



Primary Care Provider's Perceptions of Standardized Medication Monitoring Plans

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Conflicts of Interest

■ None to declare






Outline

- Background
 - Methodology
 - Results
 - Discussion
 - Questions
- 



Background – Adverse Drug Reactions

- Adverse drug reactions (ADRs) account for 6 to 12% of hospital admissions – of which 70% are preventable.
- Inadequate monitoring of medications in ambulatory patients accounts for 45% of hospital admitting ADRs.
- 1000 admissions = 120 ADRs = 54 due to monitoring



Background – Electronic Medical Record

- ▶ Primary care providers in Prince George use MOIS™ EMR
- ▶ Highly customizable – can create care plans
- ▶ Health Maintenance Review – provides snapshot of coded medical conditions.

Health Maintenance Review

Health Maintenance Review : As Of 2018.04.26

Patient: **MICKEY D MOUSE** DoB: **1958.01.01** Insurance: **BC 11111111111111**
Alias: Gender: **M** Chart: **2213** [Flow Sheet](#) [Print](#)

Age = 60 SEX = MALE

GENERAL AND AGE/SEX SPECIFIC SCREENING
SCREENING CHOLESTEROL Not Found
SCREENING CHOL/HDL RATIO Not Found
SCREENING FASTING GLUCOSE Not Found
SCREENING FECAL OCCULT BLOOD Not Found
PHYSICAL ACTIVITY MINUTES PER WEEK - 2016.08.29 - **2 L** [150 to 1500]
ALCOHOL DRINKS PER WEEK - 2014.09.08 - **10** [0 to 14]
CIGARETTES SMOKED.CURRENT (PACK/DAY) - 2014.09.08 - **1** [0 to 0.01]
WAIST CIRCUMFERENCE - 2014.01.22 - **79** [10 to 101]
BODY MASS INDEX - 2016.01.19 - **38.5 HH** [18.5 to 25]
TETANUS VACCINE - 2015.09.25
BLOOD PRESSURE (SYSTOLIC/DIASTOLIC) - 2017.01.24 - **???** [N/A] GOAL: BETWEEN 110 and 130
NOT IDENTIFIED AS A SMOKER IN HEALTH ISSUES LIST
HIV Screening Not Found

INCENTIVE CLAIM HISTORY
14050 INCENTIVE FOR FULL SERVICE GP - NOT COMPLETED

FRAIL ELDERLY
FRAILTY INDEX - CSHA - 2014.08.25 - **6** [0 to 3]
ADVANCE DIRECTIVE DOCUMENTED - 2016.10.31

MAJOR DEPRESSION - ANXIETY/DEPRESSION
MOST RECENT ENCOUNTER - 2018.04.16
PHQ-9 TOTAL SCORE - 2018.01.04 - **16 H** [N/A]

DIABETES, TYPE 2, - UNCOMPLICATED
LDL Not Found
HDL Not Found
CHOLESTEROL Not Found
CHOL/HDL RATIO Not Found
TRIGLYCERIDES Not Found
URINE MICROALB/CREAT RATIO Not Found
Calculated GFR Not Found
HGBA1C Not Found
FASTING GLUCOSE Not Found
BLOOD PRESSURE (SYSTOLIC/DIASTOLIC) - 2017.01.24 - **???** [N/A] GOAL: BETWEEN 110 and 130
PNEUMOCOCCAL VACCINE - 2015.05.13
NOT DESIRED FURTHER MEDICATION as of 2014.11.06
INFLUENZA VACCINE - 2017.10.31
NOT DESIRED FURTHER MEDICATION as of 2015.09.16
OPHTHALMOLOGY ASSESSMENT Not Found
DIABETES EDUCATION ASSESSMENT Not Found

HYPERTENSION - ESSENTIAL
Creatinine Not Found
Fasting blood glucose Not Found



Background – Existing Literature


- ▶ Mixed results regarding EMR interventions on improving monitoring adherence
- ▶ Caveats:
 - ▶ Baseline adherence rate was >90%
 - ▶ Parameters included were commonly ordered for medical condition
 - ▶ Passive intervention system
 - ▶ Paper based reminders


Questions and Objectives

Question	Objective
Will medication monitoring plans be well received by care providers?	Determine overall provider satisfaction with monitoring plans.
What are barriers to monitoring medications?	Identify perceived barriers to monitoring medications.
What medications are challenging to monitor in primary care?	Identify medications perceived to be difficult to monitor.
How often do patients get monitoring lab work according to recommended parameters?	Determine the baseline adherence rate to a subset of recommended monitoring parameters.




