HF UPDATE 2017 WORKSHOP

Expanding Knowledge And Awareness In Time For The Coming HF Tsunami

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Dr. Stephanie Poon
Disclosures

**Consulting/Advisory Board:**
Astra Zeneca, Medtronic, Novartis, Servier

**Speaker:**
Boehringer Ingelheim, Medtronic, Novartis, Servier, St. Jude Medical

**Clinical Trials:**
Amgen, Bayer, Boehringer Ingelheim, Medtronic, Merck, Novartis, Servier, Tenax Therapeutics

**Research Grants:**
Novartis
Objectives

1. Recognize the needs of an increasingly prevalent heart failure patient population
2. Employ strategies that enhance heart failure care capacity on the community level
3. Describe the requirements for competency in heart failure patient care.
Stephanie’s Real Life Solutions
Ontario’s Prescription for the HF Tsunami

Stephanie Poon
Assistant Professor
Division of Cardiology

November 19, 2016
Disclosures

Consulting/Advisory Board:
Novartis, Servier

Clinical Trials:
Merck
Toronto Central LHIN Quality Table
(Oct 18, 2013)

- 19,396 heart failure hospitalizations in Ontario each year
- $167 M for heart failure alone
- Highest readmissions within 30 days (21%) = total acute inpatient cost of $38 M
Practice Variation

- Hospitalization rates vary from 39 to 97 per 100,000 residents across LHINs
- Inconsistent use of HF clinics and cardiac rehabs across the province
- Inconsistent access to cardiologists across the province
How do we provide the incentive for change?

**Current State**
- Based on a lump sum, outdated historical funding
- Fragmented system planning
- Funding not linked to outcomes
- Does not recognize efficiency, standardization and adoption of best practices
- Maintains sector specific silos

**Future State**
- Transparent, evidence-based to better reflect population needs
- Supports system service capacity planning
- Supports quality improvement
- Encourages provider adoption of best practice through linking funding to activity and patient outcomes
- Ontarians will get the right care, at the right place and at the right time

**How do we get there?**
- **Strong Clinical Engagement**
- **Current Agency Infrastructure**
- **System Capacity Building for Change and Improvement**
- **Knowledge to Action Toolkits**
- **Meaningful Performance Evaluation Feedback**

*Figure 1: Current and Future States of Health System Funding*
Quality-Based Procedures: Clinical Handbook for Congestive Heart Failure

Health Quality Ontario & Ministry of Health and Long-Term Care

January 2013
A Typical Patient in the Sunnybrook ER:

CASE: MR PB
Case: Mr. PB

- 65M, “hates doctors”
- PMHx: HTN, dyslipidemia, ex-smoker
- Meds: Metoprolol 50 mg BID, Crestor 10 mg OD
- “Flu-like illness” 1 month ago, increasing SOBOE, cough, orthopnea
- Wife drives him to ER
- On exam: BP 116/78, HR 95, SaO2 94%, afebrile
- Labs: Na 134, K 4.5, Cr 142, hsTn-T 34
Q1: Would you admit Mr. PB?

A. No.
B. Depends. If he responds to iv lasix, I might send him home.
C. Yes.
Prediction of Heart Failure Mortality in Emergent Care
A Cohort Study
Douglas S. Lee, MD, PhD; Audra Stitt, MSc; Peter C. Austin, PhD; Therese A. Stukel, PhD; Michael J. Schull, MD, MSc; Alice Chong, BSc; Gary E. Newton, MD; Jacques S. Lee, MD, MSc; and Jack V. Tu, MD, PhD

