Using Data & Information Systems in Partnered Research

Session 8:

Using National Power BI Dashboards to Improve Patient Safety and Quality of Care

Sanket Dhruva, MD, MHS; Gabriela Schmajuk, MD, MSc; Tonya Kaltenbach, MD, MS; and Mary Whooley, MD

VA Measurement Science QUERI

September 21, 2021

Using Data & Information Systems in Partnered Research Cyberseminar Series

Presentations from the field focusing on VA data use in quality improvement and operations-research partnerships.

Topics

- Use of VA data and information systems in QUERI Projects and Partnered Evaluation Initiatives
- Operational data resources and QI-related data
- Challenges in using and managing multiple data sources
- VA resources to support data use
- Experiences working within operations/research partnerships

Using Data & Information Systems in Partnered Research – FY21

Third Tuesday of the month | 12:00 – 1:00 PM ET

Date	Topic
10/19/21	Measuring Transformation in Healthcare: Findings and Lessons Learned from the Whole Health Implementation Study

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https://www.hsrd.research.va.gov/cyberseminars/catalog-archive-virec.cfm?SeriesSortParam=y&SeriesIDz=91

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Poll Question #1

What is your role in research and/or quality improvement projects?

a) Investigator, PI, Co-I

b) Statistician, data manager, analyst, or programmer

c) Project coordinator

d) Other – please describe via the chat function

Poll Question #2

How many years of experience working with VA data?

a) None – I'm brand new to this!

b) One year or less

c) More than 1, less than 3 years

d) At least 3, less than 7 years

e) At least 7, less than 10 years

f) 10 years or more

Session roadmap

- National Cardiac Device Surveillance Program (NCDSP)
- Disease-Modifying Anti-Rheumatic Drugs (DMARDs)
- Endoscopy Quality Improvement Program (EQuIP)

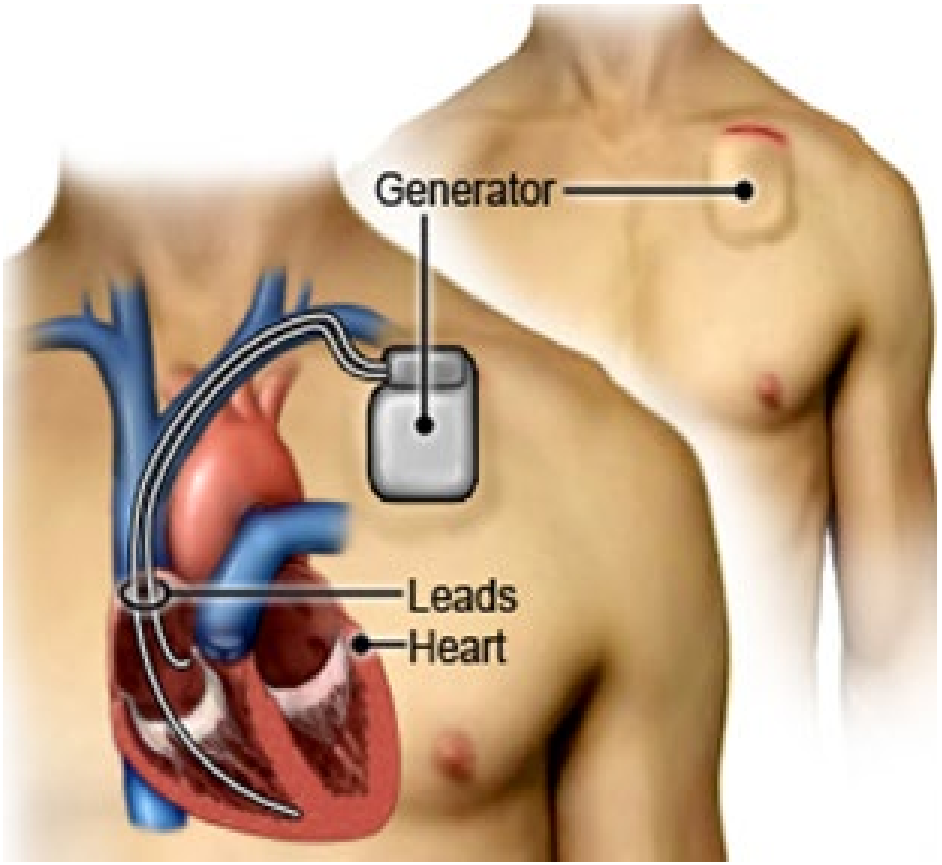
Using Data & Information Systems in Partnered Research

Dashboards to Improve Remote Monitoring Adherence of Veterans with Pacemakers and Implantable Cardioverter-Defibrillators (ICDs)

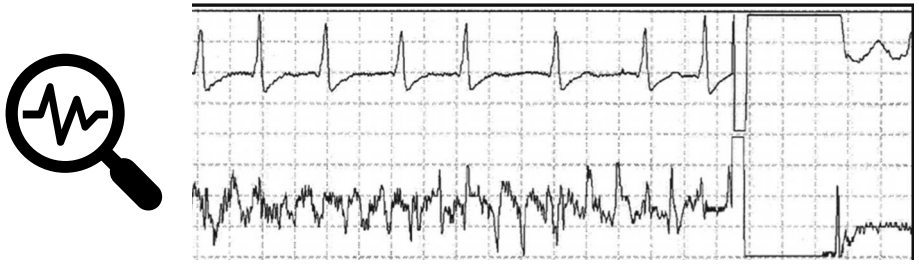
Sanket Dhruva, MD, MHS; Gary Tarasovsky; Mary Whooley, MD; and Merritt Raitt, MD
VA National Cardiac Device Surveillance Program (NCDSP)

Pacemakers and Implantable Cardioverter-Defibrillators (ICDs)

- > 55,000 living Veterans with a pacemaker or ICD
- Life-saving, permanently implanted
- Monitor or initiate each heartbeat
  - Generate valuable data for clinical interpretation

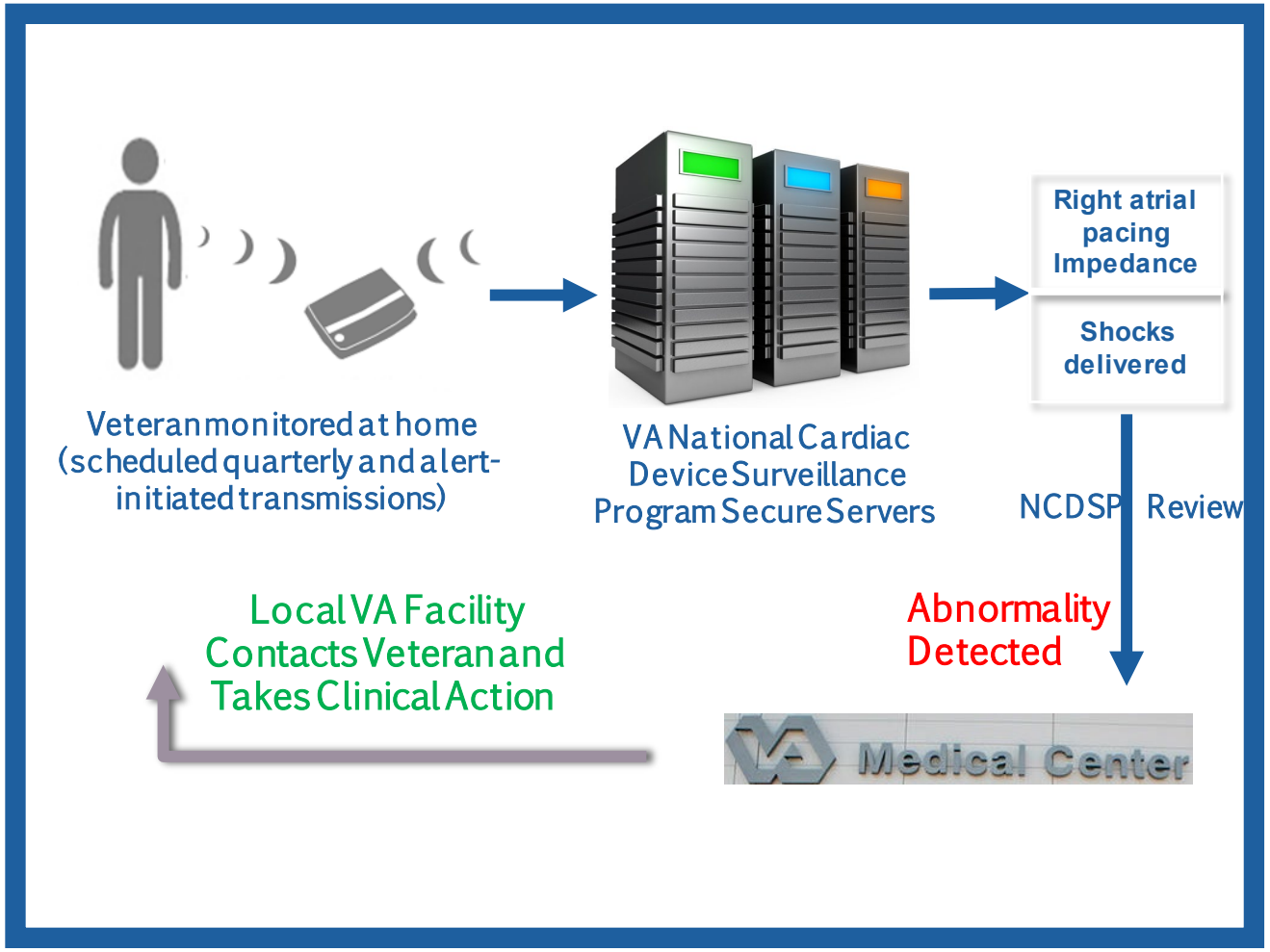


Remote Monitoring / Home Monitoring



- Transmission of pacemaker/ICD data using cellular, Wi-Fi, or analog transmission from a patient's residence
  - For example – new cardiac arrhythmias or device failure
- RCTs & large observational studies show reduced mortality, hospitalizations, ICD shocks, healthcare costs, and improved patient satisfaction with remote monitoring
  - Class 1, Level of Evidence A (strongest) professional society recommendation
- Transmissions should occur at least every 90 days

Friedman P.A., Swerdlow C.D. (2020) Remote Transmission After a Shock. In: Natale A., Wang P., Al-Ahmad A., Estes N. (eds) Cardiac Electrophysiology. Springer, Cham. https://doi.org/10.1007/978-3-030-28533-3_165



Remote Monitoring Within VA

VHA Directive 1189 (issued 1/2020):

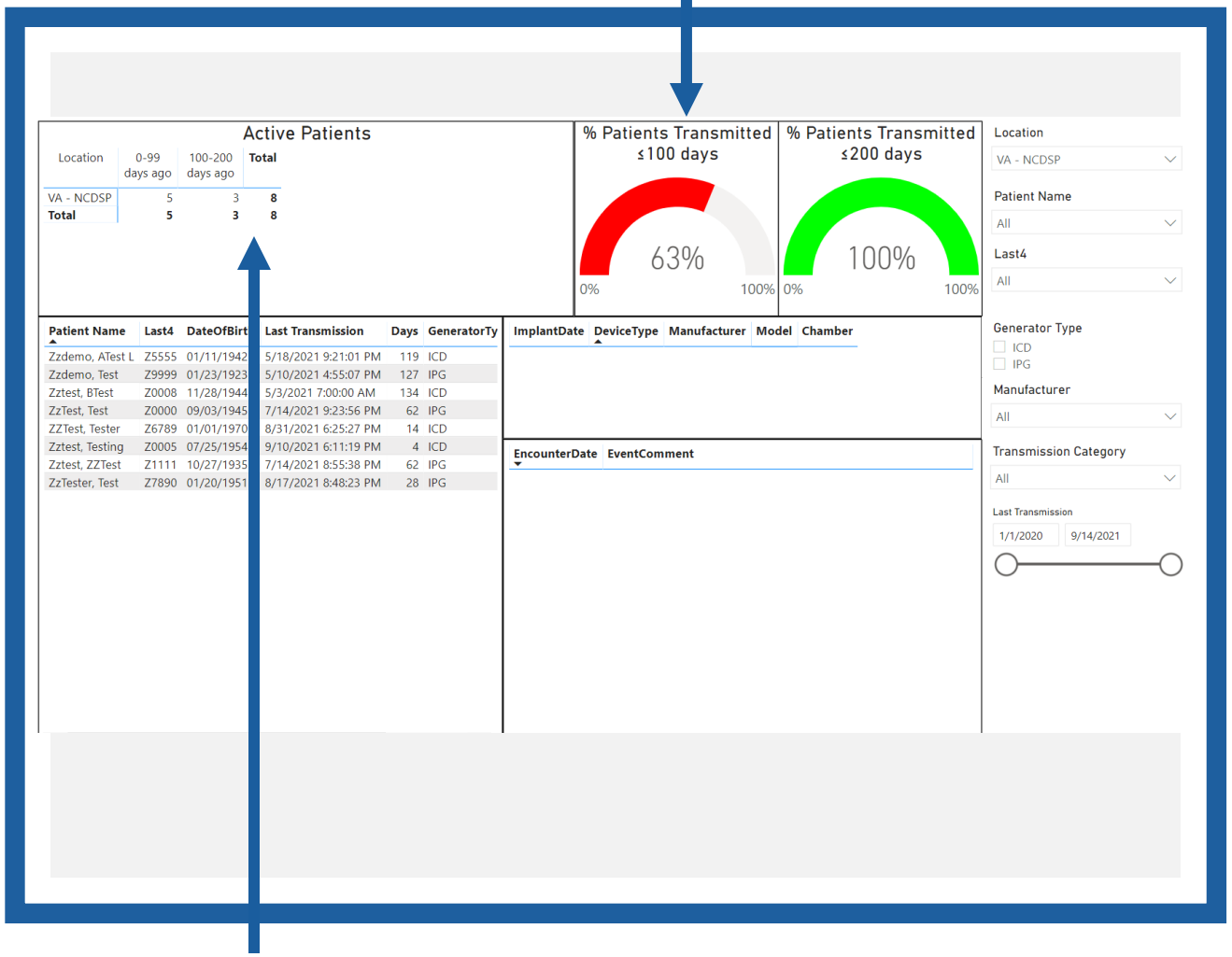
- All willing and able Veterans with pacemakers/ICDs must be offered remote monitoring
- All remote monitoring must occur through National Cardiac Device Surveillance Program (NCDSP)

