Safe Prescribing and Renal Dosing:

Can Your EMR Help?

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Empowered Practices. Enhanced Care.

Faculty / Presenter Disclosure

- Faculty / Speaker's Name: Lisa Ruddy RN
- Relationships with commercial interests:
  - No relationships with commercial interests

Faculty / Presenter Disclosure

- Faculty / Speaker's Name: Stephen McLaren BSc, MD, CCFP, FCFP
- Relationships with commercial interests:
  - No relationships with commercial interests

Disclosure of Commercial Support

- This program has not received financial support or in-kind support from any organization
- **Potential for conflict(s) of interest:**
  - Lisa Ruddy and Stephen McLaren have not received payment or funding from any organization supporting this program AND/OR organization whose product(s) are being discussed in this program.

Mitigating Potential Bias

- There are no potential sources of bias.

Safe Prescribing and Renal Dosing: Outline

- Impetus
- Manpower, Tools and Technique
- Clinical Lessons
- Data Lessons
- EMR Lessons
- Change Management Lessons

Safe Prescribing and Renal Dosing:

- Impetus

Result	08-Aug-2016	13-May-2016	09-May-2016	09-Sep-2015	08-Apr-2015	14-Oct-2014	28-Apr-2014	08-Aug-2012	28-Mar-2012
CREATININE	133		122	111	112	95	114	92	78
eGFR	33		36	41	41	49	40	51	62

HbA1c <7%
LDL <2
BP <130/80
Foot Exam
Eye Exam

Safe Prescribing and Renal Dosing:

- Impetus **Metformin**

- **Renal Clearance**
- **Therapeutic Index**
- **Fraction Excreted Unchanged**
- **Creatinine Clearance**

Diabetes
NOACs
Allopurinol
Lithium
Amoxil
HmGCoA
NSAIDS

Safe Prescribing and Renal Dosing:

- Impetus **Safe Dosing**

One patient at a time OR
Can technology assist a population of at risk patients?

When serum creatinine is measured in μmol/L:

$$eC_{Cr} = \frac{(140 - \text{Age}) \times \text{Mass (in kilograms)} \times Constant}{\text{Serum Creatinine (in } \mu\text{mol/L)}}$$

Where *Constant* is *1.23* for men and *1.04* for women.

Safe Prescribing and Renal Dosing:

- Manpower, Tools and Technique

1 person, Accuro EMR, Excel, web resources

Calculate Creatinine Clearance

Identify “AT RISK” Cohort

Search for Drugs of concern

Safe Prescribing and Renal Dosing:

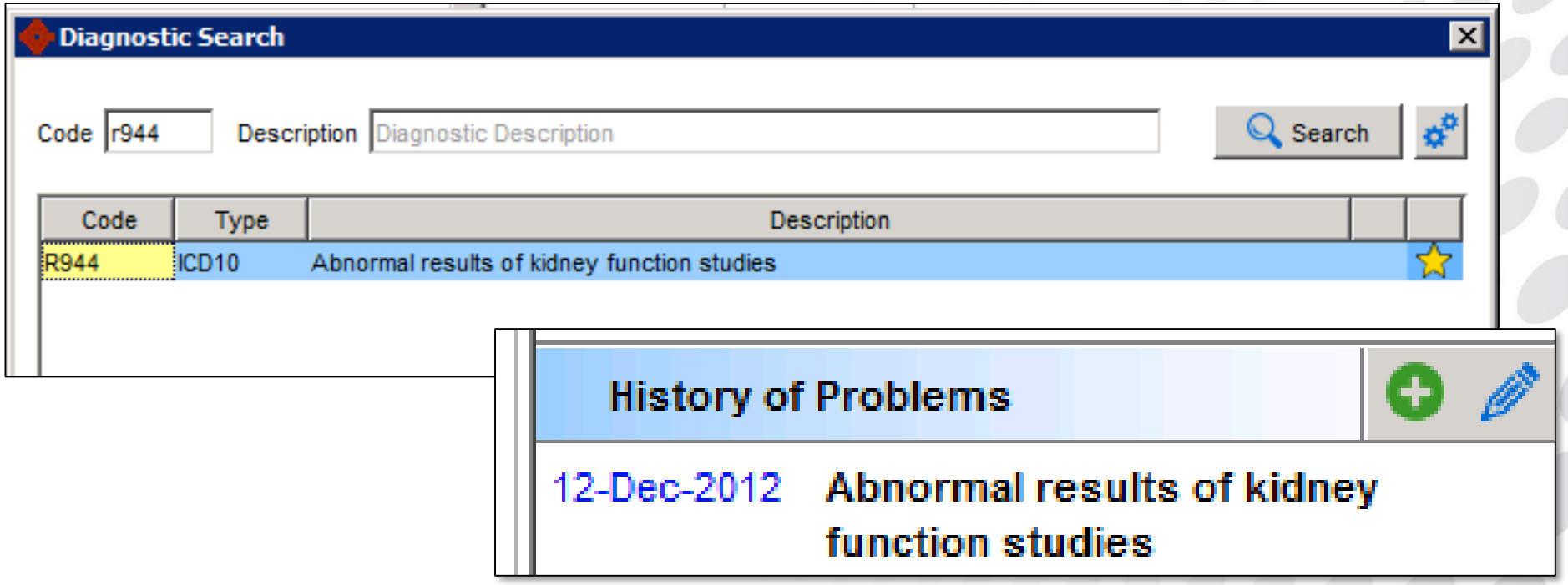
- Calculate Creatinine Clearance

  - EMR Lesson – no formula application
  - Solution - Excel

  - EMR Lesson – No mass import / populate tool
  - Solution – Manual entry and Worksheet

Safe Prescribing and Renal Dosing:

Manually Populate CPP , then manually enter CrCl



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Safe Prescribing and Renal Dosing:

Lab Tests

creatinine c

Select a Test Name:

- CREATININE CLEARANCE (OTL-Manual ml / min Manual Entry)
- CREATININE CLEARANCE (MSH-Manual)
- CREATININE CLEARANCE (ON CML HealthCare)
- Creatinine Clearance (OLIS)
- CREATININE CLEARANCE (Gamma-Dynacare)
- CREATININE CLEARANCE (MDS-Manual)
- CREATININE CLEARANCE (ON MSH)

- PATIENT WEIGHT (OTL-Manual, Numeric)
- PATIENT HEIGHT (OTL-Manual, Numeric)
- CREATININE SERUM (OTL-Manual, Numeric)
- CREATININE URINE (OTL-Manual, Numeric)
- CREATININE (OTL-Manual, Numeric)
- CREATININE CLEAR. UNCORR. (OTL-Manual, Numeric)
- BODY SURFACE AREA (OTL-Manual, Numeric)
- CREATININE CLEARANCE CORR (OTL-Manual, Numeric)
- CREATININE CLEARANCE (OTL-Manual, Numeric)
- PATIENT HEIGHT (OTL-Manual, Numeric)
- PATIENT WEIGHT (OTL-Manual, Numeric)
- TOTAL VOLUME 24 HR URINE (OTL-Manual, Numeric)
- CREATININE 24 HR URINE (OTL-Manual, Numeric)

OK Close

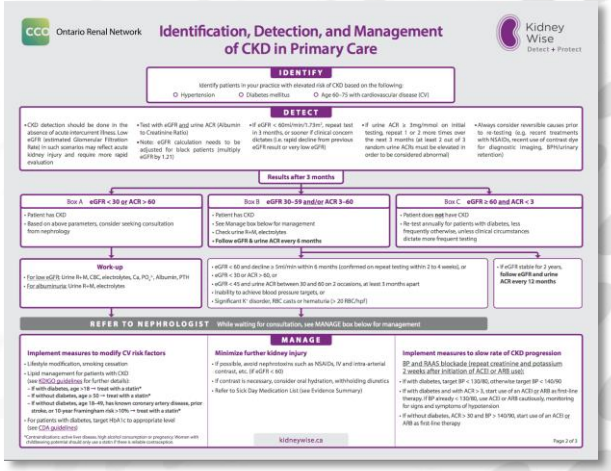
TEST, LISA (Elizabeth): CKD (Physician - MCLAREN, STEPHEN)

Patient: TEST, LISA (Elizabeth) 777777777111
DOB: 21-Apr-1978

DOS: 08/28/2016 Select Recent Values

		Current Value
Initial Steps	Identify patients at risk for ckd	☐ Hypertension ☐ Diabetes ☐ CVD + age 60-75
Lab Values for Diagnosis	Urine ACR (random)	
	eGFR	
If eGFR > = 60 and ACR <3 The patient does NOT have CKD	Retest Annually for patients with DM	☐ F7 to set a Task
If eGFR<30 OR ACR>60, the patient has CKD	For low eGFR: Urine R+M, CBC, lytes, Ca, PO4, PTH, Albumin	☐ ordered
	For albuminuria: Urine R+M, lyes	☐ ordered
	Consider Referral to Nephrology	☐ completed
If eGFR 30-59 and/or ACR 3-60, The patient has CKD	Check Urine R+M, lytes, follow eGFR & ACR q6m	☐ ordered
	Refer if:	
	If eGFR stable x 2 yrs follow eGFR and ACR q12m	☐ F7 to set a Task
CKD Labs	K+ (Serum Potassium)	
	Na+ (Serum Sodium)	
	PTH	
	Calcium	
	Creatinine	
	Urine RBC	
	Urine Casts	
	Weight	
	Height	
	CrCl	
Manage	Smoking Cessation Required?	
	Lipids Optimized?	choose-
	Minimize Renal Injury	Nsaid caution ☐ IV Dye caution ☐
	CKD Hypertension	ACE / ARB as 1st line
Comments and Follow Up	If eGFR stable x 2yrs follow eGFR and ACR q12m	☐ F7 to set a Task
	General Comments	Add Comment
	Follow Up	3 Months ☐ 6 Months ☐ Other:

New Worksheet



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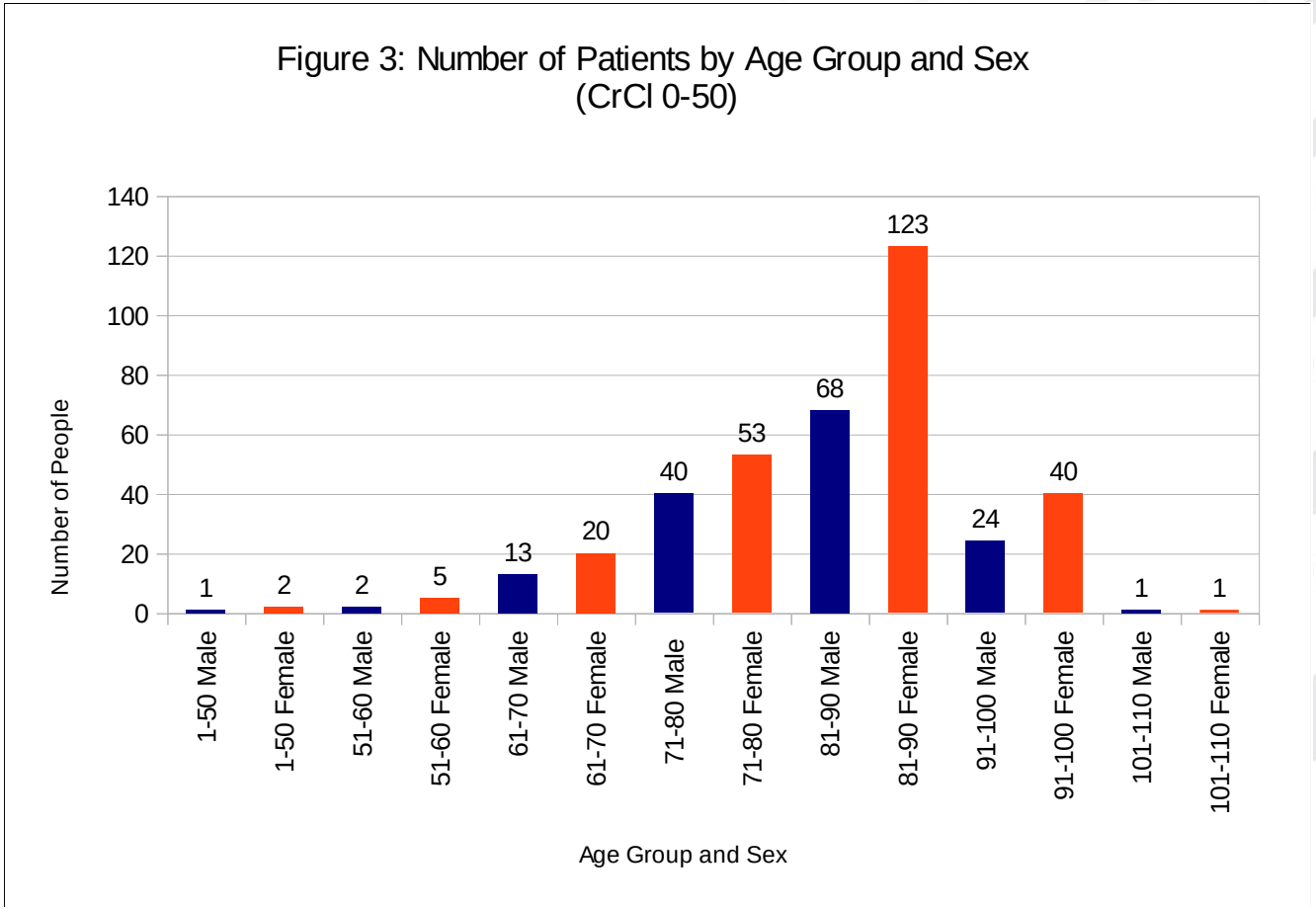
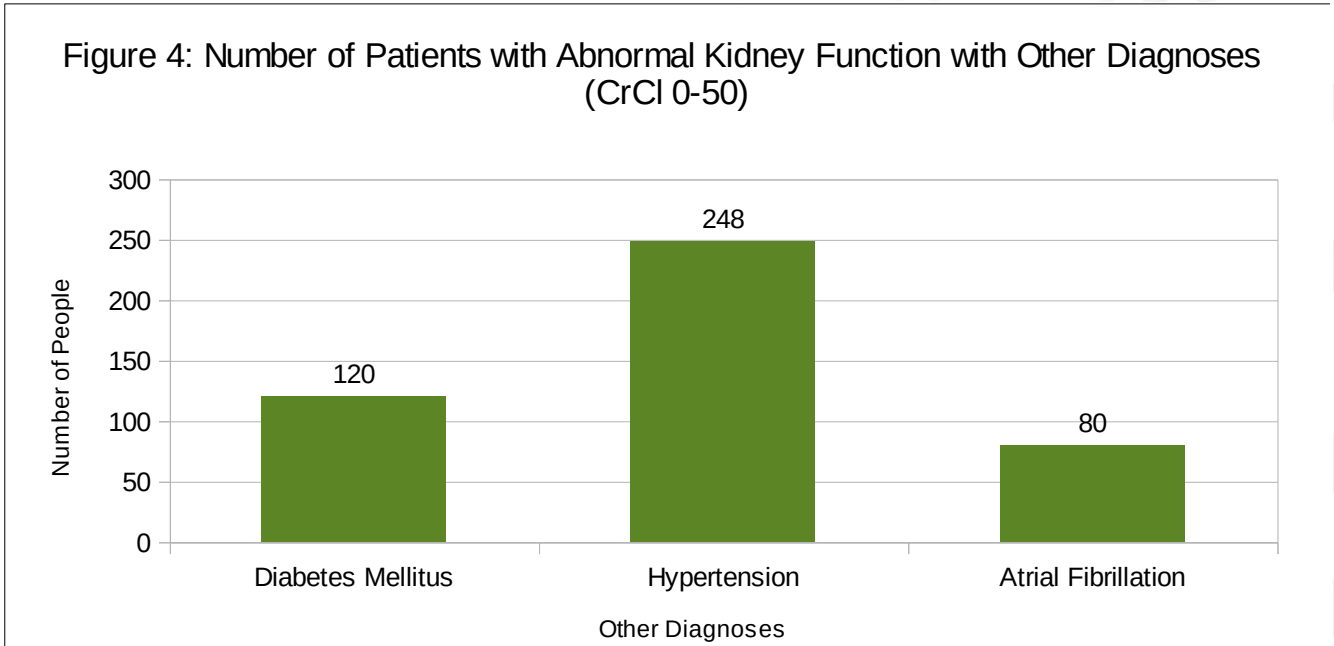
- Data Lessons



