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Securing Med Use Analytics and Surveillance in the Cloud

Session 171, March 7, 2018

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U.S. Department
of Veterans Affairs

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Faculty Biography

Dr. Schaefer, Pharm.D. is the Clinical Informatics Pharmacist at the Kansas City VAMC and is a member of many national and regional informatics and clinical committees and advisory boards. He is AMIA VA Health Informatics 10x10 certified, a current member of the Federal Pharmacy Executive Steering Committee Informatics Subcommittee and is involved with developing and implementing many local and national innovations projects.

Conflict of Interest

Richard S. Schaefer, PharmD

Has no real or apparent conflicts of interest to report



U.S. Department
of Veterans Affairs

Agenda

- Cloud Computing and its service modalities
- Deployment models: Private vs. Public vs. Hybrid Cloud
- Patient data in the Cloud
- Example of Deploying to Cloud at KCVA

Learning objectives

1. Define the characteristics of all the Cloud Computing modalities available
2. Describe the cybersecurity measures put in place to keep patient data secured in the Cloud
3. Compare the benefits of Cloud Computing for enterprise clinical practice governance and standardization versus standard site implementation (On Premise)

Polling Question!

Which of these statements about Cloud computing is INCORRECT?

- a. Enables scalability
- b. Does not require an internet connection
- c. Provides data storage capability
- d. Cybersecurity is offered by Cloud providers

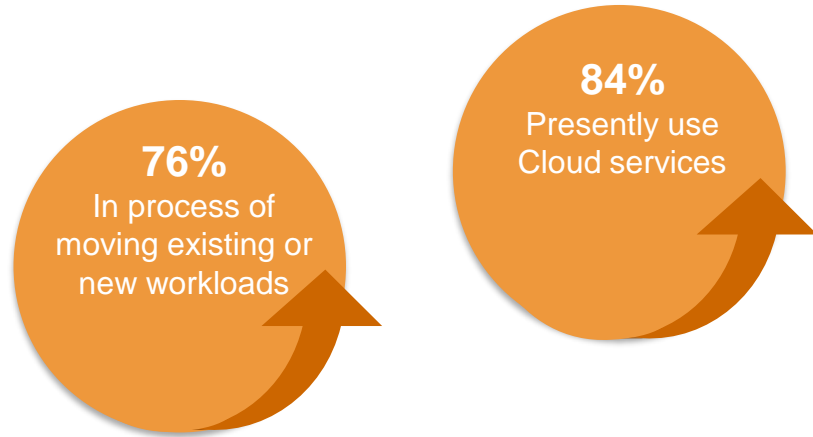
“the delivery of computing services—servers, storage, databases, networking, software, analytics, and more—over the Internet”⁽¹⁾

Advantages

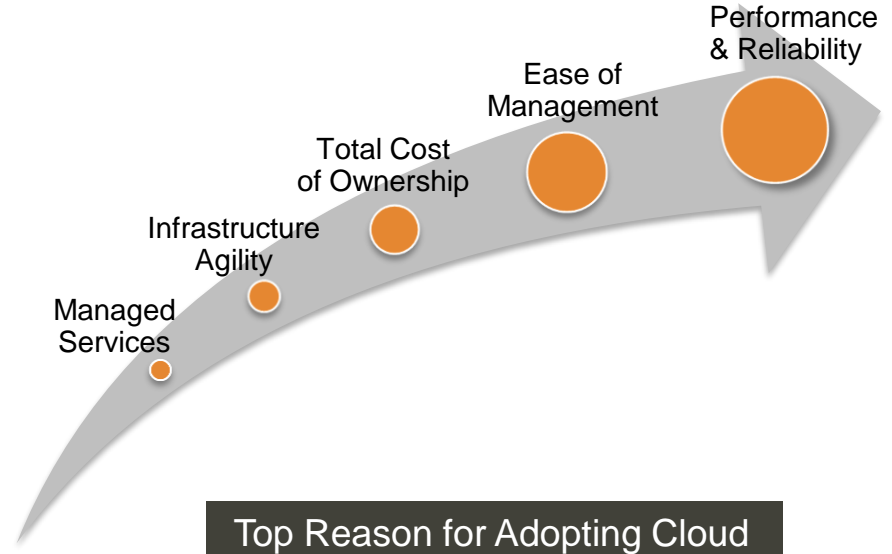
- High computing power
- More affordable cost of services
- Scalability

(1) <https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/> - Definition of Cloud Computing. Accessed on Nov 3th, 2017.