The Need for a Dashboard

- The approximately 120 local VA clinics caring for Veterans with pacemakers/ICDs **need to know**:
  - If a patient has missed a remote transmission or never transmitted
    - **Without remote transmission, patients cannot receive the clinical benefits of remote monitoring**
  - Interpretation of the remote transmission
  - Details of the patient's device (generator/lead(s))

- Prior to dashboard implementation:
  - Slow, manual process for local VA clinics

Overall adherence for Veterans enrolled in local facility's clinic (goal ≥ 80%)



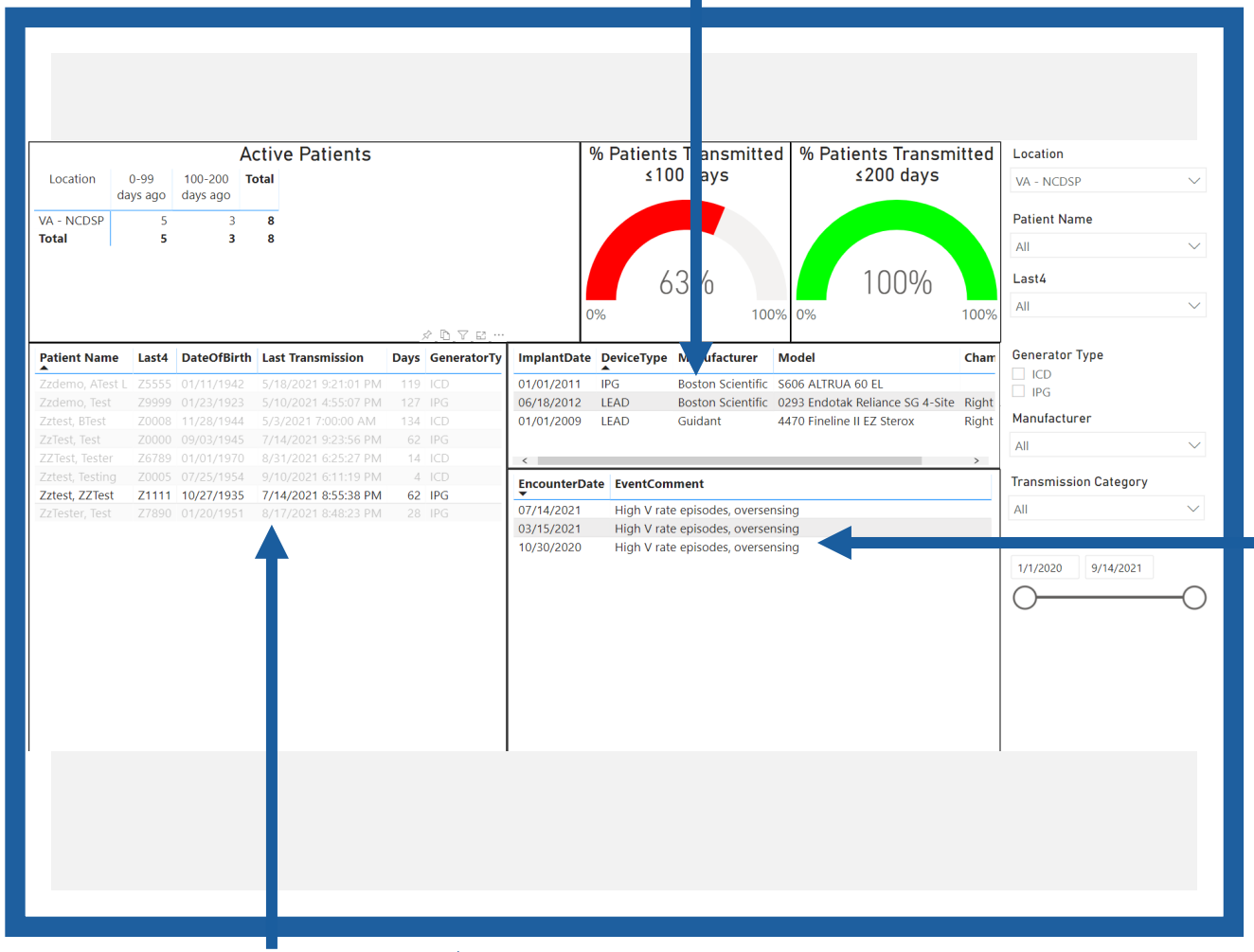
PowerBI Dashboard

Data on this and the following slides are fictional.

Clinics can ONLY see data for Veterans who they are following

Distribution of adherence for Veterans followed by specific clinic

Information about currently implanted devices

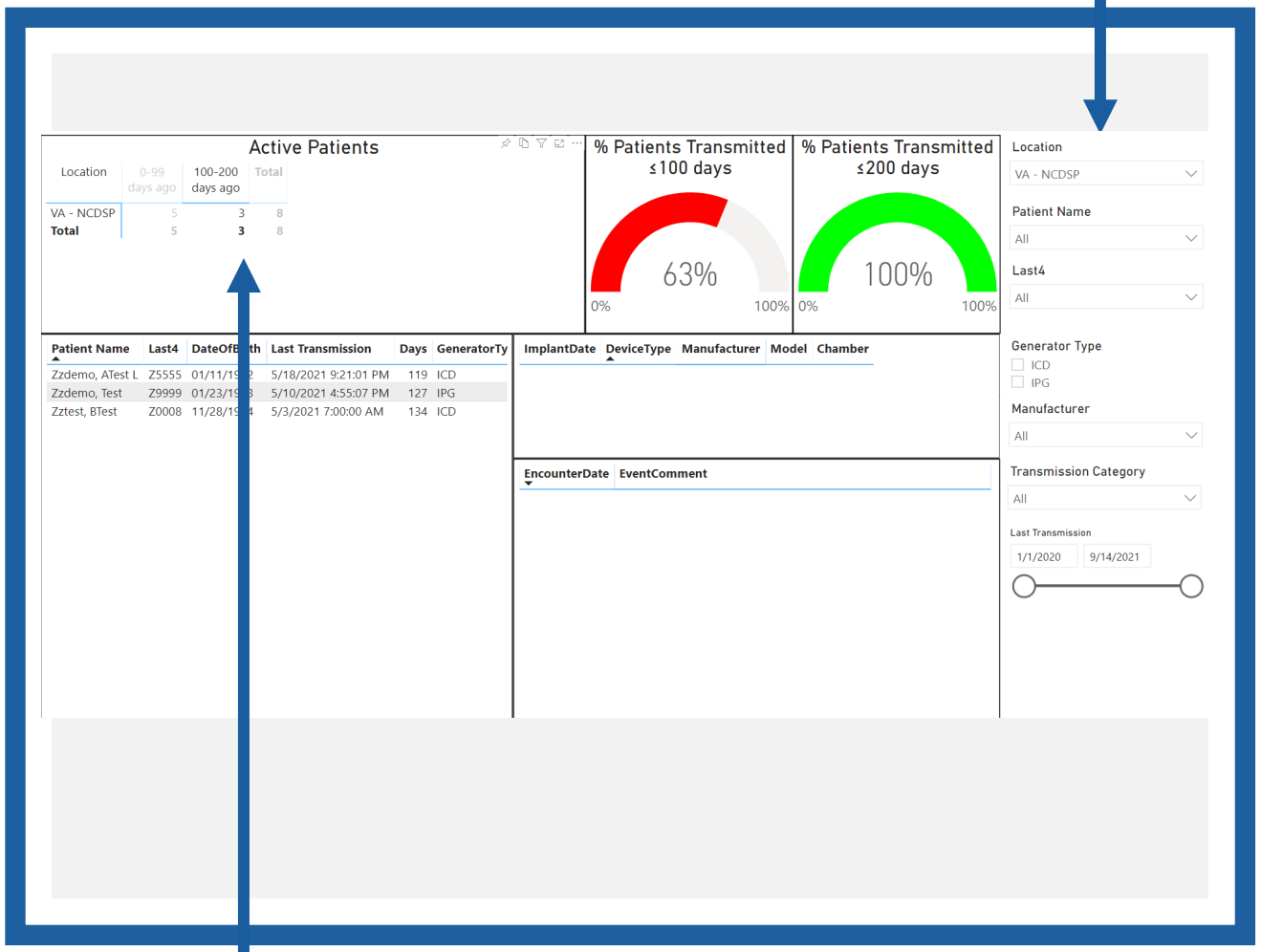


Patient-Specific Information

National Cardiac Device Surveillance Program Interpretation of Remote Transmission(s)

Patient-Specific Information (name, last 4, date of birth, last transmission, generator type, manufacturer)
Transmissions for 3 of 4 pacemaker/ICD manufacturers appear **as soon as they occur**

Multiple search parameters (name, last 4, transmission category, date of last transmission)



Select any time period to identify Veterans

Searching Capabilities

Launch and Feedback

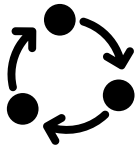
- Beta launched to 5 VA cardiology clinics 8/12/21, followed by Microsoft Teams demonstration
- Positive feedback obtained via REDCap survey
  - Request for PDFs
  - Drill-down capability
- Launched nationally to VA cardiology clinics 8/31/21

Next Steps

- Evaluation
  - Examining usage (# of viewers, total # of views)
  - REDCap survey
  - Qualitative interviews with frequent and infrequent users
  - Rates of adherence for Veterans with pacemakers/ICDs
- Augmentation/Enhancement Plans
  - PDFs of EKG transmissions (large size, with 250,000 annually)
  - In-person device-clinic visit information
  - Patient contact information
  - Drill-down capability or multiple views

Summary

- Remote monitoring adherence is crucial for Veterans with pacemakers and ICDs because it improves many clinical outcomes
- Local VA clinics need a real-time mechanism to evaluate adherence
- Through a successful operational partnership between the Measurement Science QUERI and NCDSP, a PowerBI dashboard now solves this important information gap for local VA clinics
- Opportunities to continue evaluating and improving the dashboard



Using National Power BI Dashboards to Improve Medication Safety in Rheumatology

Gabby Schmajuk, MD, MSc

The Case

- 62 F from China diagnosed with rheumatoid arthritis 3 years ago
- Treated with methotrexate and a TNF inhibitor but continued to have active disease
- Switched from TNF to IV rituximab based on her joint exam and lab tests (RF+ CCP+)
- Initially did well but 4 months later admitted with fulminant liver failure
- Found to have chronic Hepatitis B with high viral load
- Died 1 month later while on the liver transplant list

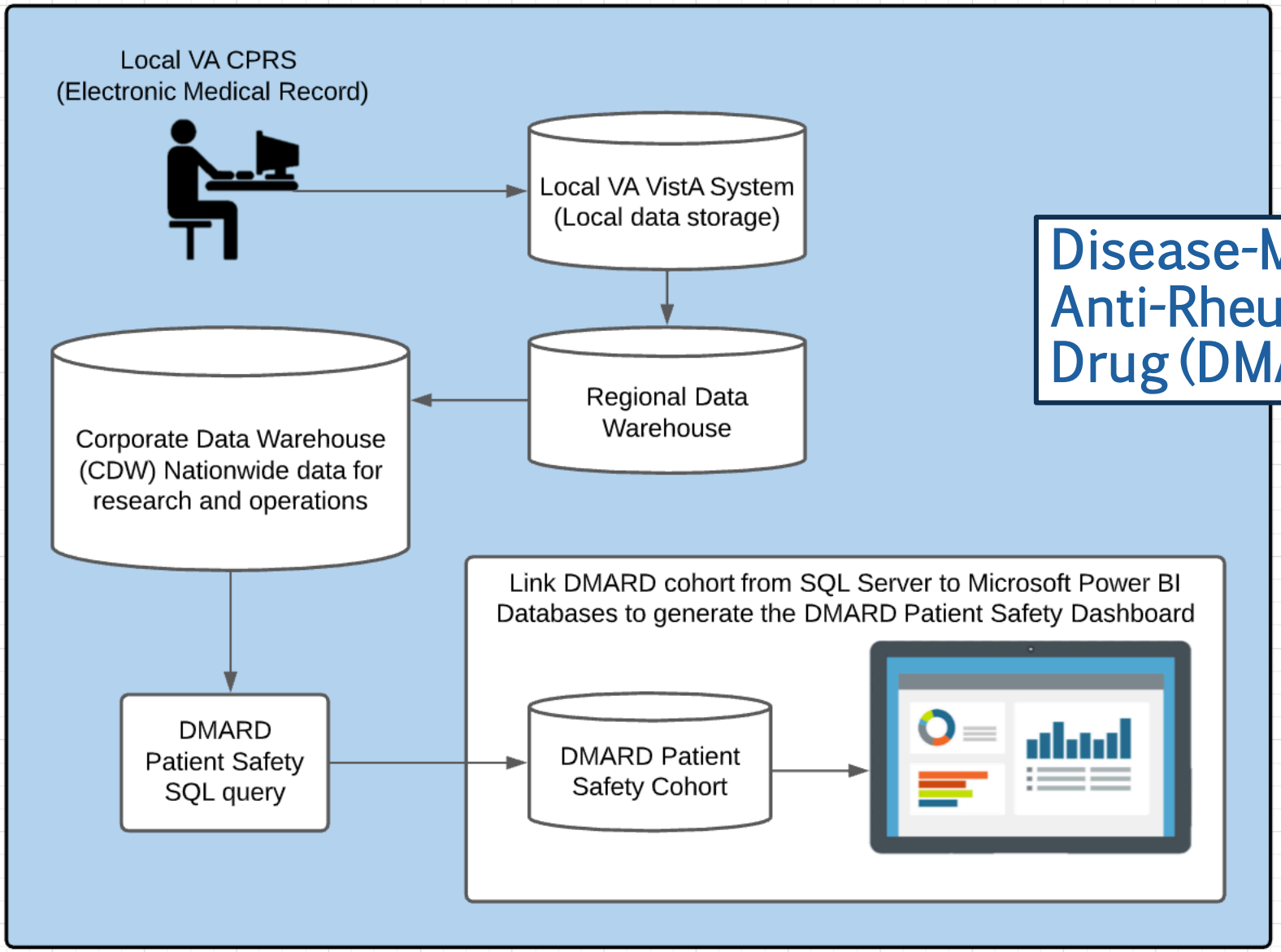
https://reference.medscape.com/slideshow/rheumatoid-arthritis-6006748#2

