

September 28th 2017

Proactive & opportunistic management of diabetics:

How we harnessed EMR to change
the way we manage diabetics

Presenter Disclosure

- **Presenter:**

Rosemarie Lall MD, CCFP, FCFP

- **Relationships with commercial interests:**

none

Disclosure of Commercial Support

No Commercial Support

Potential for conflict(s) of interest:

- No conflict of interest

Mitigating Potential Bias

N/A

Platinum Medical FHO @ Scarborough Village



Platinum Medical FHO @ Scarborough Village

Low Income
New Immigrants
Material Deprivation



Objectives

- Appreciate the importance populating data tables
- Implementation strategies for diabetes screening using algorithms
- Appreciate the power of EMR

Collecting & Preparing Data

**If your data are not
in the right place
they will be difficult to locate**

A needle in the haystack



Strength of EMRs

*Every piece of data you collect has its own appropriate table

*Ability to search

- HT
- WT
- BP
- Medications
- Blood results, etc.



Populating Data Tables

And Data Scrubbing

Populating Data Tables

1. Keywords in CPP, chart notes to identify diabetics ('DM', Medications,)
2. Verified diabetic conditions with data from Rx and test results (e.g. HbA1C, FBS, OGGT)
- 3 Added diabetics to “Disease Registry”
- 4 Data collection was standardized

What was collected/where recorded in the EMR?

Same units of measurements (Kg/cm)

Data Scrubbing

A process to improve the quality of your data

Remove obvious errors

HT of 576 ?

WT of 0.26 ?

BMI of 3,410 ?

Zero ?

Males with record of PAP or Mammo

Convert to standard measure

HbA1C from 0.067 to 6.7 (done by service provider)

Lbs to Kgs etc.

Move data recorded in wrong table to correct table!

What happens when you collect data and put it in the right place?



How Do We Compare?

Completeness of selected data items for active patients with age ≥ 18 *

Data Item	Your site	UTOPIAN	diff
Height	87.1 %	72.7 %	14
Weight	93.2 %	80.7 %	13
Waist circumference	15.5 %	10.4 %	5
BMI	85.1 %	69.3 %	16
Blood pressure	94.9 %	87.9 %	7
Family history	63.2 %	74.0 %	-11
Smoking history	72.7 %	76.5 %	-4
Postal code	99.3 %	87.6 %	12

*UTOPIAN: U of T Practice Based Research Network

Harnessing the Power of EMRs

Implementation Strategies

Reactive vs Proactive Processes

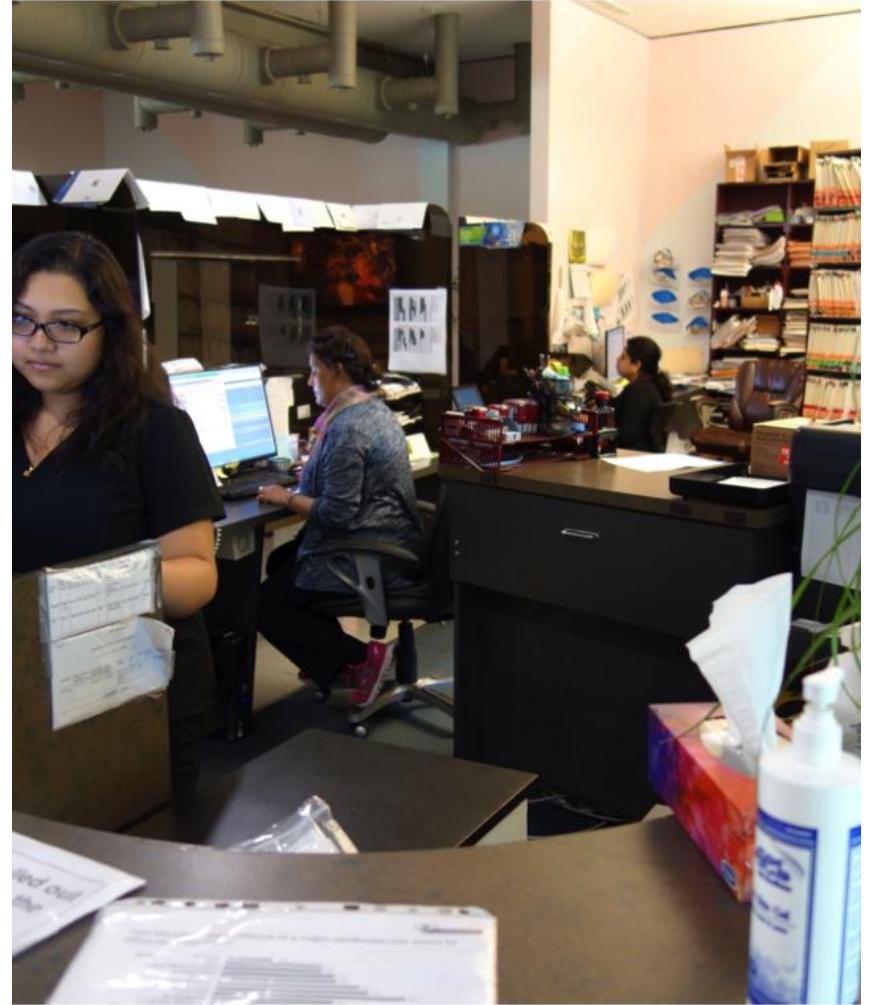
Previous-Reactive	Current-Proactive/Opportunistic
Patient initiates appointment	At each diabetic review: book next review, provide requisition for next review, send e-mail reminders
MD reviews chart and decides a diabetic review is needed: If b/w is recent, review is done	Opportunistic review: Flag diabetics who are booked for another reason but are due for a review Add diabetic review
If b/w is not up to date: Pt. given requisition & does bloodwork. Pt. schedules diabetic review. Diabetic review is done. Pt. is asked to come back in 3-4 months	Rebook missed reviews: Search for missed or cancelled reviews and rebook

