The Canadian Cardiovascular Society Quality Indicators E-Catalogue for Heart Failure

A CCS CONSENSUS DOCUMENT

DRAFT

Last Updated: December 2019

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ACUTE HEART FAILURE (HF) /HOSPITAL PHASE

INITIAL EVALUATION BLOOD CHEMISTRY: ELECTROLYTES, BUN, CREATININE

Patients presenting with a working diagnosis of HF seen in the emergency department (ED) and/or admitted to hospital should have electrolytes and renal function assessment as part of their initial evaluation.

Numerator	All patients with acute HF seen in the ED or admitted to hospital with Sodium (Na), Potassium (K), blood urea nitrogen (BUN), and Creatinine measured <2 hours from the time of admission to hospital or triage in ED.
Denominator	All patients with acute HF seen in the ED or admitted to hospital. **Exclusions**: • Patients who left before medical evaluation. • Patients who died before the test could be performed.
Period of Assessment	ED or hospital first 24 hours
Sources of Data	EMR, paper chart, electronic reporting system.

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 I.V. 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)

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; thus Na, K, BUN, and Creatinine should be available before this reassessment. According to the Guidelines, patient disposition should be decided < 8 hours after first medical contact. Such decisions should incorporate the level of renal dysfunction. 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

Per patient as proportion (n/d) or percent of patients receiving all of the 4 blood tests (Na, K, BUN, Creatinine) within 2 hours from the time of admission to hospital or triage in ED. For example, if there are 100 patients admitted and 75 have all 4 blood tests completed within 2 hours of the time of admission, then 75% of the patients have received appropriate monitoring.

Challenges to Implementation

None.

DAILY ASSESSMENT BLOOD CHEMISTRY: ELECTROLYTES, BUN, CREATININE

Patients presenting with a working diagnosis of HF seen in the ED and/or admitted to hospital should have electrolytes and renal function assessment as part of their daily assessment.

Numerator	All patients with acute HF admitted to hospital receiving IV therapy for HF with Na, K, BUN, and Creatinine measured daily.
Denominator	All patients with acute HF admitted to hospital receiving IV therapy for HF. **Exclusions**: • Patients who left before medical evaluation. • Patients with comfort care measures or declines blood work.
Period of Assessment	Daily while patients receive IV therapy for acute HF (day 1 is day of presentation/admission)
Sources of Data	EMR, paper chart, electronic reporting system.

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

Per patient as proportion (n/d) or percent receiving each of 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 each of 4 blood tests measured each day while on IV Lasix then 75% would have been appropriately monitored.

Challenges to Implementation

None.

CHEST X-RAY

Patients presenting with a working diagnosis of HF seen in the ED and/or admitted to hospital should have a chest X-Ray (CXR) as part of their initial evaluation.

Numerator	All patients with acute HF seen in the ED or hospital with CXR performed within 8 hours from presentation to first medical contact (ED or hospital).
Denominator	All patients with acute HF. **Exclusions**: • Patients who left before medical evaluation. • Documented reason a CXR not required • Patients who died before the test could be performed.
Period of Assessment	Within 8 hours of presentation in ED or hospital.
Sources of Data	EMR, paper chart, electronic reporting system.

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

Per patient as proportion (n/d) or percent performed within 8 hours from presentation to first medical contact (ED or hospital).

Challenges to Implementation

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

ELECTROCARDIOGRAM

Patients presenting with a working diagnosis of HF seen in the ED and/or admitted to hospital should have an electrocardiogram (ECG) as part of their initial evaluation.

Numerator	All patients with acute HF seen in the ED or hospital with ECG performed within 2 hours from the time of admission to hospital or triage in ED.
Denominator	All patients with acute HF seen in the ED or admitted to hospital. **Exclusions**: • Patients who left before medical evaluation. • Patients who died before the test could be performed.
Period of Assessment	Within 2 hours of triage in ED or admission to hospital.
Sources of Data	EMR, paper chart, electronic reporting system.

Rationale

Evaluation of ECG is fundamental to identify causes of acute dyspnea and/or causes of HF decompensation, some of which require immediate actions: acute coronary syndrome, atrioventricular blocks, microvoltages (e.g. tamponade), pacemaker dysfunction, supraventricular and ventricular arrhythmias. The ECG results can thus impact on diagnosis, prognosis, therapy and referral. Assessment is widely available, low-cost and usually re-assessed over time for response to therapy in cases of coronary syndromes and arrhythmias.

Clinical Recommendation(s)

CCS HF Guidelines 2006 (Class IIa, Level of evidence C) and 2012 (Practical Tip), states that acute HF should be diagnosed within 2 hours from the time of admission to hospital or triage in ED.

Method of Reporting

Per patient as proportion (n/d) or percent within 2 hours from the time of admission to hospital or triage in ED.

Challenges to Implementation

- Interpretation of the ECG by a physician in rural areas or during night shifts might take longer.

SPECIALIST INVOLVEMENT IN PATIENTS WITH ACUTE HF

Patients admitted to hospital with a primary diagnosis of HF will benefit from support by a specialist with expertise in the management of HF.

Numerator	All patients admitted to hospital with a primary (most responsible) diagnosis of HF seen in consultation or under the direct care of a specialist in the management of HF or reviewed within 4 weeks of discharge by a specialist in the management of HF. A specialist is defined as an internist or cardiologist. Consultation is defined as in-person or by telephone.
Denominator	All patients admitted to hospital with a primary diagnosis of HF. **Exclusions**: • Patients who left before medical evaluation. • Patients who decline specialist care, or recommended investigations. • Patients under the care of an existing disease management program, including renal replacement therapy, Cardiac Rehabilitation Services. • Patients who are institutionalized, or who have poor life expectancy or function due to non-cardiac illness. • Documented plan for specialist visit within 4 weeks of discharge.
Period of Assessment	Hospitalization and within 4 weeks following discharge.
Sources of Data	EMR, paper chart, Provincial Hospital discharge or Professional Billing databases.