The Problem

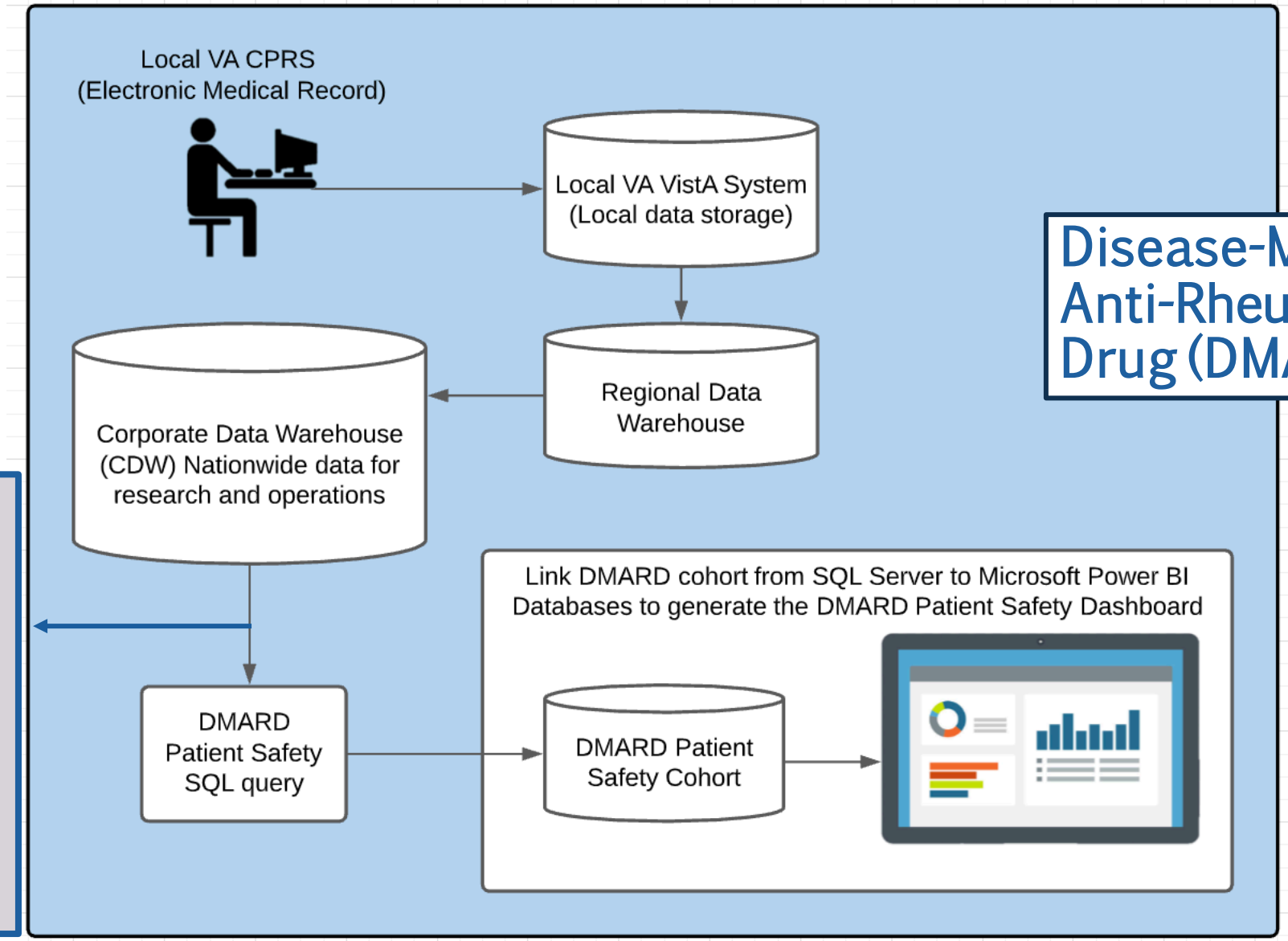
- Treatment with immunosuppressive medications known as biologics can cause fatal re-activation of latent infections such as Hepatitis B and Tuberculosis
  - Examples include rituximab and TNF inhibitors
- Guidelines recommend pre-treatment screening for Hepatitis B, Hepatitis C, and Tuberculosis to identify and treat latent infections
- National data (VA and non-VA) suggest that **40-80%** of biologic users have not received all of the recommended pre-treatment screening tests

One Potential Solution

- "Audit and feedback" EHR-based dashboard for population health management
- Single stop for a bird's eye view of medication safety issues
- Can be checked by individual providers, practice managers, pharmacists, or trainees – weekly, monthly, quarterly
- Updates made to CPRS propagate into the Dashboard within 24 hours



Disease-Modifying Anti-Rheumatic Drug (DMARD)



Disease-Modifying Anti-Rheumatic Drug (DMARD)

DATA VALIDATION

- Identify IV and SC medication users
- Identify active Rx
- Identify and validate screening tests
  --multiple collaborations
  -->3000 charts reviewed
- Identify providers

DMARDs Safe Prescribing

VA | U.S. Department of Veterans Affairs

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Screenings Complete: Yes: ✓ No: ✗ Not Applicable: ●

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FILTERS

Station: All

Drug Type: All

All Screenings Complete: N, Y

Provider: All

Drug Name: All

Hepatitis B Virus: N, Y

Hepatitis C Virus: N, Y

Tuberculosis: N, N/A, Y

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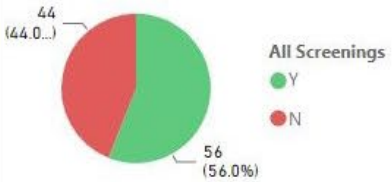
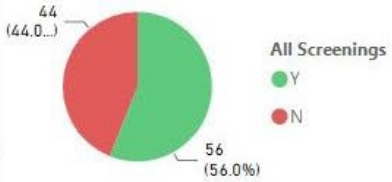
Unique Patients

Local



National



fictitious data

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VA | U.S. Department of Veterans Affairs

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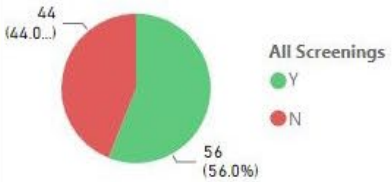

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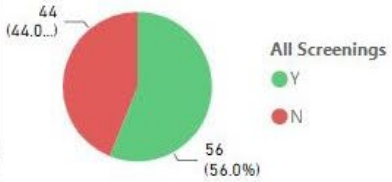

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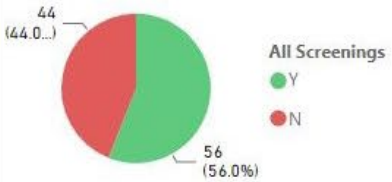

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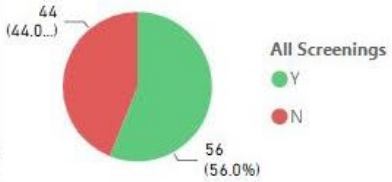

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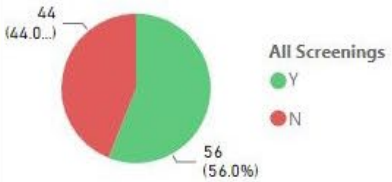
404	Aaronson, Cole	Lenz, Bethany Joy	9999	B-cell	RITUXIMAB-P...	05/11/21	✗	✓	●	✗
404	Aaronson, Cole	Philbin, Darryl R	9999	Other	SECUKINUMAB	06/28/21	✗	✓	✗	✗
404	Aaronson, Cole	Potter, Sherman T	9999	TNF	ADALIMUMAB	11/12/20	✓	✓	✓	✓
404	Aaronson, Cole	Scott, James Haley	9999	TNF	ADALIMUMAB	06/28/21	✓	✓	✓	✓
404	Aaronson, Cole	VanSanten, Shantel Quinn	9999	TNF	INFLIXIMAB-...	06/28/21	✓	✓	✓	✓
404	Aaronson, Cole	Woods, Barbara Alyn	9999	TNF	CERTOLIZUM...	06/15/21	✓	✓	✓	✓
404	Alabaster, Kimberly S	Mulcahy, Francis Maxwell	9999	B-cell	RITUXIMAB	11/06/20	✗	✓	●	✗
404	Alexander, Raymond	Davis, Brooke Sophia	9999	B-cell	RITUXIMAB-P...	07/13/21	✓	✓	●	✓
404	Allen, Debra C	Carrelle, Steven	9999	TNF	ADALIMUMAB	07/15/21	✗	✗	✗	✗
404	Avery, Jackson J	Martin, Angela K	9999	B-cell	RITUXIMAB-P...	07/22/21	✓	✓	●	✓
404	Bailey, Miranda C	Kent, Jonathon	9999	TNF	ADALIMUMAB	05/27/21	✓	✓	✓	✓
404	Benson, Crista J	Charles, Gregory Joseph	9999	TNF	ADALIMUMAB	04/21/21	✗	✓	✓	✗
404	Benton, Peter W	Frankfurt, Harold S	9999	TNF	CERTOLIZUM...	06/08/21	✓	✓	✓	✓
404	Bialik, Mayim C	Crane, Frasier	9999	TNF	ADALIMUMAB	05/19/21	✗	✗	✓	✗
404	Bishop, Maya D	Brundage, Jamie Scott	9999	B-cell	RITUXIMAB-P...	06/24/21	✓	✗	●	✗

100

Unique Patients

Local



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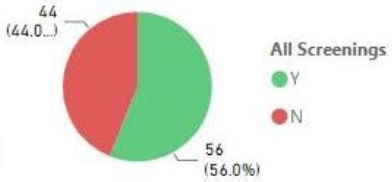


fictitious data

DMARDs Safe Prescribing

VA | U.S. Department of Veterans Affairs

The purpose of this dashboard is to provide information on pre-treatment screening for latent infections for patients receiving biologics or targeted small molecules.

Screenings Complete: Yes: ✓ No: ✗ Not Applicable: ●

For a patient have "All Screenings" complete each of the following is required:

⇒ **Hepatitis B Virus surface antigen (or viral load) and core antibody labs**

⇒ **Hepatitis C Virus viral load or antibody labs**

⇒ **Tuberculosis PPD, Interferon-Gamma Release Assay, or evidence of TB treatment (ever)**

*Disclaimer: TB testing information comes from lab tests or health factors but not clinical note narratives; Therefore, TB tests for some patients may not be captured here.

