An INSPIRED model of care for patients with advanced COPD

Graeme Rocker
Clinical Improvement Advisor, CFHI
Professor of Medicine, Dalhousie University, NS
Medical Director, INSPIRED COPD Outreach Program

Joanne Young
Clinical Care Coordinator/Team Lead, INSPIRED COPD Outreach Program
Overview

• What INSPIRED a new way of delivering care for patients with COPD?
• An INSPIRED journey - its genesis, aims and outcomes
• INSPIRED ideas for improvement across Atlantic Canada
COPD at the QEII HSC

300 admissions/year

Average length of stay = 10 days

Daily cost to system per day = $1000.00

300 pts x 10 days x $1000.00 = $3,000,000 per year

The IHI Triple Aim is about system designs that simultaneously improve three dimensions:

- Improving the **health of populations**;
- Improving the **patient experience** of care (including quality and satisfaction); and
- Reducing the **per capita cost** of healthcare.
Current system design - unable to meet new needs of those with chronic disease *the “Silver Tsunami”*

System was built to deal with *acute care*, with *short-term* community based follow-up, and while still relevant...

With increasing disability, access to quality care decreases

Need improved community based management of chronic illness better continuity of care *over* long-term
Population Health & Healthcare Use

• COPD: 4\textsuperscript{th} leading cause of death in Canada
• 1 in 4 people > 35 yrs will be diagnosed with COPD in their lifetime
• Acute exacerbations of COPD (AECOPD): most responsible cause of hospital admission in Maritimes
• Patients with COPD: highest use of acute care services
• ON data: 12\% of population, 24\% admissions \textit{Gershon et al 2013}
Atlantic: Quality of care

Grades for COPD Care:
Canadian Lung Association
Canadian Thoracic Society
Costs
Dollars well spent?

Annual cost in NS
$360,000,000

Population: 946,759
Prevalence: 6.3%
Cost per head: $6342
Patient Experience
Comparing COPD & Lung Cancer

Gore Thorax 2000

Calverley, Canadian Respiratory Conference
Halifax, NS, May 2010
Patient Experience

• Increasing recognition of the psychosocial burdens of COPD

• Many patients with advanced COPD are housebound with limited interface with primary care and specialist medical teams

• Prognostic uncertainty of COPD and fears of crushing patients’ hope limits clinicians’ willingness to initiate discussions around advance care planning

• Patients have limited access to teams with expertise in treating “refractory dyspnea” and “dyspnea crises”
**Listen to Patients**

Advanced COPD: Most important elements of end of life care  

<table>
<thead>
<tr>
<th>Patients n=118</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not being kept alive on a ventilator when no meaningful hope of recovery</td>
<td>55%</td>
</tr>
<tr>
<td>Relief of physical symptoms</td>
<td>47%</td>
</tr>
<tr>
<td>An adequate plan of care and health services after after discharge</td>
<td>40%</td>
</tr>
</tbody>
</table>
### Listen to Patients - We Need Integrated models

**Advanced COPD: Top 3 opportunities for care improvements**

Young J, Allan DE, Simpson AC, Heyland DK, Rocker GM. What matters to family carers of patients with advanced COPD. Am J Respir Crit Care Med 2008:A665

<table>
<thead>
<tr>
<th>Caregivers n=37</th>
<th>Need to fix</th>
<th>Patients n=37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know which doctor is the main doctor in charge of your family member’s care</td>
<td></td>
<td>That you not be a physical or emotional burden on your family</td>
</tr>
<tr>
<td>Family member has relief of physical symptoms</td>
<td></td>
<td>An adequate plan of care and health services available to look after me at home after discharge</td>
</tr>
<tr>
<td>An adequate plan of care and health services available to look after him/her at home after discharge</td>
<td></td>
<td>To have trust and confidence in the doctors looking after you</td>
</tr>
</tbody>
</table>
Listen to family caregivers

Loss is a central theme

Social isolation, boredom, relationship tension, fatigue, resentment, restricted personal freedom, anger, helplessness, guilt, depression, difficulty sleeping, anticipatory grieving, loss of self-identity, and PANIC

Simpson AC et al. One Day at a time: Caregiving on the edge….. Int J COPD 2010
Simpson AC, Rocker GM. Advanced COPD: Rethinking models of care. QJMEd 2008
The downward spiral of COPD
(patients and caregivers)

VULNERABILITY
Research findings:

- Reluctance to prescribe opioids  
  Rocker et al. CMAJ 2012

- Highly unpredictable disease trajectory challenges timing of traditional palliative care interventions

- Poor communication about goals; crisis decision-making

- Many patients/caregivers fail to appreciate that COPD is a life threatening disease - normal aging  
  Pinnock at al BMJ 2011

- Dying at home may be neither a reality nor best option for most (COPD IMPACT trial – Horton, Rocker et al, J Palliat Med 2013)
An Outreach Program for Patients and Families living with Advanced Chronic Obstructive Pulmonary Disease

Implementing a Novel and Supportive Program of Individualized care (for people with) Respiratory Disease
INSPIRED Mission

The INSPIRED program will provide exemplary individualized needs-based interdisciplinary support across care transitions for patients and families living with COPD
INSPIRED Objectives/Measures

• **Improve self-management and care planning** via education, provision of action plans, facilitation of ACP, psychosocial/spiritual support, and liaison with supportive health and community services/professionals for patients with AECOPD who live within the Halifax Regional Municipality.