Rationale

Outcomes of HF patients with both primary and specialist visits are superior compared to those of patients who do not have specialist visits.

Clinical Recommendation(s)

- CCS HF Guidelines 2006 and 2007, Class I, Level of evidence C.
- 2007 CCS White paper on access to care for patients with HF.

Method of Reporting

Per patient as proportion (n/d) or percent of patients receiving specialist consultation.

Challenges to Implementation

- Challenges in rural area s, variable billing sources, potential to miss private services billings.
- Variable data sources for physician's visit data between provinces.

EARLY OUTPATIENT ASSESSMENT FOR HF PATIENTS DISCHARGED FROM HOSPITAL

Patients with HF discharged from hospital should see a health care professional within 2 weeks of hospital discharge.

Numerator	All patients with a diagnosis of HF who are discharged alive from hospital and with an outpatient assessment by a health care professional within 2 weeks of separation. Health care professional can be a physician, registered nurse, nurse practitioner, pharmacist (other than simple prescription filling), and telemedicine. Outpatient assessment can include telephone, videoconference/telemedicine visit, or in-person visit.
Denominator	All patients with a diagnosis of HF who are discharged alive from hospital. **Exclusions**: • Patients who decline specialist care, or recommended investigations. • Patients under the care of an existing disease management program, including renal replacement therapy, Cardiac Rehabilitation Services. • Patients who are institutionalized, or who have poor life expectancy or function due to non-cardiac illness.
Period of Assessment	Hospitalization and within 2 weeks following discharge.
Sources of Data	EMR, paper chart, Provincial Hospital discharge or professional billing databases.

Rationale

Patients with HF discharged from hospital will experience lower 30-day readmission if they are seen by a health care professional within two weeks.

Clinical Recommendation(s)

- CCS HF Guidelines 2012, Class II, Level of evidence C.
- 2007 CCS White paper on access to care for patients with HF.

Method of Reporting

Per patient as proportion (n/d) or percent of patients discharged with an outpatient assessment by a health care professional within 2 weeks compared to all patients discharged alive from hospital.

Challenges to Implementation

- Challenges in rural areas, variable billing sources, and potential to miss private services billings.
- Variable data sources for physician's visit data between provinces.
- Tracking the outpatient assessment and linking it to the discharge from the hospital

IN-HOSPITAL USE OF ANGIOTENSIN CONVERTING ENZYME INHIBITOR (ACE-I) OR ANGIOTENSIN RECEPTOR BLOCKER (ARB) OR ANGIOTENSIN RECEPTOR-NEPRILYSIN INHIBITOR (ARNI)

Patients with a documented history or new diagnosis of HF due to poor LV systolic function who are admitted to hospital should be prescribed an ACE-I or ARB or ARNI prior to hospital discharge, unless a contraindication or known drug intolerance exists.

Numerator	All patients admitted to hospital with HF who have a LVEF < 40% or a qualitative assessment of moderate or severe LV systolic dysfunction who are prescribed ACE-I or ARB or ARNI at hospital discharge. Prior testing is acceptable for EF documentation purposes.
Denominator	All patients admitted to hospital with HF who have a documented LVEF < 40% or a qualitative assessment of moderate or severe LV systolic dysfunction discharged alive from hospital. Prior testing is acceptable for documentation purposes. **Exclusions**: • Patients who left before medical evaluation. • Documented patient refusal to take these medications. • Documented eGFR < 30 ml/min/1.73 m^2 or >35% decline in eGFR over baseline with initiation of ACE-I or ARB or ARNI • Documented serum potassium > 5.5 mmol/L • Documented systolic BP < 95 mmHg, symptomatic hypotension or history of falls possibly related to hypotension. • Known allergy or intolerance (for any reason) to ACE-I or ARB or ARNI • History of angioedema (may still consider introduction of ARB in monitored setting). • Known bilateral clinically important renal artery stenosis. • Severe aortic stenosis • Pregnancy • Patients who are undergoing comfort measures only
Period of Assessment	At hospital discharge.
Sources of Data	EMR, paper chart.

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 discharge is associated with greater long-term usage, and shorter 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
- CCS HF Guidelines 2017, Strong Recommendation, High-Quality of Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

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

IN-HOSPITAL USE OF BETA BLOCKERS

Patients with a documented history or new diagnosis of HF due to poor LV systolic function who are admitted to hospital should be prescribed a beta blocker prior to hospital discharge, unless contraindication or known drug intolerance exists.

Numerator	All patients admitted to hospital with HF with a documented LVEF < 40% or where it is a qualitative assessment of "severe" or "moderately severe" LV systolic dysfunction who are prescribed a beta-blocker (bisoprolol, carvedilol or metoprolol) at hospital discharge. Prior testing is acceptable for EF documentation purposes. Note: The use of metoprolol CR/XL is recommended by CCS HF Guidelines.
Denominator	All patients admitted to hospital with HF with a documented LVEF < 40% or where it is a qualitative assessment of "moderate or severe" LV systolic dysfunction and discharged alive from hospital. Prior testing is acceptable for documentation purposes. **Exclusions**: • Patients who left before medical evaluation. • Documented patient refusal to take these medications. • Resting heart rate < 60 beats/minute. • History of symptomatic bradycardia. • Documented systolic BP < 90 mmHg, symptomatic hypotension or history of falls possibly related to bradycardia. • Known allergy or intolerance (for any reason) to beta blockade. • Severe and uncontrolled asthma or unstable COPD with acute reactive airway component. • Documented reason for no requirement for LV assessment.
Period of Assessment	At hospital discharge.
Sources of Data	EMR, paper chart.

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 shorter 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 Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

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

ASSESSMENT OF DAILY WEIGHTS

Patients with a documented history or working diagnosis of HF seen in the ED and/or admitted to hospital for HF should have an assessment of weight recorded daily.