Implementation Strategies: It takes a team!

- Front staff
- Triage staff
- Medical/EMR Champion

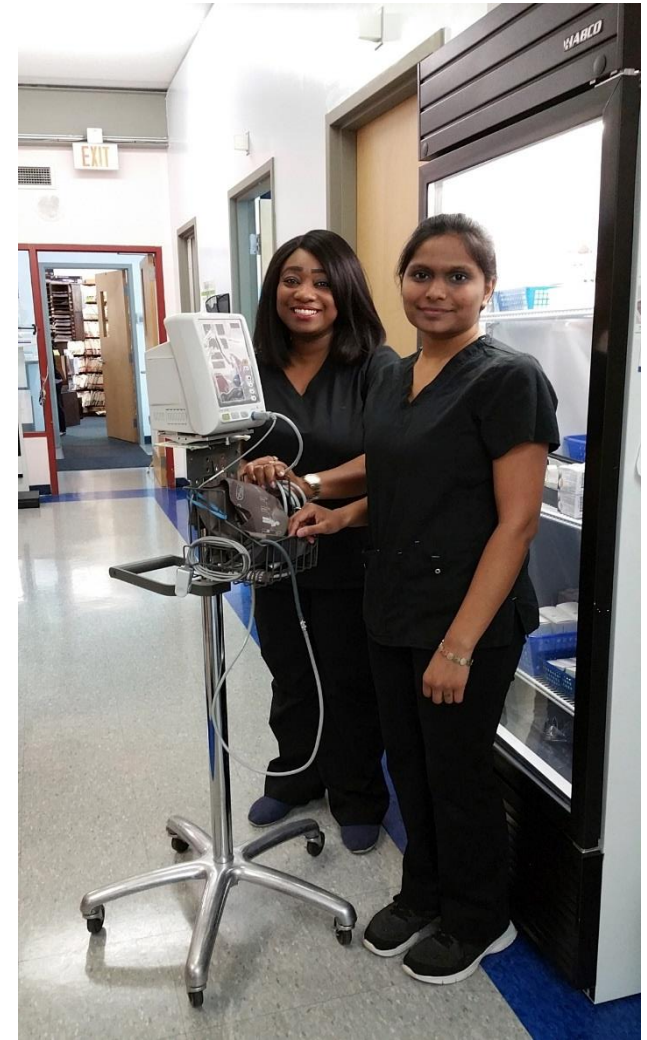
CLERICAL (Front Desk) STAFF

- Learn new procedures for diabetics
- Book future reviews
- Educate patients
- Run algorithms... all day long



Triage Staff

- We hired 2 additional full time staff
- They were trained:
 - Diabetic review requirements
 - What data to collect
 - Where to enter the data



Medical Lead-EMR Champion

- Challenges
- Involve colleagues in the process
- Keeping them informed of progress
- Soliciting feedback at each stage
- Removing roadblocks
- Making their work easier






The Launch

- Broadcast e-mail to all diabetics explaining the new procedures
- Birth month was used to stagger appointments and invite diabetics to a review

However the dominant tactics became:

- opportunistic reviews
- scheduling future appointments
- rebooking missed appointments

Schedule Example

09:45	1	 [Redacted], Addison E B M Rx 12 mo immu
10:00	1	 [Redacted], Elvira E B M Rx K030;
10:15	1	 [Redacted], Geoffrey E B M Rx k030
10:30	1	 [Redacted], Sahir E B M Rx Baby check
10:45	1	 [Redacted], Laeba Su E B M Rx disability form
11:00	1	 [Redacted], Goldie E B M Rx K030
11:15	1	  [Redacted], Gulalai E B M Rx t/r
11:30	1	  [Redacted], Sajida E B M Rx forms,
11:45	1	 [Redacted], Sal E B M Rx f/u from the ER
12:00	1	 [Redacted], Solomo E B M Rx child cpx,
12:15	1	 * [Redacted], Samuel E B M Rx child cpx,

After Running the Algorithms...