• **Improve patients’ health-related QoL** Chronic Respiratory Questionnaire (CRQ), Hospital Anxiety and Depressions Scale (HADS), and the Herth Hope Index (HHI).

• **Reduce ER visits and admissions for AECOPD** Record use of acute care services (LOS) both pre- and post-program enrollment.

• **Improve care and outcomes during EHS transfers/ER** Reduce incidence of oxygen related hypercarbia.
Evidence or what works?
Canadian Data: Education/Self Management

*Borbeau et al. Arch Intern Med 2003*

<table>
<thead>
<tr>
<th>Usual Care</th>
<th>n=95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in admissions 40%</td>
<td></td>
</tr>
</tbody>
</table>

- Projected cost savings at QEII: $1.2 million
- Hospital days (LOS): Down 40% (500 fewer days at $1000)
  - $0.5 million
COPD: Disease Management
A Randomized Controlled Trial

Baseline Characteristics
Overall (n=743)
Age
LE 70 (n=351)
GE 70 (n=392)
Current Smoker
No (n=575)
Yes (n=165)
Percent Predicted FEV1
LT 40% (n=336)
GE 40% (n=307)
Hospitalized for COPD in Past Year
No (n=655)
Yes (n=278)
ED Visit for COPD in Past Year
No (n=330)
Yes (n=413)
Systemic Steroid Use for COPD in Past Year
No (n=332)
Yes (n=407)
Current Home Oxygen Use
No (n=231)
Yes (n=409)
Current Steroid MDI Use
No (n=311)
Yes (n=432)
Current LABA or LAAC Use
No (n=311)
Yes (n=432)
Site
Des Moines (n=128)
Iowa City (n=62)
Minneapolis (n=272)
Omaha (n=204)
Sioux Falls (n=77)

Rice et al Am J RCCM 2010;182:890
INSPIRED: Evidence-based interventions

• Hosp/home-based support early discharge support

• Education based on need (patient and family focus)

• Written action plans (per CTS) for COPD exacerbations - self care

• Written action plans for “Dyspnea Crises” – video

• ACP/Written advance directive/DNR orders
INSPIRED at the QEII HSC:

Critical early funding and support for concept

- QEII Foundation $10,000
- CDHA Innovation Fund $25,000
- ACCP 2009 Roger Bone Award $10,000
- Rocker matched funding $10,000
- Industry partnership (GSK) $60,000 over 2 yrs
- Support from DOH, Exec, Medicine, managers

This enabled Medical Director (GR) to fund an RT “Team Lead” to pilot INSPIRED from July 2010 – July 2011.
# Implementing INSPIRED

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phases 4/5</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Approve concept</td>
<td>• Continue to identify stakeholders/create linkages</td>
<td>• Launch pilot Sept 2010</td>
<td>• Expand at QEII (to ER) and beyond QEII (DGH)</td>
</tr>
<tr>
<td>• Secure funding for pilot</td>
<td>Family Medicine Respirology 8.2, 8.4, ER, Pulm Rehab (charge RNs, key clinicians NS Continuing Care LANS Lung Health Strategy CDHA exec Dept. Health</td>
<td>• Enroll eligible patients</td>
<td>• Tackle patients with multiple ER visits (Have data)</td>
</tr>
<tr>
<td>• Secure RRT coordinator</td>
<td></td>
<td>• Monitor efficacy including satisfaction and resource utilization</td>
<td>• Oxygen policies</td>
</tr>
<tr>
<td>• Set up documentation (clinical and research), order equipment</td>
<td></td>
<td>• Launch revised pilot Feb 2011</td>
<td>• Rapid response team for patient who presents to ER</td>
</tr>
</tbody>
</table>
The road to acute care...

