CTS **Choosing Wisely** Workshop:

An Overview of De-implementation Activities Across Canada and CTS' Choosing Wisely Recommendations

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Chair, Canadian Respiratory Guidelines Committee
Chair, CTS Choosing Wisely Working Group

Choosing Wisely Canada

CANADIAN THORACIC SOCIETY

Disclosure of Conflict of Interest (over the past 2 years)

Samir Gupta

☑ I have no conflict of interest.

The Plan

- Some background on Choosing Wisely and the CTS list
- 3 real-world examples of de-implementation projects from around Canada
- A focus on how to improve use of diagnostic spirometry for airways diseases
- Breakout sessions on barriers/enablers and possible implementation strategies for spirometry in primary care
- Large group discussion

Knowledge Translation

- Gaps between research evidence and clinical practice lead to practice variation

- Conventionally, we conceive of these as care gaps: gaps between "what we ought to do" and "what we do"
  - Almost half of patients do not get treatments of proven effectiveness

Schuster Milbank Q 1998
McGlynn NEJM 2003

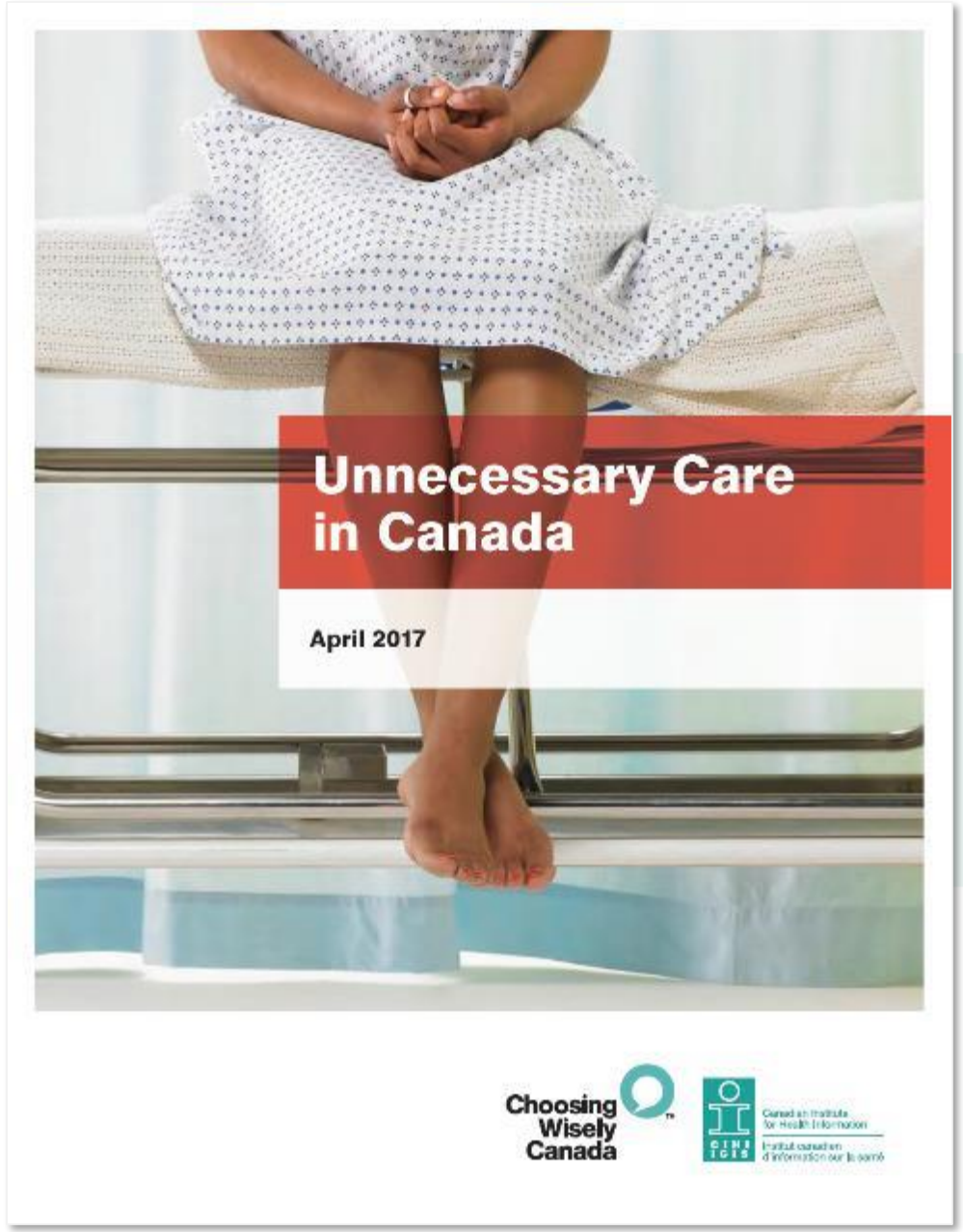
Overuse

- However, there are also compelling gaps between what we “ought *not* to do” and “what we do”
  - Up to a quarter of patients get care that is not needed or potentially harmful

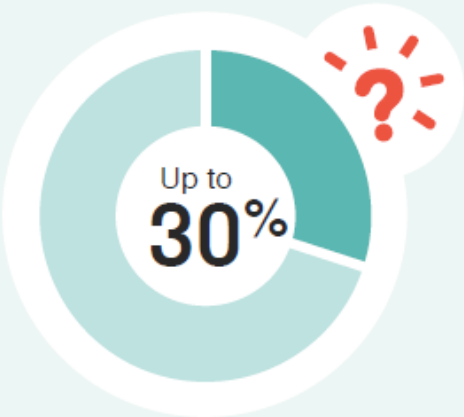
McGlynn NEJM 2003

  - Almost a third of medical tests, treatments and procedures in Canada are potentially unnecessary
    - Amounts to >1 million potentially unnecessary medical tests and treatments every year

Unnecessary Care in Canada, CIHI 2017



The report found that up to 30% of the tests, treatments and procedures associated with the 8 selected CWC recommendations are potentially unnecessary.



Choosing Wisely Canada is the national voice for reducing unnecessary tests and treatments in health care.

History

- Choosing Wisely® 2012 in US; 80 medical societies; 500 recommendations
- Choosing Wisely Canada 2014; 70 societies; 325+ recommendations
- Now over 20 countries

Choosing Wisely™

- Premise:
  - Unnecessary tests and treatments expose patients to harm, lead to more testing to investigate false positives, and strain resources

Facets of the Choosing Wisely Initiative

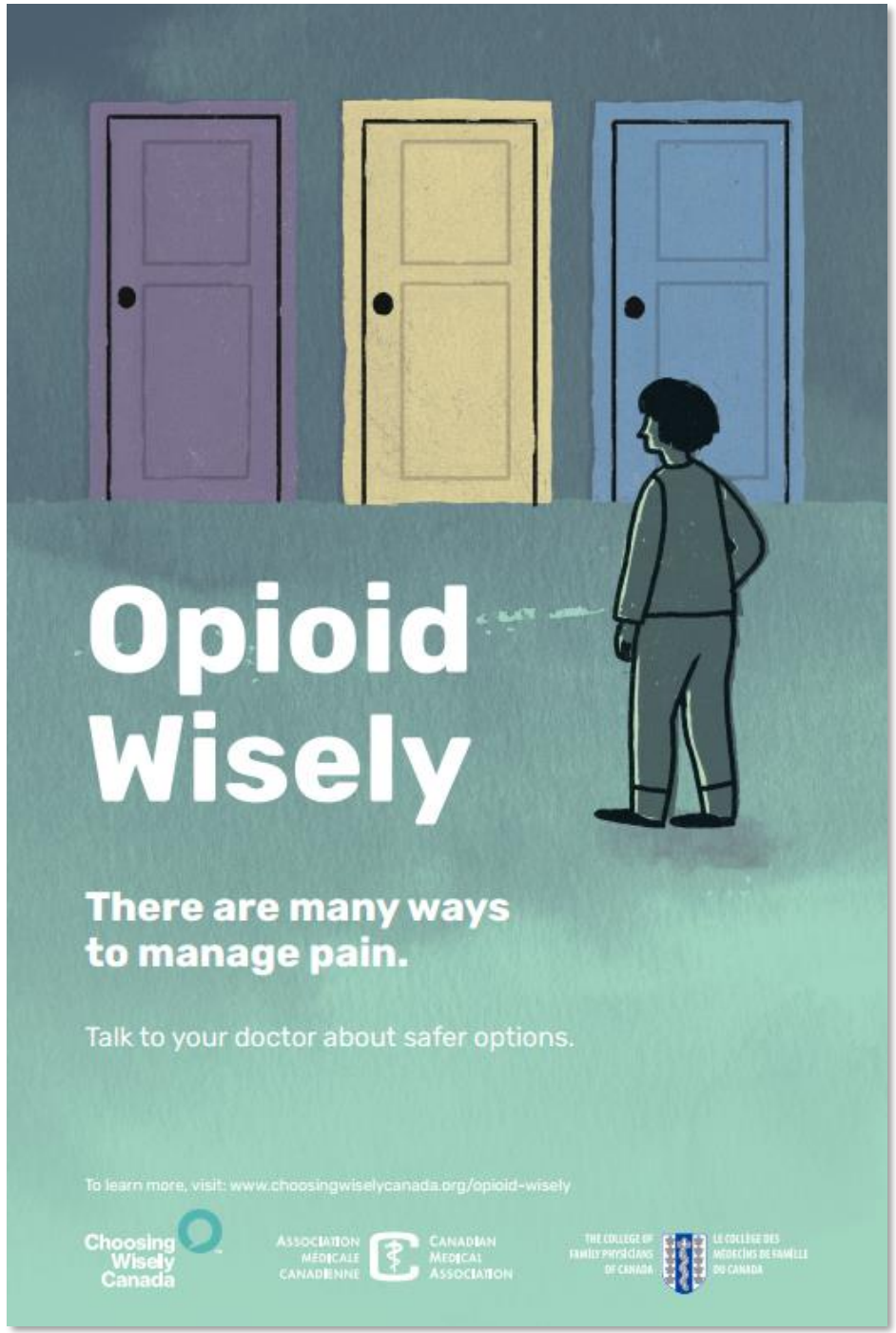
Clinicians	• Societies develop and disseminate lists
Patients	• Develop and disseminate patient materials
Medical education	• Mobilize students and trainees • Integrate resource stewardship as a core competency
Implementation	• Support adoption of recommendations in care settings
Measurement	• Measure rates of overuse and build research capacity

