Let's Talk Informatics

Achieving HIMSS Stage 7 at the Centre for Addiction and Mental Health (CAMH)

Heather Sulkers, Senior Director, EPMO & Clinical Informatics February 28th, 2019

Bethune Ballroom, Halifax, Nova Scotia

Please be advised that we are currently in a controlled vendor environment for the One Person One Record project.

Please refrain from questions or discussion related to the One Person One Record project.

Informatics...

utilizes health information and health care technology to enable patients to receive best treatment and best outcome possible.

Clinical Informatics...

is the application of informatics and information technology to deliver health care.

AMIA. (2017, January 13).

Objectives

At the conclusion of this activity, participants will be able to...

- Identify what knowledge and skills health care providers will need to use information now and in the future
- Prepare health care providers by introducing them to concepts and local experiences in Informatics
- Acquire knowledge to remain current with new trends, terminology, studies, data and breaking news
- Cooperate with a network of colleagues establishing connections and leaders that will provide assistance and advice for business issues, as well as for best-practice and knowledge sharing

Session Specific Objectives

- Understand how HIMSS EMRAM Stage 7 can be leveraged to influence practice and technology change and adoption
- Identify unique challenges to HIMSS Stage 7 achievement within a mental health organization
- Apply lessons learned to other health care organizations aspiring to reach HIMSS Stage 7

Conflict of Interest Declaration

• I do not have an affiliation (financial or otherwise) with a pharmaceutical, medical device, health care informatics organization, or other for-profit funder of this program.

CAMH – Who We Are

CAMH - Who We Are



- Largest Mental Health and Addictions hospital in Canada
- University of Toronto-affiliated teaching hospital
- * World leader in brain science
- 3 main sites with 30+ locations
- 90 distinct services between an emergency department, inpatient, outpatient, day treatment and partial hospitalization models
- HIMSS Stage 7

CAMH Clinical Programs

Acute Care

- ED (Emergency Department) and Inpatient Services
- Outreach & Telemedicine
- Ambulatory Services

Complex Care and **Recovery**

- CCR Inpatient Services
- CCR Outpatient Services
- CCR Specialized Services and Research

Child, Youth & Emerging Adult

 Child, Youth & Emerging Adult Services

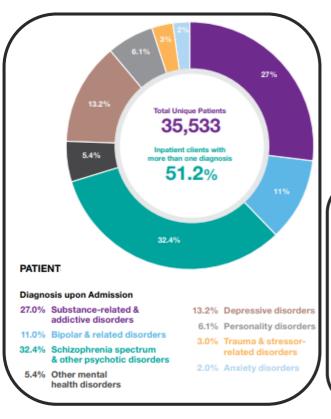
Clinical Services

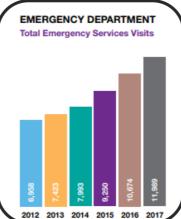
- Clinical Operations
- Clinical Laboratory & Diagnostic Services
- Pharmaceutical Services
- Medical Services
- Hospitalist Services

- Infection Prevention and Control
- Dental Clinic
- Podiatry Clinics
- Dietetic Services
- Nursing Resource Unit

CAMH - By the Numbers

2017-2018 Report







MEDIA AND DIGITAL

7,470 media mentions (41% increase from in 2016/17) Average of 20/day 3,430,54 user sessions on camh.ca

EDUCATION

Educating the next generation of mental health professionals

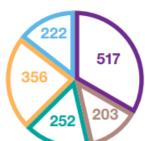
Research fellows and student research trainees

Medical students

Psychiatric medical resident and fellows

Nursing student

Other health care students



92% students would recommend a placement at CAMH

12,000 professionals

participated in CAMF Training Sessions

Our Clinical Information System Transformation

The Evolution of I-CARE

Transformation
Readiness & System
Purchase

CIS Project Design, Build & Test

Training & Launch

Transition to Operations Optimization & Maintenance

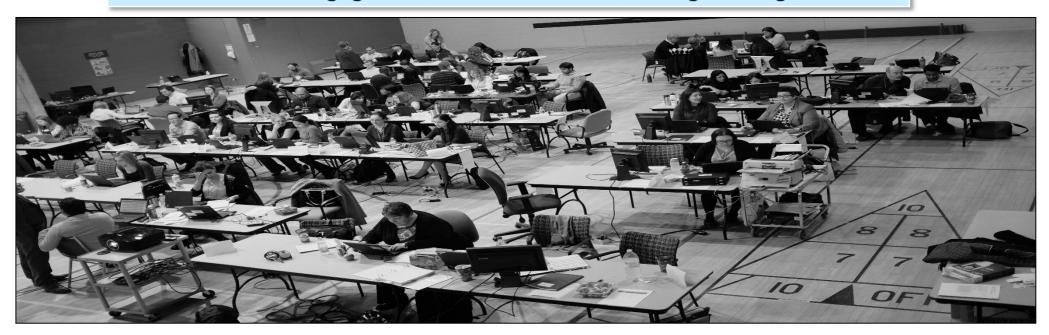
Fall 2010 - Aug 2012

Aug 2012 - April 2014

April - May 2014

May 2014 - Sep 2014

Stakeholder Engagement, Communications, Change Management



Integrated Approach to Clinical Care



Pre Go-Live

Registration System

Workload

Measurement

Systems

Pharmacy

System

Lab System

Dental System

Document Imaging System

Dietary System

Paper

Consent & Authorization

Legal Documents

Hybrid: System + Pape:

Client/Patient Scheduling Clinical Documentation Clinical Reporting

Medication Processing Order & Results Mgmt Medication Mgmt

Post Go-Live

Data Warehouse

I-CARE (Cerner Millennium Solution)