Arrive ER in crisis
Long Length of stay

Discharged back to broken system
Off the radar

Poor knowledge of disease; little to no support
Don’t want to burden others
Symptoms worsen (denial, panic) and no plan in place
The Program (the mechanics of it all)

In hospital: consent, optimize treatments, link with staff, action plan(s) written

Home visits (≈4) every 2 weeks: assessment, education, review action plan(s), support, ACP

Pre-evaluation phone interview/questionnaires

Advantages:
- Cross sector communication
- Expertise
- Focused (lean)
- Evaluation (QA)

Post-evaluation Repeat measures Follow admin data

Follow up call monthly for 3 months
New Patient and Caregiver Journey

Admitted to QEII

Contacted by INSPIRED coordinator early

Discharged (if possible a ↓ LOS) early post-discharge f/u

Clinical f/u from INSPIRED (home visits/calls)

Existing primary care services and programs (coordinate)

Success = ↓ ED visits, admissions, LOS
Action Plan for Shortness of Breath (dyspnea)

Created for: [Patient Name +/- ID number]
Date: [Insert date plan was created]

A good morning routine to minimize shortness of breath first thing in the morning:

- Take 5 breaths from your incentive spirometer (slowly open airways). Use 4 times daily as needed
- Huffing/cough to clear your airway. Do your pursed-lip breathing if this helps
- Use your blue puffer, gray inhaler, and purple puffer as directed (don’t forget to use your Aerochamber and rinse after your purple puffer). Your blue puffer may be used as often as every four hours as needed
- Take your long-acting opioid medication [insert name, dose] as directed

When more short of breath than usual:

- With a slight increase in your shortness of breath at rest (not a result of infection or “crisis”), you can use an extra [insert dose] of your opioid syrup every 1-2 hours as needed for “breakthrough” dyspnea between your regular doses
- For predictable shortness of breath with activity (i.e. getting up, dressed, bathed), time these activities ½ hour after your puffers and opioid dosing

For “crisis” shortness of breath (that is not due to infection) comes on suddenly, catches you by surprise:

- Use your hand-held fan and do pursed-lip breathing. Try recovery positions
- Use 2 puffs of your blue puffer (with Aerochamber) or try your nebub; instead
- Adjust oxygen flow from ___ to ___ liters/minute for 10-15 mins only then re-adjust back to ___
- Take your anti-anxiety medication [insert name, dose], 1 tablet under the tongue
- If not settling, use Fentanyl, 12.5 mcg from pre-prepared syringe. Let liquid dissolve under the tongue. Repeat in 10 mins if still not settling and call 911

For flare ups of COPD with increased sputum volume and mucky colour, use antibiotics and prednisone at your COPD action plan.
Action Plan for Dyspnea and Dyspnea Crises

• Best of conventions medical management (puffers, breathing techniques, relaxation strategies)
• Education re: anti-anxiety medications if appropriate
• Hand-held fan, education around oxygen adjustment and risk
• Education re: management of “refractory dyspnea” (not related to infective exacerbation)
  – Long-acting opioids for persistent dyspnea
  – Short-acting opioids for “breakthrough” (like pain mgmt)
  – Preemptive dosing for predictable dyspnea
  – Fast-acting Fentanyl for sudden “dyspnea crises” (avoid ED)
Advance Care Planning

Ultimate goal: “best care possible” (including end-of-life care)

An organized process of communication to help an individual (and “family”) understand, reflect upon, and discuss goals, values, and beliefs for her/his future care (including healthcare decisions)
Experience: ACP in INSPIRED

• Critical element of program
• Builds on trust established by the team; communication about “goals” is part of the INSPIRED care process from outset
• Welcomed, sense of relief, breaking the silence
• Tackles Lack of quality (or any) ACP
  • Code status discussions in ER
  • Barriers (MDs & others)
Patient Experience

“\(I\) used to feel so alone with my illness, now people check on me and I know there’s someone I can call if I’m having a problem. I would feel so much more isolated, frustrated and apprehensive without this support.”
Outcomes (mixed methods)

Qualitative interviews suggest that participants greatly appreciated the program and felt:

• more confident in managing COPD-related symptoms
• less anxious/stressed, and
• willing to discuss goals of care including those related to end-of-life

Quantitative: CRQ, HADS, Herth Hope Index revealed no statistical change pre/post
Care Transition Measure

15 questions, Scored 1-4, scaled to a percentage, max Score 100%

\[ p < 0.0001 \]

<table>
<thead>
<tr>
<th>Label</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>N</th>
<th>N Miss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Care Transition Score</td>
<td>71.00</td>
<td>25.00</td>
<td>96.00</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Post Care Transition Score</td>
<td>83.00</td>
<td>69.00</td>
<td>100.00</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>12.00</td>
<td>-3.00</td>
<td>75.00</td>
<td>27</td>
<td>0</td>
</tr>
</tbody>
</table>

No change in CRQ, HADS, Herth Hope index
ED, admission data, length of stay
6 month pre/post data