Numerator	All patients with HF seen in the ED or hospital receiving daily weight >90% of acute length of stay days.
Denominator	All patients with HF seen in the ED or hospital. **Exclusions**: • Patients who left before medical evaluation. • Documented reason unable to weigh (immobilized in bed and no bed-scale available).
Period of Assessment	Inpatient and/or ED duration, done daily.
Sources of Data	EMR, paper chart, nursing or physician notes.

Rationale

Evaluation of daily weight is important for monitoring the response to treatment in patients with acute HF.

Clinical Recommendation(s)

CCS HF Guidelines 2006, Class I, Level of evidence C

Method of Reporting

Per patient as proportion (n/d) or percent, as days receiving this metric.

Challenges to Implementation

None.

USE OF A HF-SPECIFIC ORDER SET

Patients with a documented history or working diagnosis of HF seen in the ED and/or admitted to hospital for HF should be managed with a stand-alone or incorporated HF order set or care pathway.

Numerator	All patients with HF seen in the ED or hospital with orders and management plan as per HF order set/care pathway.
Denominator	All patients with HF seen in the ED or hospital. **Exclusions**: • Patients who left before medical evaluation.
Period of Assessment	Inpatient and/or ED duration, done once.
Sources of Data	EMR, paper chart, nursing or physician notes.

Rationale

Use of an order set incorporates many aspects of a patient's care and is associated with improved outcomes.

Clinical Recommendation(s)

CCS HF Guidelines 2006, Class I, Level of evidence C

Method of Reporting

Per patient as proportion (n/d) or percent, once per care episode.

Challenges to Implementation

None.

ASSESSMENT OF CORONARY ARTERY DISEASE ETIOLOGY

Patients with a documented history or working diagnosis of HF seen in the ED and/or admitted to hospital for HF should have an assessment to rule-out or rule-in coronary artery disease (CAD) as the etiology of HF, once diagnosed with HF. The assessment may have occurred previously or is planned within 30 days from discharge.

Numerator	All patients with HF seen in the ED or hospital with documentation of assessment for ischemic or CAD etiology for HF or within 30 days of discharge. The assessment may include a diagnosis of CAD by imaging study (nuclear, cardiac magnetic resonance imaging (CMRI), angiogram, coronary computed tomography (CT)), prior percutaneous coronary intervention (PCI), prior coronary artery bypass graft (CABG) surgery or prior myocardial infarction (MI). Assessment of risk factors for CAD is acceptable if done by validated instrument incorporated into CCS guideline documents.
Denominator	All patients with HF seen in the ED or hospital. **Exclusions**: • Patients who left before medical evaluation. • Documented reason for no requirement for etiology assessment (palliative care, hospice care, patient preference documented). • Other etiology already documented (e.g. peripartum, amyloidosis).
Period of Assessment	Inpatient duration and/or outpatient within 30 days if discharged from ED.
Sources of Data	EMR, paper chart, radiology reporting system, echocardiogram lab, cardiac catheterization lab, cardiology clinic.

Rationale

Evaluation of etiology is fundamental for decisions on diagnosis, prognosis, therapy and referral. Assessment is widely available, and best done with imaging techniques rather than risk scores. Available evidence suggests that coronary revascularization might provide quality of life and prognostic benefits to patients with HF and noninvasive imaging delineating high risk. In particular, patients with systolic HF because of ischemic heart disease might derive clinical benefit from coronary revascularization even in the absence of angina or reversible ischemia.

Clinical Recommendation(s)

CCS HF Guidelines 2006, Class I, Level of Evidence C
CCS HF Guidelines 2012 Strong Recommendation, Low-Quality Evidence
CCS HF Guidelines 2017 Strong Recommendation, Moderate-Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- In-hospital imaging identification is likely easy, however, outpatient imaging either before or after hospitalization may be challenging in some jurisdictions.
- Documentation of prior CABG surgery or PCI is likely obtained from major centers without difficulty.

ASSESSMENT OF LV FUNCTION

Patients with a documented history or working diagnosis of HF seen in the ED and/or admitted to hospital for HF should have an assessment of LV function within last 18 months of admission date or planned within 30 days from discharge from ED.

Numerator	All patients with HF seen in the ED or hospital with assessment of LV function by a quantitative imaging modality, e.g., echocardiogram or CMRI within 12 months from admission date or within 30 days post-discharge from ED.
Denominator	All patients with HF. **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 CMRI).
Period of Assessment	Inpatient duration and/or outpatient within 30 days if discharged from ED and up to 12 months from admission date.
Sources of Data	EMR, paper chart, radiology reporting system, echocardiogram lab, cardiology clinic.

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
The Canadian Cardiovascular Society HF Companion: Bridging Guidelines to Your Practice 2015

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- 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.

DISCHARGE/TRANSITION PHASE

DOCUMENTATION OF 30-DAY RE-ADMISSION RATE	
Documentation of 30-day re-admission rate.	
Numerator	All patients with a primary diagnosis of HF discharged from hospital and experiencing re-admission within 30 days after discharge.
Denominator	All patients with a primary diagnosis of HF discharged alive from hospital **Exclusions**: • Those discharged to a nursing home or short-term rehabilitation facility or other chronic care facility. • Those who died outside of hospital. • All patients readmitted for elective procedure.
Period of Assessment	30-day period following discharge.
Sources of Data	Provincial Hospital discharge or Professional Billing databases and community follow up of outcome.
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	
Per patient as proportion (n/d) or percent.	
Challenges to Implementation	
• Tracking to make sure all the patients discharged from hospital are followed up. • Requires linking the hospital records with those in the community.	

REFERRAL FOR CARDIAC REHABILITATION

Documentation of HF patient being referred to a cardiac rehabilitation program.

