



**CorHealth
Ontario**

*Advancing cardiac, stroke
and vascular care*

Chronic Heart Failure:

General Information and Practical Tips for
Health Care Providers

About CorHealth Ontario

As of June 22, 2017, we are CorHealth Ontario, an organization formed by the merger of the Cardiac Care Network of Ontario and the Ontario Stroke Network, with an expanded mandate spanning cardiac, stroke and vascular care. CorHealth Ontario proudly advises the Ministry of Health and Long Term-Care, Local Health Integration Networks, hospitals, and care providers to improve the quality, efficiency, accessibility and equity of cardiac, stroke and vascular services for patients across Ontario. For more information, visit corhealthontario.ca.

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What is Heart Failure?

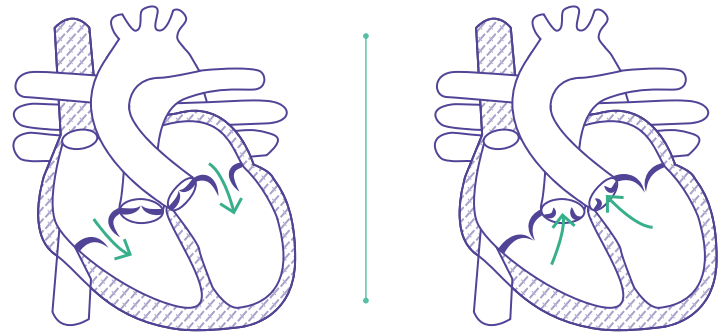
Heart failure (HF) is a condition when the heart is unable to pump enough blood to meet the metabolic demands of the body.

The most common symptoms of HF include: shortness of breath (SOB), fatigue, and edema. Heart failure symptoms can occur in the absence of fluid overload or 'congestion', and therefore the term 'congestive heart failure' has been changed to 'heart failure'.

Although there are many causes of HF, the most common causes include coronary artery disease and hypertension.

Heart Failure and Ejection Fraction (EF)

Left ventricular ejection fraction (LVEF): The % of blood pumped out of the left ventricle with each beat. Normal LVEF >55%



HF with preserved EF:
LVEF > 40% ('HF-pEF')

Stiff Heart Muscle
Trouble filling during
ventricular diastole

HF with reduced EF:
LVEF ≤ 40% ('HF-rEF')

Weak Heart Muscle
Trouble ejecting blood
during ventricular
systole

Symptoms of Heart Failure

Shortness of breath (SOB) and fatigue are the most commonly reported symptoms of HF. The following section outlines a number of symptoms that can be related to HF.

Symptoms	Description
Shortness of Breath (SOB)	<ul style="list-style-type: none"> • Usually occurs on exertion or, with more severe HF, can occur at rest • Can be a result of many reasons beyond fluid in the lungs including, but not limited to: inadequate cardiac output, fluid retention, deconditioning, or skeletal muscle weakness
Fatigue	<ul style="list-style-type: none"> • Decreased exercise tolerance • Can be a result of many reasons including, but not limited to: inadequate cardiac output, fluid retention, deconditioning, or skeletal muscle weakness
Peripheral Edema	<ul style="list-style-type: none"> • May be present in the lower extremities, abdomen, sacrum, scrotum or generalized

Symptoms	Description
Orthopnea	<ul style="list-style-type: none"> • SOB when lying flat • Need to prop up their head to avoid SOB (e.g. extra pillows) • Occurs due to redistribution of fluid from lower extremities when lying recumbent, increasing pulmonary capillary pressure
Paroxysmal Nocturnal Dyspnea (PND)	<ul style="list-style-type: none"> • Wake up suddenly with severe SOB • Anxiety and a sense of suffocation may be associated symptoms • Occurs due to redistribution of fluid from lower extremities when lying recumbent, leading to pulmonary edema
Cough	<ul style="list-style-type: none"> • Chronic, non-productive cough worse when lying down is often associated with pulmonary congestion • May be due to pulmonary, cardiac or gastric causes or may be a side effect of medication (e.g. ACE inhibitor)
Wheezing	<ul style="list-style-type: none"> • May be present at rest or with exertion and occurs in the setting of fluid overload • May be caused by congestion of bronchial mucosa and compression of small bronchi