FILTERS

Station: All

Drug Type: All

All Screenings Complete: N, Y

Provider: All

Drug Name: All

Hepatitis B Virus: N, Y

Hepatitis C Virus: N, Y

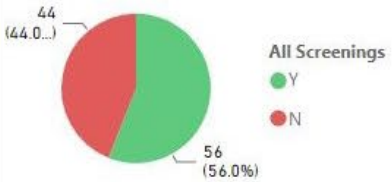
Tuberculosis: N, N/A, Y

St3n	Provider	Patient Name	Last4	Drug Type	Drug Name	Last Rx Date	HBV Complete	HCV Complete	TB Complete	All Screenings
404	Aaronson, Cole	Gallagher, Thomas	9999	B-cell	RITUXIMAB	10/23/20	✗	✓	●	✗
404	Aaronson, Cole	Hudson, Stanley David	9999	TNF	INFLIXIMAB-...	07/06/21	✓	✓	✓	✓
404	Aaronson, Cole	Lenz, Bethany Joy	9999	B-cell	RITUXIMAB-P...	05/11/21	✗	✓	●	✗
404	Aaronson, Cole	Philbin, Darryl R	9999	Other	SECUKINUMAB	06/28/21	✗	✓	✗	✗
404	Aaronson, Cole	Potter, Sherman T	9999	TNF	ADALIMUMAB	11/12/20	✓	✓	✓	✓
404	Aaronson, Cole	Scott, James Haley	9999	TNF	ADALIMUMAB	06/28/21	✓	✓	✓	✓
404	Aaronson, Cole	VanSanten, Shantel Quinn	9999	TNF	INFLIXIMAB-...	06/28/21	✓	✓	✓	✓
404	Aaronson, Cole	Woods, Barbara Alyn	9999	TNF	CERTOLIZUM...	06/15/21	✓	✓	✓	✓
404	Alabaster, Kimberly S	Mulcahy, Francis Maxwell	9999	B-cell	RITUXIMAB	11/06/20	✗	✓	●	✗
404	Alexander, Raymond	Davis, Brooke Sophia	9999	B-cell	RITUXIMAB-P...	07/13/21	✓	✓	●	✓
404	Allen, Debra C	Carrelle, Steven	9999	TNF	ADALIMUMAB	07/15/21	✗	✗	✗	✗
404	Avery, Jackson J	Martin, Angela K	9999	B-cell	RITUXIMAB-P...	07/22/21	✓	✓	●	✓
404	Bailey, Miranda C	Kent, Jonathon	9999	TNF	ADALIMUMAB	05/27/21	✓	✓	✓	✓
404	Benson, Crista J	Charles, Gregory Joseph	9999	TNF	ADALIMUMAB	04/21/21	✗	✓	✓	✗
404	Benton, Peter W	Frankfurt, Harold S	9999	TNF	CERTOLIZUM...	06/08/21	✓	✓	✓	✓
404	Bialik, Mayim C	Crane, Frasier	9999	TNF	ADALIMUMAB	05/19/21	✗	✗	✓	✗
404	Bishop, Maya D	Brundage, Jamie Scott	9999	B-cell	RITUXIMAB-P...	06/24/21	✓	✗	●	✗

100

Unique Patients

Local



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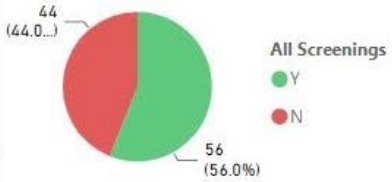


fictitious data

Expanded Patient Labs

The purpose of this dashboard is to provide information on pre-treatment screening for latent infections for patients receiving biologics or targeted small molecules.

Screenings Complete: Yes: No: Not Applicable:

For a patient have "All Screenings" complete each of the following is required:

⇒ **Hepatitis B Virus surface antigen (or viral load) and core antibody labs**

⇒ **Hepatitis C Virus viral load or antibody labs**

⇒ **Tuberculosis PPD, Interferon-Gamma Release Assay, or evidence of TB treatment (ever)**

FILTERS

Station: All

Drug Type: All

All Screenings Complete: N, Y

Provider: All

Drug Name: All

Hepatitis B Virus: N, Y

Hepatitis C Virus: N, Y

Tuberculosis: N, N/A, Y

Filters

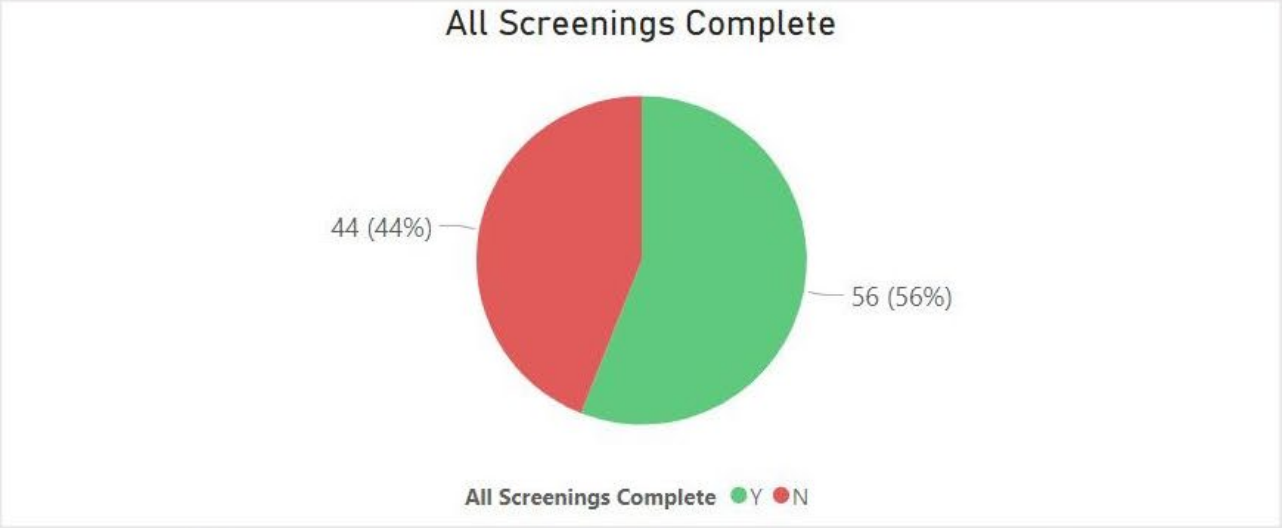
Sta3n	Provider	Patient Name	Last4	Drug Name	HBVsAg date	HBVvl date	HBVcAb date	HBV complet	HCVab date	HCVvl date	HCV complete	TB date	TB complete	All screenings complete
404	Faber, Michelle N	Addams, Mortici...	9999	ADALIMUMAB	02/12/18		02/12/18	✓	02/12/18		✓	02/12/18	✓	✓
404	Faber, Michelle N	Alexander, Jason...	9999	ETANERCEPT	09/22/20		09/22/20	✓	09/22/20		✓	09/22/20	✓	✓
404	Torres, Catherine S	Astin, John Ken	9999	INFLIXIMAB-AB...	08/06/12			✗	08/06/12		✓	08/06/12	✓	✗
404	Faber, Michelle N	Bach, Catherine	9999	RITUXIMAB	06/15/20	07/01/20		✗	06/21/11		✓	01/09/08	●	✗
404	Lawrence, Bill	Baker, Julian Aus...	9999	INFLIXIMAB-AB...	07/11/18		07/11/18	✓	07/11/18		✓	07/11/18	✓	✓
404	Grey, Meredith E	Baumgartner, Br...	9999	RITUXIMAB-PV...	12/08/20		12/08/20	✓	12/08/20		✓	06/16/14	●	✓
404	Schmitt, Levi J	Bavier, Frances A	9999	RITUXIMAB-PV...	08/18/16		08/18/16	✓	11/19/03		✓		●	✓
404	Shepherd, Armelia C	Beesly, Pamela ...	9999	ETANERCEPT				✗	11/13/17		✓	09/15/20	✓	✗
404	Sloan, Mark E	Benes, Elaine Cla...	9999	ADALIMUMAB	09/09/20		09/09/20	✓	09/09/20	11/30/20	✓	09/09/20	✓	✓
404	Maschio, Robert	Bernard, Andrew...	9999	TOFACITINIB	09/18/09		09/18/09	✓	08/14/17		✓	07/26/12	✓	✓
404	Plenn, Wanda Dean	Bishop, Winston...	9999	RITUXIMAB-PV...	12/14/15		12/14/15	✓	12/14/15		✓	12/14/15	●	✓
404	Doss, Barrett V	Blake, Meredith	9999	RITUXIMAB-PV...	09/12/16		09/12/16	✓	09/12/16	12/20/04	✓	07/11/07	●	✓
404	Pierce, Margaret K	Booke, Sorrell	9999	ETANERCEPT	11/28/06		05/23/19	✓	05/23/19		✓	12/04/17	✓	✓
404	Plenn, Wanda Dean	Bosch, Karl S	9999	RITUXIMAB-PV...	09/28/20		10/22/19	✓	10/22/19		✓	10/22/19	●	✓
404	Mahoney, Denise E	Boyd, Woody Jo...	9999	ETANERCEPT	11/26/19	01/10/20	01/10/20	✓	11/26/19		✓	11/26/19	✓	✓

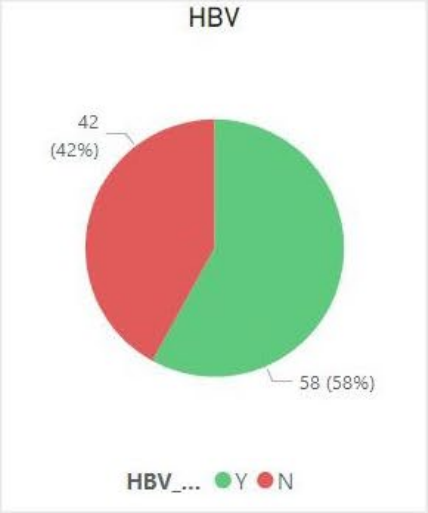
fictitious data

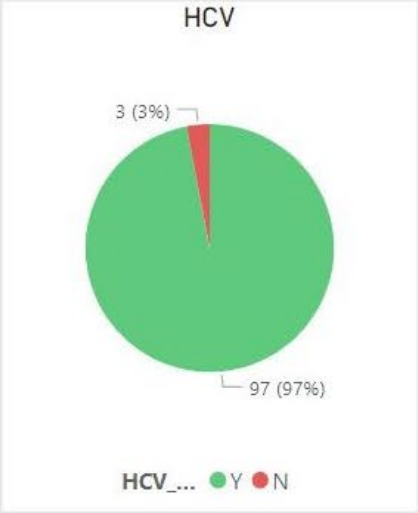
Latent Infection Screening Charts by Station

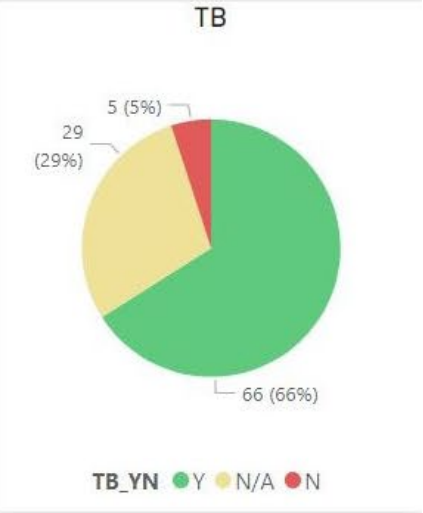
All Screenings Complete
(Number of Patients per Provider)

Stations	N	Y	Total
⊟	44	56	100
Aaronson, Cole	3	5	8
Alabaster, Kimberly S	1		1
Alexander, Raymond		1	1
Allen, Debra C	1		1
Avery, Jackson J		1	1
Bailey, Miranda C		1	1
Benson, Crista J	1		1
Benton, Peter W		1	1
Bialik, Mayim C	1		1
Bishop, Maya D	1		1
Boswell, Lauren H	1		1
Braff, Zach D	1		1
Brandage, Jackson S	1		1
Burke, Preston W	1		1
Burton, Ellis		1	1
Carter, John Mathew	1		1
Corday, Elizabeth A	1		1
Delpino, Vinnie	1		1
DeLuca, Andrew G		1	1
Doss, Barrett V		1	1
Duquette, Dennis D	1	3	4
Edwards, Stephanie J	1		1
Emerson, Charlie O	1		1
Total	**44**	**56**	**100**





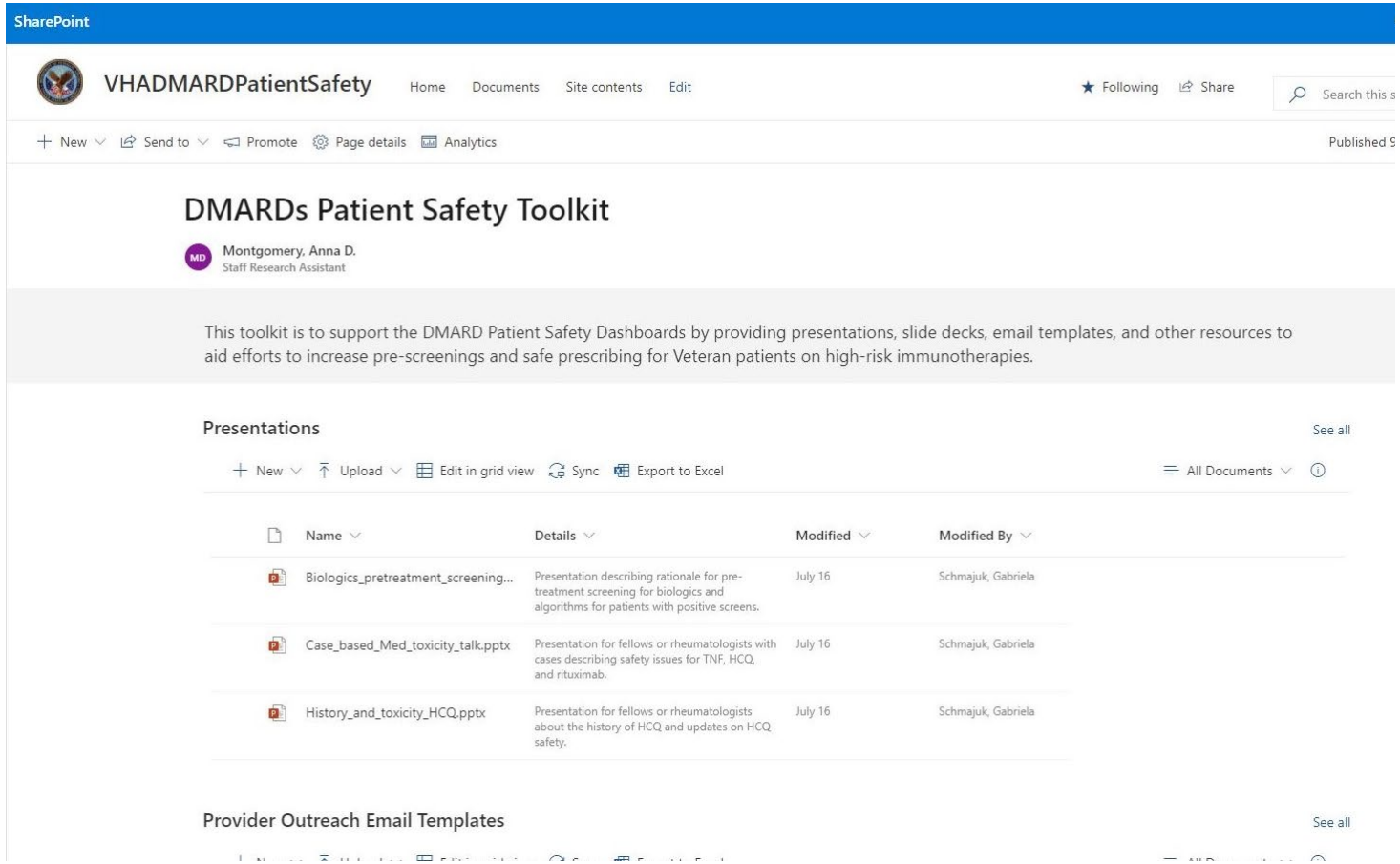




fictitious data

DMARD Safety Toolkit

- Video tutorials on using the dashboard
- Powerpoint presentations with background information on latent infections and guidelines
- Sample workflows for using the dashboard
- Template communications to clinicians and patients explaining goals of screening



Next Steps

- Continue to validate data elements
- Enhance toolkit
- Pilot roll-out (6 sites)
- Consider creating additional suite of dashboards for other medication safety issues
  - e.g. HCQ dosing, LFT monitoring, CBC monitoring, HLA-B5801 testing, etc.