Safe Prescribing and Renal Dosing:

- Data Lessons



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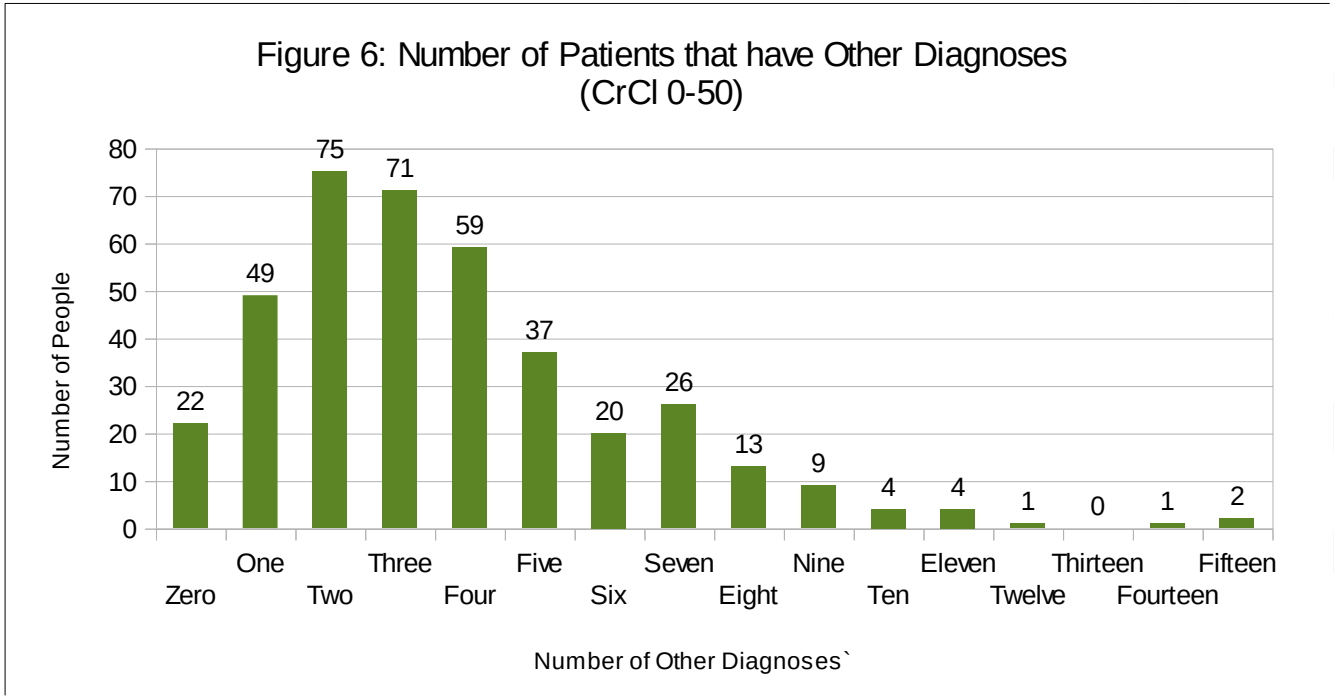

