator * 100
Sources of Data	EMR or Administrative databases, Hospitalization and Physician Billing databases for diagnoses (e.g. Discharge Abstract Database, Ambulatory Care Database, Physicians Claims Database), Provincial formularies for drug information (e.g. Blue Cross), paper charts or specific HF clinical databases.

Rationale

Patient education should be a key component of the activities of a HF disease management program.

Clinical Recommendation(s)

CCS HF Guidelines 2010, Practical Tip states teaching patients to control their sodium intake, weigh themselves and to recognize symptoms of worsening HF, as well as providing an algorithm to adjust a patient's diuretics are key strategies to clinical stability in patients with recurrent fluid retention.

1. Lee DS et al. Can J Cardiol 2003;19:357-64
2. Stromberg A. Eur Heart J 2005;7:363-9
3. CCS HF Guidelines 2010, Class I, Level of evidence A

Method of Reporting

The reported statistic will be per patient as proportion (n/d) or percent.

Challenges to Implementation/Interpretation

- Institutional resource. Also broad definition of education without respect to its effectiveness

Acknowledgements

The Canadian Cardiovascular Society acknowledges and sincerely thanks the following individuals in the development of this Quality Indicators Heart Failure Chapter:

Quality Indicators Heart Failure Chapter Working Group
Robert McKelvie (Chair), Population Health Research Institute/Hamilton Health Sciences (Ontario)
George Heckman (Vice-Chair), University of Waterloo (Ontario)
Claudia Blais, Institut national de santé publique du Québec (Québec)
Jafna Cox, Cardiovascular Health Nova Scotia and Chair, Quality Indicators Atrial Fibrillation Chapter Working Group
Justin Ezekowitz, University of Alberta
Vanita Gorzkiewicz/Yanyan Gong, Canadian Institute for Health Information
Karen Harkness, Cardiac Care Network of Ontario, McMaster University
Kori Kingsbury, Cardiac Care Network of Ontario
Gordon Moe, St. Michael's Hospital (Ontario)
Sulan Dai, Public Health Agency of Canada
David Johnstone, Mazankowski Alberta Heart Institute and Chair, Quality Indicators Steering Committee

Heart Failure Sub-theme group for Acute Heart Failure/Hospital Phase
Justin Ezekowitz (Lead), University of Alberta
Jonathan G Howlett, Libin Cardiovascular Institute of Alberta
Simon Kouz, Centre Hospitalier Régional de Lanaudière (Québec)
Eileen O'Meara, Institut de Cardiologie de Montréal (Québec)

Heart Failure Sub-theme group for Discharge/Transition Phase
Robert McKelvie (Lead), Population Health Research Institute/Hamilton Health Sciences (Ontario)
Nadia Giannetti, McGill University (Québec)
Adam Grzeslo, McMaster University (Ontario)
Shelley Zieroth, St. Boniface General Hospital (Manitoba)

Heart Failure Sub-theme group for Outpatient Phase
Gordon Moe (Lead), St. Michael's Hospital (Ontario)
Anique Ducharme, Institut de Cardiologie de Montréal (Québec)
Kori Leblanc, University of Toronto (Ontario)
Elizabeth Mann, Dalhousie University (Nova Scotia)

Heart Failure Sub-theme group for Palliative Care/End-of-Life Planning Phase
George Heckman (Lead), University of Waterloo (Ontario)
Karen Harkness, McMaster University (Ontario)
Miroslav Rajda, QE II Health Sciences Centre (Nova Scotia)
Jessica Simon, University of Calgary (Alberta)

Quality Indicators Steering Committee
Paul Dorian (Chair), University of Toronto (Ontario)
Jafna Cox, Cardiovascular Health Nova Scotia
Virginia Flintoft, Canadian Patient Safety Institute
Karin Humphries, University of British Columbia and Chair, Data Definitions Steering Committee
Kori Kingsbury, Cardiac Care Network of Ontario
Andrew Kmetic, Cardiac Services BC
Merril Knudtson, Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease
Anne McFarlane, Canadian Institute for Health Information
François Philippon, Réseau québécois de cardiologie tertiaire (Québec)
Jack Tu, Canadian Cardiovascular Outcomes Research Team
Sulan Dai, Public Health Agency of Canada
Mario Talajic (ex-officio), Montreal Heart Institute and President, Canadian Cardiovascular Society
Heather Ross (ex-officio), University Health Network and Vice-President, Canadian Cardiovascular Society
Blair O'Neill (ex-officio), Alberta Health Services and Past President, Canadian Cardiovascular Society

Project Support
Anne Ferguson, Chief Executive Officer, Canadian Cardiovascular Society
Nick Neuheimer, Project Director and Director, Health Policy, Advocacy and External Relations, Canadian Cardiovascular Society
Philip Astles, Project Manager (external)

Production of these materials has been made possible by the Canadian Cardiovascular Society through a financial contribution from the Public Health Agency of Canada.

Disclaimer

The views expressed herein do not necessarily represent the views of the Public Health Agency of Canada.