Symptoms	Description
Gastrointestinal Symptoms	<ul style="list-style-type: none"> Abdominal fullness/bloating/discomfort, nausea, poor appetite, early satiety, constipation May be due to ascites, gut edema, passive liver congestion with fluid retention Constipation may be due to fluid shifting from intravascular space into tissues
Weight Gain	<ul style="list-style-type: none"> Rapid weight gain: 2 pounds (1 Kg)/day or 5 pounds (2 Kg)/week
Atypical Symptoms	<ul style="list-style-type: none"> More common in the elderly May include functional decline, falls, depression, insomnia or nocturia, delirium (“Nights are bad”)

NYHA Classifications

The New York Heart Association (NYHA) classification system is used to describe the level of functional impairment from HF symptoms. It helps define treatment goals and modalities. Patients may fluctuate between the NYHA classes representing periods of exacerbation and the need for urgent or acute care.

Note: there is no relationship between the strength of the heart muscle and NYHA class. For example, a person with a low ejection fraction may have NYHA Class 2 symptoms while someone else with a normal ejection fraction may have NYHA Class 3 symptoms.

NYHA Class	Symptom Severity
1	No limitation of physical activity. Ordinary physical activity does not cause fatigue, palpitations, or SOB.
2	Slight limitation of physical activity. Mild HF symptoms (SOB, angina) during ordinary physical activity.
3	Moderate limitations of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, palpitations or SOB.
4	Symptoms of heart failure at rest. Unable to carry out physical activity without discomfort.

Severity and Status (e.g. same/better/worse) of HF Symptoms

It is important to note the current status of a person's HF symptoms AND determine if they are the same/ better/or worse.

Note: If a person's HF symptoms are getting worse, try to problem solve to identify possible triggers for the change. Identifying and managing the trigger(s) is required for improving and stabilizing HF symptoms.

Questions to Ask	Clinical Concerns to Report
Current level of activity and limiting factor	
If you and I could go for a walk, your pace, no hills, how long could you walk for?	<ul style="list-style-type: none"> Declining functional capacity
What would limit you from walking any further (e.g. breathing, fatigue, arthritis)?	
How does this compare to what you did last month/week (time frame dependent on patient situation)?	

Questions to Ask	Clinical Concerns to Report
SOB	
What types of activities make you short of breath?	<ul style="list-style-type: none"> Increasing SOB or SOB at rest
Are there any of your usual activities you are avoiding because they will make you short of breath?	
Orthopnea	
How many pillows do you sleep with under your head?	<ul style="list-style-type: none"> Any symptoms of orthopnea
Is the head of your bed elevated?	
Do you sleep in a chair or recliner?	
If yes, does your breathing get better when you sit up? How frequent are these episodes?	
Paroxysmal Nocturnal Dyspnea (PND)	
Do you wake up suddenly in the middle of the night gasping for air? Does it seem better when you sit up?	<ul style="list-style-type: none"> Any symptoms of PND
How frequent are these episodes?	

Questions to Ask	Clinical Concerns to Report
Peripheral Fluid Retention	
<p>Have you noticed any swelling in your feet or ankles?</p> <p>Can you fit into your socks or regular shoes?</p> <p>Does this swelling go away by the next morning?</p> <p>Do you feel like your belly/abdomen is bloated? (If yes, are you constipated?)</p> <p>Has your daily weight changed? (If yes, how much weight increase and time frame?)</p>	<ul style="list-style-type: none"> • Edema that does not resolve by the next morning • Abdominal fullness in the absence of constipation • Weight gain of 2 lbs (1Kg)/day or 5 lbs (2 Kg)/week
Frail Seniors – Atypical Symptoms	
<p>Inquire with the caregiver about sudden changes in cognition or function, or if person is ‘no longer themselves’.</p> <p>(If yes, explore possible reasons for this change such as worsening heart failure.)</p>	<ul style="list-style-type: none"> • Any new changes

Questions to Ask	Clinical Concerns to Report
Volume Depletion	
<p>Do you ever get lightheaded? (If yes, explore situation further)</p> <p>Have you had any falls? (If yes, explore situation further)</p> <p>Has your daily weight changed? (If yes, how much weight loss and time frame)</p>	<ul style="list-style-type: none"> • It is normal to have some postural light headedness; however, it should not interfere with regular activities or be unsafe • Any episodes of falling or syncope • Weight loss of > 2 lbs (1 Kg)/day or 5 lbs (2 Kg)/week • Diarrhea for more than 2 days
Arrhythmia	
<p>Do you ever feel like your heart is racing and it makes you feel unwell? (If yes, explore situation further)</p> <p>Have you ever fainted? (If yes, explore situation further)</p>	<ul style="list-style-type: none"> • Prolonged palpitations • Fainting (syncope)

