Evaluation of VISN21 Medication Safety Dashboard

Paul Heidenreich MD, MS, Anju Sahay PhD, Mary Goldstein MD, MS

9/25/2018

Relationships

- No relevant financial relationships with industry
- Partner with Pharmacy Benefits Management in our Quality Enhancement Research Initiative (QUERI) on Medication Safety

Outline

- Overview of VISN21 Pharmacy Dashboard for Medication Safety

- Use of interventions to improve medication safety

- Are certain interventions associated with better safety?

  - National example: Medication Use Evaluation Tracker

- Plans for Decision support added to the VISN21 Dashboard

Poll Question 1

What is your current <u>primary</u> role at the VA?

- ❑ VACO/Facility Leadership
- ❑ Pharmacist
- ❑ Other Provider (Physician/Nurse/Nurse Practitioner/etc.)
- ❑ Researcher
- ❑ Other

Poll Question 2

At what level do you <u>primarily</u> work in the Pharmacy Service?

- ❑ Facility level
- ❑ VISN level
- ❑ National level
- ❑ Do <u>not</u> work in the Pharmacy Service

Poll Question 3
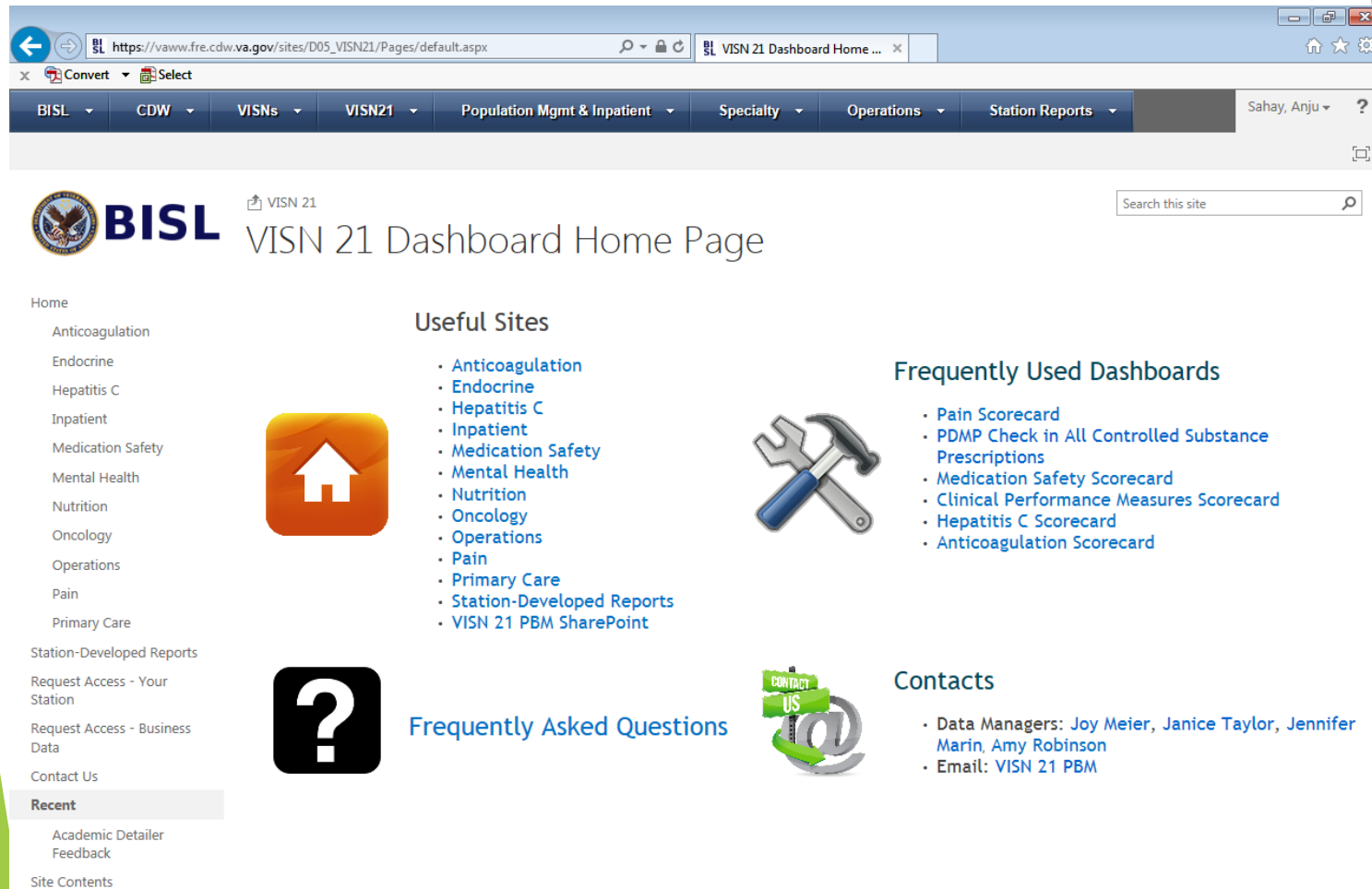
Does your VISN have medication-related Dashboard(s)?

- ❑ Yes
- ❑ No
- ❑ Don't know/not sure

Poll Question 4

How often do you use Dashboard(s) for your work at the VA?