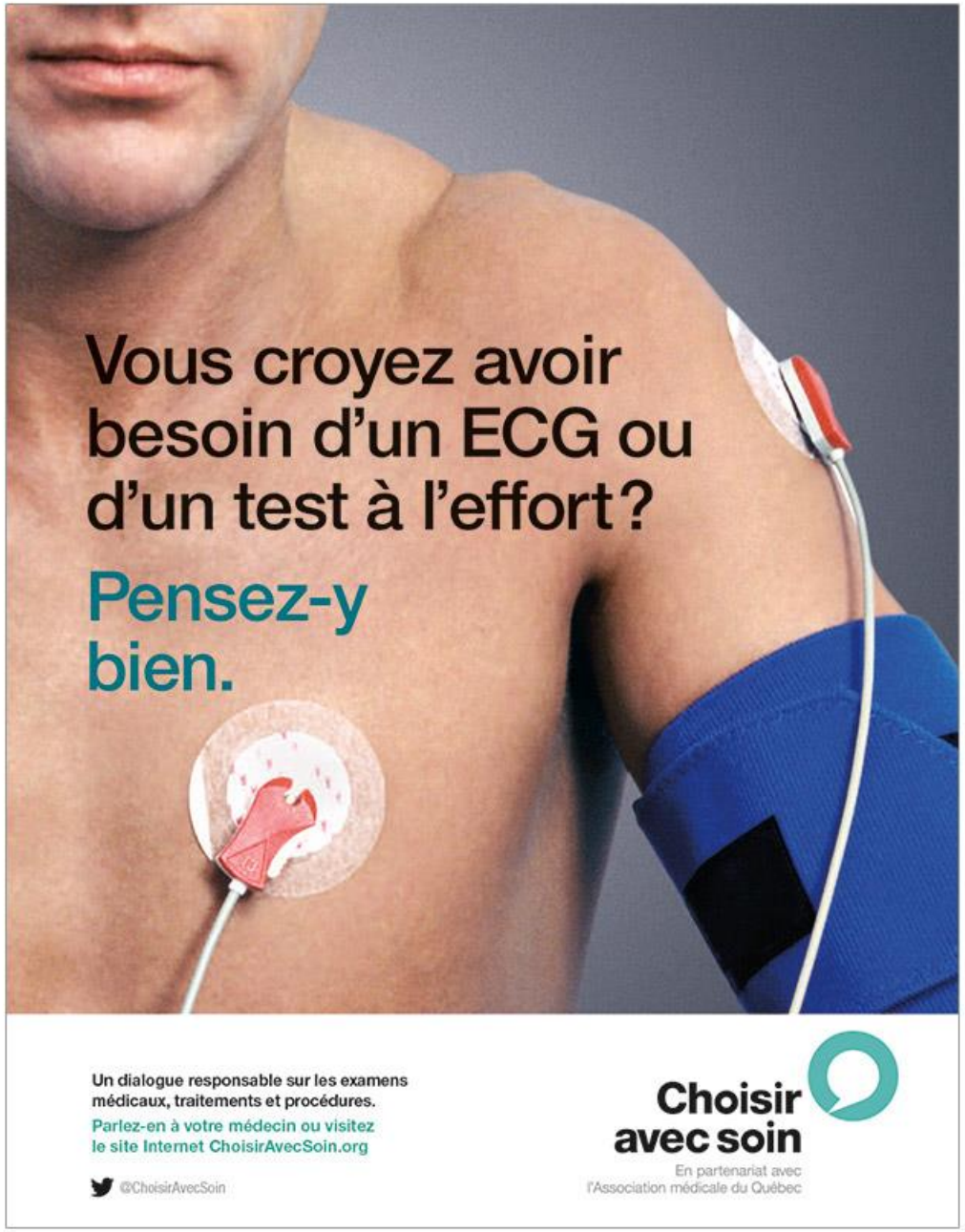
MORE IS NOT ALWAYS BETTER

www.ChoosingWisely.ca


Choosing Wisely Canada
WHY GIVE TWO WHEN ONE WILL DO?
(CSTM#2)
Make Choosing Wisely your next improvement project.
Join the campaign to prevent 10 million unnecessary tests and treatments by 2020.


Sorry, but no amount of antibiotics will get rid of your cold.


Opioid Wisely
There are many ways to manage pain.
Talk to your doctor about safer options.
To learn more, visit: www.choosingwiselycanada.org/opioid-wisely
Choosing Wisely Canada
Association médicale canadienne
Canadian Medical Association
The College of Family Physicians of Canada
Le Collège des médecins de famille du Canada


Vous croyez avoir besoin d'un ECG ou d'un test à l'effort?
Pensez-y bien.
Un dialogue responsable sur les examens médicaux, traitements et procédures.
Parlez-en à votre médecin ou visitez le site Internet ChoisirAvecSoin.org
@ChoisirAvecSoin
Choisir avec soin
En partenariat avec l'Association médicale du Québec

FOUR QUESTIONS
TO ASK YOUR DOCTOR

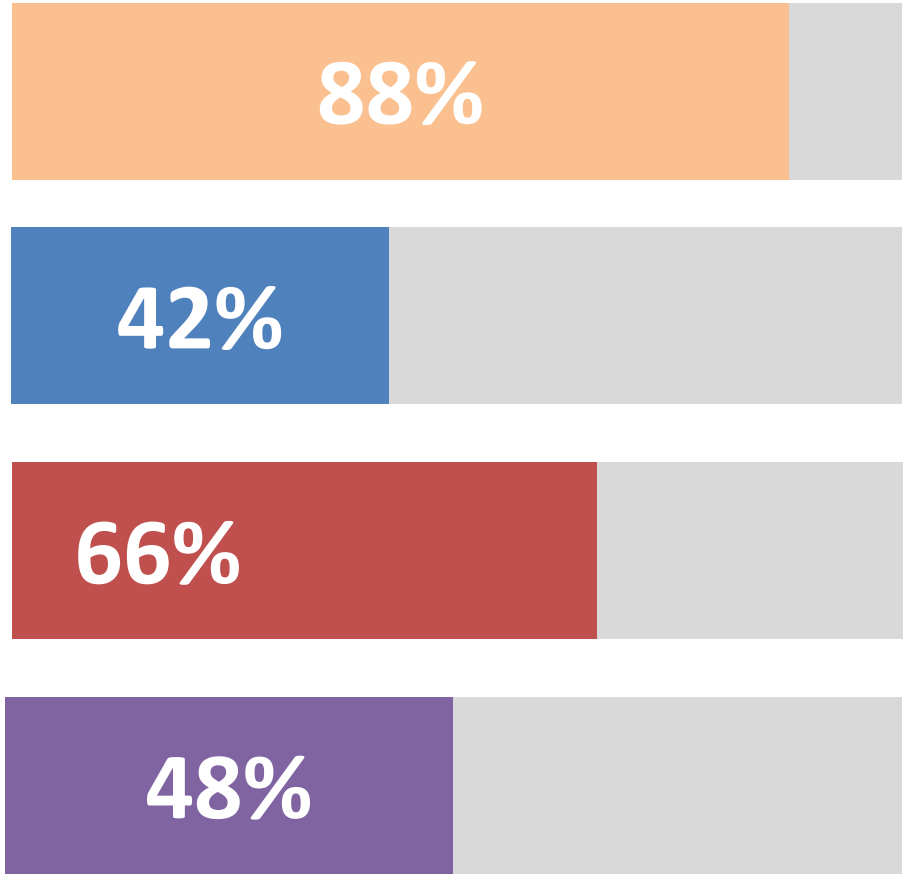
1) Do I really need this test, treatment or procedure?

2) What are the downsides?

3) Are there simpler, safer options?

4) What happens if I do nothing?