09:45	1	📁	██████████ Addison E B M Rx 12 mo immu	09:45	1	📁	██████████ Addison E B M Rx 12 mo immu
10:00	1	📁	██████████ Elvira E B M Rx K030	10:00	1	📁	██████████ Elvira E B M Rx K030; HZV
10:15	1	📁	██████████ ██████████ E B M Rx k030	10:15	1	📁	██████████ ██████████ E B M Rx k030
10:30	1	👁️	██████████ Sahir E B M Rx Baby check	10:30	1	👁️	██████████ Sahir E B M Rx Baby check
10:45	1	📁	██████████ Laeba ██████████ E B M Rx disability form	10:45	1	📁	██████████ ██████████, Laeba ██████████ E B M Rx disability form ; LLL
11:00	1	📁	██████████ Goldie E B M Rx K030	11:00	1	📁	██████████ Goldie E B M Rx K030
11:15	1	📁	██████████ ██████████ Gulalai E B M Rx t/r	11:15	1	📁	██████████ ██████████ Gulalai E B M Rx t/r ==
11:30	1	📁	██████████ ██████████ Sajida E B M Rx forms	11:30	1	📁	██████████ ██████████ Sajida E B M Rx forms; TTT; Pneu-23; HZV; K030
11:45	1	📁	██████████ ██████████, Sal E B M Rx f/u from the ER	11:45	1	📁	██████████ ██████████, Sal E B M Rx f/u from the ER ; K030; MMR
12:00	1	📁	██████████ ██████████ Solomo E B M Rx child cpx	12:00	1	📁	██████████ ██████████ Solomo E B M Rx child cpx; E/MAIL
12:15	1	📁	██████████ ██████████, Samuel E B M Rx child cpx	12:15	1	📁	██████████ ██████████, Samuel E B M Rx child cpx; E/MAIL

Actual Day

09:00	1	[redacted] awara E B M Rx 842 - rx Pneu-23	[redacted] anna L E B M Rx u/s f/u;MMR
09:15	1	[redacted] Donna Le E B M Rx 843 - req for blood work, req for mammo TTT;E/MAIL	[redacted] E B M Rx ear infection
09:30	1	[redacted] alia E B M Rx 1019 concerning -IUD;TTT;MMR	[redacted] Taramatti E B M Rx f/u on the way@1023
09:45	1	[redacted] Donna E B M Rx 1010 -acid reflux-RL;MMR ,Wheezing .Rm #8	[redacted] dison E B M Rx 12 mo immu
10:00	1	[redacted] ole E E B M Rx 951 cramping,throwing up-RL	[redacted] Elvira E B M Rx K030; HZV
10:15	1	[redacted] holet E B M Rx cancer concern; MMR	[redacted] Geoffrey E B M Rx k030
10:30	1	[redacted] E B M Rx Baby check-->rm 8	
10:45	1	[redacted] Khalida E B M Rx 1026 -eye	# [redacted] Laeba Su E B M Rx disability form ; LLL +1
11:00	1	[redacted] Goldie E B M Rx K030@ rm #5	[redacted] Rah E B M Rx 1018 -chest pain
11:15	1	[redacted] Gulalai E B M Rx t/r ==	
11:30	1	[redacted] Sajida E B M Rx forms; TTT; Pneu-23; HZV; K030-	
11:45	1	[redacted] Sal E B M Rx f/u from the ER ; K030; MMR	
12:00	1	[redacted] Solomo E B M Rx child cpx; E/MAIL	
12:15	1	[redacted] Samuel E B M Rx child cpx; E/MAIL -a @1150 -walkout	