Exam Findings that Specifically Relate to Heart Failure

General Appearance

- Does the patient look well, ill or malnourished?
- Does the patient look frail?
- Use of assistive devices
- Skin colour, presence of pallor or cyanosis
- Shortness of breath or orthopnea during the visit or exam?
(Tip – Are they tachypneic, or exhibiting respiratory distress or wheezing either at rest, or more when lying back?)
- Pitting edema - feet, ankles, legs, sacrum (can they fit into their shoes?)
- Current weight and any changes in weight in the last week?

Vital Signs

- There is no consistent change in vital signs that always indicates fluid overload
- Heart rate and blood pressure readings must be interpreted in combination with other findings. Check for postural drop in blood pressure to assess for fluid depletion (e.g. diuretics too strong)
- Low blood pressure is not unusual
- Low blood pressure is a concern if patients feel unwell, lightheaded, dizzy, more tired than usual or report falling or fainting
- Consult with a physician before advising a patient not to take heart failure medications when blood pressure is low
- For medication tips in the setting of low blood pressure, see page 21

Jugular Venous Pressure (JVP)

- The JVP reflects the ability of the heart to accommodate venous return. The JVP can be elevated when someone has increased fluid volume, even in the absence of peripheral edema.
- When people complain of abdominal bloating but have no obvious edema- JVP can be a great clue for fluid status.
- Normal JVP \leq 4 cm above the sternal angle. Quick clue- if you can see the JVP while they are sitting, it is elevated
- The JVP is easiest to see when someone is lying down (“fat when flat”)
- The JVP can also be increased for other reasons such as: tricuspid regurgitation; pulmonary hypertension; complete heart block (right atrium contracting against a closed tricuspid valve)

Pulmonary Assessment

Crackles: not cleared by coughing, caused by excessive fluid in the airspaces

- Crackles in early inspiration denote CHRONIC lung condition, crackles at end inspiration more often indicate fluid in the airspaces (heart failure)
- Wheezes – may be caused by bronchial edema from worsening HF. Can be on inspiration or expiration

Hemoptysis: Frank blood, or pink tinged frothy sputum is indicative of acute pulmonary edema due to rupture of engorged bronchial veins, anticoagulation may worsen. (Often a medical emergency).

Note: Some patients may have relatively clear lungs on examination but can still be fluid overloaded.

Medication Pathway for Symptomatic Chronic Heart Failure (LVEF $\leq 40\%$)

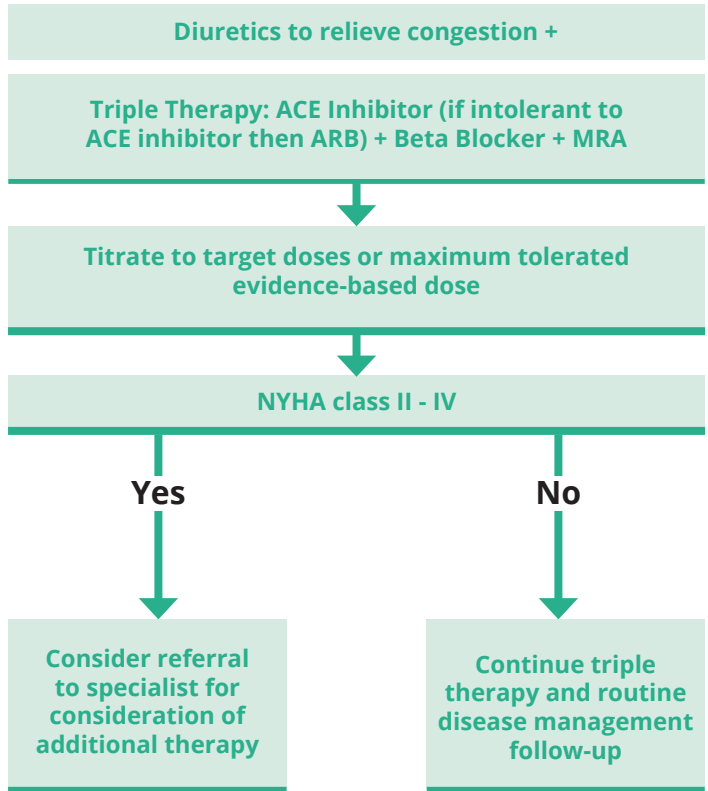
Source:
CCS Guidelines, 2017
(www.ccs.ca)

ACE inhibitor
Angiotensin
converting
enzyme inhibitor

ARB
Angiotensin II
receptor blocker

BB
Beta blocker

MRA
Mineralocorticoid
receptor antagonist



Note: Entresto™ (Sacubitril/ Valsartan) and Lancora™ (Ivabradine) are now approved for use in Canada. Please see pages 22 to 23 for general information regarding these medications.