Registration

Medication Management Client/Patient Scheduling

Workload Measurement Order & Results Management

Clinical Reporting

Laboratory Processing Medication Processing Clinical Documentation

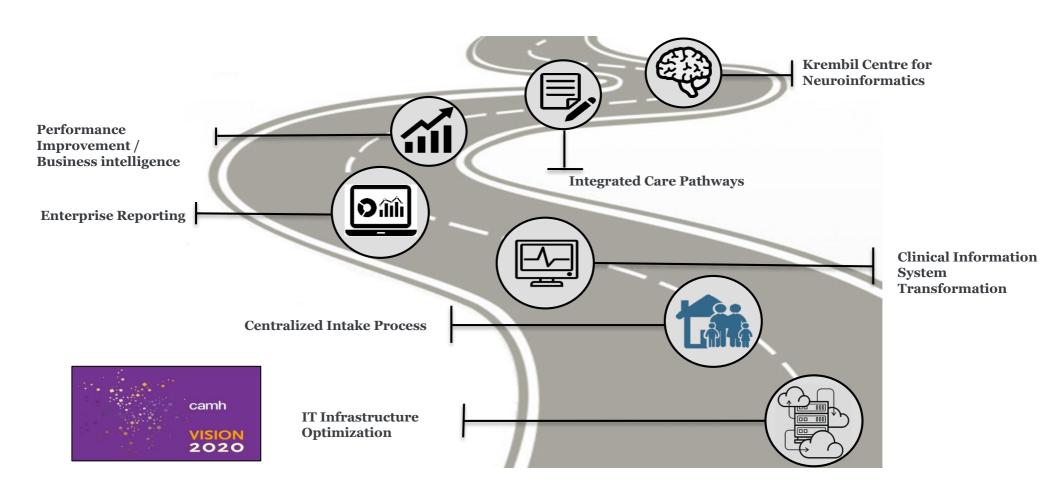
Document Imaging Legal Documents Collaborative Communication Tools

Pharmacy Management

Consent & Authorization

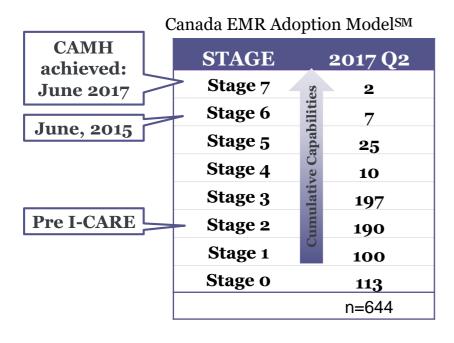
Alerts & Notifications

Roadmap to Data Driven Care



Journey to HIMSS Stage 7

HIMSS – Health Information Management Systems Society - created 8 EMRAM stages to support an organization in determining their level of maturity in implementation and adoption of an electronic medical record



Stage 7 builds on criteria achieved for previous stages, and demonstrates:

- Hospital wide paperless charting to manage patient care
- Use of clinical data to improve quality of care, patient safety, and care delivery efficiency
- Information exchange capabilities with other health entities
- Documentation which supports continuity of care for all inpatient hospital services

"Achieving different stages signifies that an organization aspires to and/or delivers high quality patient care with truly shared, interoperable patient information resulting in increased process performance, quality of care and patient safety amongst their peers within healthcare"

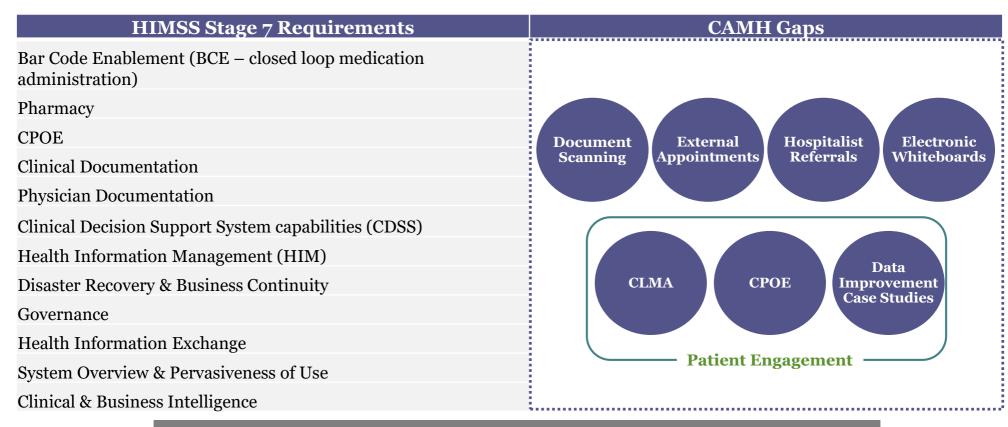
Why HIMSS Stage 7?

International recognition that CAMH leverages its clinical information system to support excellence in care delivery and identify ongoing improvement opportunities, in support of our overarching strategic vision



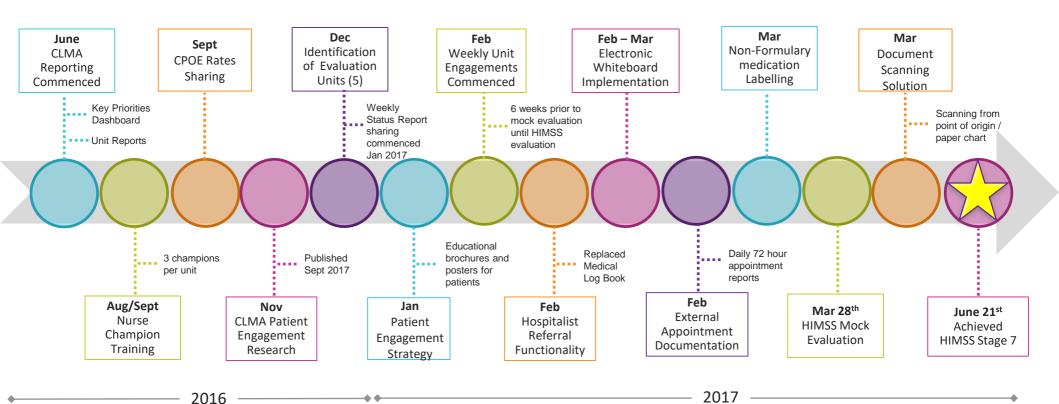
"Achieving different stages signifies that an organization aspires to and / or delivers high quality patient care with truly shared, interoperable patient information resulting in increased process performance, quality of care and patient safety amongst their peers within healthcare"