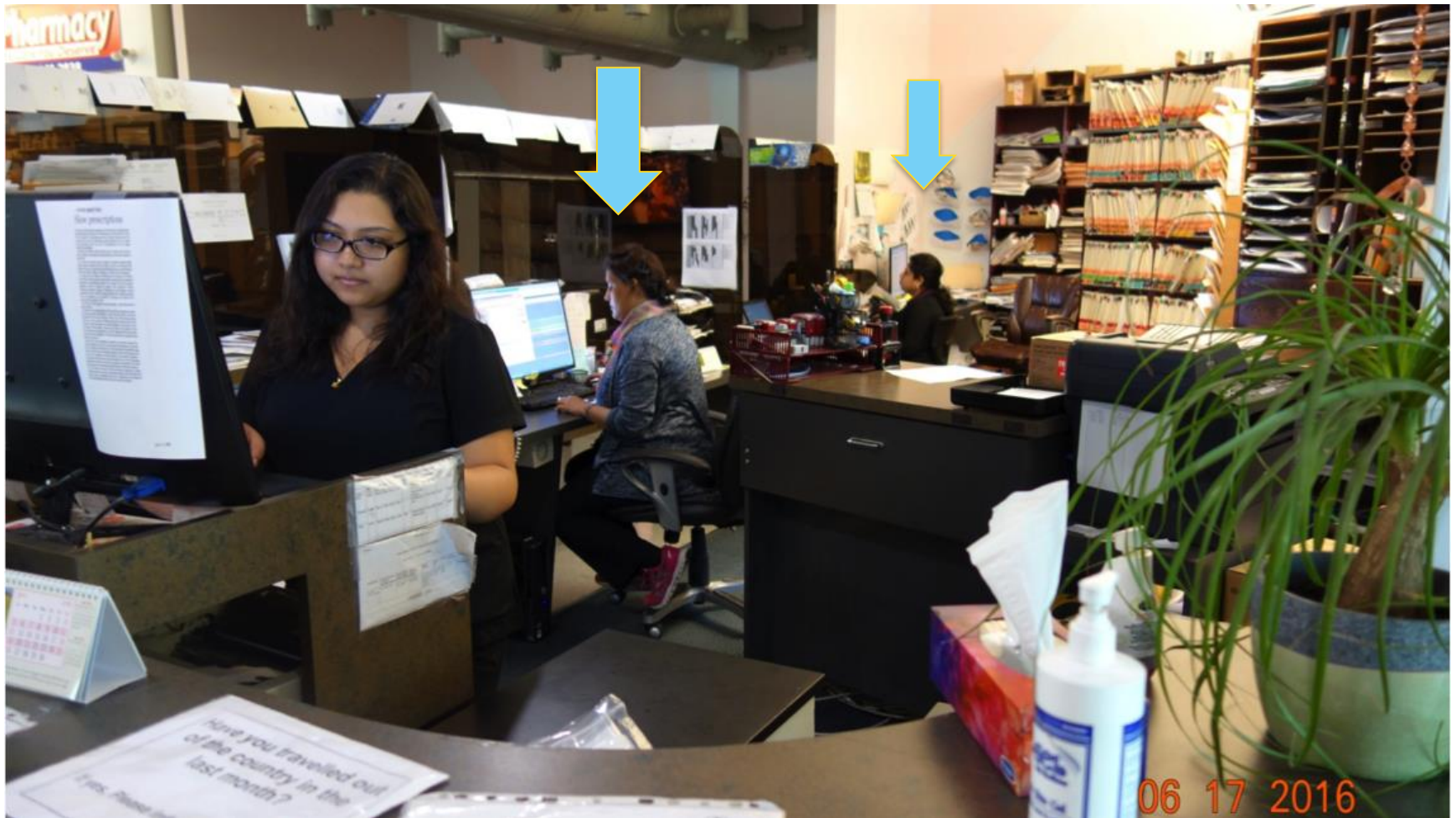
ALGORITHMS

at the end if there is time

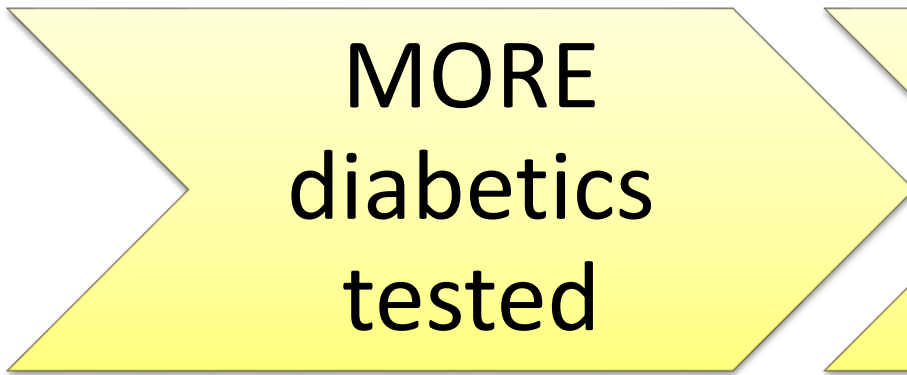
Algorithm Examples

Report	Report By Template						
Add Template Select a template: Main Page 1. # Active patients/provider 2. 10-Appointment booked Tetanus missing 3. 11-Appointment booked 65+ Pneumovax missing 4. 12-Appointment booked today Shingles Vacc missing 5. 13-Diabetics Booked today onward, not reviewed (complement to #173) 6. 14-Appointment MMR missing for 1970-1992 7. 15-Appointment booked Tetanus given TTT showing	13-Diabetics Booked today onward, not reviewed (complement to #173) <table border="1"><tr><td>Step 1:</td><td>Provider Number</td><td><input type="text" value="all providers"/></td></tr><tr><td>Step 2:</td><td>Generate Query</td><td><input type="button" value="Run Query"/></td></tr></table> <p>View Template XML Edit Template Delete Template Export Template to K2A</p>	Step 1:	Provider Number	<input type="text" value="all providers"/>	Step 2:	Generate Query	<input type="button" value="Run Query"/>
Step 1:	Provider Number	<input type="text" value="all providers"/>					
Step 2:	Generate Query	<input type="button" value="Run Query"/>					

Running Algorithms



How did the new process impact diabetic care?