**LVEF > 40%
Medication**

- Control of hypertension per current CHEP guidelines is critical
- Control of heart rate

Medication Chart for Chronic Heart Failure (LVEF $\leq 40\%$)

	Drug	Start Dose	Target Dose
ACE INHIBITOR	Enalapril	1.25 - 2.5 mg BID	10 mg BID
	Lisinopril	2.5 - 5 mg daily	20 - 35 mg daily
	Perindopril	2 - 4 mg daily	4 - 8 mg daily
	Ramipril	1.25 - 2.5 mg BID	5 mg BID
	Trandolapril	1 - 2 mg daily	4 mg daily
BB	Bisoprolol	1.25 mg daily	10 mg daily
	Carvedilol	3.125 mg BID	25 mg BID 50 mg BID (> 85 kg)
	Metoprolol CR/XL	12.5-25 mg daily	200 mg daily [†]
ARB	Candesartan	4 mg daily	32 mg daily
	Valsartan	40 mg BID	160 mg BID
MRA	Spironolactone	12.5 mg daily	50 mg daily
	Eplerenone	25 mg daily	50 mg daily
VASODILATOR	Hydralazine	37.5 mg TID	75 mg TID
	Isorbide Dinitrate	20 mg TID	40 mg TID
ARNI	Sacubitril/Valsartan (Entresto™)	50 - 100 mg BID	200 mg BID
I₁ INHIBITOR	Ivabradine (Lancora™)	2.5 - 5 mg BID	7.5 mg BID

Note: Drugs and doses may vary and depend upon the clinical scenario.

[†] Not available in Canada. Limited evidence of short-acting metoprolol tartrate in HF.

Note: For information regarding Entresto™ and Lancora™, see medication tips, page 22 - 23.

Patients prescribed Entresto™ should never currently be taking an ACE Inhibitor and should not currently be taking an Angiotensin II Receptor Blocker.

Medication Tips

<p>Loop Diuretics Lasix</p>	<ul style="list-style-type: none"> • Avoid taking after 4pm • Recheck renal function, electrolytes within 7 days after a change in dose • Burinex - better GI absorption than Lasix when gut edema (cost of medication needs to be considered)
<p><u>Metolazone</u></p>	<ul style="list-style-type: none"> • <u>Means trouble</u> if patient not closely monitored (volume status, kidneys, potassium) • Recheck renal function, electrolytes within 2 days after a change in dose • Consider using a low dose (1.25mg - 2.5mg) sparingly or periodically rather than daily dosing • Most effective when taken 30 mins before the Lasix dose
<p>Titrating ACE Inhibitor/ ARB/MRA</p>	<ul style="list-style-type: none"> • Baseline renal function, potassium • Renal function, potassium (blood work within 7-10 days of any change in dose) • Asymptomatic low blood pressure is OK
<p>Digoxin</p>	<ul style="list-style-type: none"> • Low dose (trough level <1.0 nmol/L) • Be very careful with elderly, renal impairment • Not first choice of medication. It can increase mortality if dose too high • "Caution with digoxin"

Titrating Beta Blocker (BB)

Note:

- Asymptomatic low blood pressure OK
- May experience worse HF symptoms with dose increase (symptoms occur within 1-2 weeks, treat with temporarily increasing diuretic versus decrease BB if possible)
- Exercise caution increasing the dose when:
 - Any extra fluid on board (can't be 'wet' - will feel worse with increase)
 - Symptomatic low pulse (<60) or low blood pressure
 - New conduction delays on EKG