Numerator	All HF patients discharged alive from hospital AND are referred to a cardiac rehabilitation program or secondary prevention rehabilitation program.
Denominator	All HF patients discharged alive from hospital. **Exclusions**: • Patients unable to do cardiac rehabilitation due to non-cardiac limitations (e.g. serious mental illness, or being discharged to long-term care). • Those discharged to a nursing home or other chronic care facility
Period of Assessment	Within four weeks following discharge.
Sources of Data	Collect information of office visit in hospital database.

Rationale

Participation in a cardiac rehabilitation program, which would include regular exercise, is associated with improved patient outcomes such as reduced mortality, lower risk of readmission and higher quality of life. Referral of eligible patients to cardiac rehabilitation is recommended by CCS and the Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) Guidelines. Higher rate of referral indicates better care. Referral to a cardiac rehabilitation program should be considered for all stable NYHA I to III HF patients. This rationale places a high value on regular exercise and doesn't necessarily emphasize structured exercise training because it is recognized that not all patients will be able to participate in a structured exercise training program due to patient preferences or availability of resources.

Clinical Recommendation(s)

CCS HF Guidelines 2006, Practical Tips
CACR Guidelines
CCS HF Guidelines 2013, Strong Recommendation, Moderate-Quality Evidence
CCS HF Guidelines 2017, Strong Recommendation, Moderate-Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Cardiac Rehabilitation programs are under-resourced.
- Challenges in rural areas where there are no such facilities.

ASSESSMENT OF LV EJECTION FRACTION (LVEF) WITHIN 30 DAYS FOLLOWING A MYOCARDIAL INFARCTION (MI) AND 90 DAYS FOLLOWING CARDIAC REVASCULARIZATION POST DISCHARGE IN PATIENTS WITH LVEF <35%

Assessment of LVEF post discharge in patients with LVEF < 35%, 30 days following MI or 90 days following revascularization.

Numerator	Number of patients who received an assessment of LVEF post discharge with LVEF < 35%, 30 days following MI or 90 days following cardiac revascularization.
Denominator	All patients admitted with MI or receiving cardiac revascularization having an LVEF <35% during hospitalization and discharged alive. **Exclusions**: • Those who died outside of hospital.
Period of Assessment	Within 30 days for post MI patients and 90 days for cardiac revascularized patients.
Sources of Data	Charts of physicians caring for the patients in the community.

Rationale

To ensure patients with LV dysfunction are appropriately assessed for implantable cardioverter defibrillator (ICD) and cardiac resynchronization therapy (CRT). Primary ICD therapy should be considered in patients with:
i.Ischemic cardiomyopathy, NYHA class II-III, LVEF ≤ 35%, measured at least 1 month post MI, and at least 3 months post coronary revascularization procedure OR
ii.Ischemic cardiomyopathy, NYHA class I, LVEF ≤ 30% at least 1 month post MI, and at least 3 months post coronary revascularization procedure OR
iii.Nonischemic cardiomyopathy, NYHA class II-III, LVEF ≤ 35%, measured at least 3 months after titration and optimization of guideline-directed medical therapy

Clinical Recommendation(s)

CCS HF Guidelines 2006 Class I, Level of evidence A
CCS HF Guidelines 2012 Strong Recommendation, High-Quality Evidence
CCS HF Guidelines 2017 Strong Recommendation, High-Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- May be difficult to track outpatient requested tests.

OUTPATIENT PHASE

REFERRAL FOR HF CLINICAL ASSESSMENT POST-DISCHARGE	
The percentage of HF patients referred for clinical assessment post-discharge.	
Numerator	Number of HF patients referred for clinical assessments within four weeks post-discharge from hospital. Clinical assessments include clinic appointments or telephone follow-up calls.
Denominator	All patients discharged from hospital alive following a HF admission. **Exclusions**: • Those who died outside of hospital. • Those discharged to a nursing home or other chronic care facility
Period of Assessment	Within four weeks following discharge.
Sources of Data	• Departmental administrative database. • Annual institutional report.

Rationale

HF patients need a rapid response from clinic for care. Patients with recurrent HF admission should be referred to a disease management program by family physicians, emergency room physician, internists or cardiologists for follow up within four weeks of hospital and emergency room discharge or sooner if feasible.

Clinical Recommendation(s)

CCS HF Guidelines 2010 (Class I, Level of Evidence A)

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Resource constraint of the clinic or institution.

ACE-I OR ARB OR ARNI USE

All patients with symptomatic HF and LVEF <40% should be assessed as to whether they are taking an ACE-I or ARB or ARNI at each clinic visit; for patients not receiving any of these medications, the reasons should be clearly documented. Note: a similar indicator for In-Hospital has been defined.

Numerator	Number of clinic visits for patients that have both: 1) HF and LVEF <40% AND 2) taking an ACE-I or ARB or ARNI.
Denominator	Total number of clinic visits for patients having HF and LVEF <40% **Exclusions**: • Demonstrated eGFR < 30 ml/min/1.73 m^2 or >35% decline in eGFR over baseline with initiation of ACEI or ARB or ARNI • Symptomatic hypotension despite adjustment of other therapies. • Bilateral renal artery stenosis. • Severe aortic stenosis. • Persistent hyperkalemia >5.5 mmol/L. • Pregnancy. • Previous angioedema (may still consider introduction of ARB in monitored setting) • Patients with previous intolerance to ACE-I and ARB and ARNI who are currently receiving hydralazine and isosorbide dinitrate in combination. • Patient refusal.
Period of Assessment	Annually.
Sources of Data	Patient medical record and prescription drug database for people aged ≥65 years.