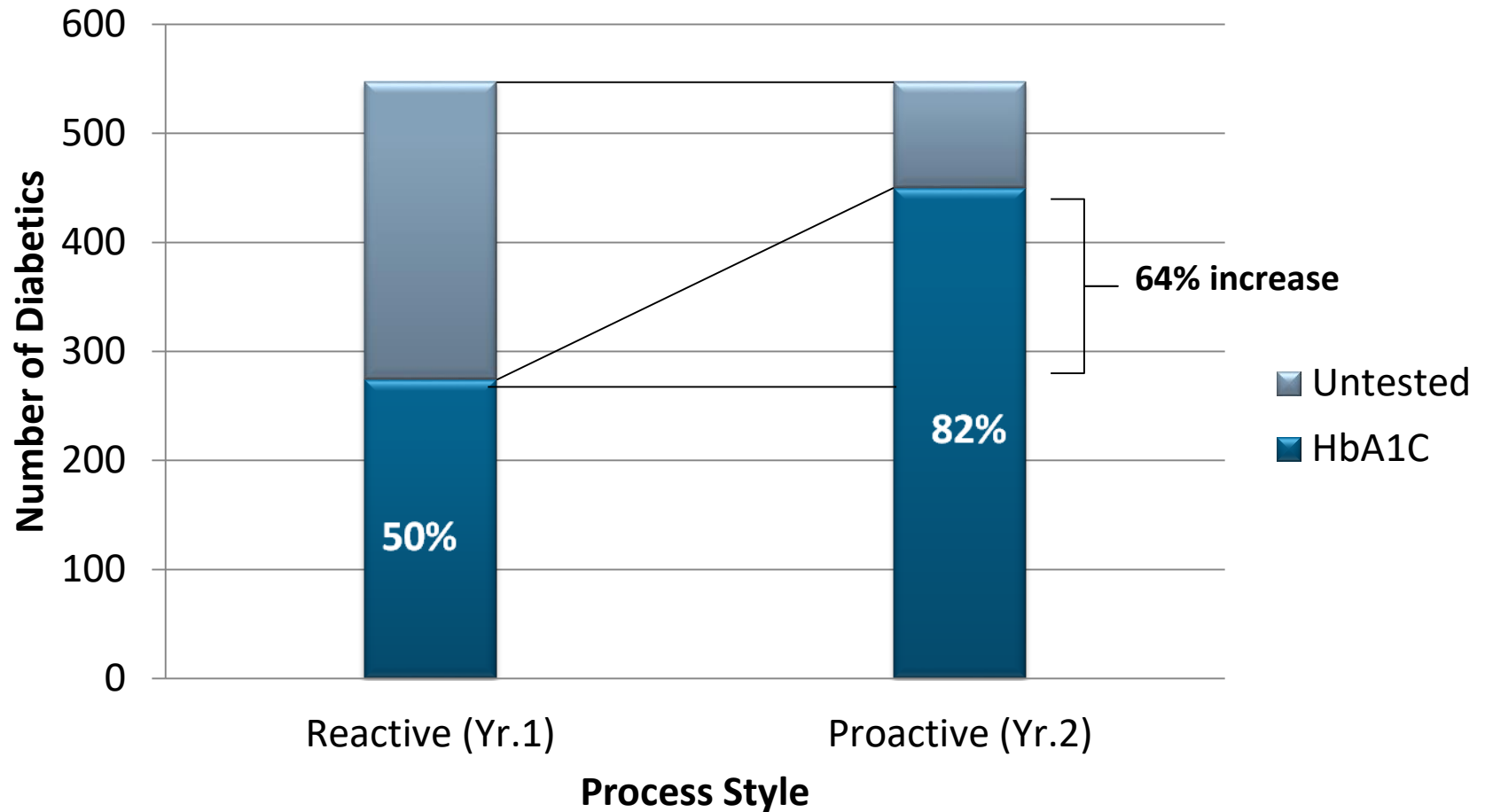


MORE
diabetics
tested

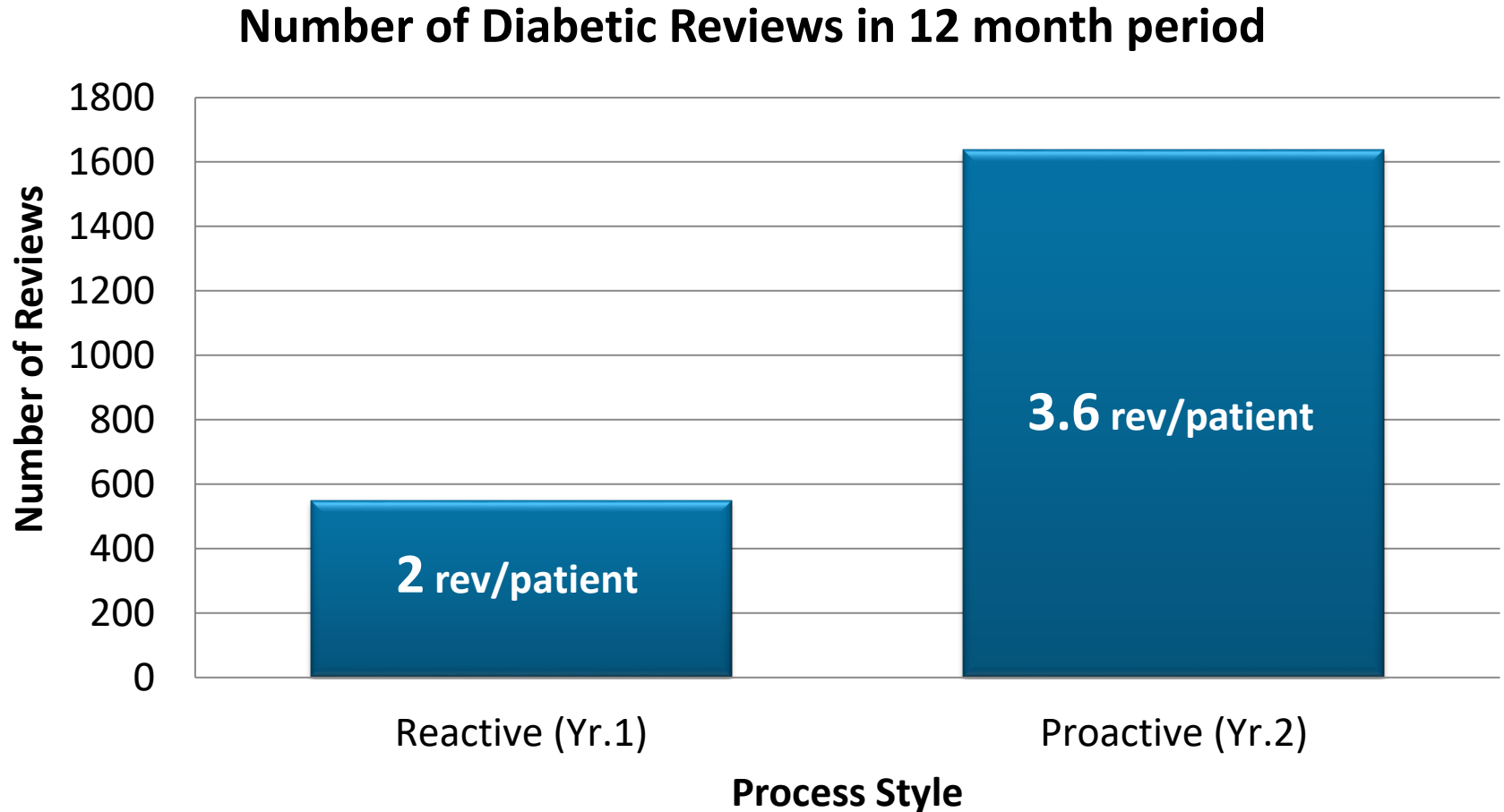


MORE
diabetic
reviews


Diabetics Tested in a 12 Month Period



Diabetics Were Tested More Often



Overall Benefits

-  Physician, Staff & Patient satisfaction
- Improved health of the clinic population (results pending)
- Economic impact on a practice- 3 x K030
- Attained MOH recommendation for number of diabetic reviews per year (EPEP* review, 2017)
- Attained MOH goal of testing 80% of diabetics in prior 6 months

- *EPEP-EMR Practice Enhancement Review

Summary & Take Home:

- Search for data to populate tables
- Enter in the right place!
- Collect new data
- Enter in the right place!
- Use algorithms to unleash the power of EMR
 - You still have a needle in a haystack, but...

