

AFHTO Tool Demonstration

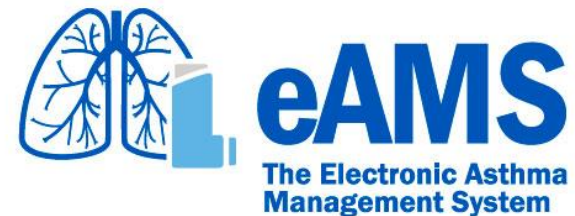
The Electronic Asthma Management System (eAMS): Improving Asthma Management in Primary Care

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Chair, Canadian Respiratory Guidelines Committee

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St. Michael's
Inspired Care.
Inspiring Science.



Objectives

1. Identify the prevalence of the **major care gaps** contributing to **poor asthma control** in the Canadian primary care context
2. Explain how a novel **eHealth tool – the eAMS (Electronic Asthma Management System)** - can address barriers to guideline-based asthma care
3. Describe how the eAMS affected **asthma care in real-world** primary care settings
4. **Demonstrate** the eAMS
5. Discuss the process of **launching** the eAMS in your clinic

Asthma



1 in 3 Canadians will get diagnosed with
asthma in their lifetime

65000

Emergency

11000

Hospital
Admissions

93%

Do not have
control

\$2.1B

Cost

WHY?

Gaps in Current Asthma Care

- “Key principles” of asthma management
 - Established by very strong evidence
 - No equipoise
 - No need for ongoing research
 - Consistent across international guidelines
 - Recommended in guidelines for > 10 years
 - Taken for granted

Control Assessment

- Avoiding “poor control” associated with:
 - Improved **quality of life**
 - Reduced **healthcare utilization**



- Accordingly, poor control is the **threshold for initiation or escalation** of therapy
- Control criteria first articulated in the (original) **1996 Canadian Asthma Guidelines**

Control Assessment: Gaps

- US primary care chart review:
 - All criteria: 1% visits; 1 criterion: 59% visits

Cicutto JCEHP 2014

- Ontario primary care chart review
 - Control determined in 202/4122 (4.9%) visits
 - 136/884 (15.4%) patients had control status determined at least once in the study year

Price BMJ Open 2019

Escalation of Therapy

- Tailor pharmacotherapy to level of control



Escalation of Therapy

- **Initiation of ICS:**

- improves health-related quality of life, lung fn
- reduces symptoms, exacerbations, mortality
- 200 RCTs (30000 subjects) Adams CDSR 2008
- since **1996 Canadian Asthma Guidelines**

- **Addition of LABA** if suboptimal on ICS:

- improves lung function
- reduces rescue bd use and exacerbations
- 77 RCTs (20000 subjects) Ducharme CDSR 2010
- since **2003 Canadian Asthma Guideline update**

Escalation of Therapy: Gaps

- **Canadian self-report survey (n=893):**

- **Uncontrolled patients:**

- 25% no ICS
- 42% on ICS without LABA

Fitzgerald CRJ 2006

- **Saskatchewan admin data (n=24 616):**

- **Uncontrolled patients:**

- 37% on no ICS
- 76% of those on high dose ICS had no LABA

Klomp CMAJ 2008

Provision of an Asthma Action Plan

- Asthma action plan:
 - Individualized written plan
 - HCP → patient with asthma
- Provides:
 - education
 - guidelines for self-management of worsening symptoms:
 - how to modify medications
 - when to access the medical system

Name: _____

Date: _____

Review with your healthcare provider at every visit.

Asthma Action Plan

Emergency contact name: _____ Phone: _____

Personal Best Peak Flow _____ L/min

Physician name: _____ Phone: _____

The goal of asthma treatment is to live a healthy, active life.

Remember that it is very important to remain on your maintenance medication, even if you are having no symptoms of asthma.