- ❑ Daily or Weekly
- ❑ Monthly
- ❑ Quarterly
- ❑ Yearly
- ❑ Don't use it

Screenshot of
VISN21 Pharmacy Dashboard Home Page

VISN 21 Pharmacy Dashboards

- Anticoagulation
- Endocrine
- Hepatitis C
- Inpatient
- Medication Safety
- Mental Health
- Nutrition
- Oncology
- Operations
- Pain
- Primary Care
- Station-Developed Reports
- VISN 21 PBM SharePoint

VISN 21 Pharmacy Dashboards

- Anticoagulation
- Endocrine
- Hepatitis C
- Inpatient
- Medication Safety
- Mental Health
- Nutrition
- Oncology
- Operations
- Pain
- Primary Care
- Station-Developed Reports
- VISN 21 PBM SharePoint

Medication Safety

- Missing or Out of Range Labs
  - Amiodarone (ALT/AST, TSH)
  - Carbamazepine (ALT/AST, Hgb/Hct, platelet, sodium, WBC)
  - Dimethyl Fumarate (WBC)
  - Erythropoietin Stimulating Agents (Ferritin/Hgb)
  - Methotrexate (ALT/AST, platelet, WBC, creatinine)
  - Spironolactone or Eplerenone (potassium, creatinine)
  - Sulfasalazine (ALT/AST, platelet, WBC)
- Not on Proton Pump Inhibitor
  - High-risk patient on non-steroidal antagonist

VISN 21 Dashboard

Medication Safety

- Other VISN21 Safety Initiatives
  - Spironolactone/Eplerenone
  - Hypoglycemia
  - Lithium
  - Oncology Drug
  - Opioid monitoring

VISN 21 Dashboard

Medication Safety Measures and Monitors

Scorecard report with individual station and comparative data across the VISN.

| Home | Dashboard Terminology | Measure Definitions | Contact Us | Share |

Click here for information on obtaining access to SSN & patient-level data.

Update Frequency: Daily   Last Updated: 9/3/2018

(640) Palo Alto HCS (Palo Alto CA)

Measures		Recommendations for interventions			
		9/3/2018			
Measure	**Items Required**	**Score %**	**Target (%)**	**Actionable Patients** ⇕	**Denominator**
		CompositeMedications			
⊞ Med Safety Composite Measure (roll-up of missing labs and out of range) (Definition) ⬇		13.3 ⊗	13	71	532
		Carbamazepine			
⊞ No Appointment in Last Year (Definition) ⬇		1.2		1	83
⊞ Missing Follow Up Labs (Definition) ⬇		18.1		15	83
⊞ Out of Range Labs (Definition) ⬇		9.0		7	78
		DimethylFumarate			
⊞ No Appointment in Last Year (Definition) ⬇		0.0		0	8
⊞ Missing Follow Up Labs (Definition) ⬇		25.0		2	8
⊞ Out of Range Labs (Definition) ⬇		0.0		0	6

Parameters

View Scores By:

Station

Station

Palo Alto HCS (Palo Alto CA)

Division

CAPITOLA VA CLINIC, FREMON

View Scores For:

(640) Palo Alto HCS (Palo Alto C

Dimension

Medication Safety

Measure

Amiodarone_LabDue, Amiodaro

Operations Questions

▶ What strategies are the facilities using to improve medication safety

▶ Why (barriers, facilitators)?

▶ Which strategies are associated with improved safety?

Evaluation of
VISN21 Pharmacy Dashboard

VISN 21 Surveys on Pharmacy Dashboard

We conducted 2 surveys (2017 and 2018) to understand the following:

❖ Use and perceived value of:
  ➢ VISN 21 Pharmacy Dashboard for Medication Safety (Overall)
  ➢ Five Dashboards within it:
    1) Dashboard for Spironolactone/Eplerenone
    2) Dashboard for Lithium Carbonate
    3) Dashboard for Hypoglycemia Safety Initiative
    4) Dashboard for Oncology Med Monitoring
    5) Dashboard for Opioid Monitoring

❖ Use and perceived value of seven implementation strategies for each Dashboard:
  1) Provide provider education
  2) Use of academic detailing
  3) Send electronic reminders in patient chart, email
  4) Send request to providers for patient specific care plan
  5) Enter draft orders
  6) Use patient mailings
  7) Call patients

VISN 21 Surveys

❖ 2017 Survey was sent as an e-mail attachment

❖ 2018 Survey was sent as a web-based survey

Both surveys were:

o Administered in collaboration with VISN21 Pharmacy Leadership

o Sent to each facility in VISN 21 (N=8)