HIMSS Stage 7 Requirements



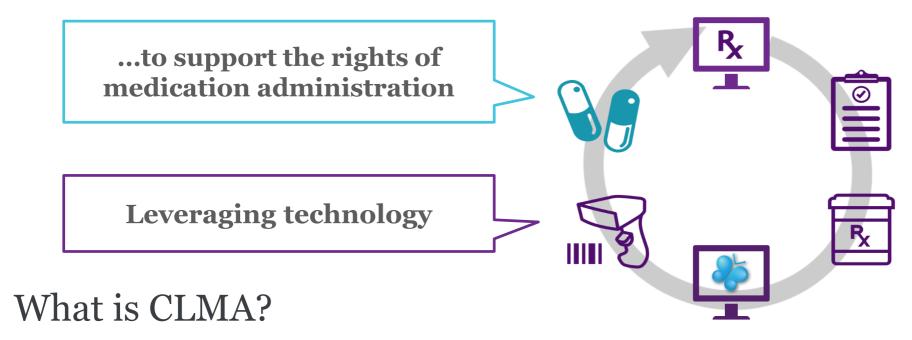
Site Visit Preparation

HIMSS S7 Project Timeline



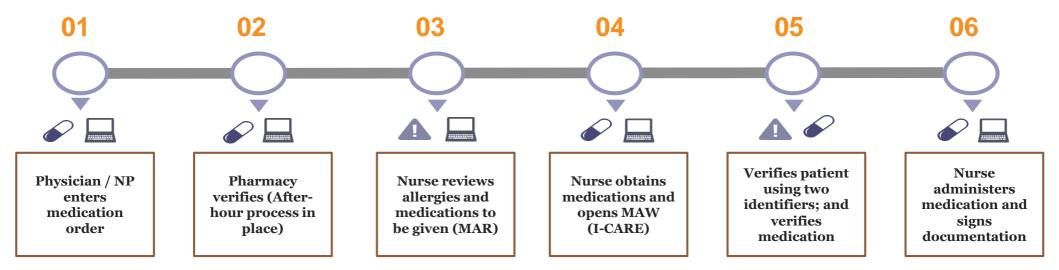
Closed Loop Medication Administration (CLMA)

Closed Loop Medication Administration (CLMA)



• "An environment where the medication process is electronic from initial entry by physicians using CPOE, to pharmacies for order validation and bar coding the medications, to the automatic dispensing machines, to the actual administration of the medication at point of care by the nurse – where the nurse scans the patient's bar code and the medication bar code which initiates clinical decision support for the five rights of medication administration.

CLMA Workflow



Prior to HIMSS Project scanning rates averaged 60% *

* Overall weighted average of patient ID scanning rate and medication scanning rate

CLMA: Interventions



- 1 Developed alternate methods of patient identification
- Distributed weekly **Key Priorities Dashboard** to clinical managers and directors

3b

Identified **categories of medications** not scanned and addressed technical errors; distributed **Weekly Communication** to managers and clinical leadership

High-alert

3a

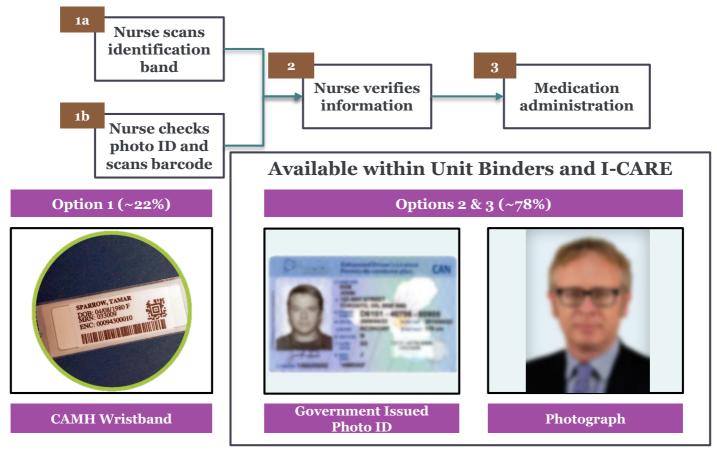
High-volume

Patient's own

3c

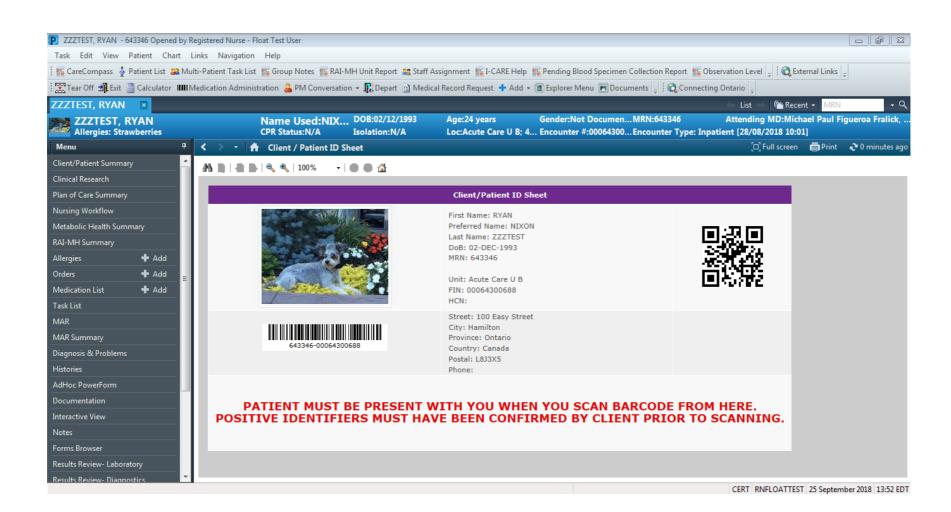
Education and Training

Intervention 1: Patient Identification



*Strudwick, G., Clark, C., McBride, B., Sakal, M., & Kalia, K. (2017). Thank you for asking: Exploring patient perceptions of barcode medication administration identification practices in inpatient mental health settings. *International Journal of Medical Informatics*.