Physician Attitudes



Aware of CWC

Use lists in daily practice

Patients need tools to make informed decisions

MDs require more tools to help make decisions

CMA e-Panel Disseminated November 2016

Canadian Thoracic Society

- The Canadian Thoracic Society (CTS) produces clinical practice guidelines across respiratory diseases

- In 2015, the CTS launched an evidence-based process to develop its Choosing Wisely list

SOCIÉTÉ CANADIENNE DE THORACOLOGIE

CANADIAN THORACIC SOCIETY

CTS's Choosing Wisely List – The Process

- Established a CTS CW "core" task force (5 members) and TF (CRGC + core TF = 19 members)
  - Lit review of other international societies' approaches (17 societies)

CTS's Choosing Wisely List – The Process

- Established Criteria for Selection and Prioritization:
  - Risk/cost-benefit suggests that the practice should be reduced
  - The evidence base is strong
  - The practice is common
  - The practice is modifiable by individual physicians (i.e. change is within the control of individual physicians)
  - The practice falls within the domain of practices performed by respirology
  - Prioritize harm above cost (i.e. avoiding harm is more important than reducing cost)
  - Prioritize recommendations that are relevant to practice across the country, as opposed to only in certain regions
  - After above factors, consider how easily adherence to the recommendation can be measured

Gilwa JAMA 2015

CTS's Choosing Wisely List – The Process

List of Prospective Recommendations:

- Existing US and Canadian CW recommendations
  - 33 recommendations across 16 societies related to respiratory disease

- IAMs ratings from ~1000 POEMs sent to CMA membership (2012-2015)
  - ≥ 10% respondents chose:
    - "This information will help to avoid unnecessary or inappropriate treatment, diagnostic procedures, preventative interventions or a referral, for this patient"
    - 9 related to respiratory disease

Grad JABFM 2015

- Presented list (42 recommendations) to TF members, clinical assembly members (i.e. guideline writers), CTS executive (120 members total)
  - 15 additional recommendations received

- Removed exact/similar duplicates (40 recommendations remained)

CTS's Choosing Wisely List – The Process

Selection and Ranking

- eDelphi 1: list of 40 recommendations to Task Force (19 members)
  - Choose top 10 and rank
  - Top 20 by rank score used in next round

- Membership stage: list of top 20 recommendations to CTS membership (625 members)
  - Response rate 158/625 (25.3%)
  - Choose top 10 and rank
  - 14 additional recommendations received
  - Top 10 by rank score + 8/14 relevant additions (18 recommendations) used in next round

- eDelphi 2: list of 18 recommendations to Task Force (19 members)
  - Choose top 10 and rank
  - Vetted with corresponding assembly chairs where relevant
  - Top 10 by rank score used in next round

CTS's Choosing Wisely List – The Process

- For each remaining top 10 recommendation, core TF prepared a narrative review of:
  - Evidence cited for an identical recommendation by another society (if applicable)
  - Evidence-based guidelines (Canadian > International)
  - Systematic reviews
  - Individual studies
- 2/10 recommendations had limited evidence
  - CADTH (Canadian Agency for Drugs and Technologies in Health) Rapid Response Report commissioned

CTS's Choosing Wisely List – The Process

- eDelphi 3: list of 10 recommendations and evidence reviews to Task Force (19 members)
  - Choose top 5 and rank
  - Top 6 by rank score kept

- Approved by CTS executive, CWC, other society leads
- Translated

Choosing Wisely Canada™
In partnership with the Canadian Medical Association

SOCIÉTÉ CANADIENNE DE THORACOLOGIE | CANADIAN THORACIC SOCIETY

Six Things Physicians and Patients Should Question

1 Don't initiate long-term maintenance inhalers in stable patients with suspected COPD if they have not had confirmation of post-bronchodilator airflow obstruction with spirometry.

A diagnosis of COPD should be considered in any patient who has dyspnea, chronic cough, and/or sputum production and an appropriate history of exposure to noxious stimuli. However, not all patients with these symptoms have COPD, and a spirometry demonstrating a post-bronchodilator forced expiratory volume in one second to forced vital capacity (FEV1/FVC) ratio < 70% (or less than the lower limit of normal, if available) is required to make a definitive diagnosis. Starting maintenance inhalers without first objectively diagnosing COPD results in unnecessary treatment in those patients who do not actually have the disease. In turn, this exposes these patients to both the side-effects and the cost of these medications, and might delay the appropriate diagnosis.

2 Don't perform CT screening for lung cancer among patients at low risk for lung cancer.

CT scan screening has no proven benefit in patients who are not at high risk for lung cancer, regardless of age, smoking history or other risk factors. Low dose chest CT screening has been found to reduce lung cancer mortality in a well-defined population of patients at high risk for lung cancer, defined by age 55-74, at least a 30-pack year history of tobacco use, and smoking within the last 15 years. However, screening is also associated with several harms, including false-negative and false-positive results, incidental findings, overdiagnosis (detecting indolent and clinically insignificant tumors that would not have been detected in the patient's lifetime without screening), and cumulative exposure to radiation (which can cause cancer). Screening also leads to unnecessary anxiety and invasive procedures, which carry their own complications. Accordingly, it should not be used in patients who do not meet these strict criteria, nor in patients with a health problem that substantially limits life expectancy or the ability or willingness to have curative therapy.

3 Don't perform chest computed tomography (CT angiography) or ventilation-perfusion scanning to evaluate for possible pulmonary embolism in patients with a low clinical probability and negative results of a highly sensitive D-dimer assay.

The majority of adults with chest pain and/or dyspnea do not have a pulmonary embolism (PE). There is strong evidence that in patients with low pre-test probability as determined by a clinical prediction rule (e.g., Wells score), a negative highly sensitive D-dimer assay effectively excludes clinically important PE. Furthermore, there are potential harms to performing CT pulmonary angiography (CTPA) or ventilation-perfusion (V/Q) scanning, including exposure to ionizing radiation, adverse events due to the administration of intravenous contrast, and identification of clinically insignificant PE leading to inappropriate anticoagulation. However, physicians should exercise clinical judgement in populations in whom this two-step algorithm has not been validated (e.g., pregnant patients).

4 Don't treat adult cough with antibiotics even if it lasts more than 1 week, unless bacterial pneumonia is suspected (mean viral cough duration is 18 days).

The majority of adults with a short duration of cough from an acute respiratory tract infection have a viral rather than a bacterial infection. Patients often underestimate the typical cough duration from an infectious illness, and when cough does not resolve within their expected time frame, may request antibiotics. The average duration of cough (not treated with antibiotics) is around 18 days, though patients only expect to cough for 5 to 7 days. Use of immediate or delayed antibiotics does not change clinical outcomes compared to no antibiotics in these situations. On the other hand, the harms of over-prescribing antibiotics include medication costs, adverse reactions, and the possibility of inducing bacterial resistance to antibiotics. Physicians should educate patients about the expected duration of cough and the consequences of inappropriate antibiotic use in acute respiratory tract infections.

Last updated June 26, 2017

5 Don't initiate medications for asthma (e.g., inhalers, leukotriene receptor antagonists, or other) in patients ≥ 6 years old who have not had confirmation of reversible airflow limitation with spirometry, and in its absence, a positive methacholine or exercise challenge test, or sufficient peak expiratory flow variability.

Although international guidelines uniformly recommend objective testing to establish an asthma diagnosis, this diagnosis is often made clinically and asthma medications are often initiated on that clinical basis. However, physical exam findings and symptoms such as cough, wheeze, and/or dyspnea can be caused by other conditions. As a result, up to one third of patients who have been diagnosed with asthma do not have evidence of asthma when objectively tested with pulmonary function tests. A false clinical diagnosis of asthma may delay diagnosis of the actual underlying condition, which may include serious cardiorespiratory conditions. Furthermore, patients with a false diagnosis of asthma who are started on asthma medications are unnecessarily exposed to both the side-effects and the costs of these medications. It should be noted, however, that this recommendation may not be applicable in patients who cannot reproducibly undergo objective testing for asthma (including children less than 6 years old), and in settings where such testing is not available.

6 Don't use antibiotics for acute asthma exacerbations without clear signs of bacterial infection.

Asthma exacerbations are characterized by decreased expiratory airflow as well as increased shortness of breath, cough, wheezing, chest tightness, or a combination of these symptoms. When such an attack is precipitated by an infection, it is much more likely to be viral than bacterial. The role of bacterial infection is often overestimated; however antibiotics should be reserved for relatively rare cases in which there is strong evidence of a bacterial infection, such as pneumonia or bacterial sinusitis. Potential harms of unnecessary antibiotic treatment include medication costs, side-effects (including a risk of allergy), and emergence of bacterial resistance.

How the list was created

The Choosing Wisely Canada top six list in respiratory medicine was developed by the Canadian Thoracic Society (CTS) through an iterative consultation process with CTS content experts and its members. A list of candidate recommendations was developed through: 1) consultation with the CTS Choosing Wisely Core Task Force (5 members), all CTS guideline writers, and the CTS Executive Committee; 2) retrieving respiratory-related choosing wisely recommendations in existing US and Canadian lists; and 3) selecting all Canadian Medical Association (CMA) POEMs™ (Patient-Oriented Evidence that Matters) between 2012-2015 that were considered to "help to avoid unnecessary or inappropriate treatment, diagnostic procedures, preventative interventions or a referral" by ≥ 10% of readers [in the Information Assessment Method (IAM) rating tool]. The CTS Choosing Wisely Task Force (comprised of the CTS Choosing Wisely Core Task Force and the CTS Canadian Respiratory Guidelines Committee; 19 members) then selected and prioritized 20 of these recommendations based on pre-established criteria, through an electronic Delphi process. These 20 recommendations were then sent to the entire CTS membership for selection and prioritization of the top 10 recommendations, along with a solicitation for new ideas. A second electronic Delphi process with the CTS Choosing Wisely Task Force narrowed this list to a final top 10. The CTS Choosing Wisely Core Task Force then performed a narrative literature review for each of these recommendations, focusing on similar prior Choosing Wisely recommendations, guideline recommendations, systematic reviews, and individual studies. The results of this review were presented to the CTS Choosing Wisely Task Force in a 3rd electronic Delphi process, in which they were asked to select and prioritize the top 5 recommendations. Given that scores between the 5th and 6th rated recommendations were close, 6 recommendations were adopted. These recommendations were approved by the CTS Executive Committee and will be broadly disseminated to our membership, other professional groups, and the general public.