o Completed by PBM Manager or Chief, Pharmacy Service

o 100% response rate

VISN 21 Pharmacy Dashboard for Medication Safety (Overall)
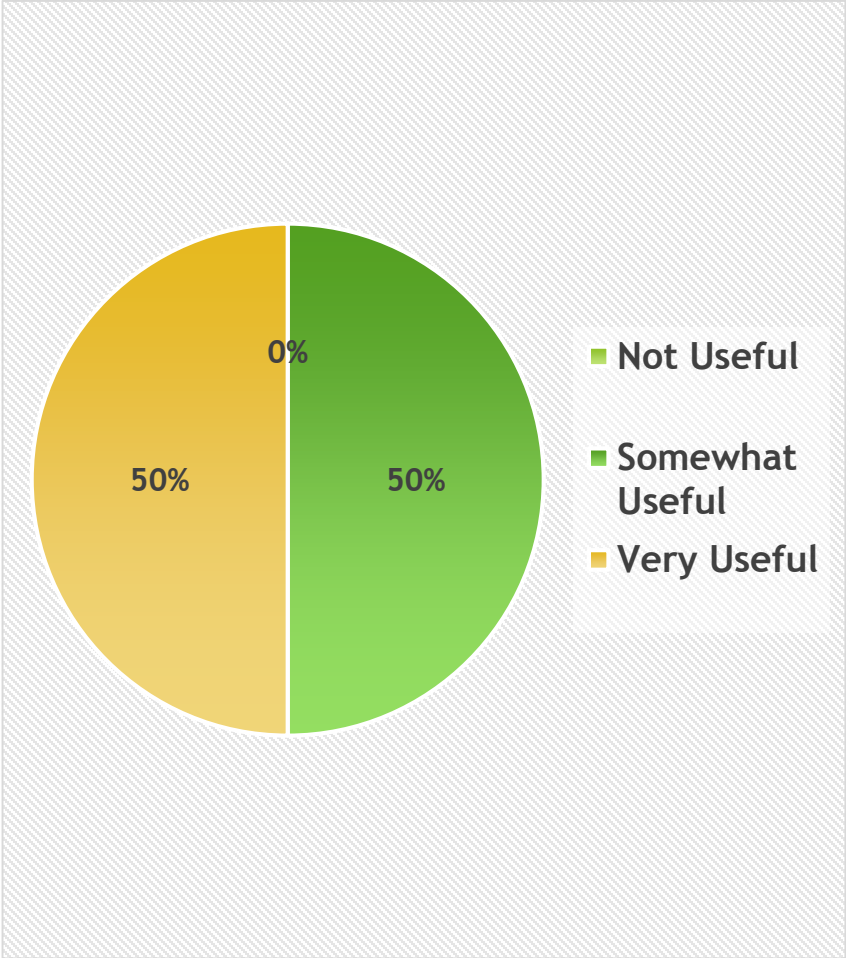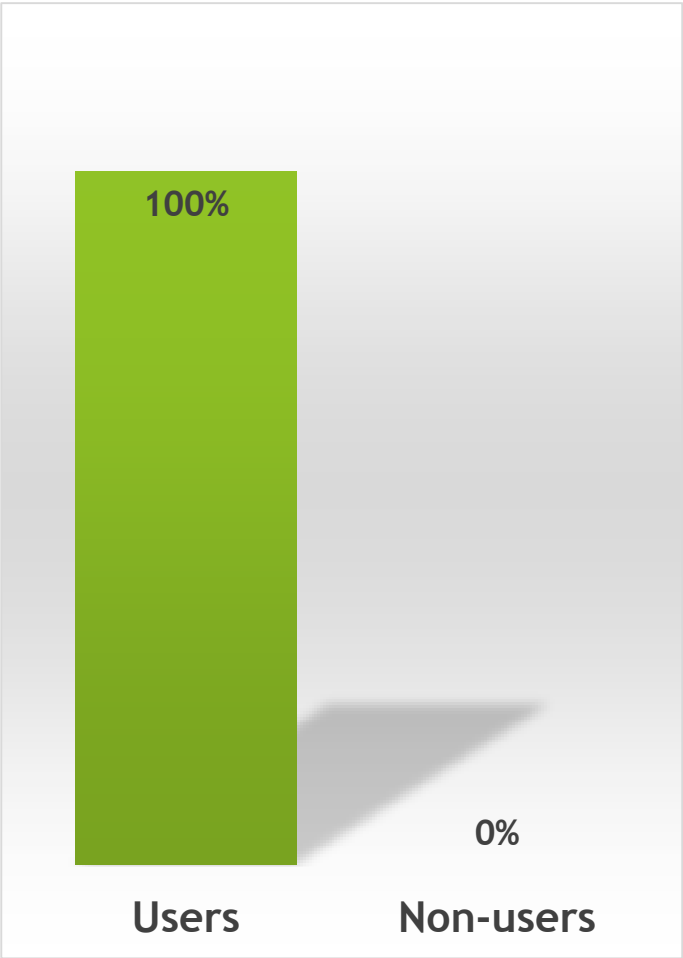
Five Dashboards: Current user and Usefulness
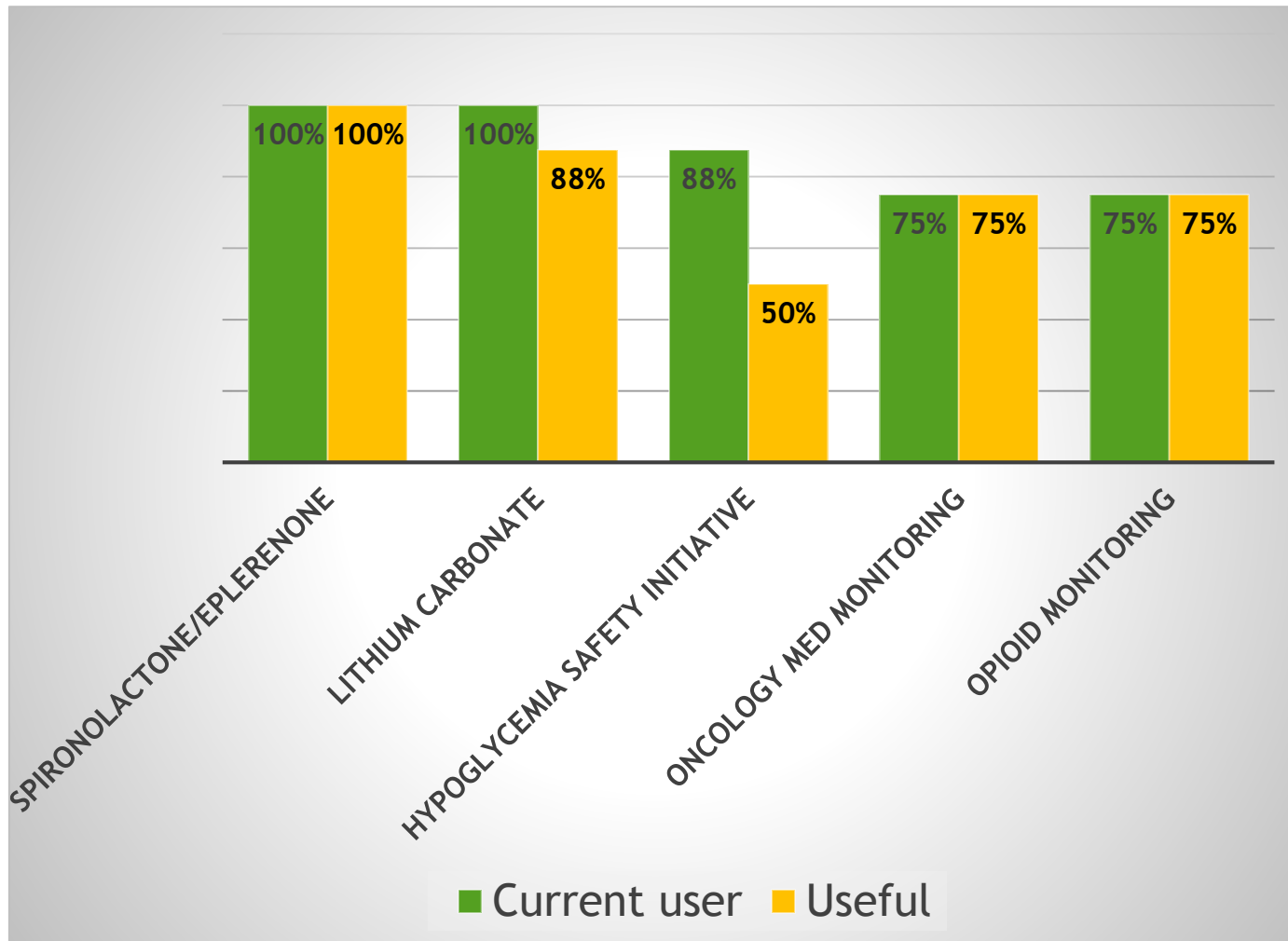
Five Dashboards: Strategies for Implementation