Intervention 1: Patient Identification in I-CARE

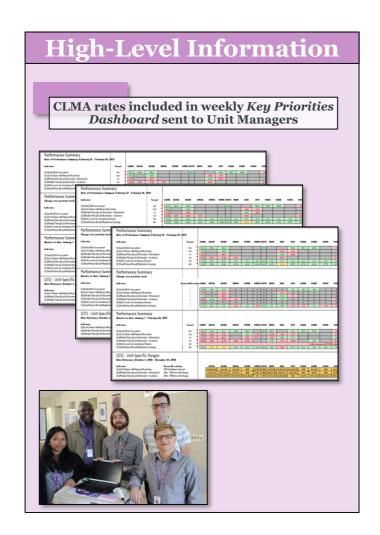


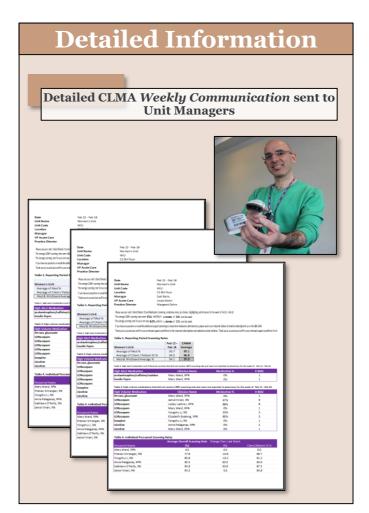
Intervention 1: Patient Engagement Strategy



*Reisdorfer, E., Warnock, C., Kalia, K., Sulkers, H., Clark, C., & Booth, R. (In Press). The effect of barcode medication administration on medication errors, and factors associated with its use that contribute to patient safety: An integrative review. Journal of Nursing Care Quality.

Intervention 2: Leveraging Data





Intervention 2: Acknowledging Results



This certificate acknowledges that

NAME OF UNIT

has successfully achieved

'Most Improved Barcode Scanning Rates' for the month of

Thank you for being a leader in patient safety via the safe administration of medication at CAMH

SVP and Chief Clinical Officer, and VP of Complex Care and Recovery present an achievement certificate to Unit 1-4 for their success on medication administration scanning rates



Vice Pesident Complex Care and Rec



Intervention 3: Targeting Specific Medications

3a

High-alert: medications requiring independent double check e.g.: insulin, clozapine, paliperidone

3b

High-volume: medications administered frequently e.g.: nicotine, loxapine, lorazepam

3c

Patient's own: non formulary e.g.: natural / herbal supplements; developed generic barcode attached to order

CLMA: Results

CLMA Rate – CAMH Weighted Average



 ${\it Data \, Source: \, Discern \, Analytics}$

Computerized Provider Order Entry (CPOE)

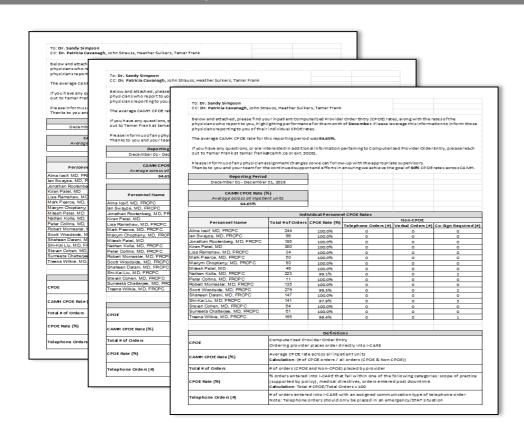
CPOE at CAMH

Goal: Ordering provider places order directly into I-CARE 90% of the time

CPOE		Non-CPOE	
V	Scope of practice	×	Telephone orders
V	Medical directive	×	Verbal orders
V	Post downtime order entry	×	Cosign required

CPOE - Sharing Data

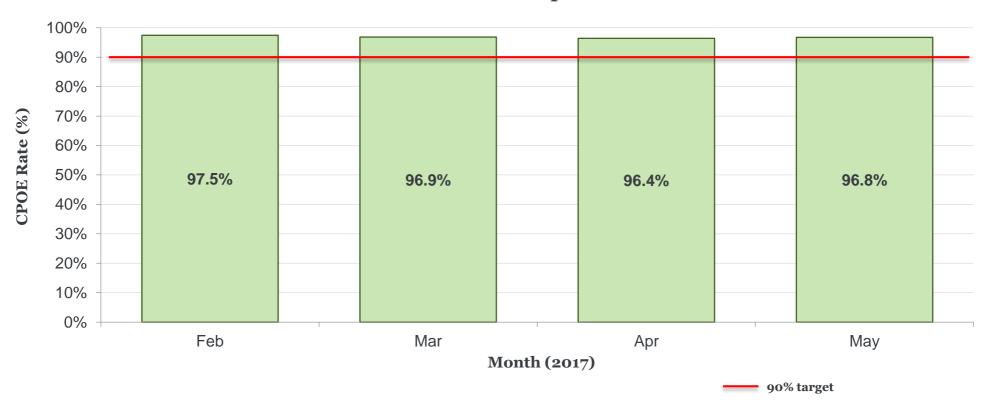
CPOE Monthly Communication sent to the Medical Directors and Discipline Chiefs





CPOE Rates

CPOE Rates – CAMH Inpatient



 ${\it Data \, Source: Cerner \, LightsOn}$

Data-Driven Care

Demonstrating Use of Data Analytics: Case Studies





Clinician Engagement

- 1. CLMA & Alerts Data Review
- 2. Monitoring Protocol for Clozapine-induced Myocarditis
 - 3. Non-OHIP Billing Process