Methodology

- ▶ 5-month prospective pilot project
 - ▶ 3 primary clinics in Prince George
 - ▶ Ethics approval by NH and UBC
- 



Methodology – Creation of Monitoring Plans

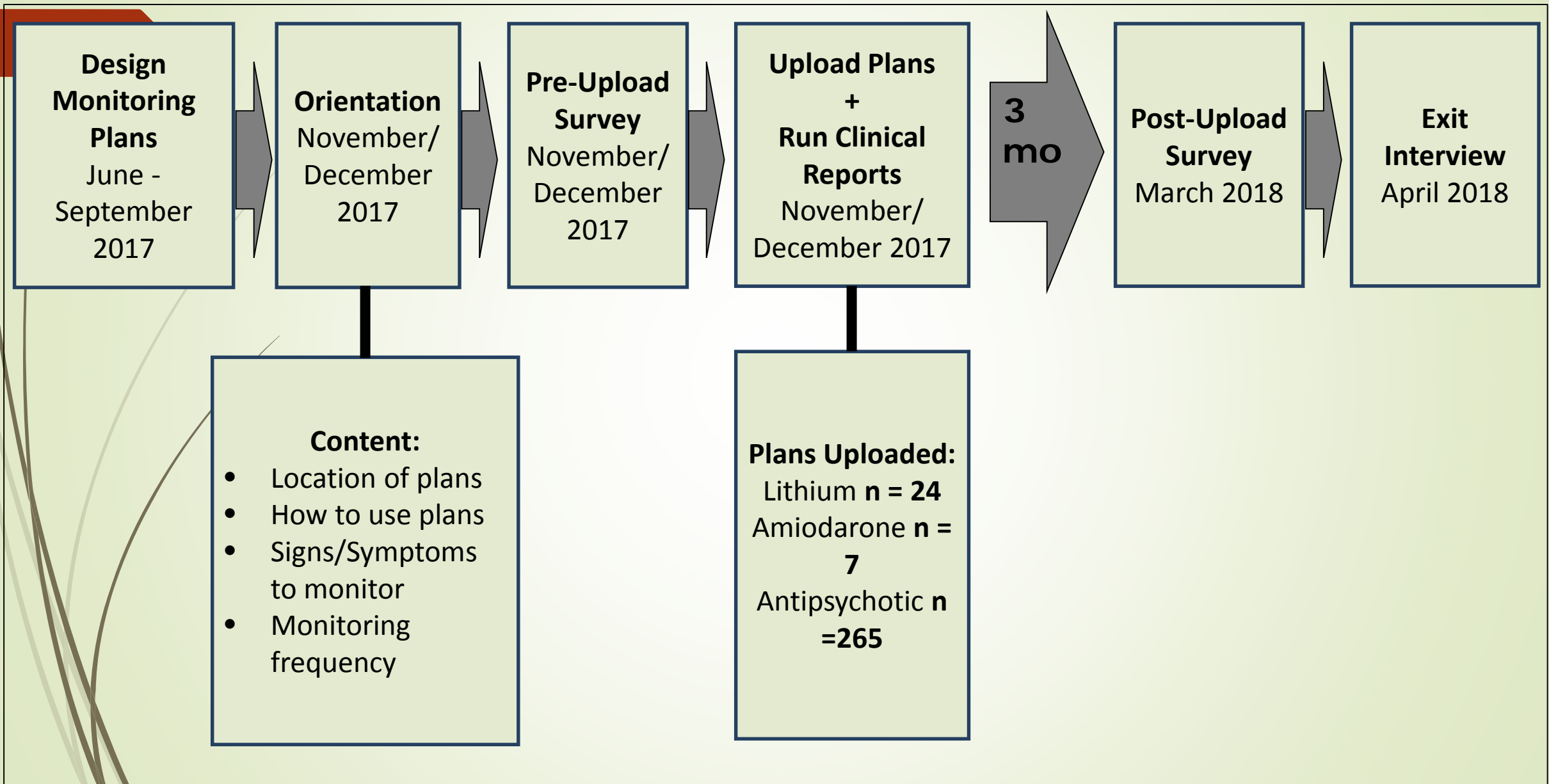
- Built plans for lithium, amiodarone, and antipsychotics
 - Literature review of product monographs, and clinical guidelines
 - Designed in MOIS™ using pre-existing architecture
- 