Horizontal bar chart comparing implementation strategies across five dashboards: Spironolactone Eplerenone, Lithium Carbonate, Hypoglycemia Safety Initiative, Oncology Med Monitoring, Opioid monitoring. X-axis from 0% to 120%.

Legend: Call patients, Patient mailings, Draft orders, Pt specific care plan, Electronic reminders, Academic detailing, Provider Education

20

Five Dashboards: Barriers to Their Implementation

Implementation Strategy	Need help from other Services/ Departments to implement N	Time consuming/ not enough staff N	Don't believe this would work N	Don't believe this is appropriate work for a pharmacist N
Provider education	1	0	1	0
Academic detailing	11	9	12	13
Electronic reminders	5	7	4	4
Patient specific care plan	7	6	9	9
Draft orders	17	13	12	16
Patient mailings	12	12	11	13
Call patients	6	6	5	6
TOTAL	59	53	54	61

VA Pharmacy Benefits Management: Medication Use Evaluation Tracker (MUET)

Evaluation of Medication Safety Example: WBC Monitoring for Dimethyl Fumarate Use

- Dimethyl fumarate (DMF)
    - Multiple sclerosis treatment
    - Lymphopenia (low white blood cells) side effect
        - Potentially fatal progressive multifocal leukoencephalopathy (PML)
    - Monitoring with White blood cell count (WBC)

Which Strategies are Best?

- Determine significant associations with best safety outcomes

- Obtain details on resources required to implement

- Plan to "Encourage/Facilitate adoption at other facilities Randomized

  - Stepped wedge design

    - All facilities "encouraged" over the course of a year.

Medication Use Evaluation Tracker

- Identify patients on Dimethyl Fumarate (DMF) without WBC measurement

- Contact facility pharmacists with patient list

- Pharmacists decide if and how to intervene

Survey of VA Facilities

- 118 VA systems surveyed in 2016
- Asked about use of seven interventions
  - Provider education
  - Academic detailing
  - Electronic clinical reminders
  - Draft orders for WBC testing
  - Request for care plan from provider
  - Patient calls
  - Patient mailings

Interventions to Increase WBC Monitoring for Patients on Dimethyl Fumarate (DMF)

Intervention	Facility Use N	Mean Rate of WBC Monitoring (% of patients)		P value
		Using Intervention	Not Using Intervention	
Electronic Reminders	30 (59%)	57±16	50±16	0.13
Provider Education	27 (53%)	59±13	47±18	0.008
Provider Request for Management Plan	26 (52%)	58±17	50±14	0.07
Patient Calls	7 (14%)	57±14	53±17	0.33
Academic Detailing	6 (12%)	73±9	52±15	0.003
Draft Orders for WBC	5 (10%)	66±11	53±16	0.09
Patient Mailing	2 (4%)	44±9	53±17	0.47

Which Interventions Worked? Adjusted Analysis

- Only two interventions remained significantly associated with higher WBC testing (doing neither intervention 46%)
  - Provider education (increase by 9%)
  - Academic detailing (increase by 17%)