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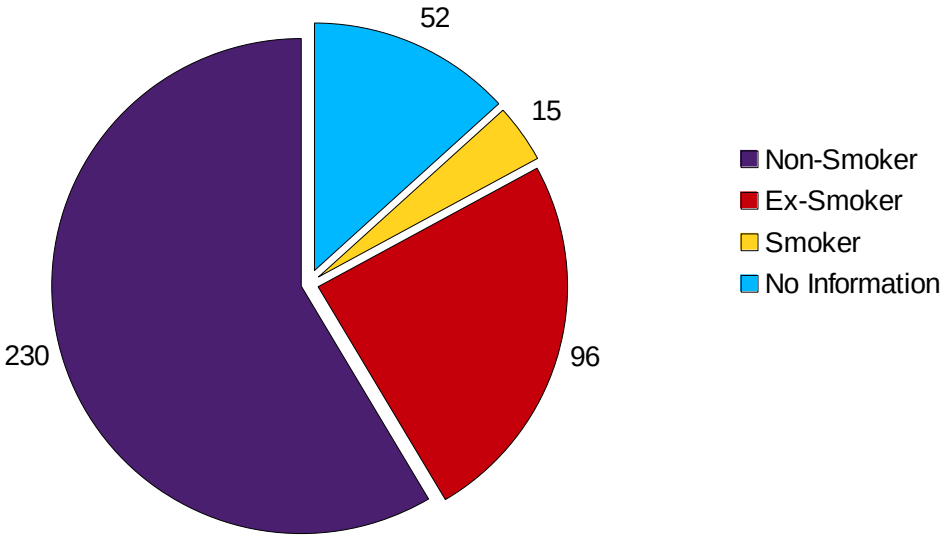
Safe Prescribing and Renal Dosing:

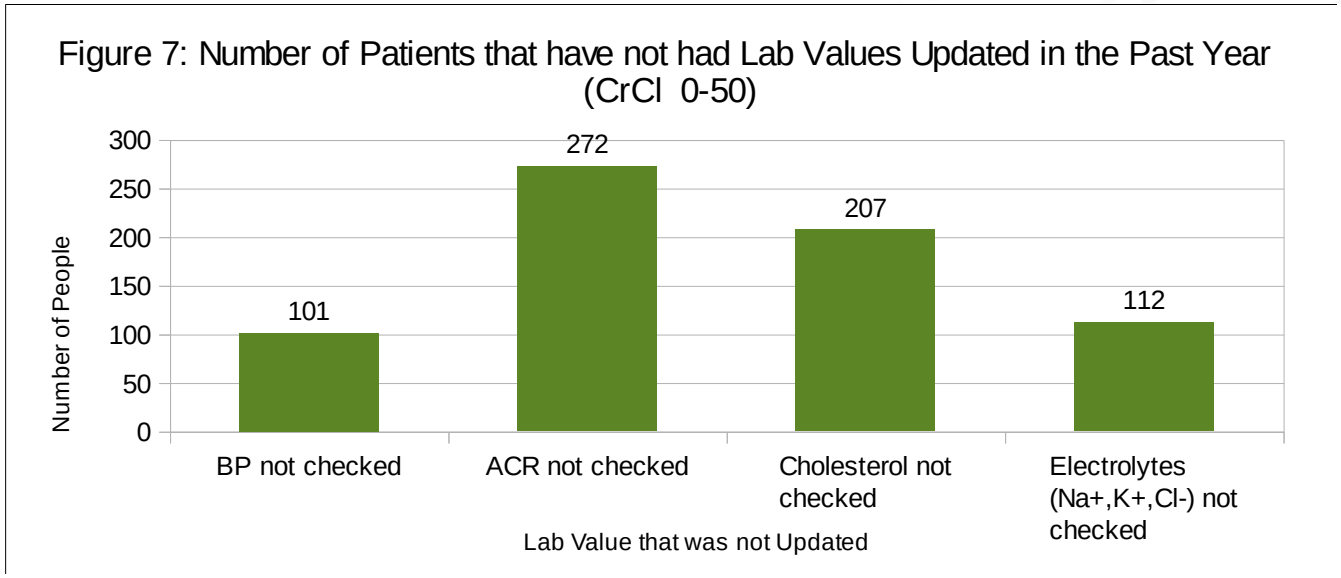
- Data Lessons

Figure 5: Smoking Status of those with Abnormal Kidney Function (CrCl 0-50)