Rationale

1. ACE-I should be prescribed to all patients with symptomatic HF and LVEF <40% (HFrEF)
2. An ARNI has recently been approved for patients with symptomatic HFrEF and is intended to be substituted for ACE inhibitors or ARBs. In an RCT that compared the first approved ARNI, valsartan/sacubitril, with enalapril in symptomatic patients with HFrEF tolerating an adequate dose of either ACE inhibitor or ARB, the ARNI reduced the composite endpoint of cardiovascular death or HF hospitalization significantly, by 20%. The benefit was seen to a similar extent for both death and HF hospitalization and was consistent across subgroups.

Clinical Recommendation(s)

- CCS HF Guidelines 2006, Class I, Level of evidence A
- CCS HF Guidelines 2007, Class I, Level of evidence A
- CCS HF Guidelines 2012, Strong Recommendation, High Quality Evidence
- CCS HF Guidelines 2017, Strong Recommendation, High Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Time to assess at each clinic visit.
- Difficulty in obtaining accurate information about current medications.
- Difficulty collecting data for patients who receive care in multiple locations.

MINERALOCORTICOID RECEPTOR ANTAGONIST (MRA) USE

All patients with HF and LVEF ≤ 40% should be assessed as to whether they are taking a MRA (spironolactone or eplerenone) at each clinic visit; for patients not receiving either, the reasons should be clearly documented.

Numerator	Number of clinic visits for HF patients with LVEF ≤ 40% and are taking a MRA (spironolactone or eplerenone).
Denominator	Total number of clinic visits per year for HF patients with LVEF ≤ 40%. **Exclusions**: • Patients with estimated glomerular filtration rate (eGFR)<30ml/min/1.73m^2 • Persistent hyperkalemia >5.5 mmol/L • Demonstrated increase in serum Creatinine with addition of MRA of over 30% of baseline. • Symptomatic hypotension despite adjustment of other therapies. • Need for concomitant potassium-sparing diuretic. • Concomitant use of strong CYP450-3A4 inhibitors (with eplerenone). • Patient refusal.
Period of Assessment	Annually.
Sources of Data	Patient medical record and prescription drug database for people aged ≥65 years

Rationale

1. There are 2 clinical trials and 1 meta-analysis which demonstrate that the additional use of an MRA with beta-blocker and ACE inhibitor therapy leads to an improvement in survival across the spectrum of symptomatic patients with HFrEF.
2. A single RCT also supports the use of aldosterone antagonists in patients who had a recent MI with a LVEF < 40% and symptoms of HF or an LVEF < 30% and diabetes without symptoms of HF. There was a 15% relative decrease in mortality and 13% relative decrease in cardiovascular mortality or hospitalization for cardiovascular events in the MRA group.

Clinical Recommendation(s)

- CCS HF Guidelines 2012, Strong Recommendation, High-Quality Evidence
- CCS HF Guidelines 2017, Strong Recommendation, High-Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Time to assess at each clinic visit.
- Difficulty in obtaining accurate information about current medications.
- Difficulty collecting data for patients who receive care in multiple locations.

BETA BLOCKER USE

All patients with HF and LVEF < 40% should be assessed as to whether they are taking a guideline endorsed beta blocker at each clinic visit; for patients not receiving a beta blocker, the reasons should be clearly documented.

Numerator	Number of clinic visits for patients with LVEF < 40% and taking a guideline endorsed beta blocker.
Denominator	Total number of clinic visits for patients with LVEF < 40%. **Exclusions**: • Demonstrated allergy or intolerance (for any reason) to beta blockade. • Severe asthma. • Unstable COPD with acute reactive airway component. • Symptomatic bradycardia or heart block without a pacemaker; resting heart rate <60 beats per minute. • Symptomatic hypotension despite adjustment of other therapies. • Documented patient refusal to take these medications
Period of Assessment	Annually.
Sources of Data	Patient medical record and prescription drug database for people aged ≥65 years

Rationale

1. Beta blockers should be considered in all patients with symptomatic HF and LVEF <40%.
2. Patients with NYHA Class IV symptoms should be stabilized before initiation of a beta blocker.
3. Therapy should be initiated at low dose and titrated to the target dose used in clinical trials or the maximum tolerated dose.

Clinical Recommendation(s)

- CCS HF Guidelines 2006, Class I, Level of evidence A
- CCS HF Guidelines 2006, Class I, Level of evidence C
- CCS HF Guidelines 2006, Class I, Level of evidence BCCS HF Guidelines 2012, Strong Recommendation, Moderate-Quality Evidence
- CCS HF Guidelines 2012, Strong Recommendation, High-Quality Evidence
- CCS HF Guidelines 2017, Strong Recommendation, Moderate-Quality Evidence
- CCS HF Guidelines 2017, Strong Recommendation, High-Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Time to assess at each clinic visit.
- Difficulty in obtaining accurate information about current medications.
- Difficulty collecting data for patients who receive care in multiple locations.

IVABRADINE USE

All patients with:
1) HF and LVEF < 40% or a qualitative description of LV function consistent with moderate or severe systolic dysfunction AND
2) whose heart rate is greater than or equal to 77 bpm in sinus rhythm AND
3) who remain symptomatic despite treatment with appropriate doses of guideline-directed medical therapy (GDMT)
should be assessed as to whether they are taking ivabradine at each clinic visit; for patients not receiving ivabradine, the reasons should be clearly documented.

Numerator	Number of clinic visits for patients with: 1) LVEF < 40% (moderate or severe LV systolic dysfunction) AND 2) NYHA II-IV symptoms AND 3) whose heart rate is greater than or equal to 77 bpm in sinus rhythm on guideline directed medical therapy
Denominator	Total number of clinic visits for patients with LVEF < 40%. **Exclusions**: • Demonstrated allergy or intolerance (for any reason) to ivabradine. • Symptomatic bradycardia or advanced heart block without a pacemaker; resting heart rate <60 beats per minute; pacemaker dependent. • History or current finding of atrial fibrillation or atrial flutter. • Documented patient refusal to take these medications.
Period of Assessment	Annually.
Sources of Data	Patient medical record and prescription drug database for people aged ≥65 years.