Go: Maintain Therapy	Caution: Step Up Therapy	Stop: Get Help Now																																			
<p>Description You have <i>ALL</i> of the following:</p> <p>Rarely need extra reliever</p> <p>Almost no cough, wheezing, shortness of breath or chest tightening</p> <p>Can do normal physical activities and sports without difficulty</p> <p>No missed regular activities or school or work</p> <p>Night asthma symptoms less than 1 night per week</p> <p>Peak Flow: > 80% personal best, or > ____</p> <p>Other: _____</p>	<p>Description You have <i>ANY</i> of the following:</p> <p>Use your reliever more than 3 times per week</p> <p>Have daytime cough, wheezing, shortness of breath or chest tightening more than 3 days per week</p> <p>Physical activity is limited</p> <p>Asthma symptoms at night or in early AM 1 or more nights per week</p> <p>Peak Flow: 60-80% personal best, or ____ to ____</p> <p>Other: _____</p>	<p>Description You have <i>ANY</i> of the following:</p> <p>Reliever lasts 2-3 hours or less</p> <p>Continuous asthma symptoms</p> <p>Continuous cough</p> <p>Wheezing all the time</p> <p>Severe shortness of breath</p> <p>Sudden and severe attack of asthma</p> <p>Peak Flow: < 60% personal best, or < ____</p> <p>Other: _____</p>																																			
<p>Instructions:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Medication</th> <th>Puffer colour</th> <th>Dose</th> <th>Puffs</th> <th>Times per day</th> </tr> </thead> <tbody> <tr> <td colspan="5"><i>Controller</i></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td colspan="5"><i>Reliever</i></td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>Other: _____</p>	Medication	Puffer colour	Dose	Puffs	Times per day	<i>Controller</i>																				<i>Reliever</i>										<p>Instructions:</p> <p><input type="checkbox"/> Increase _____ controller to: ____ puffs _____ (colour) times per day for ____ days</p> <p><input type="checkbox"/> Add _____ controller: ____ puffs _____ (colour) times per day for ____ days</p> <p><input type="checkbox"/> Take _____ reliever 1 to 2 puffs every 4 to 6 hours as needed</p> <p><input type="checkbox"/> If no improvement in your symptoms and/or peak flows in 2 days or your reliever only lasts for 2-3 hours, go to red zone</p> <p>Other: _____</p>	<p>Instructions:</p> <p>Take _____ reliever ____ puffs every 10-30 _____ (colour) minutes as needed</p> <p>Asthma symptoms can get worse quickly. When in doubt, seek medical help</p> <p>Asthma can be a life-threatening illness. Do not wait!</p> <p>If you cannot contact your doctor: call 911 for an ambulance, or go directly to the Emergency Department!</p> <p>Bring this asthma action plan with you to the emergency room or hospital</p> <p>Stay calm</p> <p>Other: _____</p>
Medication	Puffer colour	Dose	Puffs	Times per day																																	
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Adapted from Gupta S, et al. Respirator 2012;4(3):86-115. © 2014 Dr. S. Gupta (materials included for non-commercial use only)

Allergies may be triggering your asthma - avoid the things that you are allergic to and have allergy skin testing if you are unsure.
Controller: has a lasting effect, treats inflammation, prevents asthma attacks, may take time to act
Reliever: rapidly relieves symptoms of cough, wheeze, lasts 4 hours

Provision of an Asthma Action Plan

- Systematic review of 18 RCTs:
 - AAP + education + regular clinical review**
 - ↓ hospitalizations (RR 0.64)
 - ↓ ER visits (RR 0.82)
 - ↓ unscheduled visits to the doctor (RR 0.68)
 - ↓ absenteeism (RR 0.79)
 - ↓ nocturnal asthma symptoms (RR 0.67)
 - ↑ quality of life

Gibson and Powell CDSR 2002

Pinnock, et al. BMC Medicine 2017

- Since **1996 Canadian Asthma Guidelines**

Asthma Action Plan: Gaps

- Self-report surveys:

- 4% of Quebec PCPs report consistently providing a written AAP

Djandji PCRJ 2017

- 11% of asthma patients report receiving one

Fitzgerald CRJ 2006

- Chart Audits (asthma patients):