Case Study: Monitoring Protocol for Clozapine-induced Myocarditis

Overview of Clozapine

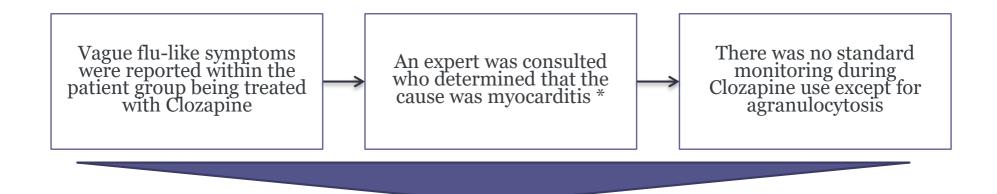


- 25-30% of all individuals with schizophrenia meet criteria for treatment resistance (Remington 2010)
- Clozapine is the only antipsychotic with proven efficacy (Remington, Addington et al. 2017)
- Substantial side-effects

Side Effect	Prevalence
Agranulocytosis	Rare (<1%)
Constipation	More common
Myocarditis	More common

- CAMH houses the largest clozapine clinic in North America (~750 patients)
- Goal to double volume over a 5-year period

Problem Identification



The implementation of I-CARE presented an opportunity to standardize and enforce adherence to monitoring protocols

* Clozapine-induced Myocarditis is a potentially fatal yet likely under diagnosed complication of Clozapine therapy

Interventions

Included Myocarditis monitoring protocol **into Clozapine policy** (Oct. 2014)

Integrated Myocarditis monitoring protocol **into I-CARE order sets** (Dec. 2014)

Reinforced education with cardiology expert (Apr. 2015); monitoring protocol elements made mandatory within I-CARE order sets (Jun. 2015)

⊿	Medications										
	Treatment: initial dose of Clozapine only:										
$\overline{\mathbf{v}}$	🗖 cloZAPine	12.5 mg, Oral, Form: Tab, q									
⊿	△ Laboratory Services										
	Reassess client/patient after 6 months.										
$\overline{}$	Ĉ CBC	T+7;N, Whole Blood, Routin									
굣	C-Reactive Protein (CRP)	T+7;N, Serum, Routine Coll									
굣	Troponin I (High Sensitivity)	T+7;N, Serum, RT Collect, q									
	Order a cloZAPine Level (plasm	a concentration) AT LEAST 5 days after reaching doses (when maintaining at) 300 mg, 400 mg and									
	500 mg, and AT LEAST 5 days a	fter every dose increase past 500 mg.									
	Clozapine Level	T;N, Plasma, Routine Collec									
⊿	Consults/Referrals										
굣	Request to Dietitian	T;N, Routine, Reason: Const									
$\overline{\mathbf{v}}$	Request to Pharmacist	T;N, Routine, Reason: Const									

Clozapine Care

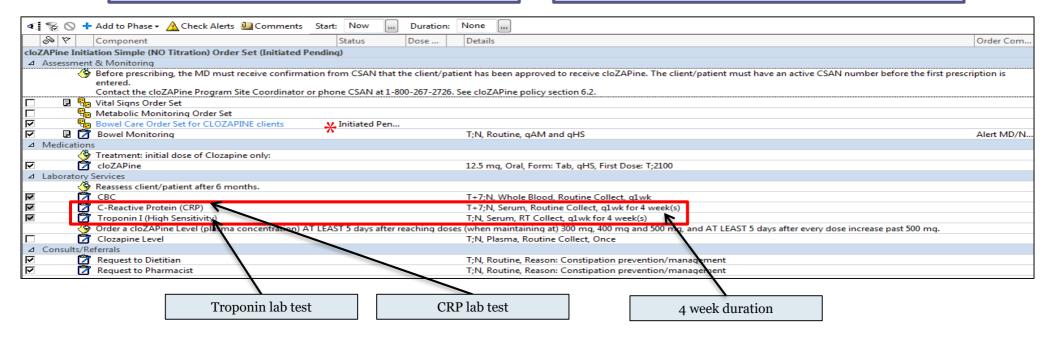
New Clozapine patients receive:

Pre-initiation

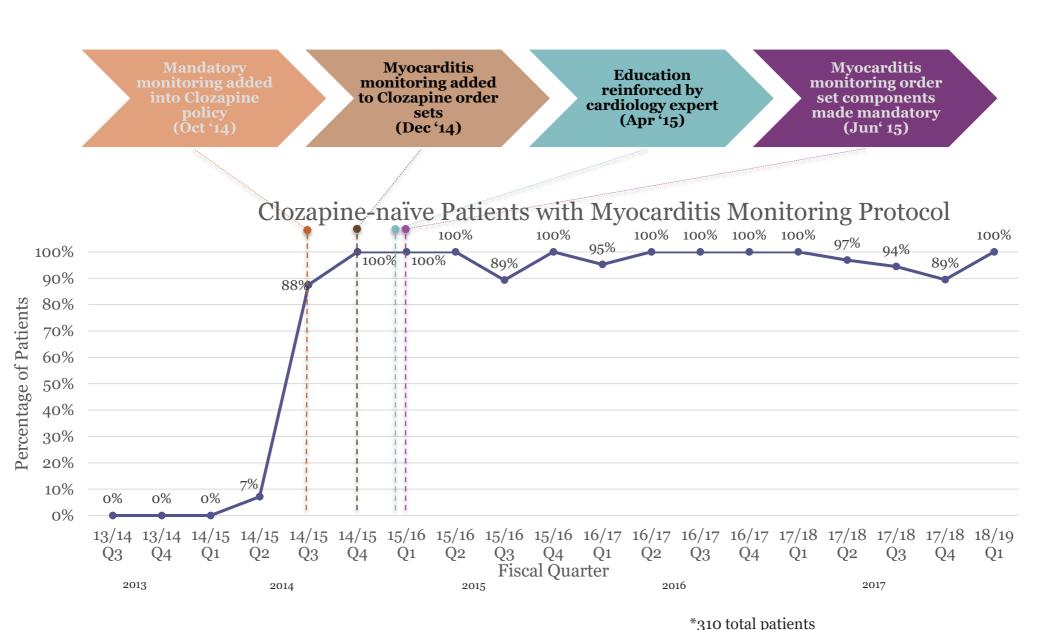
- Baseline ECG, CRP, and Troponin
- Identification of pre-existing cardiac disease