Number of Interventions and WBC Monitoring
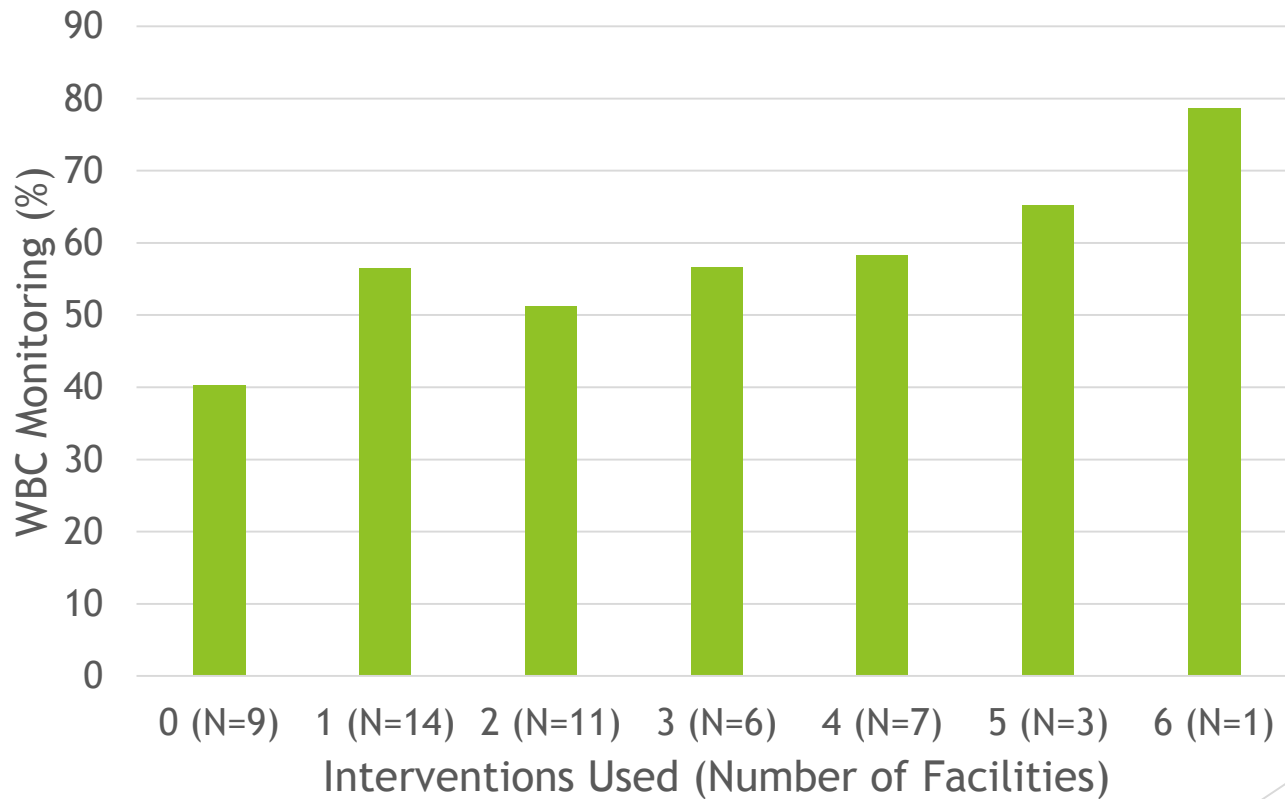
Barriers to WBC Monitoring

Facilities Previously Participating (N=14)	N (%)
Not enough patients to make it worthwhile	9/14 (64%)
Providers Adequately Educated	5/14 (36%)
Not a high priority safety issue	1/14 (7%)
Any Reason Provided	12/14 (86%)

Barriers to WBC Monitoring

Facilities that Never Participated (N=27)	N (%)
Too time consuming	8/27 (30%)
Not enough patients to make it worthwhile	6/27 (22%)
Not real time data	4/27 (15%)
Need help from other services to implement	2/27 (7%)
Not a high priority safety issue	2/27 (7%)
Not Appropriate work for a pharmacist	1/27 (4%)
Information Technology (IT) limitation	1/27 (4%)
Any Reason Provided	19/27 (70%)

Plans for Implementation

- Evaluate several other safety initiatives to determine if there physician education works in others

- Develop Standardized Physician Education
  - Possibly through academic detailing

- Announce results (passive)

- Consult with a random sample of VA facilities initially (active)

- Consult with the remaining VA facilities over the course of a year.

Clinical Decision Support (CDS)

MedSafe CDS Project

- Builds on 2 existing health informatics tools in VA:
  - V21 PBM Clinical Dashboard
    - Aka "HEDIS Dashboard" or "Performance Measures Dashboard" or "PACT Dashboard"
  - MedSafe-Clinical Decision Support (CDS) system developed from prior ATHENA-CDS

Tso GJ,… Goldstein MK, AMIA Annu Symp Proc. 2017

CDS Project Aim 1

- Implement CDS into the existing VISN 21 Clinical Dashboard for management of diabetes (DM), hypertension (HTN), hyperlipidemia, chronic kidney disease (CKD), and heart failure (HF)

CDS Project AIM 2

- Identify key opportunities within clinical workflow for providing Clinical Decision Support (CDS)
  - Obtain stakeholder input about clinical workflow within PACTS
  - Identify effective practices in use of the Dashboard and gain understanding of clinic structure, staffing, and other factors associated with effective use
  - Develop a list of 2 to 5 best practice examples of effective Dashboard use

CDS Project Aim 3

- Establish continuous quality improvement cycles for providing CDS for PACTs
  - Based on input from clinical stakeholders, fine-tune the presentation of CDS recommendations in the graphical user interface (GUI) and evaluate in iterative cycles of design/evaluation/redesign
  - Evaluate clinical stakeholder satisfaction with the process and results and recommendations for improvement
  - Evaluation clinician assessment of the usefulness of the CDS for informing their clinical practice

Clinical Decision Support for Primary Care Teams

PCMH/PACT
Panel of Patients

Items requiring PCP
input discussed with
PCP when needed

VISN 21 Data Warehouse
Performance on Quality Indicators

V21 Dashboard monitored by
PACT nursing or pharmacy
staff

CDS generates
recommendations with nurse or
Pharmacist who manage many
issues directly

Concept for the Project

- V21 PBM clinical dashboard contains information for VA Patient-Aligned Care Teams (PACTs) to monitor performance measures for chronic care for patients in PACT panels
  - Flags patients whose clinical data show that they are not meeting performance measure targets
- CDS has patient-specific recommendations for next steps in care
- Combine these so that if a patient's data don't meet the target then we can show recommendations about what to do next

The "Sociotechnical" Side

- Health Information Technology (HIT) is rarely adopted or effective in isolation
- The same HIT system may be a great success in one hospital and a big failure in another hospital in the same city
- HIT aiming for quality improvement must be part of an overall quality improvement program