Patient Chart

- [-] Patient Summary
 - [+] Demographic
 - [+] Encounters
 - [+] Measures
 - [+] Imaging
 - [+] Consults
 - [+] Procedures
 - [+] Interventions
 - [+] Family History
 - [+] Allergy / Intolerances
 - [+] Long Term Meds
 - [+] Prescriptions
 - [+] MAR
 - [+] Social History
 - [+] Documents
 - [+] Health Issues
 - [+] Conditions
 - [+] Risks for Conditions
 - [+] Needs for Care
 - [+] Care Plan
 - [+] Preferences
 - [+] Goals
 - [+] Planned Actions
 - [+] Barriers to Care
 - [+] Patient Resources
 - [+] Summary Settings
 - [+] Forms
 - [+] Orders
 - [+] Facility Admissions
 - [+] Notifications
 - [+] Alerts

Care Plan

Refresh	Tear Off	Create Snapshot	Delete Snapshot	Save
FIRST: KYLO		MIDDLE:	LAST: REN	
		DoB: 2015.12.16		Active ENC#: NO ENCOUNTER ...
Current Care Plan		Care Plan Snapshot		
Expand All	Collapse All	Copy to Clipboard		Print
Date	Description	Detail	Hyperlink	
+ GOALS [1]				
+ HEALTH ISSUES [5]				
+ LONG TERM MEDS [4]				
- ANTI-DIABETIC AGENTS MONITORING [7]				
2017.07.14	HEMOGLOBIN A1C Flag: H Ref. Range: 4.4 to 6.4	6.8 % RECENT	?	
2017.07.14	GFR/BSA.PRED SERPL CKD-EPI-ARVRAT Ref. Range: to	80 mL/min/1.7 RECENT	?	
2017.07.14	GLUCOSE (FASTING) Ref. Range: 0 to 6.0	6.6 RECENT	?	
2017.07.14	BODY MASS INDEX Flag: HH Ref. Range: 18.5 to 25	33.4 RECENT	?	
2017.07.14	WEIGHT Ref. Range: 0 to 150	100 kg RECENT	?	
	CBC, PLATELETS + DIFF BLD	NOT DOCUMENTED		
	VIT B12	NOT DOCUMENTED		
- ANTIPSYCHOTICS MONITORING [10]				
	BP	NOT DOCUMENTED		
2017.07.14	HEMOGLOBIN A1C Flag: H Ref. Range: 4.4 to 6.4	6.8 % RECENT	?	
2017.07.14	GLUCOSE (FASTING) Ref. Range: 0 to 6.0	6.6 RECENT	?	
2017.07.14	WEIGHT Ref. Range: 0 to 150	100 kg RECENT	?	
	WAIST CIRCUMFERENCE	NOT DOCUMENTED		
2017.07.14	BODY MASS INDEX Flag: HH Ref. Range: 18.5 to 25	33.4 RECENT	?	
	TRIGLYCERIDES	NOT DOCUMENTED		
2017.07.14	CHOLESTEROL - HDL Ref. Range: 0.9 to 10	1.3 mmol/L RECENT	?	
2017.07.14	CHOLESTEROL - LDL Ref. Range: 0 to 3.5	5.5 mmole/L RECENT	?	
	OPHTHALMOLOGY ASSESSMENT	NOT DOCUMENTED		
+ AMIODARONE MONITORING [9]				
+ LITHIUM MONITORING [8]				



Design Monitoring Plans
June - September 2017

Orientation
November/December 2017

Pre-Upload Survey
November/December 2017

Upload Plans + Run Clinical Reports
November/December 2017

3 mo

Post-Upload Survey
March 2018

Exit Interview
April 2018

- Content:**
- Location of plans
 - How to use plans
 - Signs/Symptoms to monitor
 - Monitoring frequency