Post-initiation

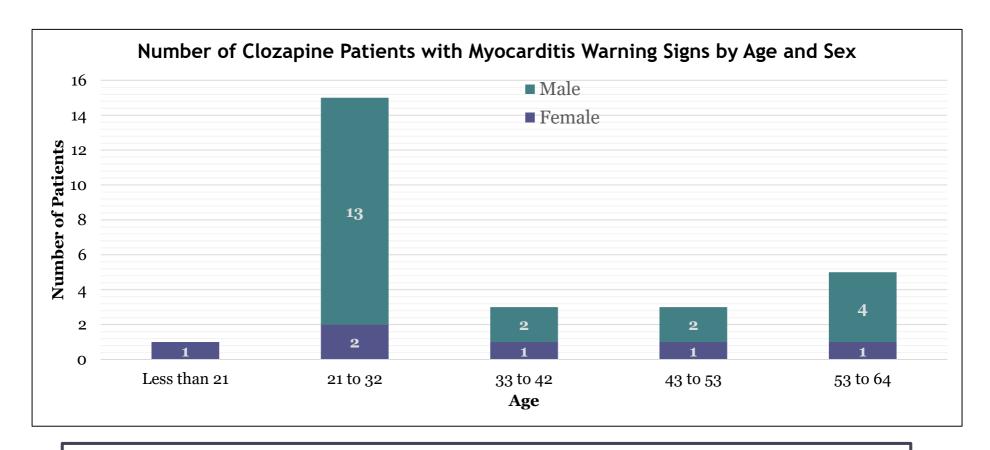
- Weekly clinical assessments
- CRP and Troponin monitoring x 4 weeks
- Regular Agranulocytosis monitoring



Order Set Compliance



Myocarditis Warning Signs - Prevalence



>55% of patients showing early warning signs of Myocarditis were 21-32 years of age; 50% were young males

Patient Impact

Discontinued Clozapine for 27 patients showing early warning signs of myocarditis, which could lead to death



Able to measure the true incidence (7.6%) of Clozapine-induced myocarditis; 27 patients removed from Clozapine due to warning signs



Clinicians are able to more easily screen for Clozapine associated Myocarditis



Developed guidelines for Clozapine cessation and reintroduction



CAMH is <u>locally</u> leading the way for Clozapineinduced myocarditis monitoring and we expect uptake on a <u>regional</u> and <u>national</u> level after publishing

Success Factors

HIMSS Stage 7 - Success Factors

- **Robust project management framework**
- Senior Leadership support
- HIMSS Stage 7 as an outcome
- Conduct a mock visit
- Leverage data

Clinician engagement +++

Questions?

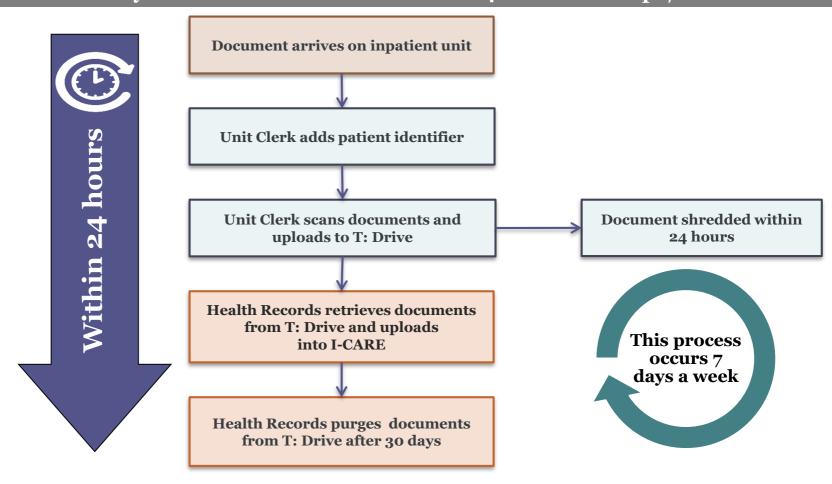


Appendix

Document Scanning

Document Scanning

GOAL: upload clinically relevant documentation within 24 hours of receipt / creation

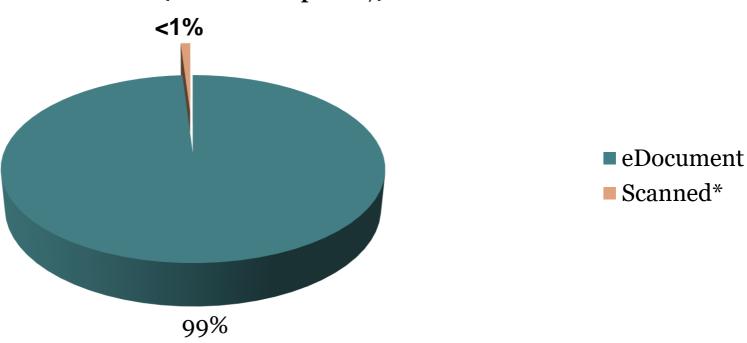


Document Scanning

GOAL: less than 2% of clinical documentation created outside I-CARE

Inpatient Clinical Documentation

(Jan 2016 – Apr 2017)

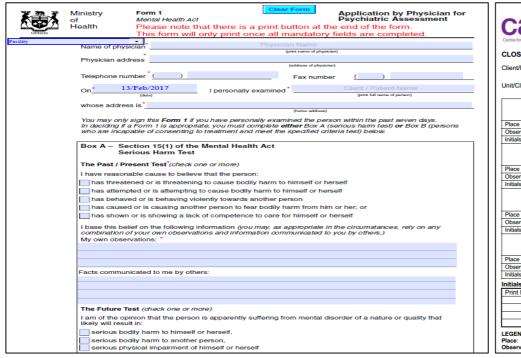


*Clinically relevant scanned documentation created by CAMH

Other Documentation

Physical Patient Charts on Unit:

- Paper copies of Legal Forms must be retained permanently
- Paper copies of consent forms
- Requisitions and accompanying documents for external appointments