Working with Stakeholders
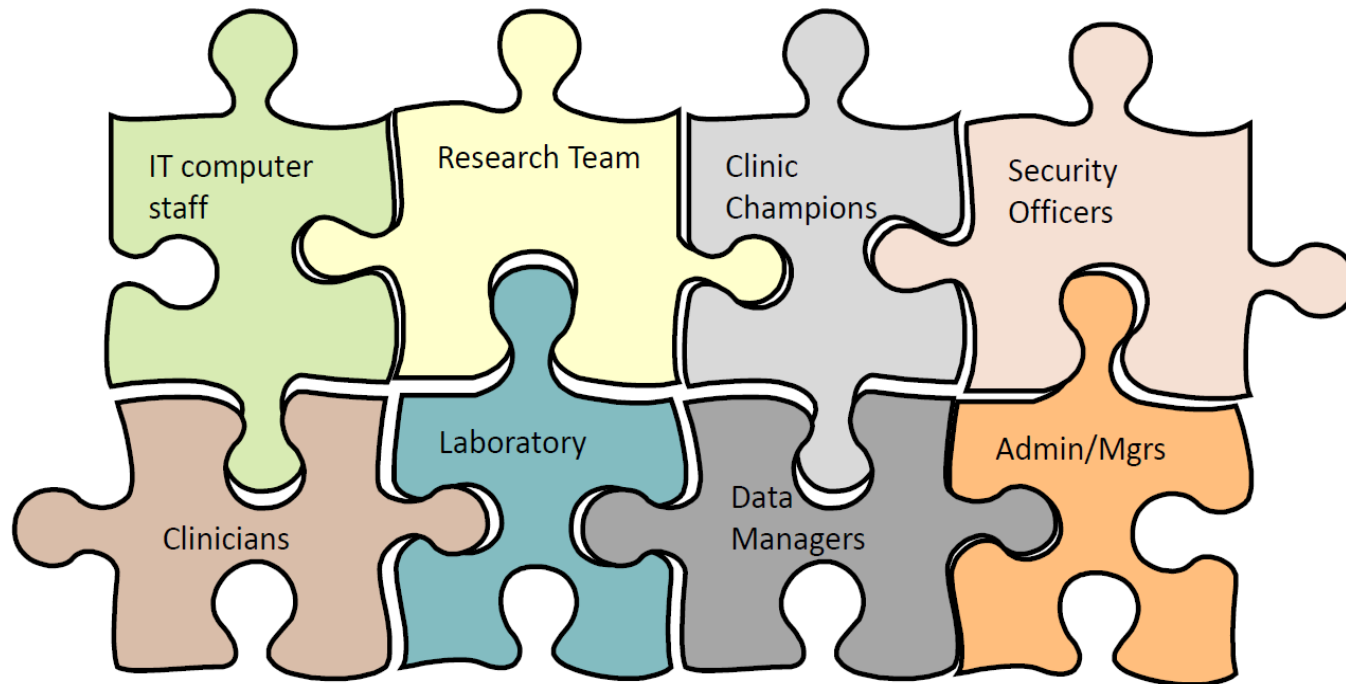
Berg, M. *Rationalizing Medical Work*. MIT Press 1997
Berg, M. Pt care info systems and health care work: a sociotechnical approach.
Int J Med Inform 1999

Working Within the Clinical Workflow

- We need to know current state of workflow
- We need to know how much change of workflow is feasible
  - New technology can allow for a change of workflow
  - But there may be limitations due to
    - Extent to which it needs to integrate with existing systems
    - Willingness of staff to change work habits

Positioning Health IT in Clinical Workflow

- Health Information Technology (HIT) that is too far removed from how health care providers do their work is likely to be rejected

- HIT developers much understand and respect the clinical workflow of the setting in which the HIT will be used

- On the other hand, HIT has potential to streamline and get beyond some routine tasks, which might change workflow

- HIT may be able to support changes in work brought about by other factors such as need for better population health management

Testing of CDS Accuracy Prior to Deployment

- Extensive literature and standard training in testing of computer systems in general

- Extensive literature evaluating clinical impact of various forms of CDS; however…

- Oddly little is published on the topic of testing Clinical Decision Support prior to deployment

- No general consensus on what constitutes adequate testing of clinical recommendations in CDS prior to release for clinical use

Compare CDS Output with Clinical Expert

- Guidelines are rarely precise enough to program into computable formats without further specification
  - For even the simplest rule-based CDS, a precise algorithm is needed
  - For more complex guidelines, detailed documents are required
- Detailed "Rules" document
- Compare outputs of the CDS with the intended output as specified in the Rules document
  - Martins SB et al AMIA Annu Symp Proc 2006: 539-43

CDS Survey

Developmental formative evaluation is important:
- ➢ to obtain stakeholder input about clinical workflow within Patient-Aligned Care Teams (PACTs)
- ➢ in different settings
- ➢ pertaining to key points of clinical decision-making
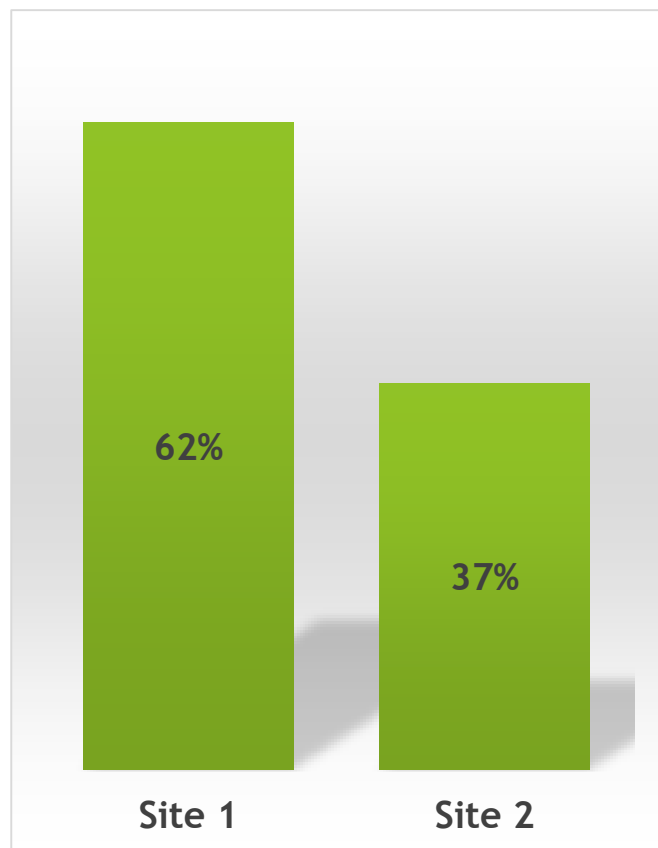
Aim of survey to understand:
- ➢ Comfort with technology and Dashboards
- ➢ Value of VISN21 Clinical Dashboard to manage patients