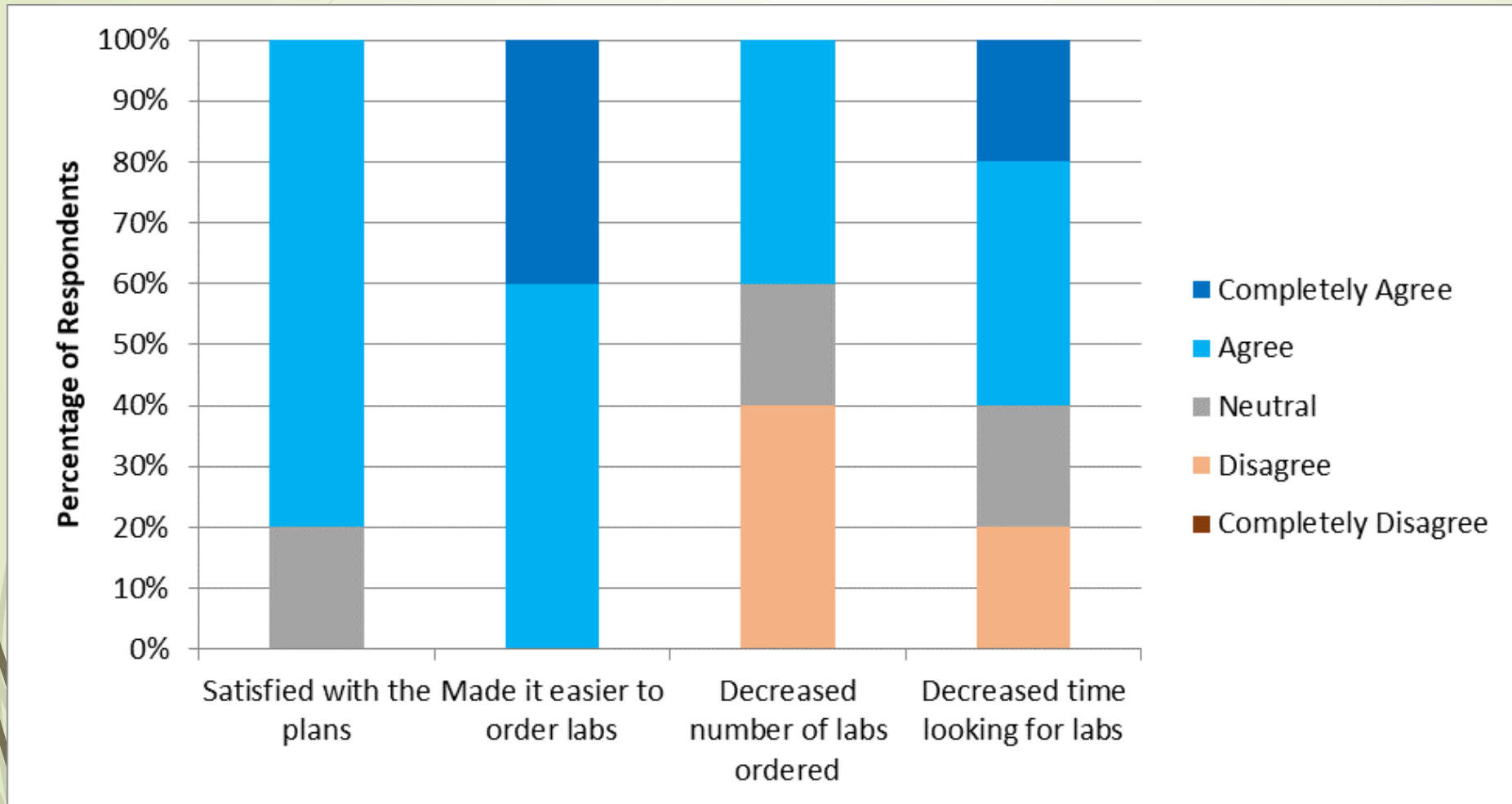
Plans Uploaded:
Lithium **n = 24**
Amiodarone **n = 7**
Antipsychotic **n = 265**




Methodology –Analysis

- Surveys
 - Descriptive Statistics
- Interviews
 - Open semantic coding using NVivo