- To derive and validate a model for acute HF mortality applicable in the ED
- Multicenter study of 86 hospitals in Ontario
- 12,591 patients presenting to the ED from 2004-2007
- Death within 7 days of presentation
### EHMRG 7-Day Mortality Risk Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Units</th>
<th>Additive or Multiplicative Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>y</td>
<td>$2 \times \text{age}$</td>
</tr>
<tr>
<td>Transferred by EMS</td>
<td>If “yes”</td>
<td>+60</td>
</tr>
<tr>
<td>SBP</td>
<td>mm Hg*</td>
<td>$-1 \times \text{SBP}$</td>
</tr>
<tr>
<td>Heart rate</td>
<td>beats/min†</td>
<td>$1 \times \text{heart rate}$</td>
</tr>
<tr>
<td>Oxygen saturation</td>
<td>%‡</td>
<td>$-2 \times \text{oxygen saturation}$</td>
</tr>
<tr>
<td>Creatinine</td>
<td>mg/dL§</td>
<td>$20 \times \text{creatinine}$</td>
</tr>
<tr>
<td>Potassium</td>
<td>4.0 to 4.5 mmol/L</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>$\geq 4.6$ mmol/L</td>
<td>+30</td>
</tr>
<tr>
<td></td>
<td>$\leq 3.9$ mmol/L</td>
<td>+5</td>
</tr>
<tr>
<td>Troponin</td>
<td>$&gt;\text{ULN}$</td>
<td>+60</td>
</tr>
<tr>
<td>Active cancer</td>
<td>If “yes”</td>
<td>+45</td>
</tr>
<tr>
<td>Metolazone at home</td>
<td>If “yes”</td>
<td>+60</td>
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<tr>
<td>Adjustment factor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td><strong>EHMRG score</strong>†</td>
</tr>
</tbody>
</table>

[https://ehmrg.ices.on.ca]

Lee DS et al. *Ann Intern Med* 2012;156:767-775
EHMRG Score: 29.127
Percent probability of 7-day mortality: 1.6%

(https://ehmrg.ices.on.ca)
Heart Failure in ED

Acute HF Risk Category
- HIGH
- INTERMED
- LOW

Substantial clinical improvement?
- Yes or unclear

Observation Unit or CDU

No acute therapy required

Hospital Admission

Consider admission:
- Active ischemia or cTn+ve
- Worsened renal function
- Uncontrolled arrhythmia
- Comorbidity that requires admission
- New HF diagnosis
- Major abnormality of vital signs*

Early follow-up feasible?
- Early follow-up: PCP or cardiologist

Discharge

*Early abnormality of vital signs: SaO2 on room air <91% OR sBP<90-100 mmHg, OR HR >90 bpm OR RR>20 breaths/min

Lee DS and Ezekowitz JA, Can J Cardiol 2014;30:312-9
Phases of the Patient Journey

Figure 7: Phases of the Patient Journey While Hospitalized
Steps 1-2: Acute and Sub-Acute Stabilization

Q2: Which of the following parameter(s) do we need to order for diuretic management and monitoring, as per the CHF QBPs?

A. Daily weights
B. 6 hour input/output
C. Salt restriction (2g/day, low level of evidence)
D. Possible fluid restriction (2L/d)
E. Electrolytes and renal function
F. Chest x-ray
G. All of the above
H. All of the above except for B
Diuretic Monitoring and Management: Acute Phase

Table 14: Diuretic Monitoring and Management—Acute Phase

<table>
<thead>
<tr>
<th>Recommended Practice</th>
<th>Relevant Evidence</th>
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</thead>
<tbody>
<tr>
<td>Recording of:</td>
<td>• Canadian Cardiovascular Society (CCS)</td>
</tr>
<tr>
<td>• Daily weights</td>
<td>• National Institute of Health and Clinical Excellence (NICE)</td>
</tr>
<tr>
<td>• 6-hour input/output</td>
<td>• European Society of Cardiology (ESC)</td>
</tr>
<tr>
<td>• Salt restriction (2 g/day) (low level of evidence)</td>
<td>• Heart Failure Society of America (HFSA)</td>
</tr>
<tr>
<td>• Possible fluid restriction (2 L/day)</td>
<td>• American College of Cardiology/American Heart Association (ACC/AHA)</td>
</tr>
<tr>
<td>• Electrolytes</td>
<td></td>
</tr>
<tr>
<td>• Renal function</td>
<td></td>
</tr>
<tr>
<td>• Chest x-ray</td>
<td></td>
</tr>
</tbody>
</table>
Steps 1-2: Acute and Sub-Acute Stabilization

Q3: Which precipitating factor(s) must we remember to identify according to the CHF QBPs?