- Alberta (n=3072) (6 years): 2%

Tsuyuki JoA 2005

- Ontario (n=884) (1 year): 0

Price BMJ Open 2019

*6/159 (3.8%) of those seen by a specialist

Our Objectives

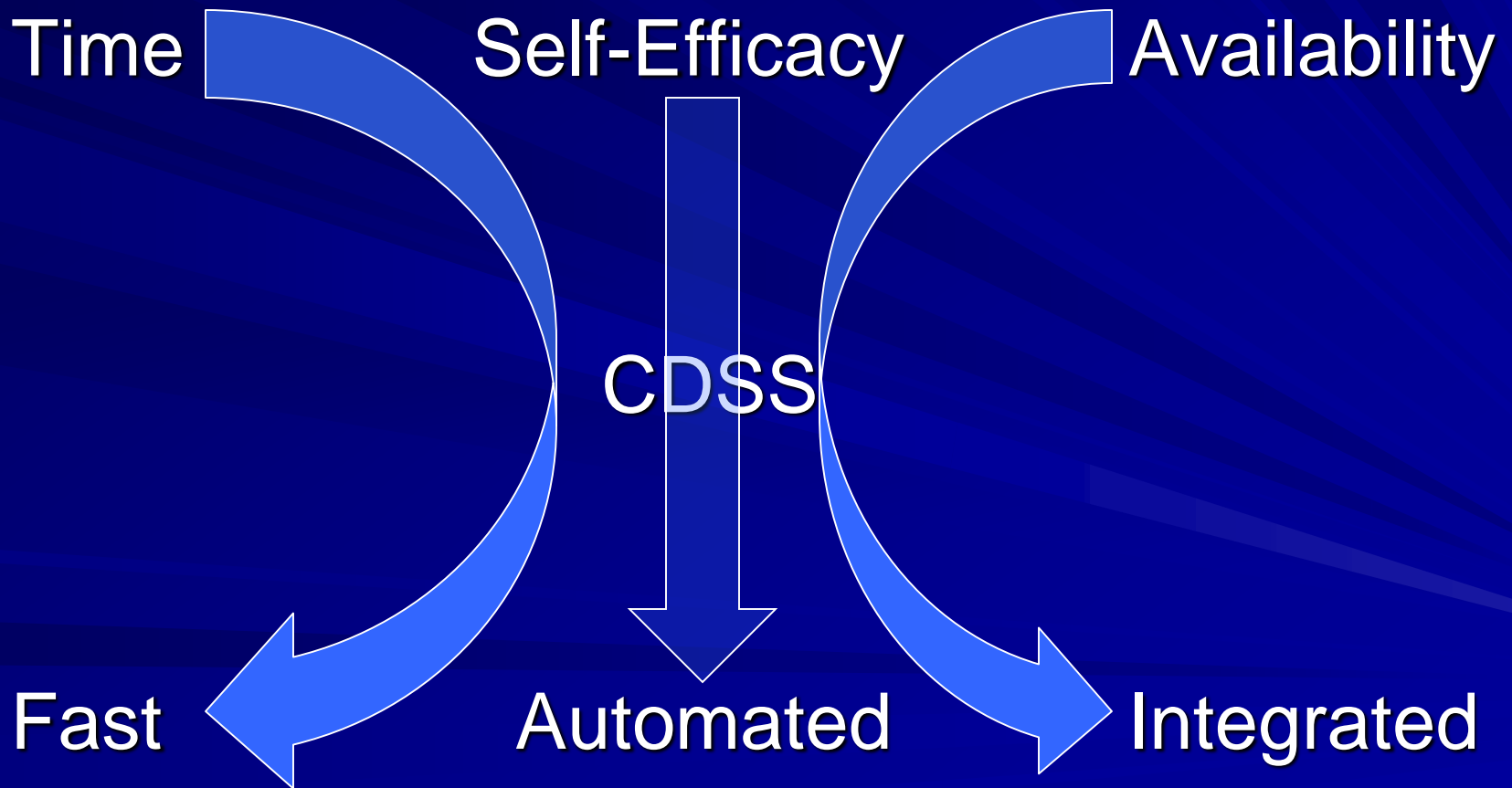
- Address 3 key gaps:
 - Ascertainment of asthma control according guideline criteria
 - Enable these tasks **virtually** HQO Asthma QS #2
 - **Evidence-based** initiation, escalation or de-escalation of **therapy** according to asthma control HQO Asthma QS #3
 - Provision of a **personalized AAP** HQO Asthma QS #4

Proposed Solution: CDSS

- Generate patient-specific assessments or recommendations
- Input patient data into a computer → software algorithm matches information from a knowledge database

Proposed Solution: CDSS

- Barriers:





eAMS

The Electronic Asthma Management System

PATIENT SIDE

Pre-visit questionnaire



Symptoms
Medications
Triggers, Activities,
Allergies

Medications
Asthma Action Plan
Education
Decision Aid

CLINICIAN SIDE



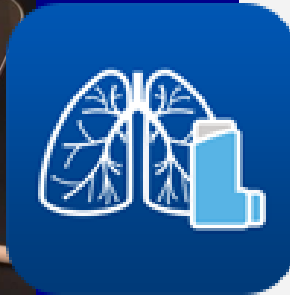
Clinical Decision Support System (CDSS)