Safe Prescribing and Renal Dosing:

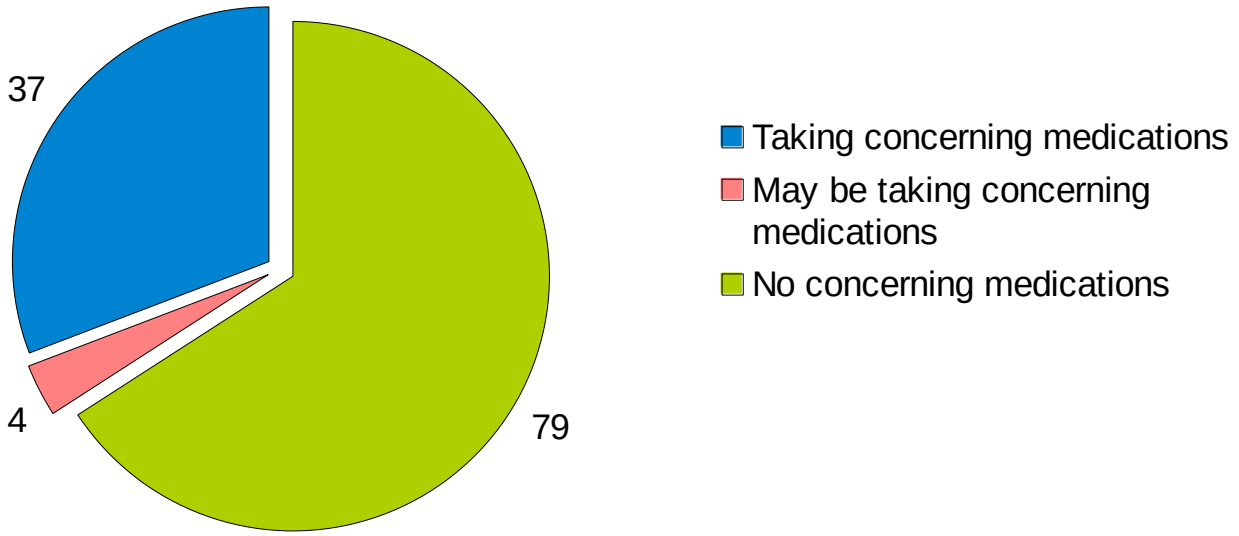
- Data Lessons



Safe Prescribing and Renal Dosing:

- Data Lessons

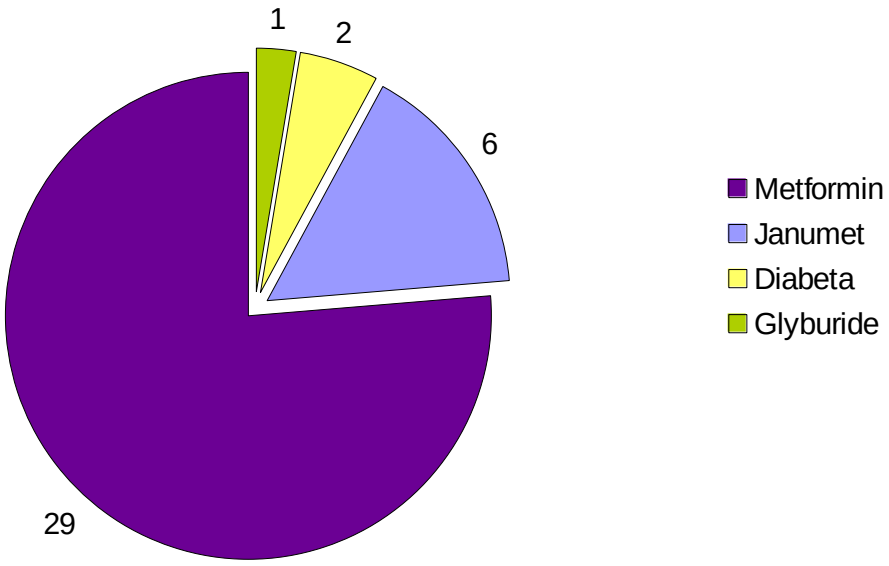
Figure 8: Number of Patients that take Concerning Medications for Diabetes Mellitus (CrCl 0-50)