Rationale

1. High value is placed on the improvement of cardiovascular death and HF hospitalizations as adjunctive therapy to standard HF medication treatments in a selected HF population.
2. Differing criteria for heart rate eligibility have been approved by various regulatory authorities ranging from 70 to 77 bpm with the trial entry criteria of 70 bpm.
3. Therapy should be initiated at low dose and titrated to the target dose used in clinical trials or the maximum tolerated dose.

Clinical Recommendation(s)

- CCS HF Guidelines 2017, Strong Recommendation, Moderate-Quality Evidence

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Time to assess at each clinic visit.
- Difficulty in obtaining accurate information about current medications.
- Difficulty collecting data for patients who receive care in multiple locations.

DOCUMENTATION OF HF ETIOLOGY

All HF patients should have a recorded etiology of HF on the patient medical chart.

Numerator	Number of HF patient visits in the practice/clinic who have recorded etiology of HF.
Denominator	Total number of HF patient visits in the practice/clinic. **Exclusions**: • None
Period of Assessment	Annually.
Sources of Data	• EMR/chart. • Investigations e.g. echocardiogram, cardiac catheterization • Laboratory tests as indicated, e.g. complete blood count, serum Creatinine, and thyroid stimulating hormone.

Rationale

- Etiology of HF important to document for optimal management
- Precipitant of acute decompensation must be recorded to ensure appropriate treatment, education, and ongoing monitoring.

Clinical Recommendation(s)

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

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Data collection.
- Population often has multiple co-morbidities, attribution of specific causality could be difficult.

DOCUMENTATION OF LV FUNCTION

LV function assessed by echocardiography or other means within the last 3 years.

Numerator	Number of patients seen in the practice/clinic who have had LV function assessed within the last 3 years.
Denominator	Total number of patients seen in the practice/clinic. **Exclusions**: • Patients at end of life from non-cardiac illness.
Period of Assessment	Annually.
Sources of Data	• EMR/chart. • Investigations, e.g. cardiac catheterization, echocardiography.

Rationale

Recommendations for evidence-based treatment are predominantly for HF with reduced LVEF. If the LVEF has not been assessed, patients may be denied recommended therapies. We recommend that echocardiography be performed in all patients with suspected HF to assess cardiac structure and function and to quantify systolic function for planning and monitoring of treatment as well as for prognostic stratification

Clinical Recommendation(s)

- CCS HF Guidelines 2006 Class I, Level of evidence C
- CCS HF Guidelines 2012 Strong Recommendation, Moderate-Quality of Evidence.
- The Canadian Cardiovascular Society HF Companion: Bridging Guidelines to Your Practice 2015

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Availability of testing facilities may limit this.

BLOOD PRESSURE MEASUREMENTS

All patients should have a recorded blood pressure on the patient medical chart.

Numerator	Number of patients with data recorded for blood pressure at each patient visit.
Denominator	Total number of patient visits in HF practice/clinic. **Exclusions**: • None.
Period of Assessment	Annually
Sources of Data	EMR/chart.

Rationale

- Evidence based treatments result in improved outcomes.
- Medication titration rate depends on clinical response.
- Monitoring of blood pressure allows reasonable judgment about the rate of medication titration, whether recommended doses can be achieved.
- Heart rate and blood pressure abnormalities may dictate which drug class should be used first or preferentially up titrated.
- Symptoms, blood pressure sitting and standing, heart rate, renal function and electrolytes should be followed closely when combinations of drugs affecting the renin-angiotensin-aldosterone system are used.

Clinical Recommendation(s)

CCS HF Guidelines 2006, Class I, Level of evidence C

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

None.

BODY WEIGHT ASSESSMENT

All patients should have a recorded body weight on the patient medical chart.

Numerator	Number of patient visits with data recorded for body weight assessment.
Denominator	Total number of patient visits in HF practice/clinic. **Exclusions**: • None.
Period of Assessment	Annually.
Sources of Data	EMR/chart.

Rationale

- Evidence based treatments result in improved outcomes.
- Medication titration rate depends on clinical response.
- Monitoring of body weight is a key clinical measure of fluid retention.

Clinical Recommendation(s)

Practical tips:

Acute renal dysfunction would generally be diagnosed when serum creatinine levels increase by more than 30% of baseline value over several days or when oliguria and rising serum creatinine are present. In this situation, volume status and clinical perfusion in HF patients must be carefully and repeatedly assessed, and this includes body weight, urine output, blood pressure (BP), serum electrolytes and renal function. These should be reviewed daily in hospitalized patients.

CCS HF Guidelines 2007, Practical Tips

Method of Reporting

Per patient as proportion (n/d) or percent

Challenges to Implementation

None.

PATIENT EDUCATION

Patient and family members should 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	Number of HF patients 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	Total number of HF patients. **Exclusions**: • None.
Period of Assessment	Within 4 weeks of discharge from hospital.
Sources of Data	Departmental administrative record/database.

Rationale

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

Clinical Recommendation(s)

Practical Tips
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.

CCS HF Guidelines 2010 (Class I, Level of evidence A)

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Institutional resource.

PALLIATIVE CARE PHASE

DISCUSSION AND DOCUMENTED OUTCOME OF ADVANCE CARE PLANNING (ACP) WITHIN THE FIRST YEAR OF A HF DIAGNOSIS

Proportion of persons with HF with who appropriate Advanced Care Planning (ACP) is discussed within the first year of HF diagnosis.

Numerator	Number of patients with HF with appropriate ACP discussions (see Clinical Recommendations criteria below) held within the first year of a HF diagnosis.
Denominator	Total number of HF patients with a new diagnosis of HF. **Exclusions**: • Patients who have died.
Period of Assessment	Within 1 year of HF diagnosis.
Sources of Data	Medical Record.