DMARDs Patient Safety Dashboards

VA | U.S. Department of Veterans Affairs

Filters

Hydroxychloroquine Dashboard

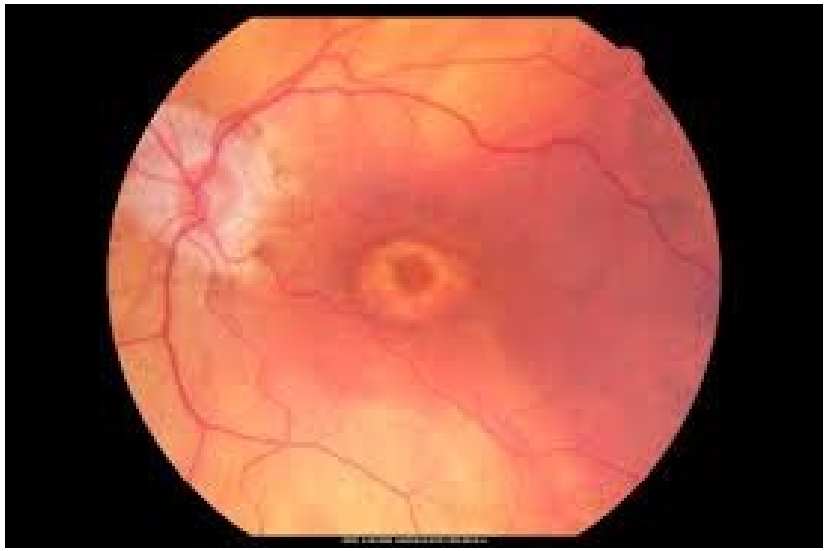
DMARD Safe Prescribing Dashboard

DMARD Patient Safety Toolkit

Information & Instructions

Another Problem

- Hydroxychloroquine (HCQ) is used widely for treatment of rheumatoid arthritis, lupus, and other inflammatory arthritis
- Recent data suggests retinal toxicity from HCQ is more common than previously thought (7%)
  - Risk factors for toxicity include DOSE and DURATION of use
- New guidelines recommend
  - Dose ≤ 5 mg / kg / day
  - Specialty retinal exam (OCT)
- National data (VA and non-VA) suggest that 20-40% of HCQ users are receiving doses > 5.0 mg/kg/day



VA | U.S. Department of Veterans Affairs

Hydroxychloroquine Dashboard

The purpose of this dashboard is to identify patients who are prescribed higher than recommended doses of hydroxychloroquine (HCQ).

Qty/day: Number of 200 mg pills of HCQ prescribed per day.
Weight: In pounds, the most recent weight available within the past 3 years (if any older weights are available, field will be marked "missing" and have a **YELLOW** flag).
Dose: In milligrams / kilogram, doses > 5.2 mg/kg will show a **RED** flag.
OCT date: The most recent date of optical coherence tomography (OCT) screening ~ required within the first year of HCQ use, and annually after 5 years of HCQ use

Sta3n	Patient Name	Last4	Qty/Day	Weight (lbs)	Dose (mg/kg)	OCT date	Provider Name	Service Section
700	Addams, Morticia Carol	9999	2.0	189.3	4.7	08/23/16	Alabaster, Kimberly S	PRIMARY CARE SERVICE
502	Alexander, Jason Scott	9999	2.0	169.7	5.2	12/16/19	McFinley, John C	MEDICAL SPECIALTY CARE SL
700	Astin, John Ken	9999	2.0	226.0	3.9		Schulenburg, Harriet O	MA-PRIMARY CARE
517	Bach, Catherine	9999	2.0	249.4	3.5		Knight, George T	MEDICAL SUB-SPECIALTY
700	Baker, Julian Austin	9999	1.1	171.0	2.9		Abruzzo, Ray A	RHEUMATOLOGY
606	Baumgartner, Brian Paul	9999	2.0	222.0	4.0		Howser, Katherine B	PRIMARY CARE SERVICE-NWI
700	Bavier, Frances A	9999	2.0	141.7	6.2		Hunter, Angela A	PRIMARY CARE
606	Beesly, Pamela Mae	9999	1.5	152.0	4.4		Benson, Crista J	MEDICAL SERVICE
502	Benes, Elaine Claire	9999	2.0	214.0	4.1	03/18/20	Braff, Zach D	AMBULATORY CARE
606	Bernard, Andrew Ed	9999	2.0	185.0	4.8	10/07/20	Kastl, Jonathon M	REMOTE
502	Bishop, Winston Charles	9999	2.0	236.5	3.7	04/02/18	Ortiz, Jaina Lee	PRIMARY CARE SL
606	Blake, Meredith	9999	2.0	168.0	5.3		Howser, Katherine B	PRIMARY CARE SERVICE
517	Booke, Sorrell	9999	2.0	233.4	3.8	11/05/11	Vernoff, Krista W	PRIMARY CARE SERVICE
404	Bosch, Karl S	9999	2.0	195.0	4.5		Wilder, Peter T	AMBULATORY CARE - CHY
517	Boyd, Woody John	9999	2.0	272.0	3.2		Doss, Barrett V	MEDICAL SERVICE
606	Brent, David	9999	2.0	265.3	3.3		Kastl, Jonathon M	AMBULATORY CARE
700	Brundage, Jamie Scott	9999	1.5	145.2	4.6		Schneider, Maria D	RHEUMATOLOGY, MED

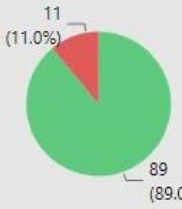
Station
All
Provider
All
Last OCT Exam Date
7/1/2008 6/28/2021
High Dose
No
Yes

100
Total Patients

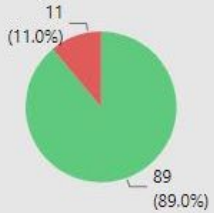
High Dose: >=5.2 mg/kg

High Dose	Patients
No	89
Yes	11

Local



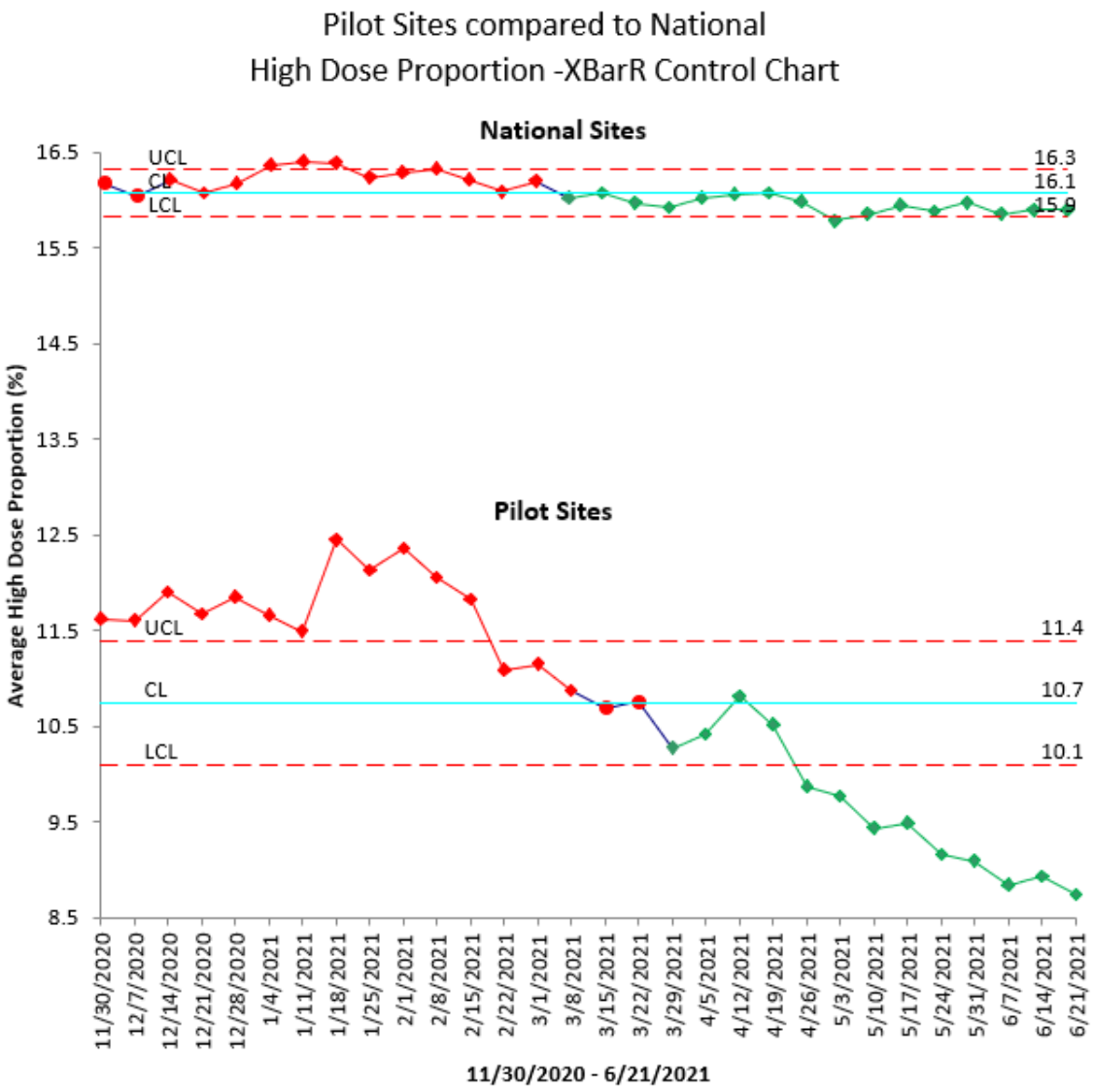
National



fictitious data

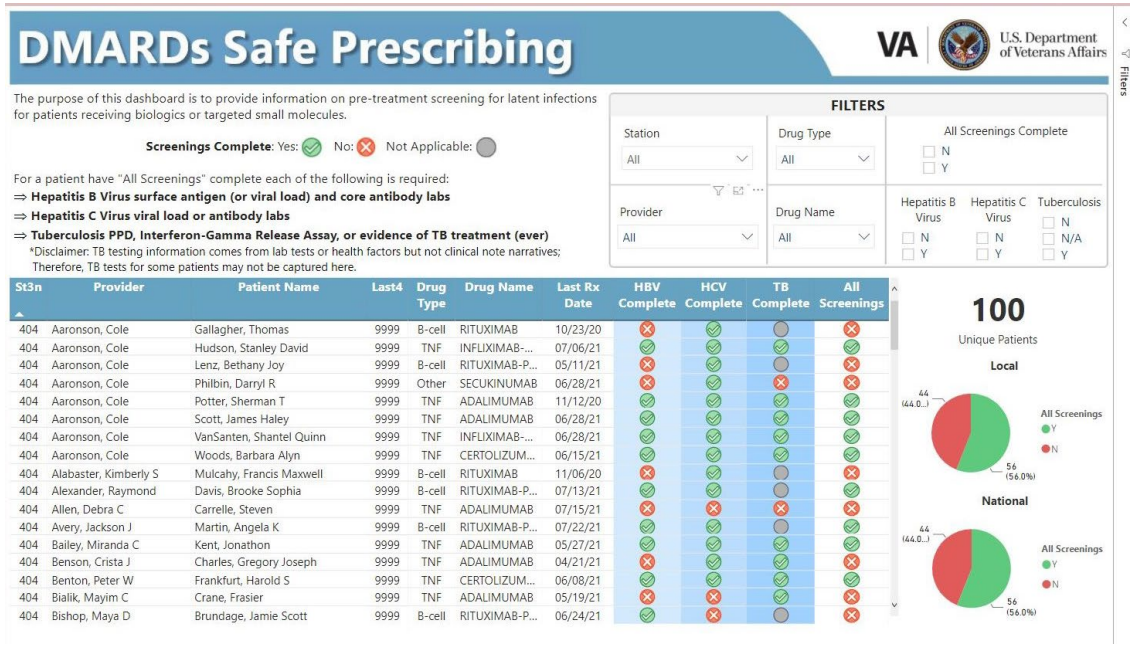
HCQ Dashboard Pilot study

- 6 pilot sites: San Francisco, Palo Alto, Portland, Puget Sound, Albuquerque, Charleston
- Intervention:
  - Access to dashboard
  - Monthly learning collaborative meetings
  - Quarterly site-specific run charts