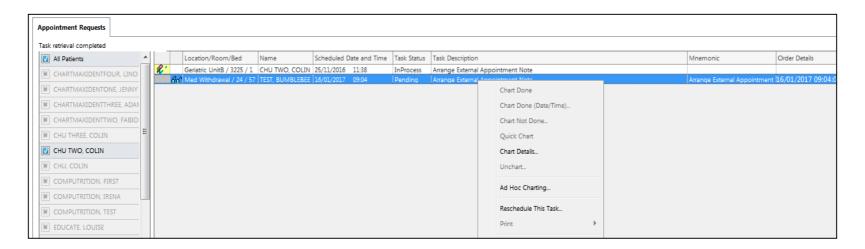
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lient/Patient Na	me:	st name																						
illi/Cillil/Jelvic	e							Da	(dd	l/mm/y	ууу)	K	DOIN #			-								
	2400	0015	0030	0045	0100	0115	0130	0145	0200	0215	0230	0245	0300	0315	0330	0345	0400	0415	0430	0445	0200	0515	0530	0545
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Initials																								
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Place		†		<u> </u>																			<u> </u>	\top
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nitials Log																								
Print Name		Sign	ature		Initia	als	Print N	lame		-	Signa	ure		Initial	s	Print N	lame			Sign	ature		Init	tials
		+			+	\rightarrow				-			_		\rightarrow					+			+	

* Close / Continuous Observation forms are environmental scans completed on paper and subsequently scanned into I-CARE – deemed non-clinically relevant

GOAL: I-CARE source of truth for all external appointment information; eliminate appointment books

Clinician enters "Arrange external appointment" order in I-CARE Dirders for Signature Acute Care U A: 526: A Encounter #:00064300120 Admit: 03/01/2017 14:21 Patient Care Details for Arrange External Appointm— Order 08/02/2017 19:16 EST, Routine Details for Arrange External Appointment Details for Arrange External Appointment Conduction of the Comments Details of Order Comments Details of Order Comments Contact Information: Special Instructions: Special Instructions:

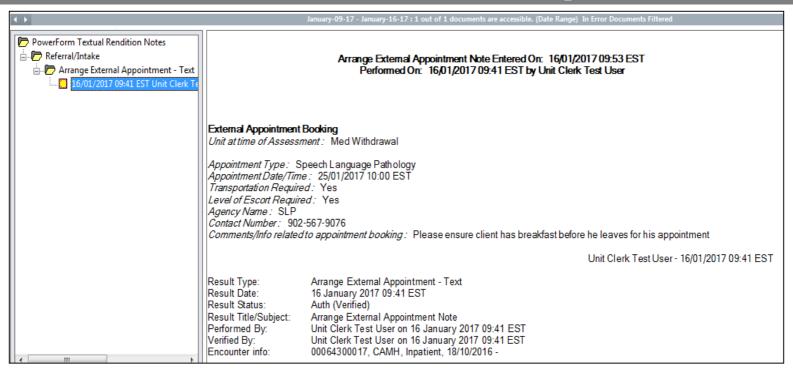
Completing the task & charting details will trigger PowerForm completion



External Appointments can be viewed from a multi-patient task list by:

- Unit Clerks
- Information Specialists
- Nurses
- Social Workers
- Hospitalists / Nurse Practitioners

Audit trail & textual rendition will be maintained in the patient's health record



Internal & External Appointment Planning

Explorer Menu Report prints upcoming patient appointments within 72 hours for each unit



Oualifiers:

Internal Appointments External Appointments

Date Date Time

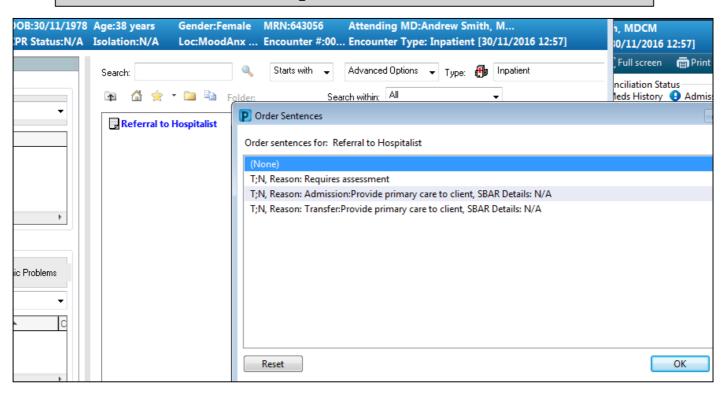
Appointment Type Appointment Type

Location Agency Name

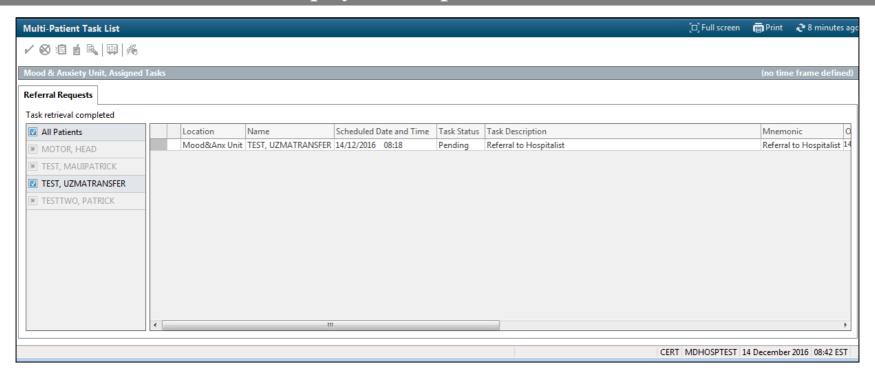
Duration Appointment Status

Goal: Eliminate paper referral books; streamline Hospitalist workflow; maintain audit trail