The haystack will look different



Thank You



ALGORITHMS

TECHNICAL STUFF

Algorithms Run

Report	Report By Template						
<p>Add Template</p> <p>Select a template:</p> <p>Main Page</p> <ol style="list-style-type: none"># Active patients/provider10-Appointment booked Tetanus missing11-Appointment booked 65+ Pneumovax missing12-Appointment booked today Shingles Vacc missing13-Diabetics Booked today onward, not reviewed (complement to #173)14-Appointment MMR missing for 1970-199215-Appointment booked Tetanus given TTT showing	<p>13-Diabetics Booked today onward, not reviewed (complement to #173)</p> <table border="1"><tr><td>Step 1:</td><td>Provider Number</td><td><input type="text" value="all providers"/></td></tr><tr><td>Step 2:</td><td>Generate Query</td><td><input type="button" value="Run Query"/></td></tr></table> <p>View Template XML Edit Template Delete Template Export Template to K2A</p>	Step 1:	Provider Number	<input type="text" value="all providers"/>	Step 2:	Generate Query	<input type="button" value="Run Query"/>
Step 1:	Provider Number	<input type="text" value="all providers"/>					
Step 2:	Generate Query	<input type="button" value="Run Query"/>					

Algorithm Framework

```
<report title="YOUR ALGORITHM NAME (TITLE) HERE" description="SUBTITLE  
HERE" active="1">
```

```
<query>
```

```
SELECT
```

```
FROM
```

```
WHERE
```



```
ORDER BY
```

```
</query>
```

```
</report>
```

Sample Appointment

EDIT AN APPOINTMENT

Date:	2017-09-10 	Status:	Scheduled 
Start Time:	09:00	Type:	
Duration (min):	15	Chart No.:	61005578
Name:	TEST,DONNA	Doctor:	Lall, Rosemarie
Reason:	K030	Search:	61005578
Location:		Notes:	
Creator:	Lall, Rosemarie	Resources:	
Create Date:	2017-09-10 10:57:26	Last Time:	2017-09-10 10:57:26
		Last Editor:	Lall, Rosemarie
		Critical:	<input type="checkbox"/>

Appointments Table

	A	B	C	E	F	G	H	I	M
1	Field	Type		provider no	appointment_date	start_time	end_time	name	reason
2	appointment_no	int(12)			2013/02/15	11:00:00	11:14:00	████████ Ramos	cpx
3	provider_no	varchar(6)			2013/02/13	12:15:00	12:29:00	Patricia	form
4	appointment_date	date			2013/02/12	14:00:00	14:14:00	████████	K030; HZV
5	start_time	time			2013/02/25	08:20:00	08:39:00	████████	back pain
6	end_time	time			2013/02/22	15:15:00	15:29:00	████████	headache
7	name	varchar(50)			2013/02/22	15:00:00	15:14:00	Camille ██████	knee
8	demographic_no	int(10)			2013/02/13	12:00:00	12:14:00	Bari	t/r
9	program_id	int(11)			2013/02/14	13:45:00	13:59:00	██████ /veena	immu
10	notes	varchar(80)			2013/02/15	13:45:00	13:59:00	(SANDRA)	TB test
11	reason	varchar(80)			2013/02/12	16:15:00	16:29:00	██████, Corine	spec diet
12	location	varchar(30)			2013/02/12	16:15:00	16:29:00	████████	t/r
13	resources	varchar(255)			2013/02/12	16:15:00	16:29:00	██████, Coburn	PAP
14	type	varchar(50)			2013/02/12	16:30:00	16:44:00	e	REQ FOR MAMMO
15	style	varchar(10)			2013/02/12	16:30:00	16:44:00	e Jerry	cpx
16	billing	varchar(10)			2013/02/12	16:30:00	16:44:00	enne	2 M
17	status	char(2)			2013/02/12	16:30:00	16:44:00	Carine	IPS

Simple Example

```
<report title="My simple example" description="SUBTITLE HERE" active="1">  
<query>  
  
SELECT name, provider_no, reason  
  
FROM appointment  
  
WHERE appointment_date >= 2017/09/28  
and reason = "K030"  
  
ORDER BY provider_no, appointment_date ;  
  
</query>  
</report>
```

The screenshot displays the Accuro software interface for managing rules. On the left, a sidebar titled 'Existing Definitions' lists various categories, with 'Diabetic Patients' selected. The main area is titled 'Diabetic Patients' and shows 'Current Rules' with two entries: 'Diagnosis Diagnosis Code Contains '250'' and 'Appointment Date in the Last 1 Year', the latter being highlighted in red. Below this, there are two panels: 'New Rule' and 'Manage Rule'. The 'New Rule' panel shows a 'Rule Category' dropdown set to 'Demographics' and a list of fields including Address, Carecard, City, Deceased, Default Insurer, Email Address, Employer, Enrolled Date, Enrolled Provider, Family Phys., File Number, Flags, Global Message, Next of Kin, Occupation, Office Provider, Official Language, and Paper Chart. The 'Manage Rule' panel shows '--None--' selected, with options for 'Doesn't Match', 'Patient Records Only', and 'Optional', and an 'Instances' dropdown set to '1'. Buttons for 'Add Rule' and 'Remove Rule' are visible. At the bottom left, there are icons for adding, deleting, and favoriting definitions.

From the **Records** window, click **Patient > Search**. The EMR displays the search window, with a list of available searches displayed on the left side.