Summary

- "Audit and feedback" using EHR-based dashboards is one solution to the problem of population health management of medication safety issues
- After data validation is complete, PowerBI dashboards are fast and easy to build and adapt for additional use cases



Acknowledgments

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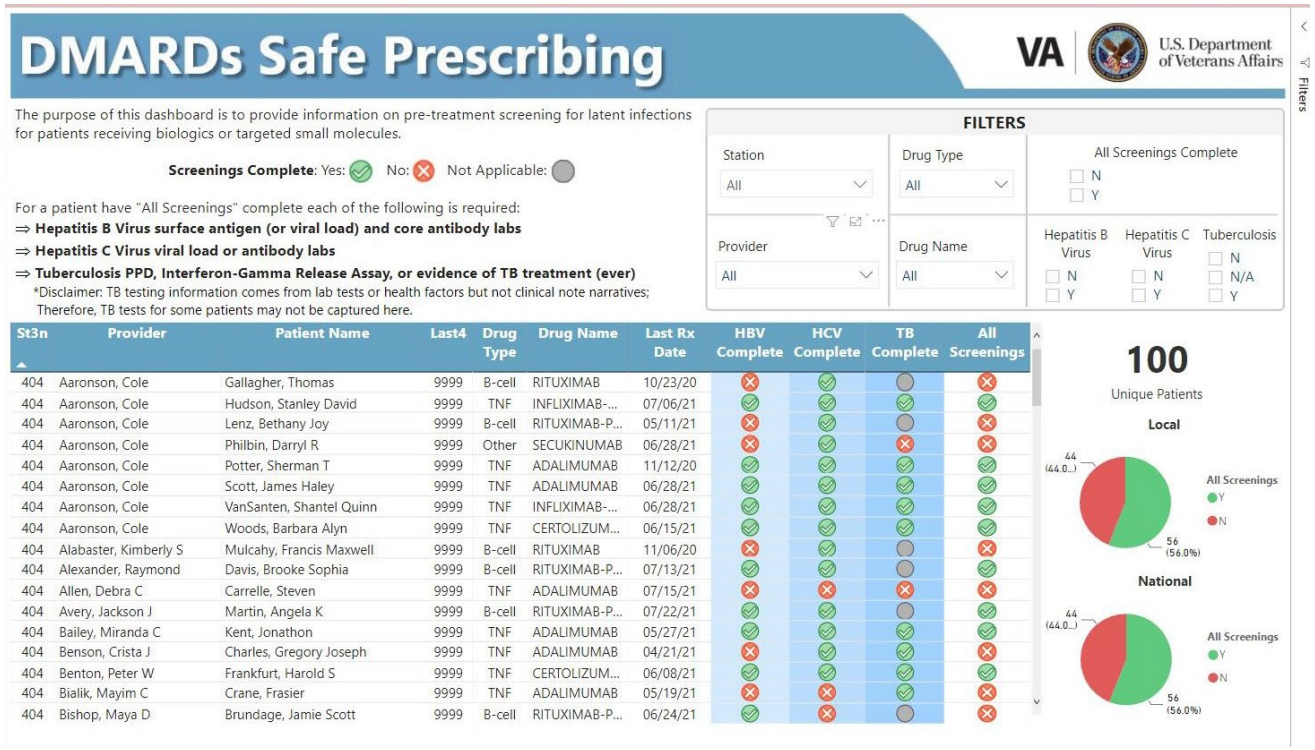
VA Viral Hepatitis and Liver Disease Program

VA Advanced Liver Disease Group

VA Rheumatology Quality and Safety Working Group



St3n	Provider	Patient Name	Last4	Drug Type	Drug Name	Last Rx Date	HBV Complete	HCV Complete	TB Complete	All Screenings
404	Aaronson, Cole	Gallagher, Thomas	9999	B-cell	RITUXIMAB	10/23/20	✗	✓	○	✗
404	Aaronson, Cole	Hudson, Stanley David	9999	TNF	INFLIXIMAB-...	07/06/21	✓	✓	✓	✓
404	Aaronson, Cole	Lenz, Bethany Joy	9999	B-cell	RITUXIMAB-P...	05/11/21	✗	✓	○	✗
404	Aaronson, Cole	Philbin, Darryl R	9999	Other	SECUKINUMAB	06/28/21	✗	✓	✗	✗
404	Aaronson, Cole	Potter, Sherman T	9999	TNF	ADALIMUMAB	11/12/20	✓	✓	✓	✓
404	Aaronson, Cole	Scott, James Haley	9999	TNF	ADALIMUMAB	06/28/21	✓	✓	✓	✓
404	Aaronson, Cole	VanSanten, Shantel Quinn	9999	TNF	INFLIXIMAB-...	06/28/21	✓	✓	✓	✓
404	Aaronson, Cole	Woods, Barbara Alyn	9999	TNF	CERTOLIZUM...	06/15/21	✓	✓	✓	✓
404	Alabaster, Kimberly S	Mulcahy, Francis Maxwell	9999	B-cell	RITUXIMAB	11/06/20	✗	✓	○	✗
404	Alexander, Raymond	Davis, Brooke Sophia	9999	B-cell	RITUXIMAB-P...	07/13/21	✓	✓	○	✓
404	Allen, Debra C	Carrelle, Steven	9999	TNF	ADALIMUMAB	07/15/21	✗	✗	✗	✗
404	Avery, Jackson J	Martin, Angela K	9999	B-cell	RITUXIMAB-P...	07/22/21	✓	✓	○	✓
404	Bailey, Miranda C	Kent, Jonathon	9999	TNF	ADALIMUMAB	05/27/21	✓	✓	✓	✓
404	Benson, Crista J	Charles, Gregory Joseph	9999	TNF	ADALIMUMAB	04/21/21	✗	✓	✓	✗
404	Benton, Peter W	Frankfurt, Harold S	9999	TNF	CERTOLIZUM...	06/08/21	✓	✓	✓	✓
404	Bialik, Mayim C	Crane, Frasier	9999	TNF	ADALIMUMAB	05/19/21	✗	✗	✓	✗
404	Bishop, Maya D	Brundage, Jamie Scott	9999	B-cell	RITUXIMAB-P...	06/24/21	✓	✗	○	✗

Using Power BI Colonoscopy Quality Dashboards to Reduce Colon Cancer

Tonya Kaltenbach, MD, MS

Colon Cancer VA

- Colorectal cancer (CRC) prevention is a top VA priority.
- CRC is commonly diagnosed in Veterans with a 35% 3-year mortality rate.
- In the VA, >200,000 colonoscopies are performed each year, 50-60% of which are for screening.

Colonoscopy Video

Endoscopist's Adenoma Detection Rate (ADR) is a Strong Predictor of Colorectal Cancer (CRC)

Table 2. Adenoma Detection Rate and Risk of an Interval Colorectal Cancer among All Patients.

Adenoma Detection Rate	Interval Cancer	Hazard Ratio (95% CI)*	Unadjusted Risk
	no. of cases		*no. of cases/ 10,000 person-yr*
Continuous rate	712	0.97 (0.96–0.98)	7.7
Rate quintile			
Quintile 1: 7.35–19.05%	186	1.00 (reference)	9.8
Quintile 2: 19.06–23.85%	144	0.93 (0.70–1.23)	8.6
Quintile 3: 23.86–28.40%	139	0.85 (0.68–1.06)	8.0
Quintile 4: 28.41–33.50%	167	0.70 (0.54–0.91)	7.0
Quintile 5: 33.51–52.51%	76	0.52 (0.39–0.69)	4.8

- Each 1% increase in ADR:
  - 3% decrease in interval CRC risk (HR, 0.97, 95%CI: 0.96-0.98)
  - 5% decrease in CRC death risk
- No threshold effect above which increases in ADR were without benefit

Corley DA, Jensen C, Marks A, et al. Adenoma Detection Rate and Risk of Colorectal Cancer and Death. N Engl J Med 2014;370:1298-306.

Gastroenterology 2017;153:307–323

CONSENSUS GUIDELINE

Colorectal Cancer Screening: Recommendations for Physicians and Patients From the U.S. Multi-Society Task Force on Colorectal Cancer

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This document updates the colorectal cancer (CRC) screening recommendations of the U.S. Multi-Society Task Force of Colorectal Cancer (MSTF), which represents the American College of Gastroenterology, the American Gastroenterological Association, and The American Society for Gastrointestinal Endoscopy. CRC screening tests are ranked in 3 tiers based on performance features, costs, and practical considerations. The first-tier tests are colonoscopy every 10 years and annual fecal immunochemical test (FIT). Colonoscopy and FIT are recommended as the cornerstones of screening regardless of how screening is offered. Thus, in a sequential approach based on colonoscopy offered first, FIT should be offered to patients who decline colonoscopy. Colonoscopy and FIT are recommended as tests of choice when multiple options are presented as alternatives. A risk-stratified approach is also appropriate, with FIT screening in populations with an estimated low prevalence of advanced neoplasia and colonoscopy screening in high prevalence populations. The second-tier tests include CT colonography every 5 years, the FIT–fecal DNA test every 3 years, and flexible sigmoidoscopy every 5 to 10 years. These tests are appropriate screening tests, but each has disadvantages relative to the tier 1 tests. Because of limited evidence and current obstacles to use, capsule colonoscopy every 5 years is a third-tier test. We suggest that the Septin9 serum assay (Epigenomics, Seattle, Wash) not be used for screening. Screening should begin at age 50 years in average-risk persons, except in African Americans in whom limited evidence supports screening at 45 years. CRC incidence is rising in persons under age 50, and thorough diagnostic evaluation of young persons with suspected colorectal bleeding is recommended. Discontinuation of screening should be considered when persons up to date with screening, who have prior negative screening (particularly colonoscopy), reach age 75 or have <10 years of life expectancy. Persons without prior screening should be considered for screening up to age 85, depending on age and comorbidities. Persons with a family history of CRC or a documented advanced adenoma in a first-degree relative age <60 years or 2 first-degree relatives with these findings at any age are recommended to undergo screening by colonoscopy every 5 years, beginning 10 years before the age at diagnosis of the youngest affected relative or age 40, whichever is earlier. Persons with a single first-degree relative diagnosed at ≥60 years with CRC or an advanced adenoma can be offered average-risk screening options beginning at age 40 years.

Colorectal cancer (CRC) screening is the process of detecting early-stage CRCs and precancerous lesions in asymptomatic people with no prior history of cancer or precancerous lesions. The U.S. Multi-Society Task Force of Colorectal Cancer (MSTF) is a panel of expert gastroenterologists representing the American College of Gastroenterology, the American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy. The MSTF, like others, has long endorsed systematic offers of CRC screening to average-risk persons (persons without a high-risk family history of colorectal neoplasia) beginning at age 50 years, with general evidence supporting screening reviewed in previous publications.[1] This publication updates the screening recommendations of the MSTF for screening in average-risk persons.[1]

Screening differs from surveillance. Surveillance refers to the interval use of colonoscopy in patients with previously detected CRC or precancerous lesions and interval colonoscopy in patients performed to detect dysplasia in persons with inflammatory bowel disease affecting the colon. Surveillance recommendations from the MSTF on surveillance after cancer[1] and removal of precancerous lesions[1] are available in other documents. Screening is also distinct

Abbreviations used in this paper: CRC, colorectal cancer; FIT, fecal immunochemical test; MSTF, U.S. Multi-Society Task Force on Colorectal Cancer; SSP, sessile serrated polyp.

Most current article

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http://dx.doi.org/xx.xxxx/j.gastro.xxxx.xx.xxx

CONSENSUS GUIDELINE

Recommendations

1. We recommend colonoscopy every 10 years or annual FIT as first-tier options for screening the average-risk persons for colorectal neoplasia (strong recommendation; moderate-quality evidence).
2. We recommend that physicians performing screening colonoscopy measure quality, including the adenoma detection rate (strong recommendation, high-quality evidence).
3. We recommend that physicians performing FIT monitor quality (strong recommendation, low-quality evidence). The recommended quality measurements for FIT programs are detailed in a prior publication.[86]
4. We recommend CT colonography every 5 years or FIT–fecal DNA every 3 years (strong recommendation, low-quality evidence) or flexible sigmoidoscopy every 5 to 10 years (strong recommendation, high-quality evidence) in patients who refuse colonoscopy and FIT.
5. We suggest that capsule colonoscopy (if available) is an appropriate screening test when patients decline colonoscopy, FIT, FIT–fecal DNA, CT colonography, and flexible sigmoidoscopy (weak recommendation, low-quality evidence).
6. We suggest against Septin9 for CRC screening (weak recommendation, low-quality evidence).