Safe Prescribing and Renal Dosing:

- Data Lessons

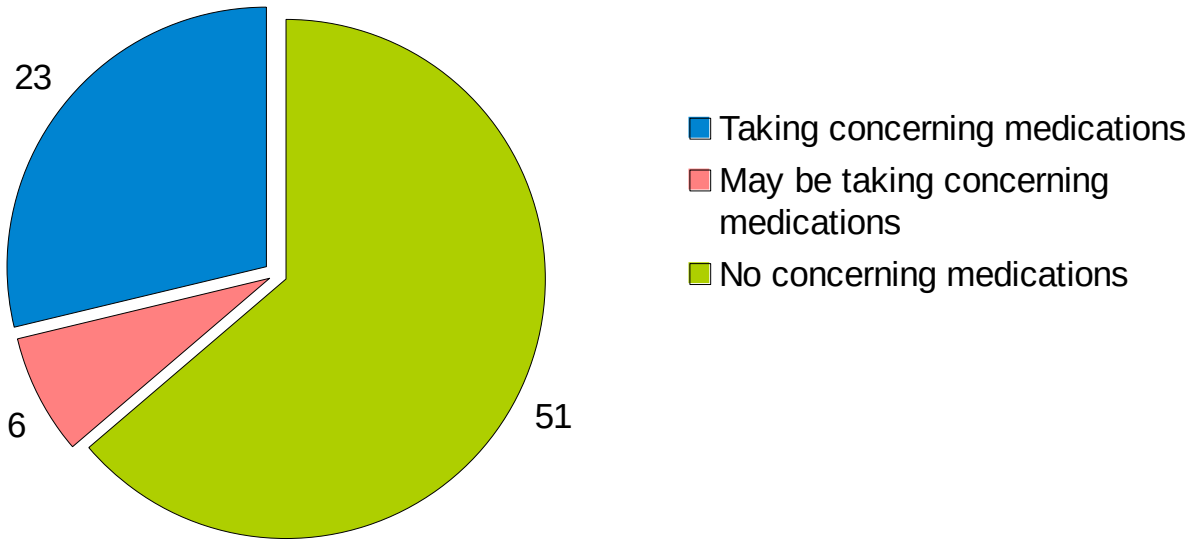
Figure 10: Types of Renal Sensitive Medications for Diabetes that are Being Used (CrCl 0-50)



Safe Prescribing and Renal Dosing:

- Data Lessons

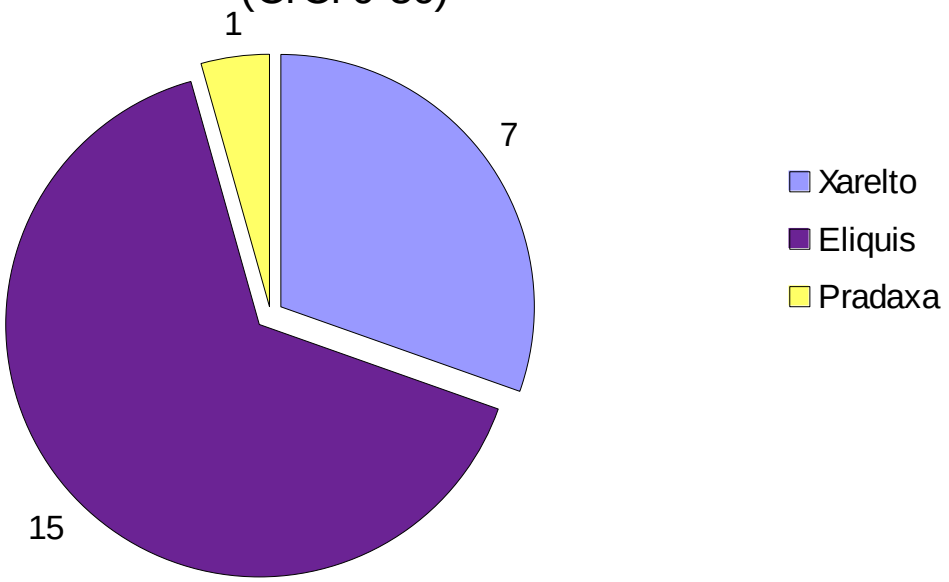
Figure 9: Number of Patients that take Concerning Medications for Atrial Fibrillation (CrCl 0-50)



Safe Prescribing and Renal Dosing:

- Data Lessons

Figure 11: Types of Renal Sensitive Medications for Atrial Fibrillation that are Being Used (CrCl 0-50)



Safe Prescribing and Renal Dosing:

- Data Lessons

- Allopurinol
- HmGCoA
- NSAIDs

Safe Prescribing and Renal Dosing:

- Data Lessons

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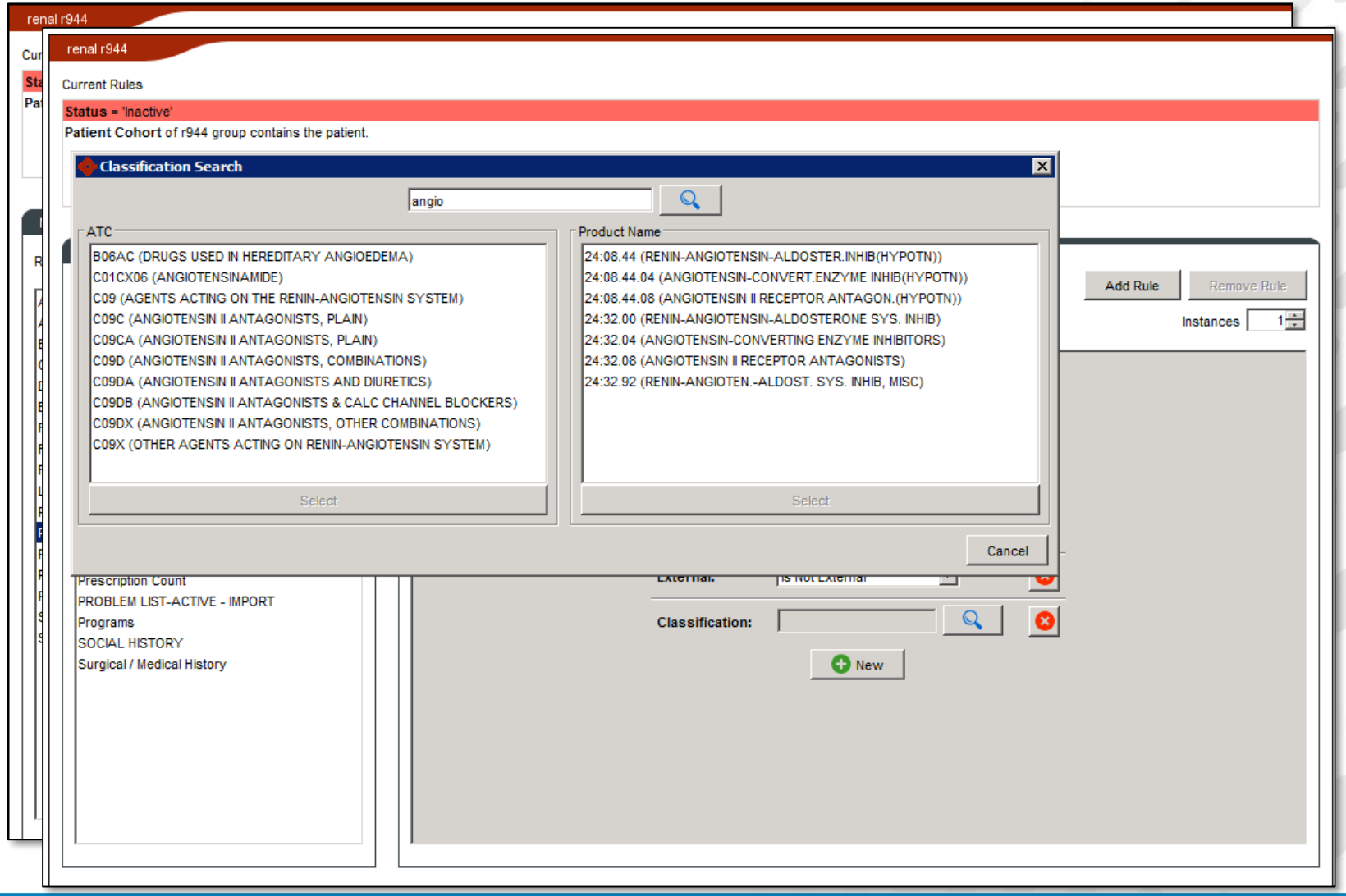
Safe Prescribing and Renal Dosing:



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Safe Prescribing and Renal Dosing:

- EMR Lessons

Strengths –

- search a Worksheet,
- ATC class searches
- Build a cohort & search,
- Data export

Weakness –

- ** ACR **
- limited formulae,
- slow searches of lab
- No Rx Sig: on search
- customer cannot mass data import
- cannot mass apply a CPP entry to a cohort,
- Worksheet building is tedious & poorly documented

Safe Prescribing and Renal Dosing:

- Change Management Lessons

Medical Record Sanctity

Communication

Peer Influence

Safe Prescribing and Renal Dosing:

- Summary … CrCl

.. Great exercise in learning about your EMR, your data & your practice.

.. Meaningful application of data to enhance safe prescribing.

Safe Prescribing and Renal Dosing:

- Next Steps

Thank you!

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