Search

6 mths - 3 yrs 6 mths
all patients
Asthmatics
Diabetes
Diabetic Diet
Diabetic Education Program
HRT and Breast Ca
Hypertensives
Late Immunizations
Missed INR
patients after 50
patients less than 20

CPP Prob ICD-9 any item starts with 250
or
CPP Prob ICD-10 any item starts with E11
or
CPP Prob Description starts with diabet
or
CPP Prob Description starts with DM
or
Hemoglobin A1C [Hb A1C] latest value > 0.64

Search for Patients of These Doctors:

- Other doctor
- Marcus Welby
- Fred Adams

Include Matched Data with Results Include Deleted Records in Evaluation

Report Format

Title: Diabetes

Columns:

First Name	Surname	Age	Home Phone	Privacy	Md Initials	Hb A1C	Date

Notes:

Select the search you want to perform. The EMR displays the search criteria for the selected search, enabling you to verify that you have selected the appropriate search.



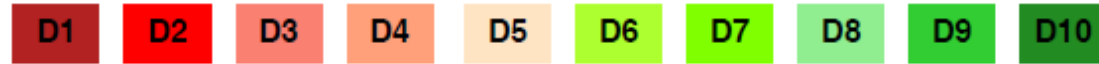
Thank you!



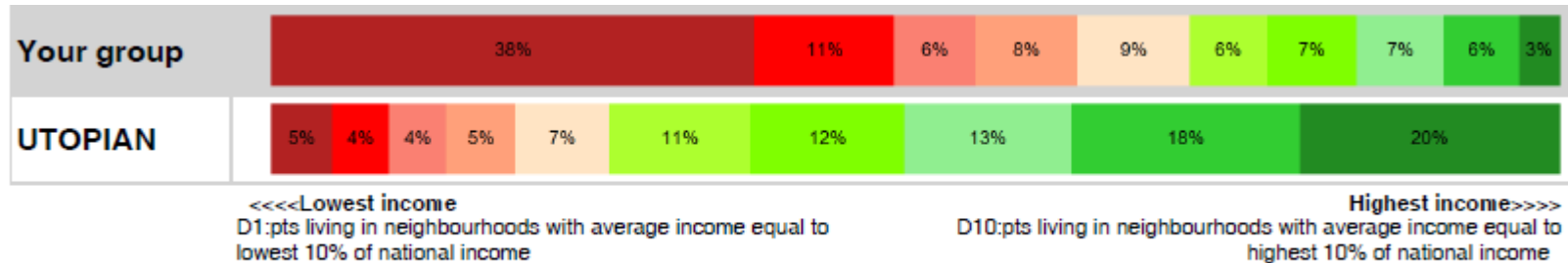
The views expressed in this publication are the views of OntarioMD and do not necessarily reflect those of the Province.

Income Levels by Deciles

Chart G1. Proportion of active patients that fall in each national neighbourhood income decile



50 % of CLINIC patients fall in the bottom 20% of incomes



D1: living in neighborhoods with average income equal to lowest 10% national income

Immigration/Refugees/Deprivation

Chart G2. Proportion of active patients that fall in each national neighbourhood immigrant (foreign-born) tercile

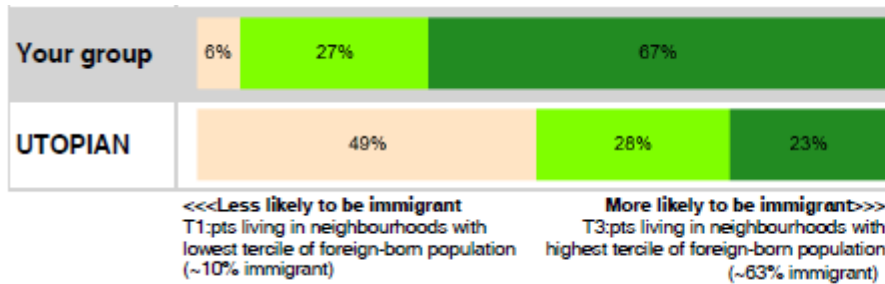
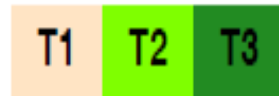
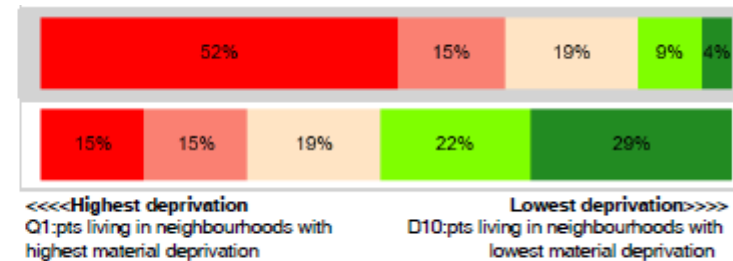


Chart G3. Proportion of active patients that fall in each material deprivation category out of five categories



The material deprivation score takes into account the average household income, the unemployment rate, and the proportion of the population who did not graduate high school.