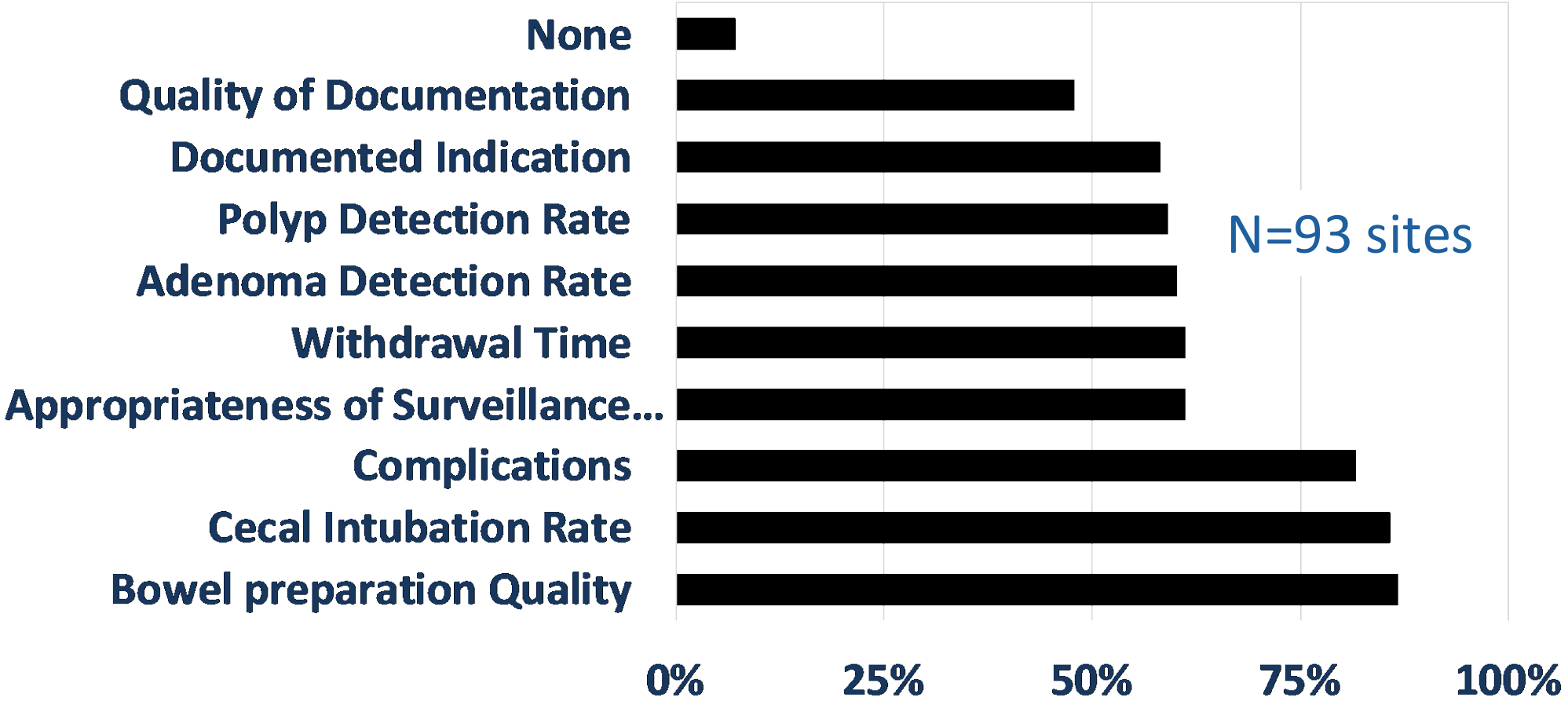
Problem: Challenge to Measure & Report Colonoscopy Quality Metrics

No reliable, efficient way of tracking procedure & pathology results to measure colonoscopy quality for the national Veteran population.

- No standardized documentation of colonoscopies, including note titles.
- No uniformity of endoscopic report-generating applications (i.e. Endopro, Provation, etc).
- None of the current endoscopy reporting programs link to pathology (to determine ADR).

Gawron A, Lawrence P, Millar M, Dominitz J, Whooley M and Kaltenbach T. A Nationwide Survey and Needs Assessment of Colonoscopy Quality Assurance Programs in the VA. Fed Practitioner, 2018.

Gap: Quality Reporting across VA is Variable



Gawron A, Lawrence P, Millar M, Dominitz J, Whooley M and Kaltenbach T. A Nationwide Survey and Needs Assessment of Colonoscopy Quality Assurance Programs in the VA. Fed Practitioner, 2018.

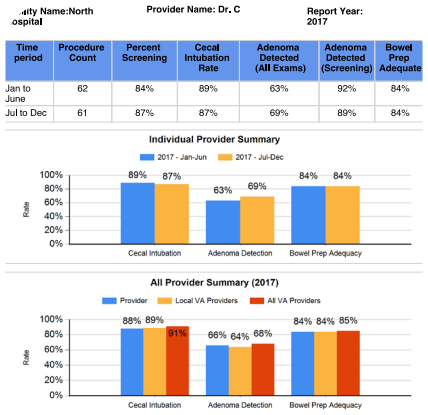
QUERI Infrastructure

Note Selection

- Colonoscopy & Pathology Notes
- Demographic info

Natural Language Processing

- Indication
- Bowel Prep Quality
- Extent of Exam
- Adenoma Detection



Provider Name: Dr. C

Report Year: 2017

Time period	Procedure Count	Percent Screening	Cecal Intubation Rate	Adenoma Detected (All Exams)	Adenoma Detected (Screening)	Bowel Prep Adequate
Jan to June	62	84%	89%	63%	92%	84%
Jul to Dec	61	87%	87%	69%	89%	84%

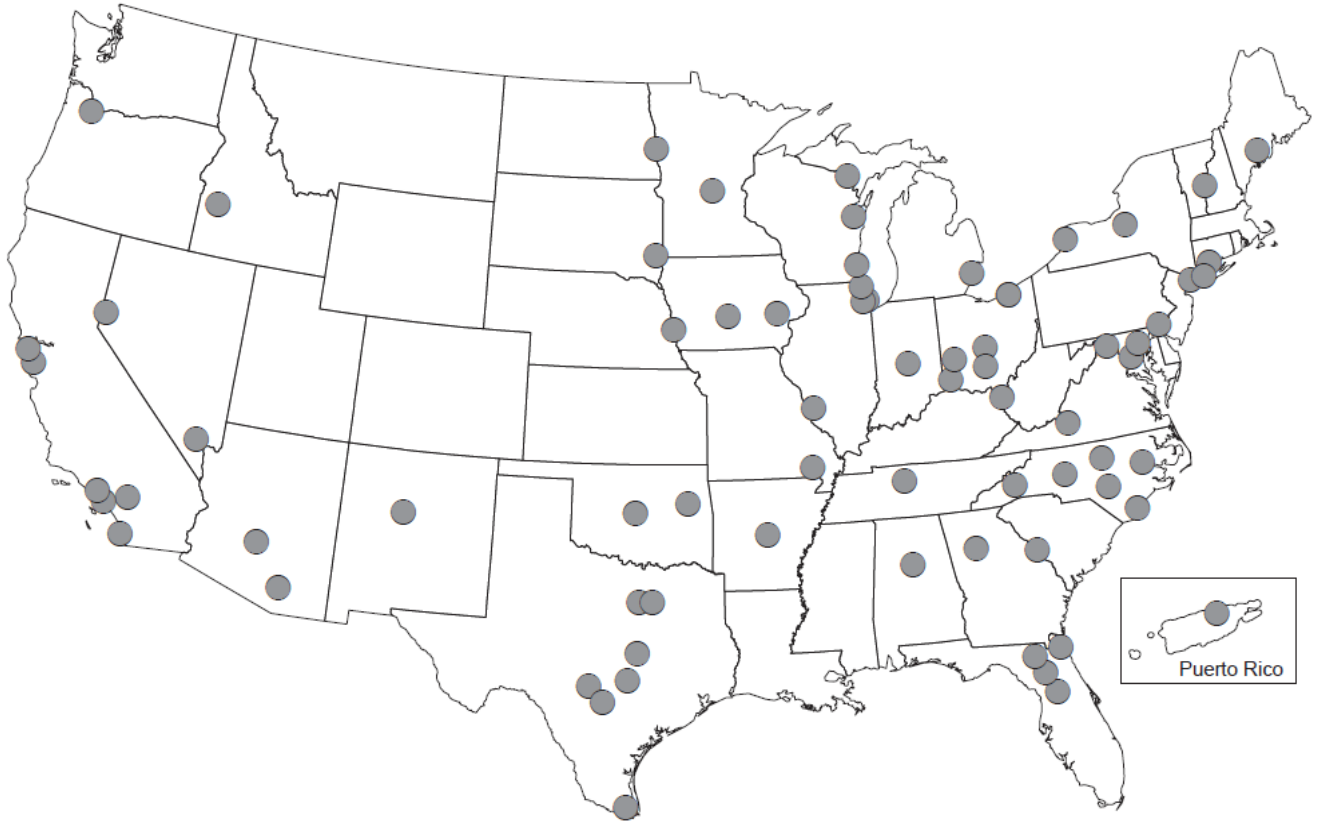
Quality Reporting

- Provider Dashboard
- Benchmarking

VA-Endoscopy Quality Improvement Program (VA-EQuIP)

75 sites, 535 Endoscopy providers
145,098 colonoscopy procedures

National Metrics (2019):
Cecal Intubation rate = 91%
Bowel Prep "Adequate" rate = 85%
Adenoma Detection Rate = 47%



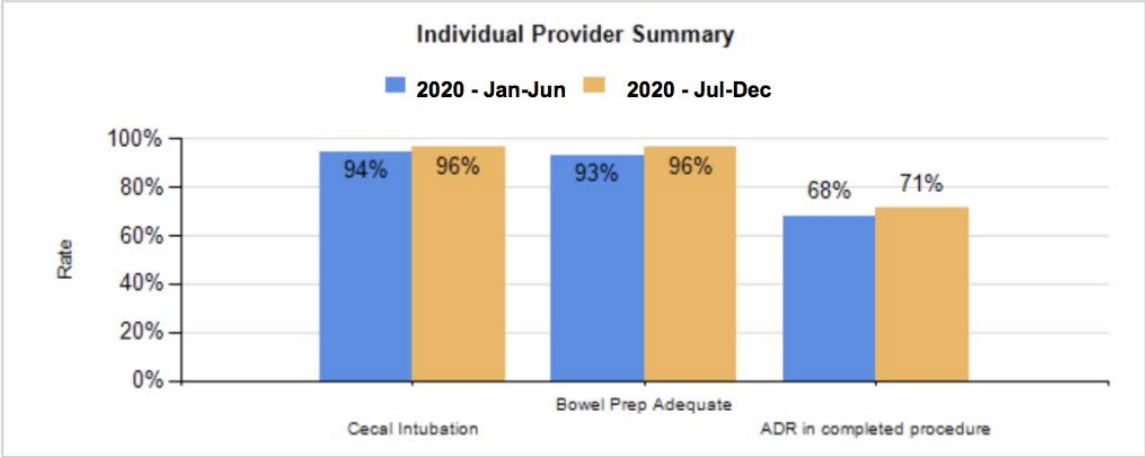
Colonoscopy Quality Dashboard - Sharepoint

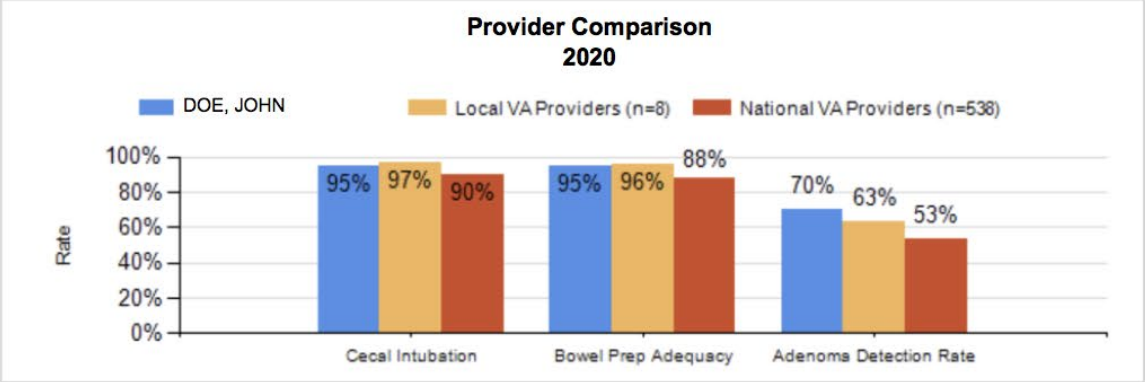
Facility Name: 002 **Provider Name: DOE, JOHN** **Report Year: 2020**

All Procedures

(Screening Procedures in the second page)

Time period	Procedure Count	Cecal Intubation Rate	Bowel Prep Adequate Rate	⊞ Adenoma Detected (Completed Procedures[1], 95% CI)
Jan to June 2020	138	94%	93%	68% (59% ,76%)
July to Dec 2020	122	96%	96%	71% (62% ,79%)





Use of Power BI Dashboard to Improve Colonoscopy Quality Reporting

- Assess colonoscopy volume
- Assess availability of data
- Provide overview and granular
- Integrate national, facility & provider benchmarks
- Dynamic data input

Power BI Video of Post COVID Colonoscopy Volume

Filter by Year

2019

Colonoscopy Quality Report Card by Facility

Station Name:

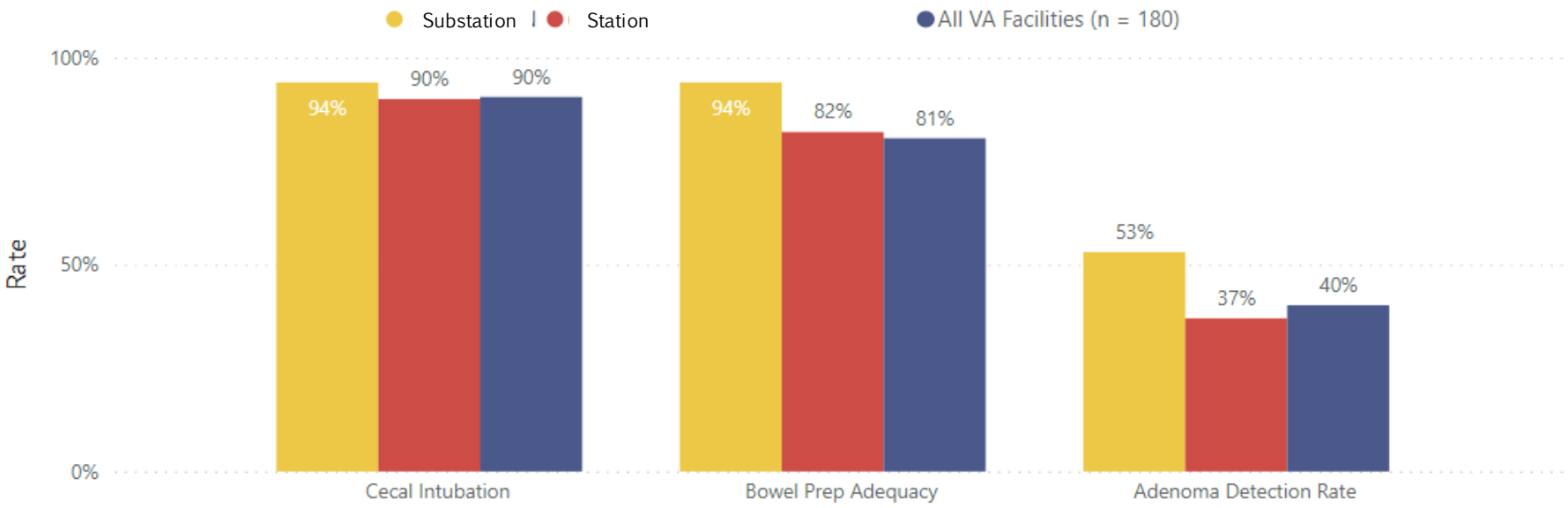
Filter by Station and Facility

- (402) Togus ME
- (405) White River Junction VT
- (436) Montana HCS (Fort Harrison MT)
- (437) Fargo, ND
- (438) Sioux Falls SD
- (442) Cheyenne WY
- (459) VA Pacific Islands HCS (Honolulu HI)
- (460) Wilmington DE
- (501) New Mexico HCS (Albuquerque NM)
- (502) Alexandria, LA
- (503) Altoona, PA
- (504) Amarillo HCS (Amarillo TX)
- (506) Ann Arbor, MI
- (508) Atlanta, GA
- (509) Augusta, GA
- (512) Maryland HCS (Baltimore MD)
- (515) Battle Creek, MI
- (516) Bay Pines,FL
- (517) Beckley, WV
- (520) Biloxi, MS
- (521) Birmingham, AL
- (523) Boston HCS (Boston)
- (526) Bronx, NY
- (528) Upstate New York HCS
- (531) Boise,ID
- (534) Charleston, SC
- (537) Chicago (Westside), IL
- (538) Chillicothe, OH

All Procedures

Facility	Year	Colonoscopy volume	Cecal Intubation Rate	% Bowel Prep Adequate	Adenoma Detection Rate and CI (completed procedures)
Substation	2019	1,360	94%	94%	53% [50%, 56%]
Station	2019	2,710	90%	82%	37% [35%, 39%]

Facility Comparison
Calendar Year: 2019



Filter by Year

2019 | 2020

Filter by Station

All

Average Global ADR

48.51%

Providers Under 25% ADR

6.44%

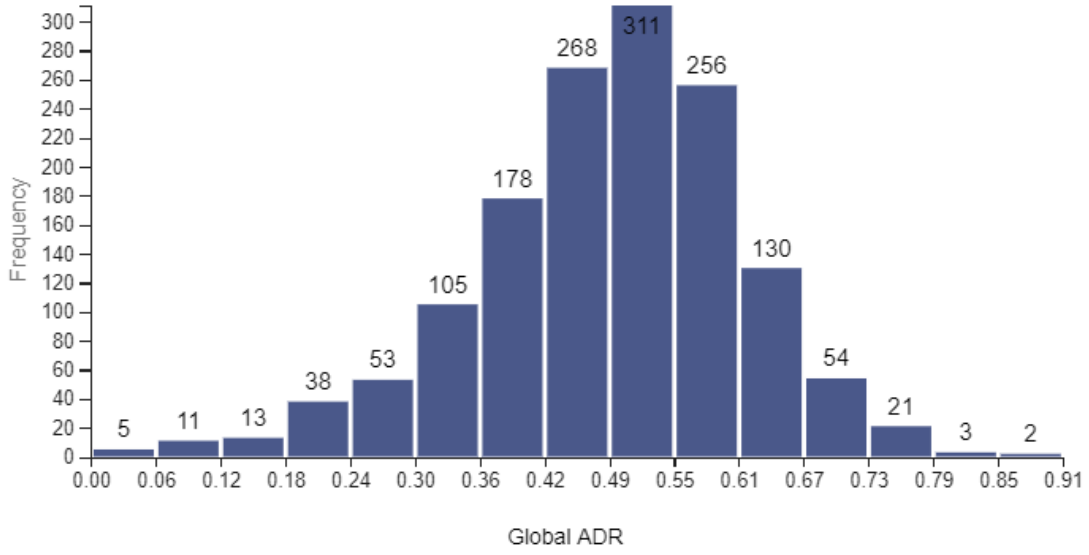
Number of Sites Under 25% ADR

23

Top 10 Sites

Average of Global ADR	Facility
69.48%	(618) Minneapolis, MN
61.96%	(663) Puget Sound HCS (Seattle WA)
61.77%	(662) San Francisco, CA
61.76%	(740) Texas Valley Coastal Bend HCS (Harlingen, TX)
61.06%	(658) Salem, VA
60.46%	(570) Central California HCS (Fresno CA)
60.31%	(644) Phoenix, AZ
59.57%	(558) Durham, NC
57.77%	(689) Connecticut HCS (Westhaven)
57.74%	(635) Oklahoma City, OK

Histogram of Global ADR

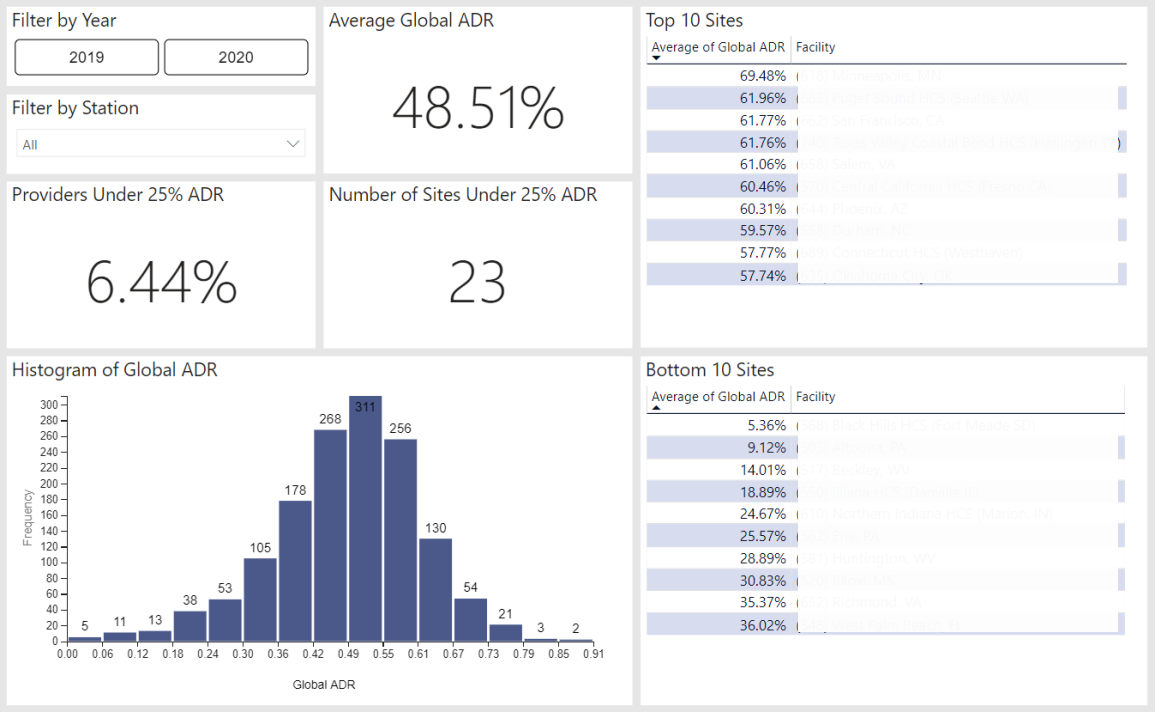


Bottom 10 Sites

Average of Global ADR	Facility
5.36%	(568) Black Hills HCS (Fort Meade SD)
9.12%	(503) Altoona, PA
14.01%	(517) Beckley, WV
18.89%	(550) Illiana HCS (Danville IL)
24.67%	(610) Northern Indiana HCS (Marion, IN)
25.57%	(562) Erie, PA
28.89%	(581) Huntington, WV
30.83%	(520) Biloxi, MS
35.37%	(652) Richmond, VA
36.02%	(548) West Palm Beach, FL

Summary

- Facility and provider use of EHR-based colonoscopy quality dashboards may narrow the quality gap in colonoscopy performance to reduce colorectal cancer incidence & mortality.
- Power BI dashboards are a robust and dynamic colonoscopy quality audit and feedback tool.



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Thank you!

Questions?

Additional Resources

Power BI app	URL
DMARD demo app	https://app.powerbigov.us/groups/me/apps/1648a824-6eca-4a9f-989e-fbdcecaeb464
DMARD app (requires permissions)	https://app.powerbigov.us/groups/me/apps/a630b4f3-956d-4e80-8dbb-b5d93af75904
NCDSP app (requires permissions)	https://app.powerbigov.us/groups/me/apps/7331b49d-942c-46a6-95ba-10265f0a2826
VSSC Access app	https://app.powerbigov.us/groups/me/apps/057a6693-7190-4fd4-9491-f8a038913689

DMARD = Disease-Modifying Anti-Rheumatic Drug
NCDSP = National Cardiovascular Device Surveillance Program
VSSC = VA Support Services Center

How to Learn More About Microsoft Power BI

VA Power BI Launch	https://app.powerbigov.us/home
VA Power BI Home	https://dvagov.sharepoint.com/sites/OITBISL/PowerBI/SitePages/PowerBIHome.aspx
VA Power BI Resources	https://dvagov.sharepoint.com/sites/OITBISL/PowerBI/SitePages/LEAF-Requests.aspx
BISL Training	https://dvagov.sharepoint.com/sites/OITBISL/PowerBI/SitePages/Power-BI-Training.aspx
How-To Guides	https://dvagov.sharepoint.com/sites/OITBISL/PowerBI/SitePages/How-To-Guides.aspx
Install Power BI Desktop	https://dvagov.sharepoint.com/sites/OITBISL/PowerBI/SitePages/PowerBI-Desktop.aspx
Microsoft training	https://docs.microsoft.com/en-us/power-bi/guided-learning/
Microsoft reference text	https://www.microsoftpressstore.com/store/introducing-power-bi-9781509302284#downloads
VA Data Access - Lookup	https://vaww.nds.va.gov/NdsCdwSharePoint/customersWorkgroups.aspx
VA Data Access - Request	http://vaww.vhadataportal.med.va.gov/DataAccess/DataAccessOverview.aspx

VIReC Options for Specific Questions

HSRData Listserv

- Community knowledge sharing
- ~1,400 VA data users
- Researchers, operations, data stewards, managers

– Subscribe by visiting https://vaww.virec.research.va.gov/Support/HSRData-L.htm (VA Intranet)

HelpDesk

- Individualized support

virec@va.gov

Quick links for VA data resources

Quick Guide: Resources for Using VA Data:
http://vaww.virec.research.va.gov/Toolkit/QG-Resources-for-Using-VA-Data.pdf (VA Intranet)

VIReC: http://vaww.virec.research.va.gov/Index.htm (VA Intranet)

Archived cyberseminar: *Meet VIReC: The Researcher's Guide to VA Data*
https://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/video_archive.cfm?SessionID=3916&Seriesid=22

VIReC Cyberseminars (overview of series and link to archive):
http://www.virec.research.va.gov/Resources/Cyberseminars.asp

VHA Data Portal (data source and access information):
http://vaww.vhadataportal.med.va.gov/Home.aspx (VA Intranet)

Quality Enhancement Research Initiative (QUERI): https://www.queri.research.va.gov

QUERI Implementation Network Archived Cyberseminars:
_https://www.hsrd.research.va.gov/cyberseminars/catalog-archive.cfm?SeriesSortParam=y&SeriesIDz=83

Implementation Research Group (IRG) Archived Cyberseminars:
https://www.gotostage.com/channel/implementresearchgrpchristinekowalski

Center for Evaluation and Implementation Resources (CEIR): https://www.queri.research.va.gov/ceir/default.cfm

Using Data & Information Systems in Partnered Research Cyberseminar Series

Next session:

October 19th at 12 pm Eastern

Measuring Transformation in Healthcare: Findings and Lessons Learned from the Whole Health Implementation Study