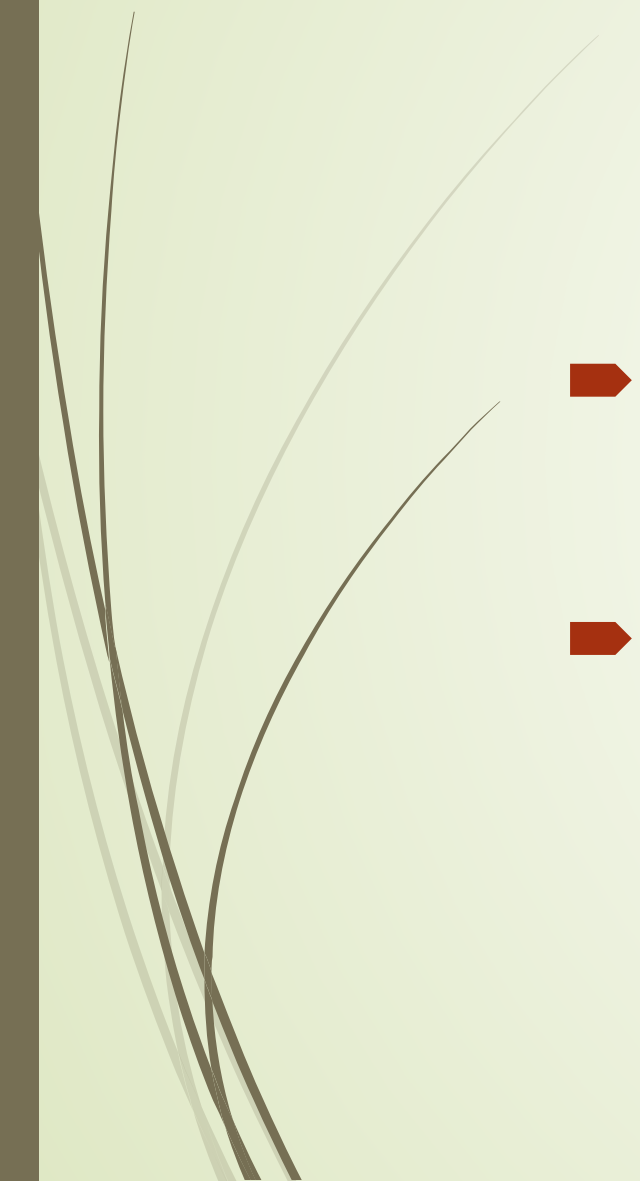
Results – Overall Impressions



N = 5

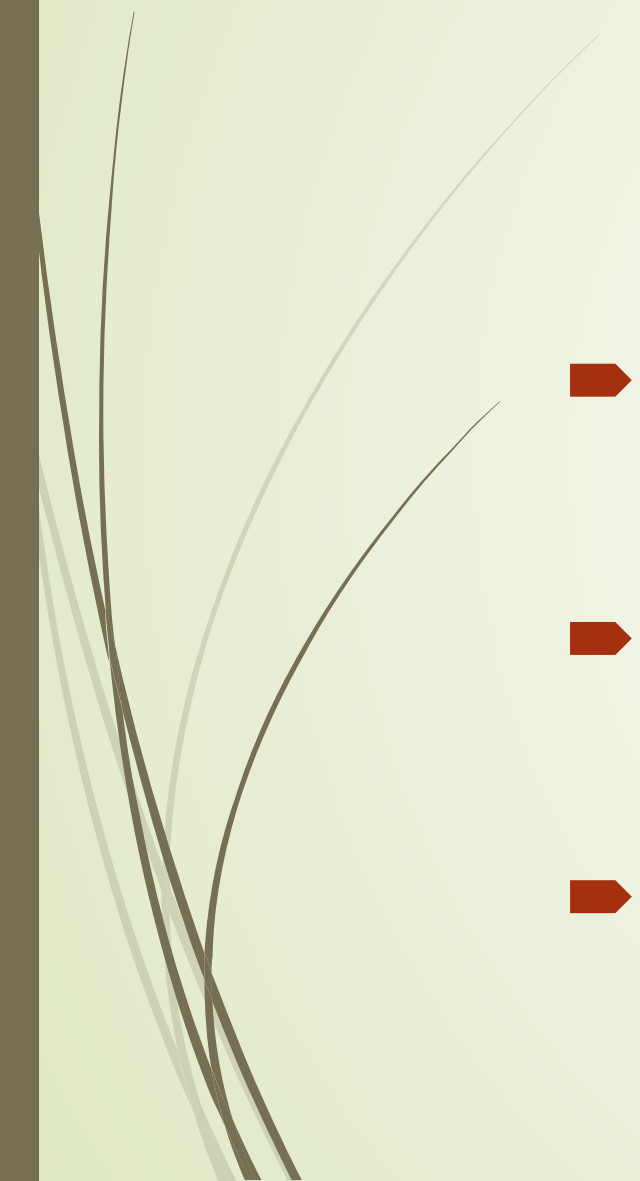


Results – Positives

- Reduced recall burden
 - Useful communication tool
- 



Results – Suggested Improvements

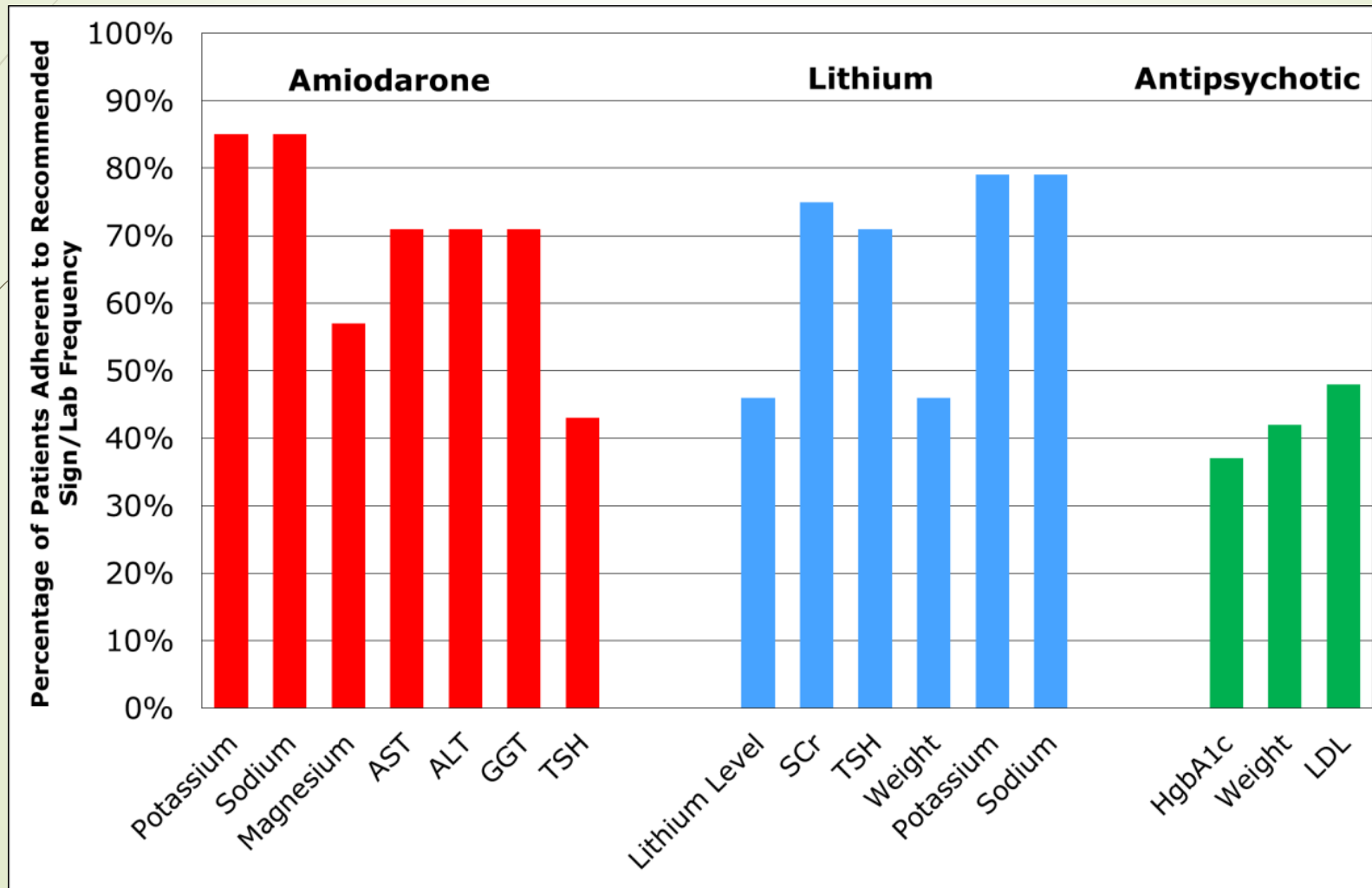
- Add an alert system
 - Improve visibility of relevant lab work
 - Add recommended frequencies into plans
- 




Results – Barriers and Medications


- Recall burden
- Poor communication between prescribers
- Medications infrequently prescribed are difficult to monitor
 - Amiodarone
 - Lithium
 - Testosterone
 - Isotretinoin

Results – Baseline Adherence






Discussion - Limitations

- Small sample size
 - Short duration
 - “Recommended monitoring parameters” often expert opinion
 - No specialist input into monitoring plans
 - Resource allocation
- 




Discussion – Additional Context

- Ideally, any monitoring plan should be patient specific
 - Time is required to create and upload plans
 - Standardized plans should be used in context of patient status
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Conclusions

- There is demand for clinical tools to help care providers monitor chronic medications
 - Standardized medication monitoring plans may be a useful tool
 - EMR designers should be encouraged to look into building medication monitoring plans into their systems.
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References

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