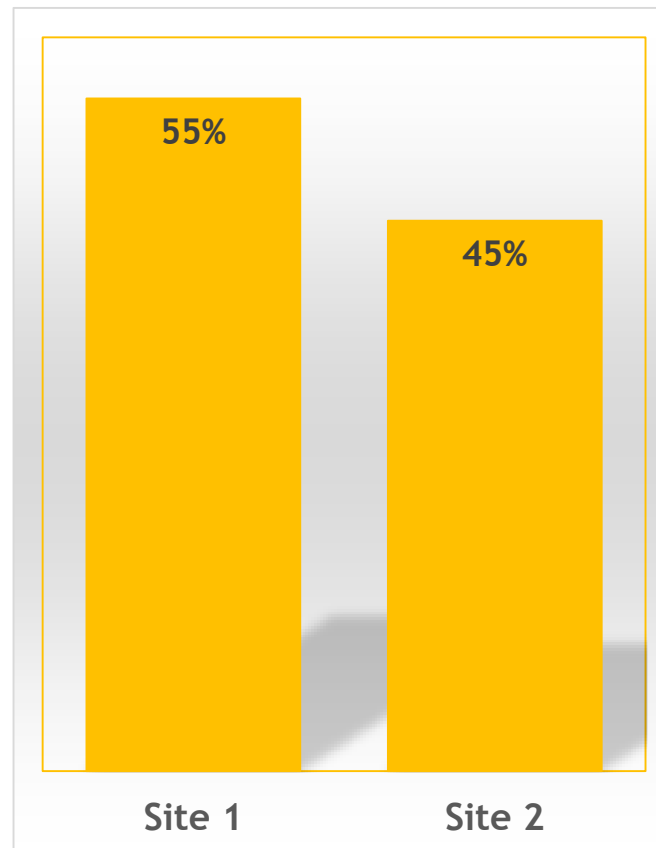Cross-sectional web-based survey was conducted:
- ➢ 2 sites in VISN21
- ➢ Respondents (n=142):
  - o Primary Care Providers (PCPs) (n=65, 45.8%)
  - o PACT- Nurses (n=54, 38.0%)
  - o Pharmacists (n=23, 16.2%).

Response rate was 48.9%
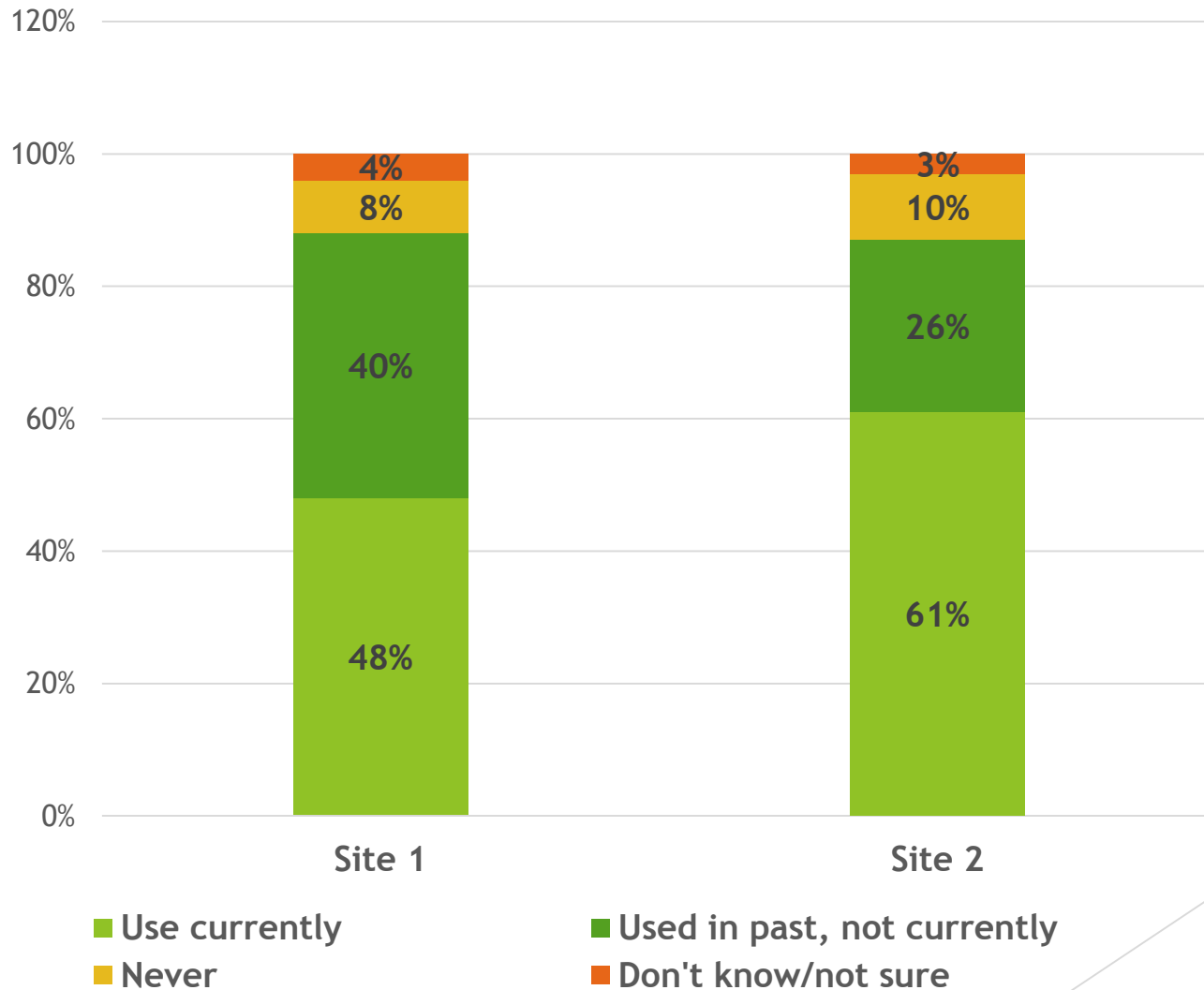
Results: Use of Technology and Dashboards