Control
Medication changes
Asthma action plan

Electronic Medical Record-
Integrated Guidance

eAMS: Overview

1. Each patient completes questionnaire:
 - At home within 1 week of apt (any device) or
 - In the waiting room immediately before apt



eAMS Overview

2. Information processing (CDSS)

eAMS Overview

3. Decision support is available to the clinician **instantaneously upon opening the chart:**
 - Alerted by a notification or a toolbar
 - Open decision support, adjust meds if required
 - Approve AAP
 - Alert patient to any meds changes through usual channels
 - Patient receives AAP on device
 - Can all be **virtual**: patient need not be physically present

eAMS Overview

- **Integrated chart note** for documentation:
 - No matter which step process is stopped at, a chart note documenting control, all recommendations, and all actions is generated
- If questionnaire complete but no actions taken (or steps remaining):
 - **E-message** sent automatically to MRP the next morning, outlining control level and any decision support actions available

Foundational Work

- AAP development

- Analysis of existing AAPs

Gupta AAI 2012

- Multi-stakeholder wiki-based development process

- Adoption by LHF, OTS, CTS

Gupta JMIR 2011

Gupta Respiration 2012

- Asthma EMR algorithm

- Validation of EMR asthma detection algorithm

Xi 2015

- Questionnaire development

- Content preferences and optimization

Gupta JoA 2018

- Usability preferences and optimization

Lam Shin Cheung HIJ 2020

Foundational Work

- CDSS intelligence

- Analysis of existing international asthma guidelines

Gupta CRJ 2016

- Optimization of language of guidance according to best evidence

Gupta CMAJ 2016

- SR for for yellow zone medication algorithm

Kouri ERJ 2017

- Disseminated to primary care

- LHF
- Canada
- Europe

Kouri CFP 2019

Gupta PCRJ 2018

Foundational Work

- Gaps Analysis

Price BMJ Open 2019

- eAMS Outcomes Analysis (ITS)

Gupta ERJ 2019

- Endorsed by the **Ontario Thoracic Society**

eAMS in Primary Care Study

- **3 FHT sites** (2 academic, 1 community)
 - All prescribers - **26 HCPs** (25 MDs, 1 NP)
 - Asthma patients ≥ 16 years old - **890 patients**
- **Primary outcome:**
 - **AAPs:**
 - 0/412 (0%) eligible patients (baseline)
 - 79/443 (17.8%) eligible patients (intervention)
 - Absolute increase **0.18 [0.14-0.22] $p < 0.01$**

eAMS in Primary Care Study

- Secondary outcomes:
 - Asthma control assessment:
 - 173/3497 (4.9%) eligible visits (baseline)
 - 849/3062 (27.7%) eligible visits (intervention)
 - ➔ absolute increase 0.23 ($p < 0.01$)
 - Controller medication escalation:
 - SABA/controller ratio 62:54 (1.15) (baseline)
 - SABA/controller ratio 33:229 (0.14) (intervention)
 - ($p < 0.001$)

Since then...eAMS Enhancements

- Patients:
 - Single downloadable app (iOS, Android) or portal (PC) with:
 - Web-responsive **questionnaire**
 - **Action plan** access
 - Dedicated **educational** resources (eg puffer technique videos)
 - **Study** to drive questionnaire uptake

Kouri JMIR *in press*

- Physicians:
 - Enhanced **system usability features**
 - **Qualitative study** to drive CDSS uptake

Lam Shin Cheung JAMIA *in press*

Yamada JMIR *in press*

System Demo

- www.easthma.ca

Getting the eAMS in Your Clinic

- **OSCAR, PSS**
 - Accuro/QHR...coming soon!
- Simple **on-boarding** process:
 - OSCAR
 - OSP settings
 - Clinic-level settings
 - PSS
 - Toolbar/reminder downloads

Getting the eAMS in Your Clinic

- Alerting asthma patients to **download** the eAMS app:
 - Waiting room **posters**
 - **Reminder cards** for handout
 - Patient outreach:
 - Run validated **EMR search**
 - **Email** outreach
 - Ocean reminders (if available)
 - **Mail/phone** outreach

Coming Soon...

– For Patients:

- A validated **decision aid** re. the new “SYGMA” treatment approach (also for **clinicians!**)
- Enhanced **educational** tools

– For Physicians:

- **CFPC/OCFP** Mainpro-C credits for each use
- “**Show me the Evidence**”

– For OHTs:

- Support from **Ontario Health** for larger rollouts as part of Ontario’s **Digital Health Playbook**

Contact me to set it up!

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