Choosing Wisely and The CTS

- Some (de-)implementation examples from the field…

- Sachin Pendharkar
  - Order Set to reduce unnecessary care in COPD
- Samir Gupta
  - Order Set to reduce unnecessary care in COPD (!)
- Tom Kovesi
  - System-level change to reduce unnecessary PFTs in asthma

Sachin Pendharkar

Samir Gupta

Admission Order Sets and CPOE: Knowledge Translation and De-Implemention in COPD

Samir Gupta, MD, FRCPC
Michael Locke Term Chair in Knowledge Translation
and Rare Lung Disease Research

Admission Order Sets as a KT Intervention

- Guideline implementation most effective when information delivered at the time and place of consultation
  - Just-in-time
  - Point-of-care

Grimshaw Lancet 1993

- Pre-formatted order sets - a template for care based on best evidence:
  - Diagnostic tests
  - Medications
  - Referrals

Care Gaps in AECOPD

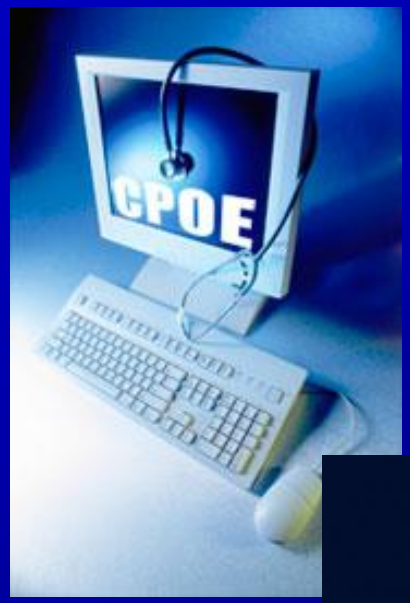
- US: ~70 000 exacerbations, 360 hospitals
  - 66% received basic set of recommended care
  - 45% received at least 1 non-recommended practice

Lindenauer Annals 2006

St. Michael's Hospital Order Sets Program

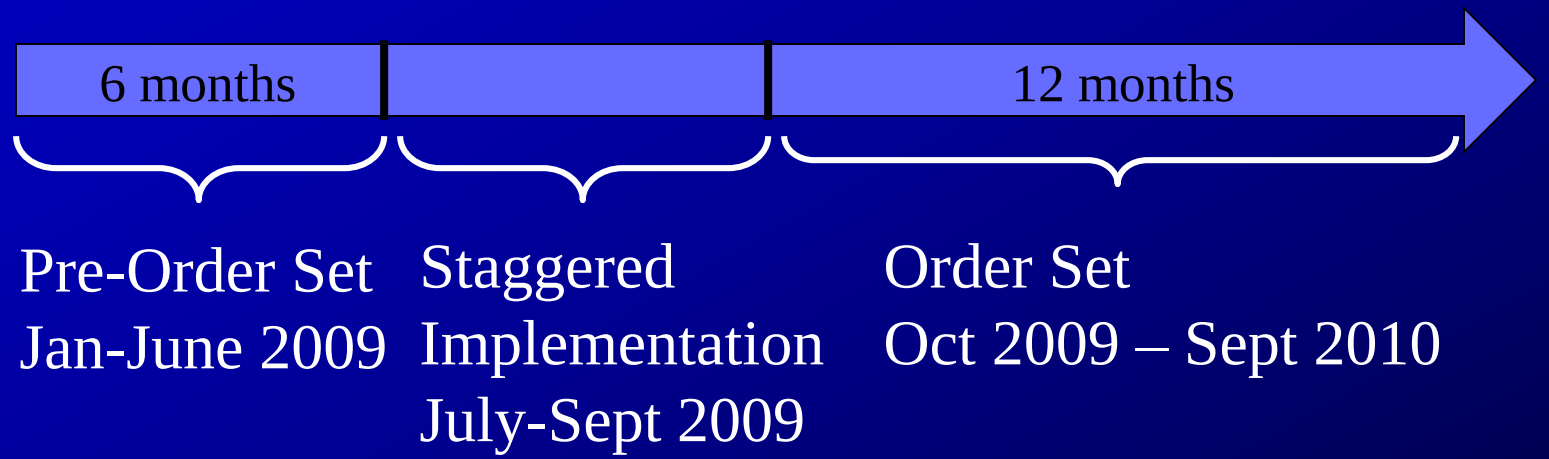
CPOE

Order Sets



COPD Order Set Study at SMH

- Prospective: pre/post design



- Setting: GIM and Respirology

Order Set Development

- Respirology + Internal Medicine
- Multidisciplinary:
  - Ward physicians (KOLs)
  - Allied health team members:
    - Nurses
    - Pharmacist
    - Respiratory therapist
    - Ward supervisor

Order Set Content

- Comprehensive admission instructions:
  - Code status
  - Infection control precautions
  - Diet

	Influenza vaccine
Instructions to MD	Influenza vaccine of benefit in all COPD patients without a contraindication – Level 2A
	☐ Please give influenza vaccine 0.5 mL IM prior to discharge (November to April only)
	☐ Influenza vaccine not indicated (previously given this influenza season)
	☐ Influenza vaccine not indicated (previous adverse reaction or allergy to eggs)

  - Vaccinations
  - Respiratory care requirements (O_2, NIV)

- Where a strong level of evidence existed to direct practice: specific behavioural prompts based on latest Canadian Thoracic Society guideline recommendations

Results

- Total: 243 admissions
  - Pre-order set (6 months): 74 admissions
    - 18 (24.3%) to Respirology
    - 56 (75.7%) to GIM
  - Order Set (12 months): 169 admissions
    - 41 (24.3%) to Respirology
    - 128 (75.7%) to GIM

HealthCare Utilization

- Mean length of stay
  - Pre-order set: 6.5 ± 7.7 days
  - Order set: 4.1 ± 5.0 days ($p = 0.017$)

- One-month re-admission
  - Pre-order set: 20.3%
  - Order set: 13.0% ($p = 0.15$)

	Antibiotics:
Instructions to MD	If infiltrate seen on chest X-ray -> Treat for Community-Acquired Pneumonia – refer to SMH CAP Guidelines. Give antibiotics for COPD exacerbations associated with any 2 of : A) Increased Sputum Volume B) Increased Sputum Purulence C) Increased Dyspnea -Level 1A Evidence Avoid repeating antibiotics from the same class within 3 months. *Antibiotic Choice Depends on Risk Stratification.*
Instructions to MD	**Group 1 Simple Chronic Bronchitis** *typical organisms: Haemophilus influenzae, Moraxella catarrhalis, Streptococcus pneumoniae*
	☐ Azithromycin 500 mg po x 1 dose on Day 1, then 250 mg po once daily x 4 days or
	☐ Cefuroxime 500 mg po Q12h x 5 days or
	☐ Levofloxacin 750 mg po once daily x 5 days or
	☐ Amoxicillin/clavulanic acid (Clavulin®) 500mg po Q8h x 5 days
Instructions to MD	**Group 3 Chronic Suppurative Bronchitis** (Risk Factors above + constant purulent sputum/bronchiectasis. Typically FEV1 < 35% or < 50% with frequent exacerbations) *typical organisms as above ± Pseudomonas, or multi-drug resistant Enterobacteriaceae (use sputum culture sensitivities to guide antibiotic choice)*
	☐ Levofloxacin 750 mg po once daily x _____ days or
	☐ Levofloxacin 750 mg IV once daily x _____ days or
	☐ Piperacillin/tazobactam 4.5 g IV ☐ q6h or ☐ q8h x _____ days

	Antibiotics:
Instructions to MD	If infiltrate seen on chest X-ray -> Treat for Community-Acquired Pneumonia – refer to SMH CAP Guidelines. Give antibiotics for COPD exacerbations associated with any 2 of : A) Increased Sputum Volume B) Increased Sputum Purulence C) Increased Dyspnea -Level 1A Evidence Avoid repeating antibiotics from the same class within 3 months. *Antibiotic Choice Depends on Risk Stratification.*

Overuse Findings In Order Set Period

1) Antibiotics prescribed for AECOPD when not indicated – 28% of admissions
2) Inappropriate antibiotic class prescribed (unnecessarily broad-spectrum an antibiotic) - 30% of admissions
3) Sputum cultures ordered unnecessarily - 19% of admissions
4) IV steroids used in 33% of admissions – too high?

International Journal of COPD

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

COPD exacerbation care bundle improves standard of care, length of stay, and readmission rates

This article was published in the following Do
International Journal of COPD
17 March 2016
Number of times this article has been viewed

J Hosp Med. 2018 June 01; 13(6): 403–404. doi:10.12788/jhm.2916.