Cloud Adoption in Healthcare is Here

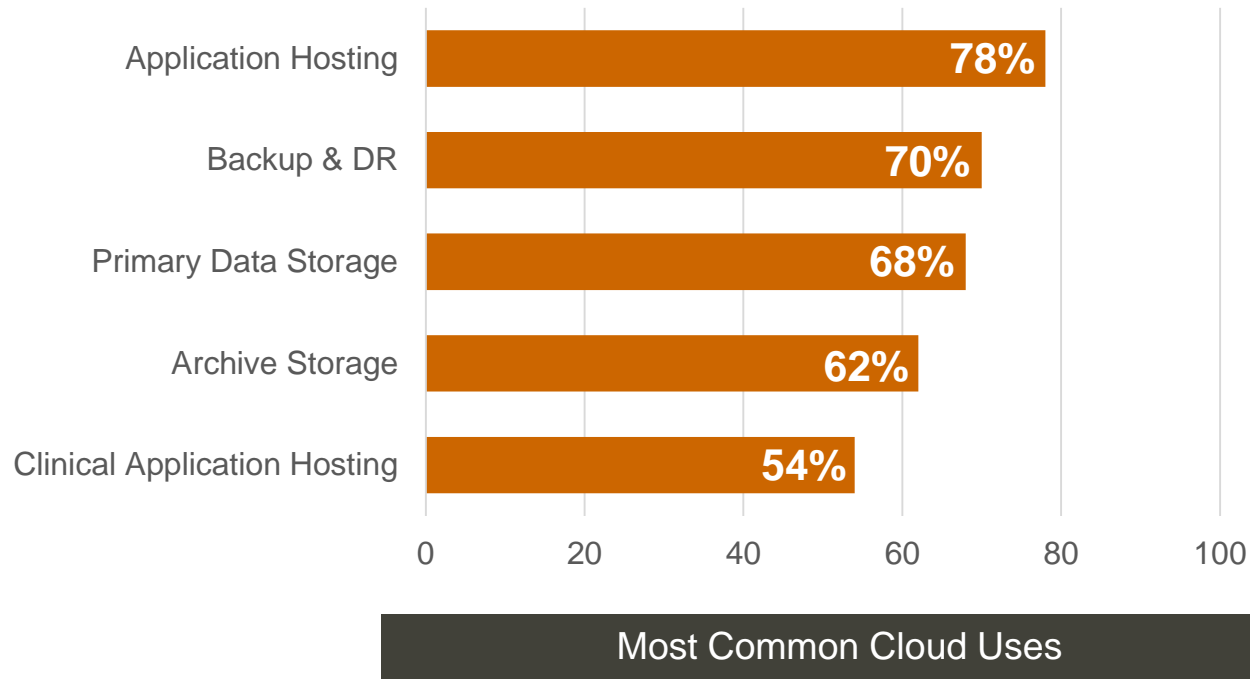


HIMSS Analytics 2016 Cloud Survey



Top Reason for Adopting Cloud

Cloud Adoption in Healthcare is Here

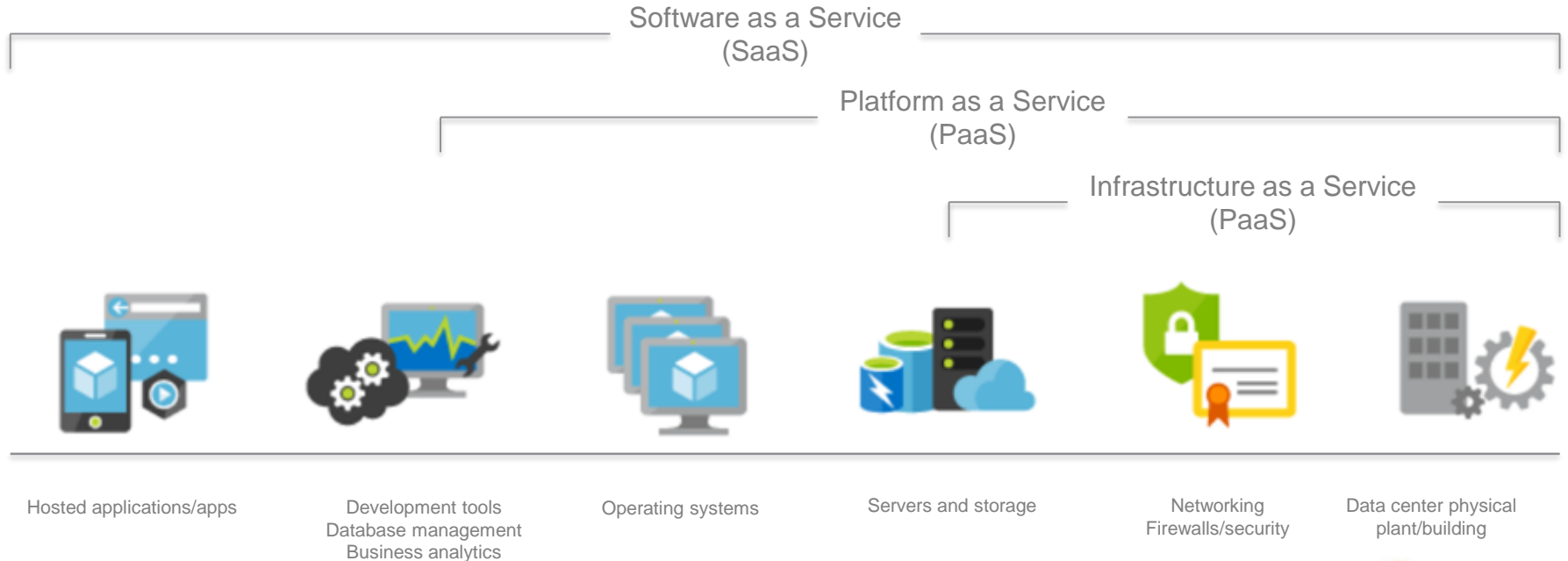


Polling Question!