Low Blood Pressure

- Stagger dose of ACE inhibitor/ARB and Beta Blocker (at least 2 hours between medications)
- Consider splitting daily dose to BID
- Start with low doses and increase slowly to help reduce side effects (monthly vs every 2 weeks)
- When trying to titrate ACE Inhibitor, ARB or Beta Blocker, consider only increasing the PM dose. If tolerated, then increase the AM dose at the next visit
- Use Bisoprolol rather than Carvedilol (more Beta 1 selective)
- Give beta blocker with meals (slows absorption)
- Consider decreasing diuretic
- Consider volume depletion, or other meds (cardiovascular or other) that can contribute to hypotension or orthostatic hypotension (e.g. alpha-blocker)

New Medications

Entresto™ (Sacubitril/ Valsartan)

Neprilysin inhibitor (Sacubitril) + ARB (Valsartan)
For the treatment of HF with LVEF \leq 40%
and NYHA class II or III:

- despite at least four weeks of treatment with a stable dose of an ACE inhibitor or ARB; and in combination with a BB and other recommended therapies, including an MRA.
- Replaces ACE inhibitor (or ARB)
- Monitor renal function, potassium - as per ACE inhibitor
- Closely monitor blood pressure for symptomatic hypotension
- Never prescribe an ACE inhibitor if taking Entresto™ (angioedema)
- When changing from ACE inhibitor to Entresto™, stop ACE inhibitor for 36 hours before starting Entresto™ (angioedema)

DOSAGE

Entresto™ 50mg =
Sacubitril 24mg/ Valsartan 26mg

Entresto™ 100mg =
Sacubitril 49mg/ Valsartan 51mg

Entresto™ 200mg =
Sacubitril 97mg/ Valsartan 103mg

Lancora™ (Ivabradine)

- Indicated for people with stable and symptomatic HF, an EF \leq 35%, in sinus rhythm and with a resting heart rate of \geq 77 beats per minute who:
 - Cannot tolerate a beta blocker; OR
 - Cannot tolerate the full strength of a beta blocker and continue to have a resting heart rate \geq 77 beats per minute.
 - For people already taking a beta blocker and continue to have a heart rate \geq 77 beats per minute, Lancora™ is added to the regimen and does not replace the beta blocker.
- Closely monitor heart rate and rhythm
- Must take medication with food (e.g. breakfast and dinner)
- Cannot take medication with grapefruit juice (>2 fold medication exposure)
- Unlike beta blockers and most calcium channel blockers, Lancora™ does not decrease contractility or reduce blood pressure
- Unlike beta blockers, there is no rebound tachycardia if stopped abruptly
- Lancora™ works by inhibiting the I_f current ("funny" current) in the sinus node to slow the heart rate. People also have an I_f current in their eyes. Some people may experience vision problems such as seeing flashes of light or halos (<5% of people). These are known as *phosphenes* and may disappear over time.

Self-Care Process

Definition	Application
Maintenance	
<p>Adherence to Treatment:</p> <ul style="list-style-type: none"> • Taking medication • Exercise • Dietary advice • Lower risk factors 	<p>What do I need to do to feel well and prevent my heart failure symptoms from getting worse?</p>
Symptom Perception	
<p>Detection of physical change and interpretation of the meaning:</p> <ul style="list-style-type: none"> • Monitoring • Recognition • Interpretation 	<p>What are my early symptoms of heart failure and are they different from my usual pattern?</p>
Management	
<p>Responding to symptoms when they occur:</p> <p>Independent decisions or provider-directed decisions</p>	<p>What do I need to do when my symptoms are changing?</p>

Factors Affecting Self-Care

Domain	Description
Confidence	<p>Self-care confidence is critical to a patient's management of their heart failure.</p> <p>Strategies to improve patient self-care confidence include:</p> <ul style="list-style-type: none"> • Counseling to recognize benefits and help overcome barriers of self-care, • Reinforcing positive behaviours, • Setting mutual and realistic goals, and • Celebrating successes.
Cognitive Status	<p>Subtle cognitive deficits often go undetected but can interfere with learning and problem solving.</p> <p>Consider screening (e.g. MOCA test) for mild cognitive impairment in patients with ongoing challenges with engaging in self-care.</p> <p>Consider underlying subtle delirium if you notice trouble with attention (e.g. infection, recent ETOH, side effects from medications).</p>

Domain	Description
Health Literacy	<p>Patients' ability to understand health and medical issues and directions is related to the clarity of the communication.</p> <p>Health care providers need to be sensitive to the individual factors that may impact health literacy as well as the degree of difficulty of the self-care activity requested (e.g. self-titration of diuretics may be too difficult for many patients).</p>
Emotional Status	<p>Consider screening for symptoms of depression/anxiety in patients with ongoing challenges with engaging in self-care.</p> <p>Consider screening for depression using 2 simple questions from the Patient Health Questionnaire-2.</p>