Poor adherence to risk stratification guidelines results in overuse of venous thromboembolism prophylaxis in hospitalized older adults

Juliessa M. Pavon, MD[1,2,3], Richard J. Sloane, MPH[1,2,3], Carl F. Pieper, DrPH[1,2,3], Cathleen S. Colón-Emeric, MD, MHS[1,2,3], Harvey J. Cohen, MD[1,2,3], David Gallagher, MD[1], Miriam C. Morey, PhD[1,2,3], Midori McCarty[1], Thomas L. Ortel, MD PhD[1], and Susan N. Hastings, MD, MHS[1,2,3,4]

pitalized for an
y Disease

[2], and Kathryn L. Rice[2]

vision, Minneapolis Veterans Administration

International Journal of COPD

Open Access Full Text Article

The use of a standardized c systemic corticosteroid dose and length of stay for individuals hospitalized with acute exacerbations of COPD: a cohort study

This article was published in the following Dove Press journal:
International Journal of COPD

Order Set Uptake

- Utilized in 78/169 (46.2%) admissions
  - 31/ 41 (75.6%) Respirology
  - 46/128 (35.9%) GIM (p<0.01)
- Literature:
  - 32.3% for paper-based order sets for six GIM diagnoses
  - 19.1% for a paper-based AECOPD order set
  - 29.0% for a CPOE-based COPD order set
  - 66.5% for a CPOE-based COPD order set

McAlearney IJMI 2006
Sandhu CRJ 2013
Gulati IJCOPD 2018
Brown Annals ATS 2016

Order Sets: Improving Uptake

- Integrated specialty order sets:
  - Users defaulting to general medical admission order set ➡ replaced with a modular order set
  - 5-fold increase in usage over 16 months

Munasinghe JAMIA 2014

- Admission Advisor:
  - Pop-up advisor suggests use of order set based on rules engine
    - ward, admitting physician, admitting diagnosis
  - 17% increase in order set usage

Ozdas JAMIA 2006

Tom Kovesi

CHOOSING WISELY: DON'T ORDER LUNG VOLUMES AND DLCO TO DIAGNOSE ASTHMA: A CASE STUDY

TOM KOVESI, PEDIATRIC RESPIROLOGIST, CHEO

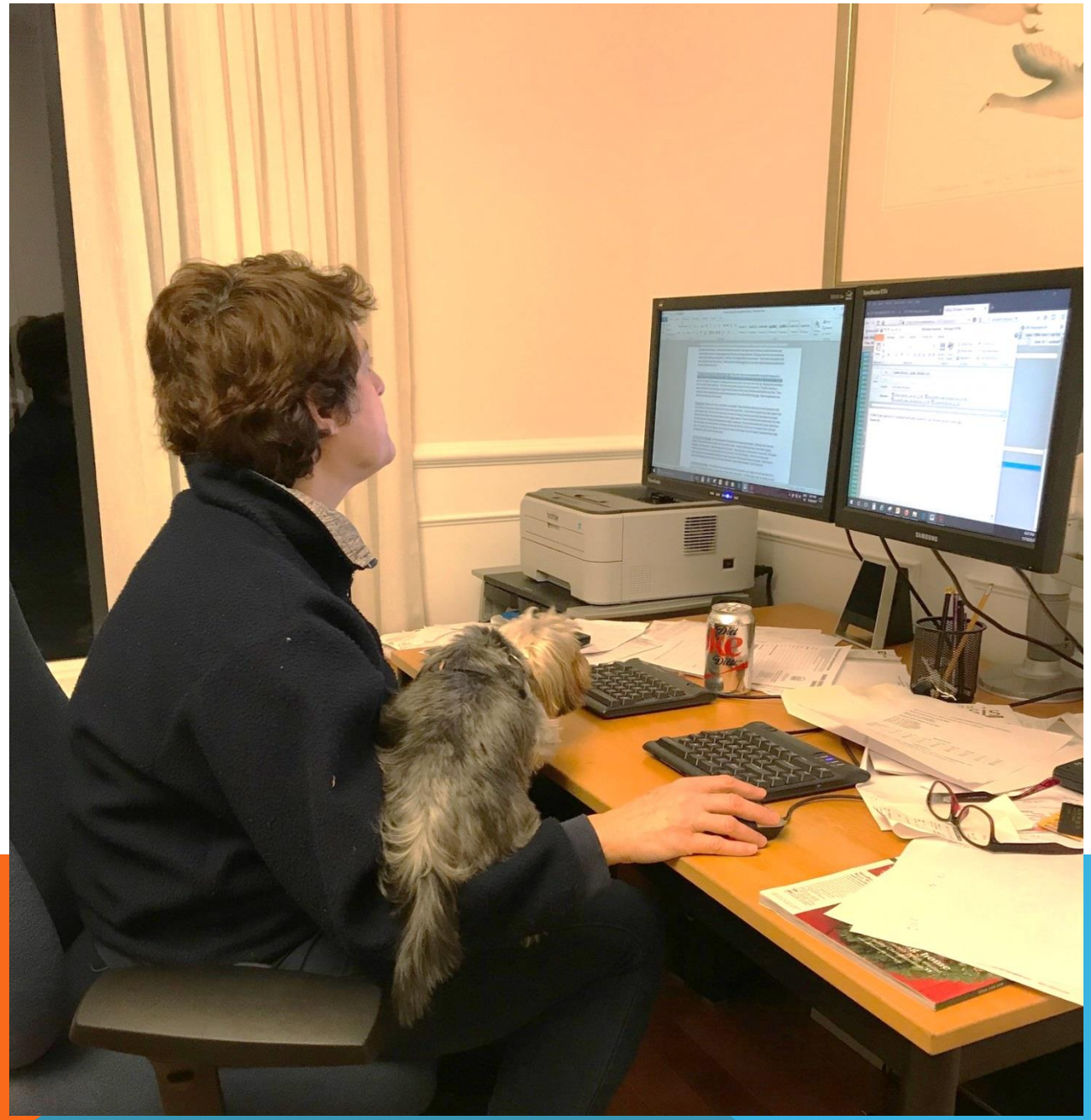
Acknowledgements: Ariyan Marvizi, CHEO for data collection via Epic

DISCLOSURE OF CONFLICT OF INTEREST
(OVER THE PAST 2 YEARS)

SOCIÉTÉ CANADIENNE DE THORACOLOGIE
CANADIAN THORACIC SOCIETY

Thomas Kovesi MD

I have no conflict of interest.



WHY HAS ORDERING RATES FOR PFT'S AND METHACHOLINE CHALLENGE INCREASED?

SPECIAL ARTICLE

Canadian Thoracic Society 2012 guideline update: Diagnosis and management of asthma in preschoolers, children and adults

M Diane Lougheed MD MSc[1], Catherine Lemiere MD[2], Francine M Ducharme MD MSc[2], Chris Licskai MD[3], Sharon D Dell MD[4], Brian H Rowe MD MSc[5], Mark FitzGerald MD[6], Richard Leigh MD PhD[7], Wade Watson MD[8], Louis-Philippe Boulet MD[9]; Canadian Thoracic Society Asthma Clinical Assembly

pulmonary function criterion supportive of an asthma diagnosis in individuals six years of age and over is spirometry showing reversible airway obstruction; alternatives include peak expiratory flow (PEF) variability or a positive challenge test (such as a methacholine or exercise challenge) (1). In preschoolers, for whom it is not possible to routinely assess lung function, the combination of a careful clinical history (including family history and risk factors for asthma development) and physical examination are used to differentiate asthma from other causes of episodic respiratory symptoms (4).

THE OLD REQUISITION

REQUEST FOR PULMONARY FUNCTION TESTS
To make an appointment, please call (613) 737-2222

CLINICAL PROBLEM

History/Reason for Test:

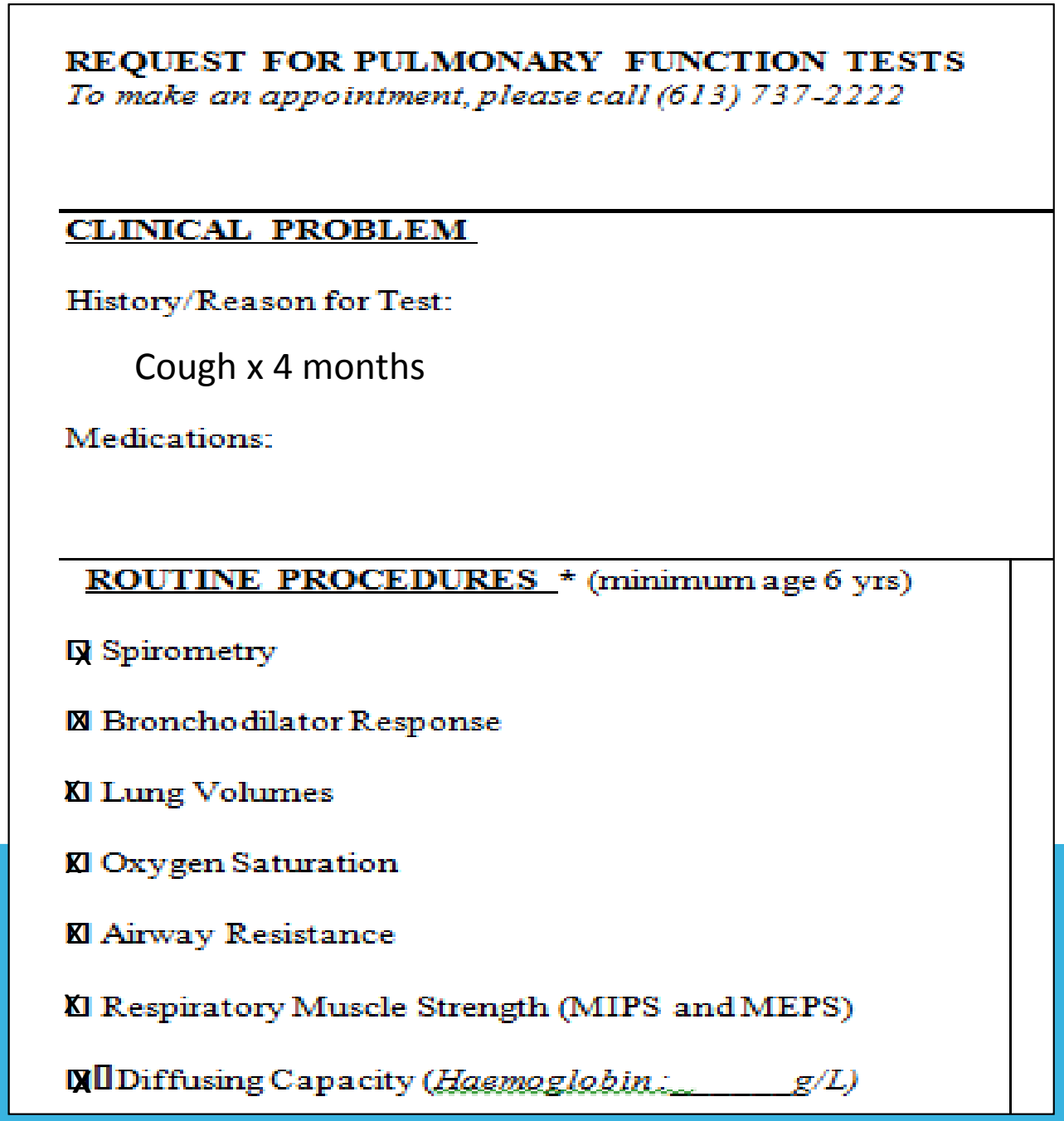
Medications:

ROUTINE PROCEDURES * (minimum age 6 yrs)

- ☐ Spirometry
- ☐ Bronchodilator Response
- ☐ Lung Volumes
- ☐ Oxygen Saturation
- ☐ Airway Resistance
- ☐ Respiratory Muscle Strength (MIPS and MEPS)
- ☐ Diffusing Capacity (*Haemoglobin: _____ g/L)*

THE PROBLEM

- **Many physicians checked off every box:**
  - Completeness!
  - Unsure which test to order
  - EMR form auto-populated



REQUEST FOR PULMONARY FUNCTION TESTS

To make an appointment, please call (613) 737-2222

CLINICAL PROBLEM

History/Reason for Test:

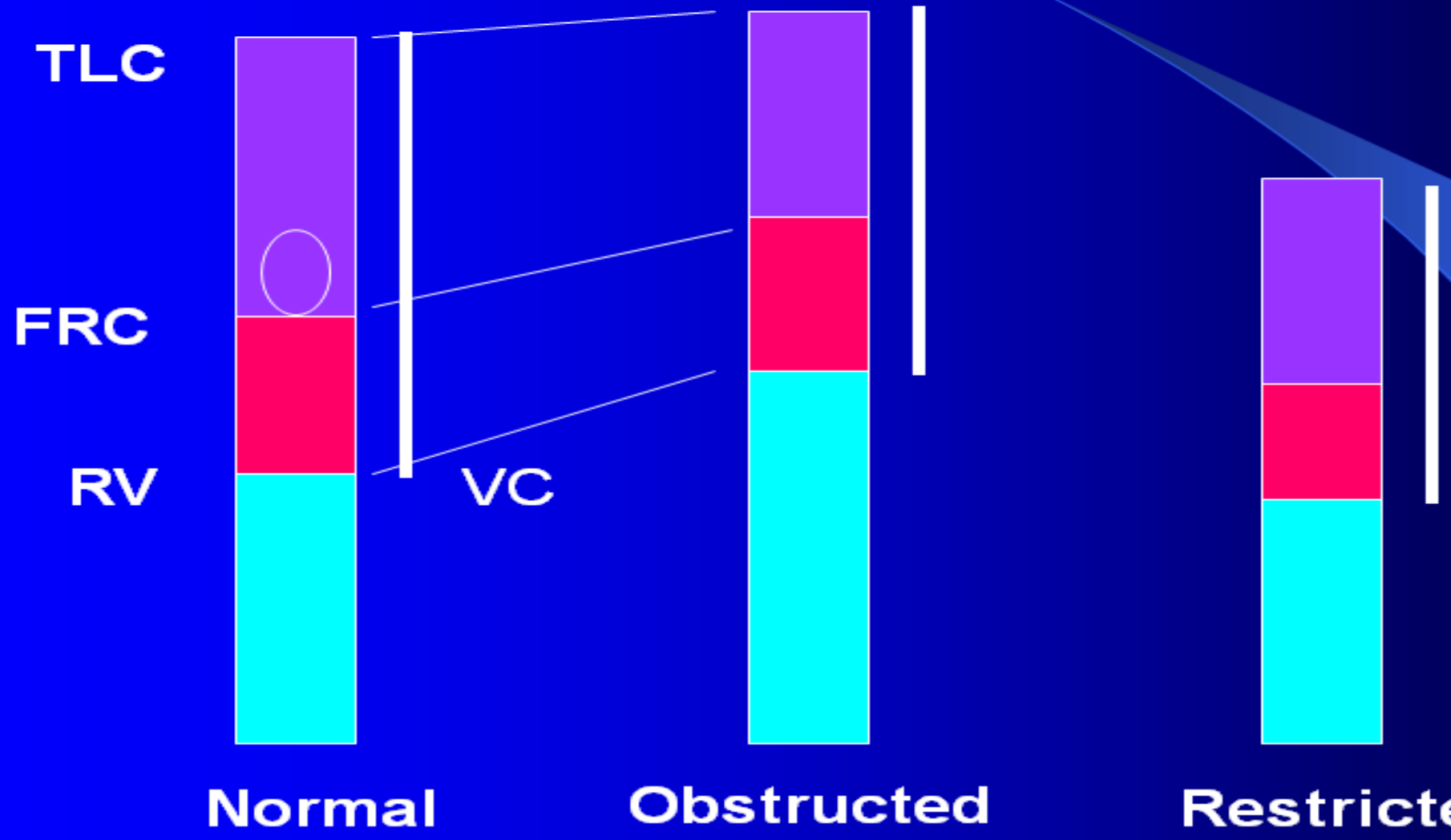
Cough x 4 months

Medications:

ROUTINE PROCEDURES * (minimum age 6 yrs)

- [x] Spirometry
- [x] Bronchodilator Response
- [x] Lung Volumes
- [x] Oxygen Saturation
- [x] Airway Resistance
- [x] Respiratory Muscle Strength (MIPS and MEPS)
- [x] Diffusing Capacity (*Haemoglobin: _____ g/L*)

Divisions of Lung Capacity



RATIONALE, AND PROBLEMS

- *TLC, FRC, RV, Raw are elevated in asthma*
- Moreover, TLC necessary to diagnose restrictive lung disease
- DLCO helpful for interstitial lung disease, pulmonary hypertension

However…

- These tests take time, cost
- Child may have trouble with tests
- Falsely low DLCO (anemia)
  - Leads to more tests, Respirology consults
  - Not needed for diagnosis of asthma according to guidelines
  - If FVC is low, lung volumes are appropriate to r/o ILD.

OHIP Fee Codes ($)

	Technical	Professional
F-V Loop	19	11
BD	3	7
FRC	17	18
Raw	16	16
DLCO	21	18

Spirometry + BD: $40
All of the above: $146

STEP 1: THE NEW REQUISITION

REQUEST FOR PULMONARY FUNCTION TESTS

To make an appointment, please fax requisition to (613) 737-4298

The Pulmonary Function Lab is located in Clinic C –9

Name: _____

Date of Birth: _____

Address: _____

Telephone Number: _____

CLINICAL PROBLEM NOTE: Patient must be 6 years of age or older for pulmonary function testing.

History/Reason for Test:

Medications:

☐ Please check here if Beta-agonist bronchodilator is contraindicated for this patient

Standard Pulmonary Function Test Panels:

☐ **Asthma Evaluation Panel**: Spirometry, Bronchodilator response

☐ **Dyspnea Evaluation Panel**: Spirometry, Bronchodilator response, Lung Volumes

☐ **Interstitial Lung Disease Panel**: Spirometry, Lung Volumes, Diffusing Capacity, Oxygen Saturation

☐ **Neuromuscular Disease Panel**: Spirometry, Lung Volumes, Inspiratory and Expiratory Muscle Strength, Oxygen Saturation, End-Tidal Carbon Dioxide

Special Testing *(Prerequisites:* ***patient must have previous spirometry that was normal and that demonstrated patient is able to perform spirometry reliably; age 8 years or older;*** *Height for any exercise test must be at least 138 cm).* ***If a previous spirometry was performed, please enclose it with this requisition****. Note: all special tests require approval by a CHEO Pediatric Respirologist.*

☐ Methacholine Challenge Test (Purpose: Asthma Diagnosis)

☐ Exercise-induced Bronchospasm Challenge Test (Purpose: Diagnosis of exercise-induced Asthma)

☐ Cardiopulmonary Exercise Test (Purpose: diagnosis of exertional dyspnea (other than asthma)

STEP 1: THE NEW REQUISITION

CHEO

Name: _____

Date of Birth: _____

Address:

REQUEST FOR PULMONARY FUNCTION TESTS

To make an appointment, please fax requisition to (613) 737-4298

The Pulmonary Function Lab is located in Clinic C –9

Not wisely used, & not a lot of impact

So… we triage instead

CLINICAL PROBLEM NOTE: Patient must be 6 years of

History/Reason for Test:

Medications:

☐ Please check here if Beta-agonist bronchodilator is contraindicate … patient

Standard Pulmonary Function Test Panels:

☐ **Asthma Evaluation Panel**: Spirometry, Bronchodilator response

☐ **Dyspnea Evaluation Panel**: Spirometry, Bronchodilator response, Lung Volumes

☐ **Interstitial Lung Disease Panel**: Spirometry, Lung Volumes, Diffusing Capacity, Oxygen Saturation

☐ **Neuromuscular Disease Panel**: Spirometry, Lung Volumes, Inspiratory and Expiratory Muscle Strength, Oxygen Saturation, End-Tidal Carbon Dioxide

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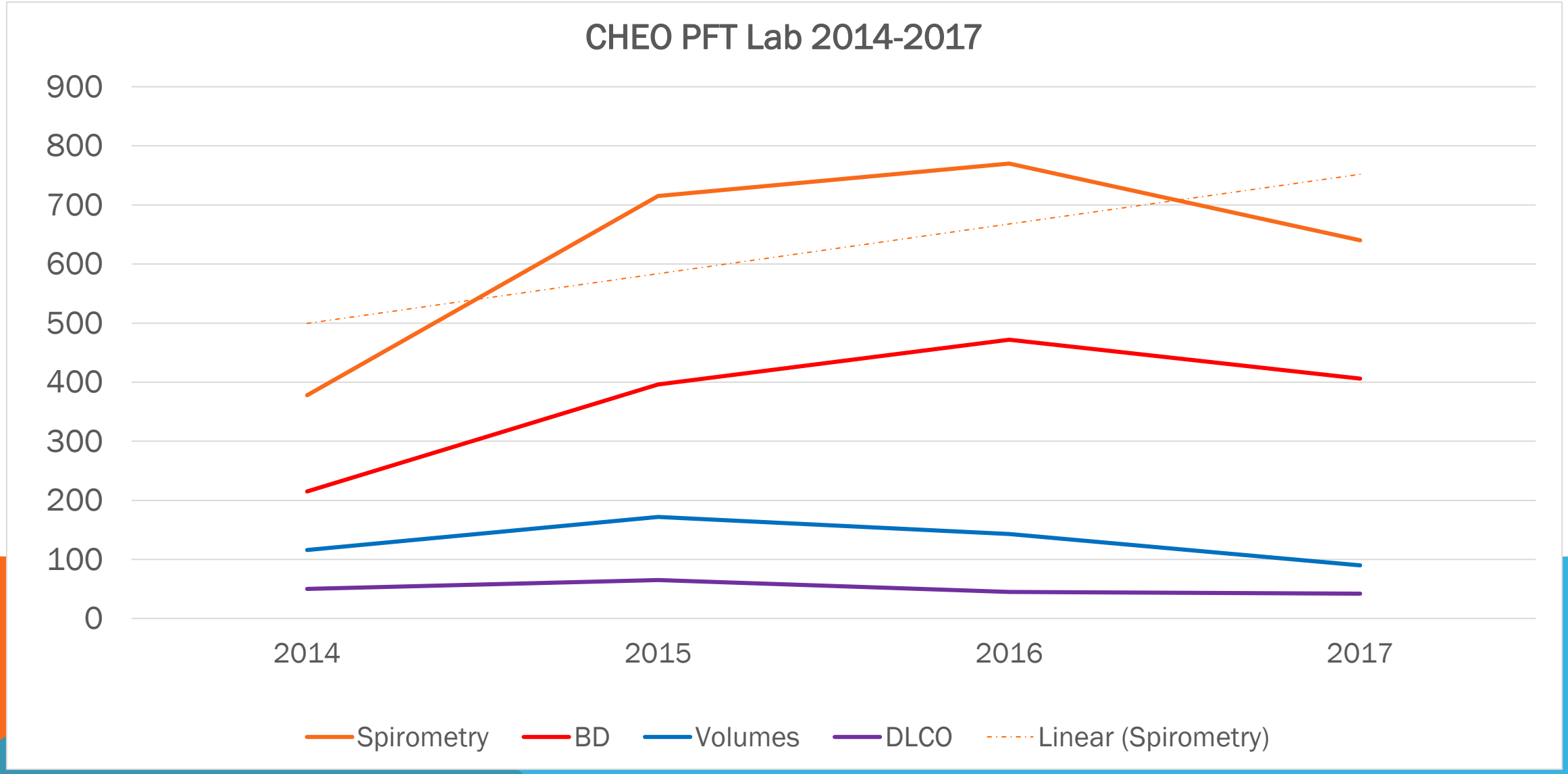
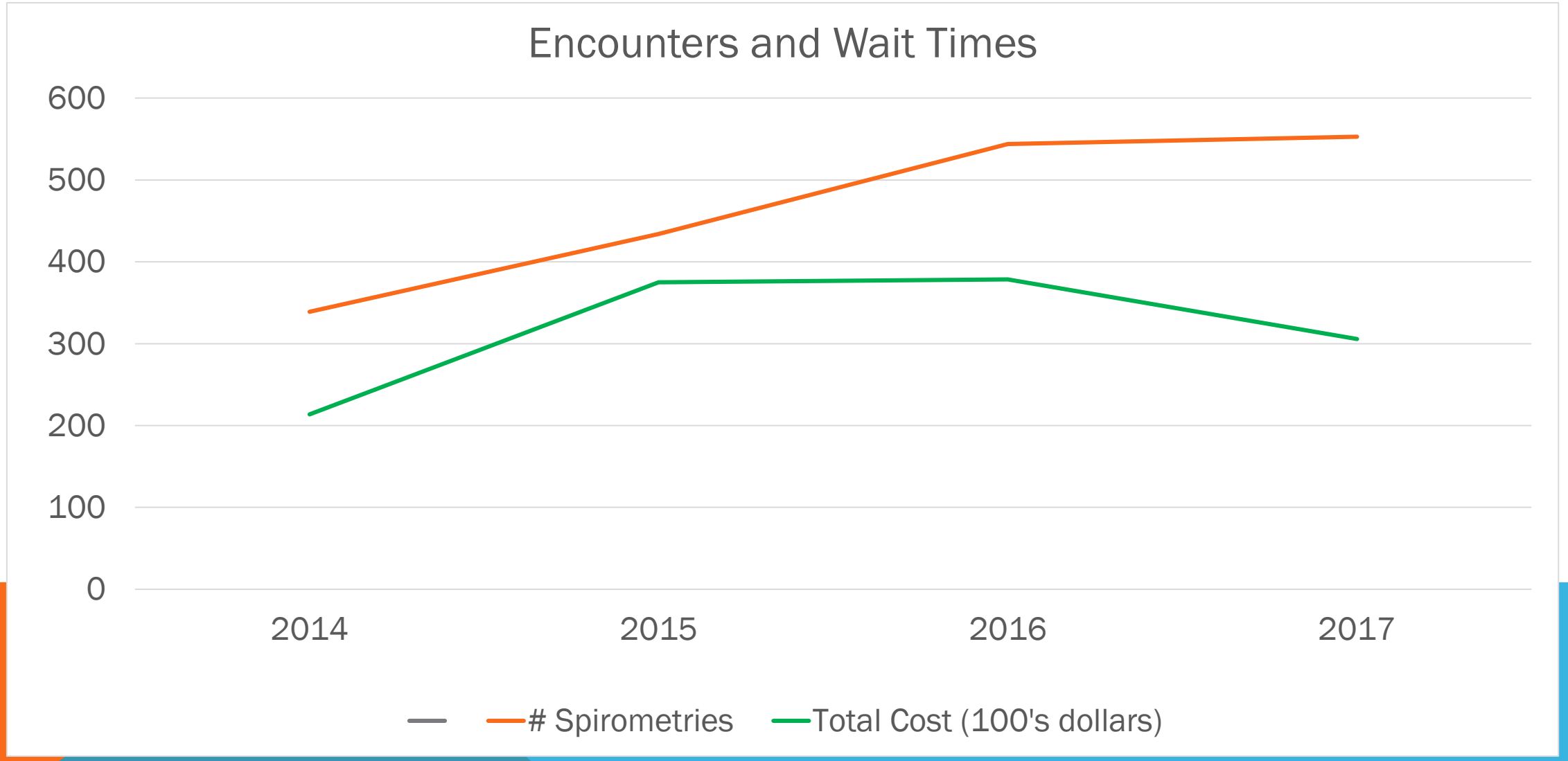
TRENDS IN PFT'S



THE RESULT


Encounters and Wait Times
600
500
400
300
200
100
0
2014
2015
2016
2017
Spirometries
Total Cost (100's dollars)

BOTTOM LINE

- **Multifaceted approach:**
  - eliminate unnecessary lung volumes & DLCO's,
  - provide spots with different durations
- **Result:**
  - Waiting times for outpatient PFT's decreased by 30% (5.9 to 4.5 months)
  - Outpatient PFT's increased by 39% (339 to 553/year) and billing increased in parallel by 43%
  - Better service to the community with no increase in lab hours or personnel costs

Choosing Wisely: Don't order lung volumes, DLCO to diagnose asthma

The CTS Choosing Wisely Top 10 List

A Focus on Spirometry…

1 **Don't initiate long-term maintenance inhalers in stable patients with suspected COPD if they have not had confirmation of post-bronchodilator airflow obstruction with spirometry.**

- Explicitly recommended by all major international COPD guidelines, including:
  - GOLD
  - US
  - European
  - Canadian

- Recommended in 2 other Choosing Wisely campaigns:
  - Allergy
  - Internal Medicine

5 Don't initiate medications for asthma (e.g., inhalers, leukotriene receptor antagonists, or other) in patients ≥ 6 years old who have not had confirmation of reversible airflow limitation with spirometry, and in its absence, a positive methacholine or exercise challenge test, or sufficient peak expiratory flow variability.