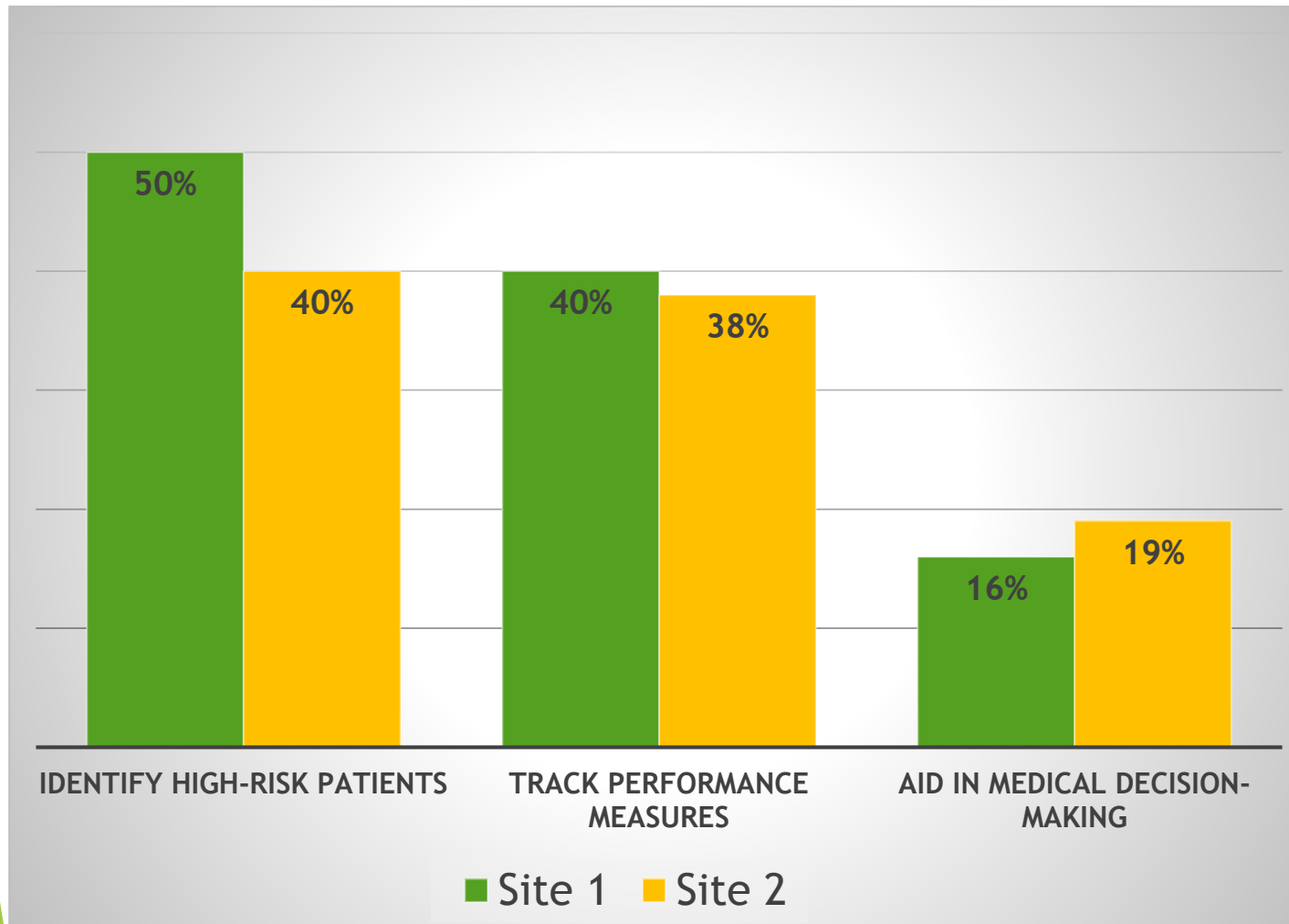Comfort using information and communication technologies

Dashboard(s) help better monitor patient care

Users of VISN21 Clinical Dashboard

Bar chart showing percentages for Site 1 and Site 2.

Site 1: Use currently 48%, Used in past, not currently 40%, Never 8%, Don't know/not sure 4%

Site 2: Use currently 61%, Used in past, not currently 26%, Never 10%, Don't know/not sure 3%

Legend:
- Use currently
- Used in past, not currently
- Never
- Don't know/not sure

48

Current Users:
Primary Purpose for Use of Clinical Dashboard

Cost Analysis

- We are gathering data to estimate the cost to introduce the system to a new VISN

  - A new site would need to connect the system to their data tables

  - Separating the one-time costs of developing CDS materials from the costs that would be incurred when a developed CDS System is integrated with dashboard at a new site

Summary

- ▶ VISN 21 Medication Safety Dashboard, one of many clinical dashboards

- ▶ Use varies by facilities including interventions to improve care

- ▶ Surveying and linking results to outcomes may be able to identify best practices

- ▶ Adding Clinical Decision Support to the Dashboard may be an important supplement to other pharmacy led interventions.

Contact Info:

Paul Heidenreich MD, MS Paul.Heidenreich@va.gov

Anju Sahay PhD Anju.Sahay@va.gov

Mary Goldstein MD, MS Mary.Goldstein@va.gov

Thank you!