Rationale

HF is often a terminal condition with a course punctuated by multiple potentially severe exacerbations. Accurately predicting a patient's prognosis, even in the setting of a HF exacerbation, is not possible. ACP is essential for clinicians to provide care consistent with patient goals in the eventuality that the patient becomes unable to direct his/her care in the setting of an acute illness. Preferably, ACP should be reviewed after any clinically significant HF event, such as a hospitalization or a change in functional capacity. Given the high one-year mortality from HF after an initial hospitalization, it is important that ACP discussions be held during that first year.

ACP discussions should be held within the first year of a diagnosis of HF. Criteria for appropriate ACP discussions include:

- Identifying and documentation of a substitute decision maker and how information will be shared with that substitute decision maker.
- Record the outcome of the ACP discussion (e.g. living will)
- Addressing and documentation of resuscitation preferences/Do not resuscitate (DNR).

All criteria must be fulfilled to satisfy the quality indicators.

Clinical Recommendation(s)

CCS HF Guidelines 2011, Strong Recommendation, Low-Quality Evidence.

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Will require chart review. The importance of this recommendation mandates that criteria for appropriate discussions be stipulated. Merely documenting that a discussion has taken place in no way guarantees that it was an appropriate one. While still not a guarantee, having the appropriateness criteria above will provide some measure of confidence that important elements of ACP have been carried out.

DISCUSSION AND DOCUMENTED OUTCOME OF ACP WITH PATIENT AFTER HOSPITALIZATION FOR HF

Proportion of persons with hospitalization for HF who have appropriate ACP discussed prior to discharge from hospital.

Numerator	Number of HF admissions with appropriate ACP discussion and/or documentation prior to discharge
Denominator	Total number of HF admissions. **Exclusions**: • Admitted patients who die prior to discharge.
Period of Assessment	After each hospitalization for HF.
Sources of Data	Medical Record.

Rationale

HF is often a terminal condition with a course punctuated by multiple potentially severe exacerbations. Accurately predicting a patient's prognosis, even in the setting of a HF exacerbation, is not possible. ACP is essential in order for clinicians to provide care consistent with patient goals in the eventuality that the patient becomes unable to direct his/her care in the setting of an acute illness. Preferably, ACP should be reviewed after any clinically significant HF event, such as a hospitalization or a change in functional capacity. Given the high one-year mortality from HF after an initial hospitalization, it is important that ACP discussions be held during that first year.

ACP discussions should be held during re-hospitalization for HF. Criteria for appropriate ACP discussions include:

- Identifying and documentation of a substitute decision maker and how information will be shared with that substitute decision maker.
- Record the outcome of the ACP discussion (e.g. living will)
- Addressing and documentation of resuscitation preferences/Do not resuscitate (DNR).

All criteria must be fulfilled to satisfy the quality indicators.

Clinical Recommendation

CCS HF Guidelines 2011, Strong Recommendation, Low-Quality Evidence.

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Will require chart review. The importance of this recommendation mandates that criteria for appropriate discussions be stipulated. Merely documenting that a discussion has taken place in no way guarantees that it was an appropriate one. While still not a guarantee, having the appropriateness criteria above will provide some measure of confidence that important elements of ACP have been carried out.

PERCENTAGE OF PATIENTS WITH HF REFERRED TO PALLIATIVE CARE

Percentage of patients with HF referred to palliative care.

Numerator	Number of patients with HF referred to palliative care within 3 months of discharge from hospital
Denominator	Total number of patients with HF. **Exclusions**: • Patient refusal to access palliative care. • Patient referred for a geriatric assessment.
Period of Assessment	Within 3 months of discharge from hospital
Sources of Data	Medical Record.

Rationale

Potentially reversible suffering can occur in HF patients with years to live, and conversely, not all death is associated with complex suffering. Palliative care interventions should be provided in response to patient needs and not be limited to individuals considered to be at end-of-life. Generic and HF-specific tools have been developed to assess the patient needs. A meta-analysis evaluating 5 HF-specific quality of life questionnaires suggests there was no compelling evidence to recommend one tool over another.

Patients with HF should be regularly assessed for the presence of classical HF symptoms, as well as for other symptoms such as anxiety, pain, depression, bowel or bladder problems, cognitive impairment, or falls. If these symptoms are not easily managed by the HF specialist or the primary care physician, referral to a specialist service physician should be considered. These characteristics are fairly broad and may fall within the competence of a specialist geriatrician; referral to a geriatrician in such a setting should not be misconstrued as poor quality care.

There are no data to provide guidance on what constitutes the appropriate proportion of palliative care referrals primarily for the purpose of symptom control in patients not actively dying. However, the literature suggests that over 40% of patients with advanced HF have psychosocial symptoms, and up to three quarters suffer daily pain. Resource limitations may preclude referral of all HF patients to a palliative care specialist. However, the proportion of HF patients who are referred not specifically in the context of a death expected anytime soon would suggest referrals made purely for symptom control. Certainly, one important usage of this quality indicator would be to identify jurisdictions where there is a potential shortage of palliative care services.

Clinical Recommendation(s)

CCS HF Guidelines 2011, Strong Recommendation, Low-Quality Evidence.

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Identification of symptoms is key. HF patients may suffer from symptoms such as anxiety, depression, pain, or falls, which may not be recognized as resulting from HF by clinicians more familiar with classical HF symptoms. There is insufficient evidence to recommend one symptom assessment tool over another. This recommendation may be restricted to patients with more severe HF.

ASSESSMENT OF COGNITIVE FUNCTION

Cognitive function is assessed in HF patients prior to discharge from hospital.

Numerator	Number of hospitalized patients with HF being discharged to the community and for whom assessment of cognition was assessed during their hospitalization.
Denominator	Total number of hospitalized patients with HF being discharged to the community. **Exclusions**: • Patients residing in nursing homes, for whom most care provision is looked after by the facility.
Period of Assessment	After hospitalization for HF.
Sources of Data	Health records.