- Explicitly recommended by all major international asthma guidelines, including:
  - GINA
  - UK
  - Canadian

- Recommended in the Internal Medicine Choosing Wisely campaign

Spirometry: Gaps

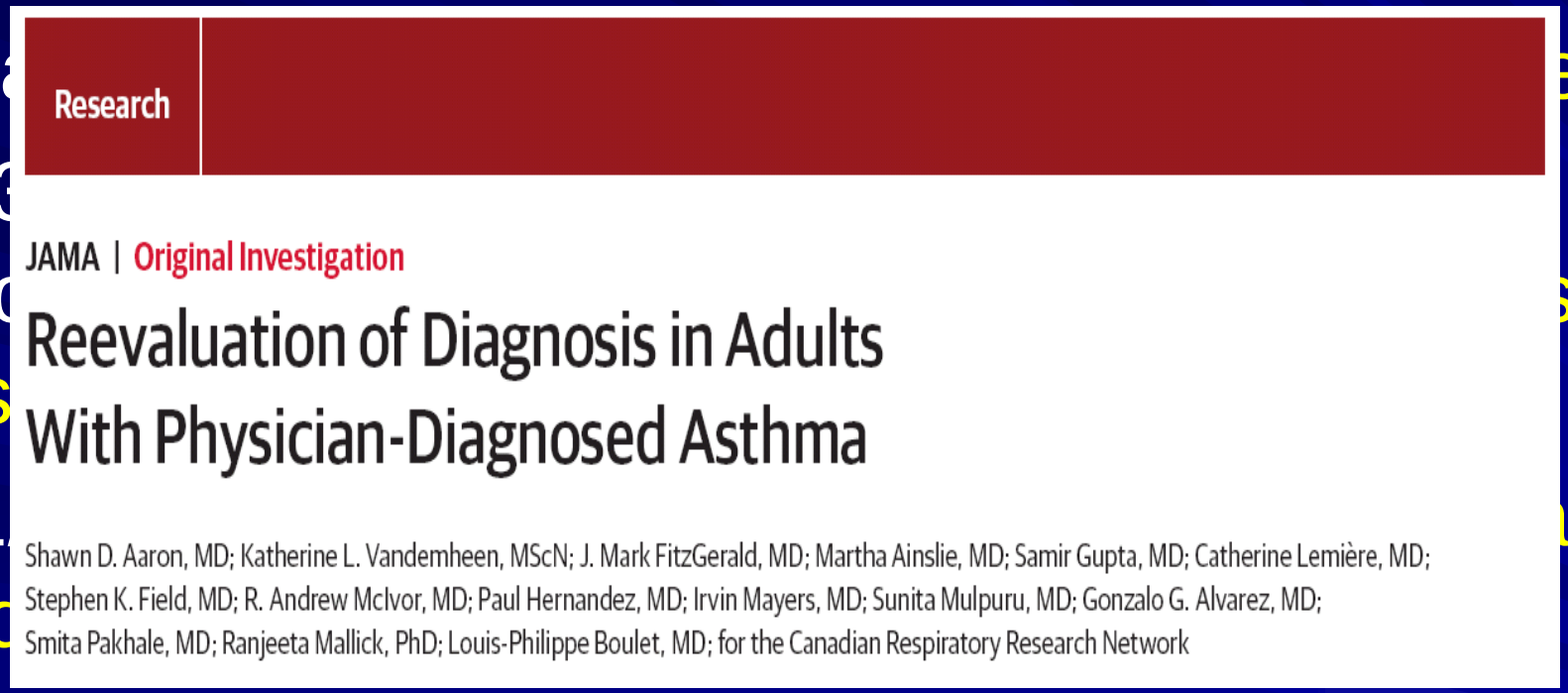
- Primary care spirometry use low across jurisdictions
- Canada:
  - 35% of patients with asthma reported having ever had spirometry
  - 46% of PCPs reported using spirometry to monitor asthma
  - 42.7% of 485 866 newly diagnosed asthmatics had spirometry +/- 1 year from dx
  - 35.9% of 491 754 newly diagnosed COPD patients had spirometry +/- 1 year from dx

Fitzgerald CRJ 2006

Gershon Chest 2012, 2014

Asthma Diagnosis Study

- Popul enters
- Of 613 diagnc sthma on tes
  - 161 a med
- 243/468 (51.9%) patients for whom GPs could be reached had evidence of objective testing at the time of diagnosis



Research

JAMA | Original Investigation

Reevaluation of Diagnosis in Adults With Physician-Diagnosed Asthma

Shawn D. Aaron, MD; Katherine L. Vandemheen, MScN; J. Mark FitzGerald, MD; Martha Ainslie, MD; Samir Gupta, MD; Catherine Lemière, MD; Stephen K. Field, MD; R. Andrew McIvor, MD; Paul Hernandez, MD; Irvin Mayers, MD; Sunita Mulpuru, MD; Gonzalo G. Alvarez, MD; Smita Pakhale, MD; Ranjeeta Mallick, PhD; Louis-Philippe Boulet, MD; for the Canadian Respiratory Research Network

Consequences

- Unnecessary medication use (asthma, COPD):
  - Cost (e.g. combo puffers $60-110/month)
  - Side effects
    - hypothalamic-pituitary-adrenal axis suppression, growth impairment in children, decreased bone density

- Chronic disease label (asthma, COPD):
  - healthcare system burden
  - activity restriction
  - impacts on psychological well-being
    - e.g. negative illness perceptions leading to anxiety in teens with asthma

Consequences

- Delayed diagnosis and treatment:
  - Aaron JAMA 2017: 12/613 (2.0%) found to have serious cardiorespiratory conditions that were misdiagnosed as asthma

- Underestimation of disease severity (COPD)

- Suboptimal pharmacotherapy (COPD, asthma)
  - Lack of spirometry ⟹ increased mortality and hospital admissions in COPD

Walker ERJ 2013
Joo COPD 2008
Mapel AJM 2015
Gershon CMAJ 2017

Barriers

Will Differ By Setting…

- In office spirometry

vs

- Lab referral for spirometry

Where To Focus Efforts?

Spirometry by GPs in Ontario

- 15417 GPs in ON (2016)
- In 2016:
  - 574 GPs billed FV and VT
  - 145 GPs billed VT alone (older spirometers)
  - Unique GPs billing one of these codes: 679
- CHCs (salary model):
  - 275 FTE physicians (413 GPs)
  - We estimate that no more than half (207 GPs) have access to spirometry in office
  - Total 886/15417 = 5.7% of GPs in-office

Administrative Data, IntelliHealth 2016

Breakout Sessions

Questions:

1) What are barriers/enablers to primary care referral for spirometry for diagnosis of asthma and COPD in your practice environment?

2) Which implementation strategies have you used/would you consider using to improve this gap?

Barriers

- Clinician:
  - “belief” (outcome expectancy)
  - Forgetting to order
  - Time (send patient, wait for result, see/call patient again)
- System:
  - Timely access (lab organization)
  - Quality of reporting
  - Turnaround for reporting
  - Requirement for 2nd visit for confirmatory testing (asthma)
- Patient:
  - inconvenience (time/travel/parking)
  - Interest/buy-in

Potential Solutions

Driving in-lab use:

- Early education (medical school, FP residency)
  - STARS program (Hamilton, Ottawa)
  - University of Toronto curriculum lecture

- Clinician-Directed eHealth Approaches
  - Automated EMR reminder to book confirmatory spirometry upon first asthma/COPD medication prescription
    - Accessible educational material
    - Practical information on closest lab, wait times, etc.
    - Ideally, 1 click lab booking
    - Patient info sheet

Potential Solutions

- Clinician-Directed Feedback
  - Audit and feedback report card data
- System change (decreasing wait times)
  - Spirometry services in pharmacies
  - Mobile spirometry services
  - Same day/walk-in PFT services (BC model)
  - Reorganization of PFT lab ordering/priority systems (Ottawa, Toronto, BC)

Potential Solutions

- Patient-mediated approaches
  - Pharmacist-driven intervention (e.g. info sheet upon first asthma/COPD medication prescription fill)
  - Patient facing messaging

A National Campaign

- Barriers and enablers are complex
- Some will differ across health systems (provinces) (e.g. access is not a barrier in Alberta)
- A complex intervention will be required
- A patient-facing strategy is universally applicable, will drive awareness and lay the foundation for more complex regional interventions

Patient-Facing Strategy

- Key messages:
  - If you are taking one of these medications, you should have had one of these tests to prove the diagnosis
  - Some patients who take these medications don’t actually have the diagnosis
  - Doctors are better at prescribing the right medicines when they have this test
  - Ask your doctor for the test

Patient-Facing Strategy

Tools

Poster* (with URL)

Patient Pamphlet*

Dissemination

- MD waiting rooms
- Pharmacies
- Public spaces
- Web resource
- Social/print/television media
- Pharmacist handout with new asthma/COPD medication prescriptions
- CFP journal?

*Multiple languages