A. Non-compliance (medication and dietary)
B. Arrhythmia
C. Ischemia
D. Valvular disease
E. All of the above
F. C and D
Identifying and Treating Precipitating Factors

- Focus on the identification of 2 prognostic indicators that have been shown to correlate with poorer 30-day outcomes of death or recurrent hospitalization:
  - Presence of myocardial ischemia and/or
  - Worsening of valvular heart disease

- Evaluation must also include the application of a risk stratification process, to help clinicians decide whether the patient should undergo cath

- Most patients should be considered for 2D echo for assessment of LV function or underlying valvular disease
Steps 3-4: Discharge Phase and Transitions of Care

- Counselling
  - Medication management
  - Lifestyle (alcohol, smoking)
  - Daily weight and self-monitoring
  - Diet
  - Physical activity
  - Advanced care directives
- Predischarge functional capacity and mobility assessment
- Predischarge cognitive and social support assessment
Step 3-4: Discharge Phase and Transitions of Care

Q5: When should Mr. PB get outpatient follow-up, as per the CHF QBPs?
A. 1 week
B. 2 weeks
C. 4 weeks
D. Only as needed
E. Depends whether follow-up is with primary care or specialist
Step 3-4: Discharge Phase and Transitions of Care

- Primary care or specialty care visit should occur within 2 weeks of discharge
  - Should be followed up by BOTH primary and specialty care providers
- CHF patients discharged from hospital should be referred to a specialized community-based heart failure clinic within 2 weeks of discharge
- Discharge notes should be dictated and sent to primary care (and relevant other) provider(s) within 1 weeks of discharge, but preferably within 48 hours
Performance Measurement:

CCS HF QUALITY INDICATORS
Q6: The CCS HF Quality Indicators include all of these parameters EXCEPT:

- A. Beta-blockers
- B. Creatinine and electrolytes
- C. Chest X-ray
- D. ACE inhibitors/angiotensin receptor blockers
- E. Educational counselling
- F. Recent assessment of LV function
CCS Quality Indicators for HF

- Check *lytes and renal function* daily while patients on iv lasix
- Order a *CXR* as part of initial evaluation
- Prescribe an *ACEi/ARB* during hospital stay or upon discharge, unless a contraindication or known drug intolerance exists
- Need recent assessment of *LV function*
  - If patients don’t have an echo, cardiac MRI, or MUGA within 18 months BEFORE admission date, order one within 30 days from ER visit
- Percentage of patients who are *readmitted within 30 days post-discharge*
- HF patients and family members need at least 1 *educational session*
  - Teach patients to control their Na intake, weigh themselves and to recognize symptoms of worsening HF
  - Provide an algorithm to adjust a patient’s diuretics
Cardiac Care Network HF Working Group

PROPOSAL FOR A PROVINCIAL HF MANAGEMENT SYSTEM PLAN
Hub and Spoke
Integrated Model of HF Care

Spoke: Level 1 heart failure patient care
- Primary care provider, Family health team, programs with home-based services

Community hub: Level 2 heart failure patient care
- Interdisciplinary team in outpatient community setting (e.g. specialty clinic) or located within a community hospital outpatient department

Tertiary node: Level 3 heart failure patient care
- Interdisciplinary specialized team in a clinic located within a hospital with advanced cardiac services

Increasing patient complexity and risk
Minimum Standards

- Support awareness and ability to implement evidence-based HF practice according to the latest guidelines
- Address CCS HF quality indicators, QBP HF performance indicators
- Monitor and evaluate quality and effectiveness of all clinical services within program
- Submit data to CCN provincial registry for purposes of monitoring and improving quality, efficiency, access and equity of care for HF patients in Ontario
CCN Database Requirements (Draft)

1. Demographic information
   - Health card number, date of birth, gender, postal code
2. Referral information
   - Referral date, intake date, hospital discharge date, category of referring provider, primary reason for referral
3. Heart failure-specific
   - LVEF, ejection fraction method
4. Medications
   - ACE inhibitors/ARBs, beta-blockers, MRAs
Q8: Does your heart failure clinic or institution have a database?

A. No
B. I don’t know
C. Yes – but we’re not capturing all of these parameters
D. Yes – we’re capturing all of these parameters