<table>
<thead>
<tr>
<th></th>
<th>Pre-INSPIRED n=89</th>
<th>Post-INSPIRED n=89</th>
<th>Cost ‘savings’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 /12</td>
<td>6/12</td>
<td></td>
</tr>
<tr>
<td>6 /12 (n, % reduction)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED visits</td>
<td>173</td>
<td>66</td>
<td>-107 (62%)</td>
</tr>
<tr>
<td>Admissions</td>
<td>107</td>
<td>37</td>
<td>-73 (68%)</td>
</tr>
<tr>
<td>Bed Days</td>
<td>1129</td>
<td>382</td>
<td>-749 (66%)</td>
</tr>
</tbody>
</table>

Cost savings at 6 months ≈ 3x annual program costs
INSPIRED at the QEII HSC:

- Over 160 patients on the books
- Ongoing analyses: ~75% reductions ER visits and admissions (bed days)
- Proof of concept completed/successful
- Commended at Province House Apr 2012
- Ever increasing media coverage
- Expanding – Dartmouth (Apr 2012), talk in Truro (Jun 2012), Windsor area exploring
- Province-wide/National Initiative?
INSPIRED - Keys to Success

Critically important that first local COPD initiatives be focused, not too broad in scope and begin with:

– Experienced, committed, clinical/evaluation team,
– Plan that is feasible to implement,
– Goals that are achievable, and
– Vision to extend services to a broader population (ie: those at risk of disease and in need with milder COPD), but only after program well established.
Identifying who may benefit most:

**Clinical markers**

- advanced (severe) COPD
- moderate COPD with frequent use of acute care
- ICU admission for AECOPD

**Follow-up post-AECOPD - ++ opportunities**

- near death experience for some
- reflections on events leading up to ED visits and admission
Unexpected Outcomes:  Mentioned in several obits

Early fruit and goody basket rate
25%

Reaching the third generation
Beyond INSPIRED to Central Health

• Joining a collaborative
• (Atlantic – CFHI)
• Initial ideas
• Local landscape
  – data
  – processes
Central Health (phase II)

Local Landscape  “Super-users”
> 2 admissions/year

JPMRHC, CNRHC (both ~100 beds)
- 14 patients, 42 admissions, 488 bed days
- 22 patients, 54 admissions, 532 bed days

36 patients, 96 admissions, 1020 bed days
$1,200,000 well spent??????
Central Health (next steps)

Quick Wins (2013)

– Create Standing orders (use best available across Canada)
– Educate Clinicians re underused resources, value of www.COPDguidelines.ca, action plans
– Automatic referrals for COPD admissions to RRTs
– Effective discharge plans (not just plans to discharge)
Beyond INSPIRED in Capital Health

• Assessing the feasibility of implementing an integrated chronic disease prevention and management strategy at Capital Health
  – Integrating and enhancing CDPM strategies in Capital Health
  – 4 CDPM services in Capital Health (Community Health Teams, Diabetes Management Centres, INSPIRED COPD Outreach Program, Integrated Chronic Care Service)
  – Two-phased approach
Two-phased approach at CDHA

Phase I Review and analyze current status and identify opportunities to integrate and enhance 4 services

- Process Mapping

Phase II Implement changes in 4 services and plan for organization wide adoption

- Reduce duplication/redundancies
- Common referral sources, outcome measures
# Six Sigma Methodology – DMAIC

<table>
<thead>
<tr>
<th>PHASES</th>
<th>DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEFINE</strong></td>
<td>Problem, voice of the customer, project goals</td>
</tr>
<tr>
<td><strong>Problem</strong>: An operational model to guide the integration and coordination of service delivery across the spectrum of chronic illness.</td>
<td></td>
</tr>
<tr>
<td><strong>Project goals</strong>: 1) To develop and implement an operational model of CDPM service integration across the 4 services 2) To develop a plan for organization wide adoption based on this model</td>
<td></td>
</tr>
<tr>
<td><strong>MEASURE</strong></td>
<td>SIPOC Diagram – to define a complex project that is not well scoped. Identify all relevant elements of a process improvement project before work begins</td>
</tr>
<tr>
<td><strong>Baseline Data</strong>: Getting to know the services, alignment with standards, standardized baseline data compilation for each service</td>
<td></td>
</tr>
<tr>
<td><strong>Voice of the customer</strong> – Patient survey (4 services and patients with multimorbidities), physician surveys</td>
<td></td>
</tr>
<tr>
<td><strong>ANALYZE</strong></td>
<td>Opportunities for each service to align, improve and integrate</td>
</tr>
<tr>
<td><strong>Opportunities across services to integrate</strong></td>
<td></td>
</tr>
<tr>
<td><strong>IMPROVE</strong></td>
<td>Improve current state based on analysis and identify / create a new future state for the 4 services</td>
</tr>
<tr>
<td><strong>Pre – post measures based on current state and future state review</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CONTROL</strong></td>
<td>Future state process, control systems</td>
</tr>
</tbody>
</table>
“A person who never made a mistake never tried anything new.”
Albert Einstein