Rationale

Cognitive impairment is common among HF patients, many of whom are approaching the end of life. It has been associated with poor outcomes in these patients. While the exact mechanisms linking cognitive impairment to poor outcomes have yet to be fully worked out, it is presumed likely that cognitive impairment affects patient ability to participate in self-care behaviours, thus increasing the risk for poor outcomes.

Routine screening for dementia is not recommended. However, cognitive impairment is common among HF patients and is associated with poorer outcomes. Therefore, the CCS HF Guidelines recommend that HF patients who present with acute illness should be assessed before discharge for the presence of cognitive impairment. The Montreal Cognitive Assessment (MoCA) has been recommended by the Canadian Stroke Network to assess cognitive function in patients with vascular disease. However, ***there is insufficient evidence at this time*** to recommend one screening method for cognitive impairment in patients specifically with HF over another. Therefore, at this time, acceptable screening instruments could include, but are not limited to: the MoCA, the Mini-mental state examination (MMSE), the Mini-Cog, the Memory Impairment Screen (MIS), the General Practitioner Assessment of Cognition (GPCOG), the clock drawing test (CDT), or Rowland Universal Dementia Assessment Scale (RUDAS).

Complaints from family caregivers about cognitive problems in a HF patient should be taken seriously and prompt further evaluation. For the purpose of this quality indicator, documentation of these complaints in the patient record would qualify as an assessment of cognitive function.

For patients with HF, the MoCA, Mini-Cog, CDT and RUDAS may be preferred; they are more sensitive to executive function and planning skills that are often impaired in patients with cardiovascular disease.

Clinical Recommendation(s)

CCS HF Guidelines 2006, level I, class C
CCS HF Guidelines 2017, Strong Recommendation, High-Quality Evidence.

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Ensuring that cognitive screening tools are administered in a standardized fashion.

PALLIATIVE CARE EDUCATION IN FACULTY OF HEALTH SCIENCES PROGRAMS

Faculty of Health Sciences programs should provide an end-of-life curriculum based on the CCS HF Guidelines regarding end-of-life care.

Numerator	Number of Faculty of Health Sciences programs that provide palliative care education that address all recommendations related to palliative care and end-of-life planning in the CCS HF Guidelines.
Denominator	Total number of Faculty of Health Sciences programs in Canada. **Exclusions**: • None.
Period of Assessment	Annually
Sources of Data	Program audits.

Rationale

HF is a terminal condition associated with a high symptom burden. Optimal care of HF patients requires clinicians to have a good working knowledge of the issues related to palliative care, advance care and end-of-life planning.

Clinical Recommendation(s)

A Faculty of Health Sciences program should develop and implement curricula for trainees in order to provide them with a good working knowledge of the issues related to palliative care, advance care and end-of-life planning. The curriculum should reflect, at a minimum, the CCS HF Guidelines, and expose learners to best-practices in the specialty of palliative care medicine for chronic non-malignant diseases.

Should include residency, and other medical training.

Method of Reporting

Proportion (n/d) or percentage of Faculty of Health Sciences programs that implement such a curriculum.

Challenges to Implementation

- Ensuring appropriate procedures to audit curricula.

SPECIALIST REVIEW OF PATIENTS WITH PERSISTENT NEW YORK HEART ASSOCIATION (NYHA) CLASS IV HF

To confirm that patients with persistent New York Heart Association (NYHA) class IV HF symptoms, despite attempts at treatment by most responsible clinicians, are referred to a specialist with expertise in the management of HF to confirm that HF therapies have been optimized.

Numerator	Number of patients with persistent NYHA class IV HF and who are viewed by a HF specialist within 1 month of discharge from hospital. A specialist is defined as an internist, cardiologist, or family physician with expertise in this area of medicine. Consultation is defined as in-person or by telephone.
Denominator	Total number of patients with NYHA class IV HF. Comments: Some patients may refuse to see a specialist, or, due to non-ambulatory status and geographic location, not have access to such a physician. For such patients, most responsible physicians might consider telephone consultations with HF specialists, or a member of a HF care team, such as a nurse practitioner, might perform a home visit and then review the patient with a HF expert team. The HF specialist need not necessarily be a cardiologist, but could include a general internist, geriatrician, or a family physician with expertise in this area of medicine. Exclusions: • Patients with other advanced comorbidities or frailty, and that are nearing the end-of-life. • Patients who left before medical evaluation. • Patients who decline specialist care, or recommended investigations. • Patients under the care of an existing disease management program, including renal replacement therapy, Cardiac Rehabilitation Services. • Patients who are institutionalized, or who have poor life expectancy or function due to non-cardiac illness. • Documented plan for specialist visit within 4 weeks of discharge.
Period of Assessment	Annually
Sources of Data	Health records.

Rationale

It is important to ensure that all potential HF-specific therapies have been considered for patients with advanced HF. Most HF care in Canada is provided by family physicians and general internists. While not all HF patients need to be seen by a HF specialist on an ongoing basis, those with severe symptoms should be reviewed by a specialist, as it cannot be presumed that all potential therapies to improve symptoms have been considered. We recommend that the presence of persistent advanced HF (NYHA class IV) despite current therapy be confirmed, ideally by an interdisciplinary team with expertise in HF management, to ensure that optimal appropriate HF management strategies have been considered and implemented, in the context of patient goals and comorbidities.

Clinical Recommendation(s)

CCS HF Guidelines 2011, Strong Recommendation, Low-Quality Evidence.

Method of Reporting

Per patient as proportion (n/d) or percent.

Challenges to Implementation

- Identification of patients with NYHA class IV HF symptoms may be problematic and relies on the quality of assessment by clinicians. Evidence of NYHA class could include documentation of dyspnea at rest or related symptoms.

ACKNOWLEDGEMENT

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

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

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