Clinician enters "Hospitalist Referral" order in I-CARE



Referral order displays on Hospitalist Multi Patient Task List



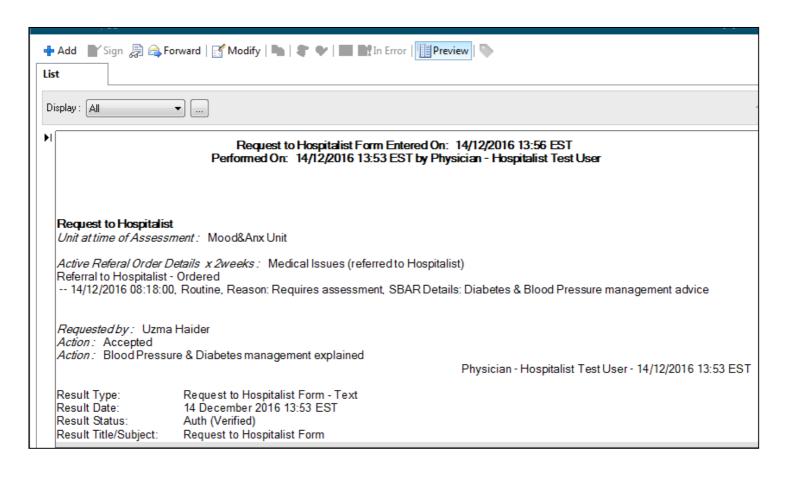
Hospitalist manages referral from Multi Patient Task List

Hospitalists
CHARTS
DETAILS on
task which
triggers a
PowerForm,
creating an
audit trail for
referral order



	orm - TEST, UZMATRANSFER		- X									
✓ □ ○ ○ □ ↑ *Performed on: 14/12/201		By: Physician - Hospitalist	Test User									
Request to Hospil	16 Table 1353 EST	by. Thysician Flospitains	A COLUMN									
noquest to Hospi	Request to	o Hospitalist										
	Unit at time of Assessment Mood&Anx Unit											
	Active Referal Ord	er Details x 2weeks										
Reference 14/	Medical Issues (referred to Hospitalist) Referral to Hospitalist - Ordered 14/12/2016 08:18:00, Routine, Reason: Requires assessment, SBAR Details: Diabetes & Blood Pressure management advice Requested by											
	A	tion										
O Ac	ccepted O Declined O Admission Note	ed O Transfer Noted O Client Declined										

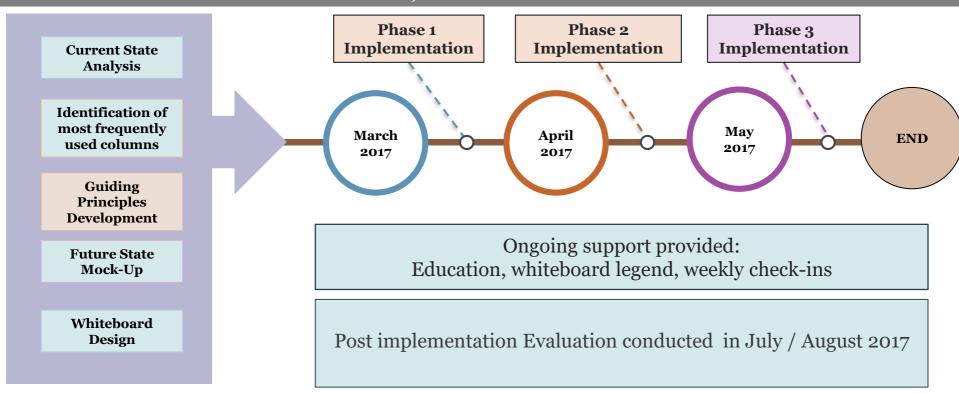
Documentation audit trail available in patient chart



Electronic Whiteboards

Electronic Whiteboard Design & Implementation

Goal: Eliminate manual whiteboards; I-CARE source of truth for electronic whiteboards



Electronic Whiteboard Overview

BED	CLIENT	LOS	MRP	sw	AX RESULTS	RISK FLAGS	STATUS	PASSES	OBS	APPTS	ADT	COMMENTS
100 A	<u>ALEX H.</u> (110032) ***Tony	8d	JR	TF			Vol	Indirect				
100 B	James Smith (348990)	364d	JR	АВ	DASA -4 SRA-High Falls- Yes EpiPen No CPR	6	Vol	None	SR		EDD - 05/12/17	RAI Due Oct 29
101 A	C A (227398)	14d	JR	TF	A&C EpiPen DASA - 7 Diet = Mod	00	F33	None	MR	Yes		
101 B	FIONA M. (234959)***Apple	1y 60d	KJ	АВ	DASA = none Thc	P- 🚜	F1 05/29	Es corte d * * *	со		F-ULOA	Primary Nurse: YP
101 C	В В (235555)	12d	KJ	TF	C DASA - 3 Etoh		F48 05/29	A***		Yes		
102 A	POLLY M. (900021)	21d	KJ	АВ	DASA - 4 SRA-Mod	0	F3 06/08	UA***				Transfer ACU
102 B	RANDALL R. (456723)*** Randy	3d	BL	TF	Dr&C DASA - 5	-3°	F3 06/08	UA				
102 C	K P (217737)	4d	BL	АВ	DASA - 7		Vol	Indirect	Q15		I-ULOA	%% #13#
103 A	Troy Talbot (232222)	17d	BL	TF	DASA - 4 SRA-Mod	P- 3	NCR	UA			EDD - 05/13/17	

Ax Results
Falls = Yes
A&C
Dr&C
C
DASA = (score)
SRA = Mod / High
Diet = Mod
Substances

Proposed Risk Flags	Approved Risk Flags	Risk Flag
P- 🖲		"Aggression/Violence Risk"
p- 🔞	8	"Sexual Aggression Risk"
P- 🚜	00	"Wepons Risk"
P- 🕜	0	"Letter of Trespass"
P3 ²	3.	"I-ULOA Risk"
P- 🎳	6	"Arson Risk"

Status
Vol
MHA Form Name
MHA Form Expiry Date
F33
CTO & Expiry Date
Forensic Status
ALC

Let's Talk Informatics has been certified for continuing education credits by;

- College of Family Physicians of Canada and the Nova Scotia Chapter for 1 Mainpro+ credit.
- Digital Health Canada for 1CE hour for each presentation attended. Attendees can track their continuing education hours through the HIMSS online tracking certification application, which is linked to their HIMSS account.

Thank you for attending this event.