Domain	Description
Learning Environment	<p>Patients need a safe environment (e.g. not punitive) to explore real or potential situations where self-care is difficult.</p> <p>Patients experience many difficulties despite deliberate attempts to make healthy choices. Watch for "unintentional non-adherence".</p> <p>Common triggers are often tinned soup, processed foods, restaurant food, holiday meals or over-the-counter medications that cause fluid retention (e.g. Ibuprofen).</p> <p>Creative problem solving, cognitive-behavioral strategies and mutual goal setting are necessary.</p>
Learning Over Time	<p>Self-care is a skill and requires practice and learning over time.</p> <p>Let patients know that others have difficulties and encourage them to share concerns and problems.</p> <p>Repeat reinforcement is often necessary in this population.</p>

Domain	Description
Personalization of self-care symptom monitoring and management	<p>Information on 'how' to apply self-care information into daily lives is necessary.</p> <p>Help patients work through their experience and strategies for self-care as opposed to reiterating self-care tasks and recommendations.</p> <p>Teach-back technique has been shown to be effective.</p>
Family Caregivers	<p>Caregivers often provide a substantial amount of support for patient self-care activities and need to be seen as partners in the overall care plan. Their contribution, and involvement to self-care cannot be underestimated.</p> <p>Be mindful of caregiver burden.</p>

Advance Care Planning

Although people living with HF can enjoy a good quality of life, it is a progressive condition and having honest discussions around goals-of-care with patients and their caregivers, including advance care planning are a critical part of patient-centred care.

Unlike cancer, the prognosis for HF is difficult to predict. The trajectory of HF can have periods of relative stability punctuated by periods of decompensation requiring hospitalization.

Goals-of-care discussions and advance care planning should take place early on in the illness trajectory, when patients are well enough to make informed decisions around their wishes.

Too often, these important discussions do not take place until a patient is severely ill and in hospital. Whenever possible, these discussions should be anticipated and undertaken by the health care team that knows the person and not left for acute care providers in an urgent or crisis situation.

People with HF often have multiple care providers and it is important not to assume that another health care provider will, or has, engaged in these conversations.

Discussions should focus on the values and goals of the individual patient – what they find valuable and important in their lives and what they hope for in the future (e.g. attending an important family event). These conversations are dynamic and evolve over time, as they reflect a person’s changing goals and values, and may therefore occur over several visits.*

Care providers are responsible for informing capable patients (or if incapable, the Substitute Decision-Maker) of the expected course of an illness, without conveying false hope, and helping them decide which of the available treatment options are best for them. When making these difficult decisions, clinicians need to support them by verifying their understanding and eliciting their preferences.

*FMPE- The Foundation for Medical Practice Education (2016) Advanced Heart Failure. A Palliative Approach to Care. 24(2). February 2016. www.fmpe.org

Advance Care Planning Resources

Some tools and resources are available to assist care providers with engaging in serious illness conversations, goals-of-care discussions and decision-making.

Advance Care Planning

Speak Up Ontario: www.speakuontario.ca

CPR Decision Aid

To prepare patients and their families for shared decision making about cardiopulmonary resuscitation (CPR), visit the Speak Up Ontario website at www.speakuontario.ca and type “CPR Decision Aid” in the search box.

Canadian Hospice Palliative Care Association

www.chpca.net

Article: Communication about Serious Illness Care Goals: A Review and Synthesis of Best Practices*

This article includes some excellent tips and suggestions, and can be accessed online by visiting: <https://goo.gl/cxR9o5>


Note: In Ontario, an Advance Care Plan is not considered a legal document.

*Bernacki R and Block S. Communication about Serious Illness Care Goals. A Review and Synthesis of Best Practices. *JAMA Intern Med* 2014; 174 (12): 1994-2003.

Notes

Information in this booklet has been guided by the Canadian Cardiovascular Society Heart Failure Guidelines and produced in collaboration with members of the Heart Failure Working Group at CorHealth Ontario. We would also like to acknowledge the contribution of community and primary care nurses who asked key questions and provided valuable feedback to inform the topics addressed in this booklet.

Our Vision:
**The best cardiac, stroke
and vascular care for
all Ontarians.**

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December 2017