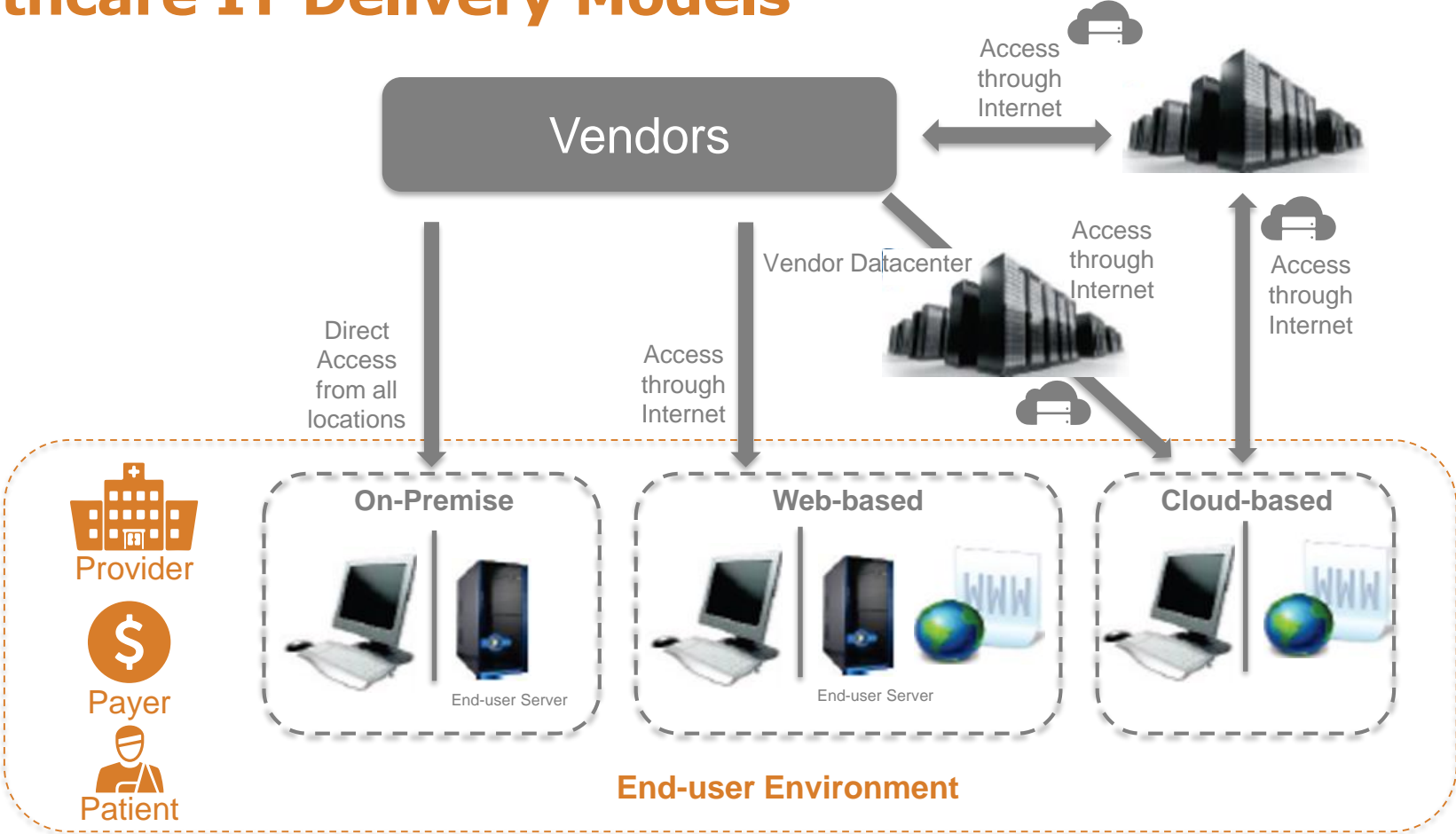
Which of the following is NOT a Cloud Computing modality?

- a. Infrastructure as a Service
- b. Software as a Service
- c. Platform as a Service
- d. System as a Service

Cloud computing service models



Healthcare IT Delivery Models



Private vs. Public vs. Hybrid Cloud

HYBRID CLOUD

The combination of Public and Private Cloud whereby specific resources (e.g. compute) are used in a Public Cloud while others (e.g. storage) are used in a Private Cloud

PUBLIC CLOUD

- Publicly shared virtualized resources (multi-tenant)
- Supports multiple customers
- Supports connectivity over the Internet

PRIVATE CLOUD

- Privately shared virtualized resources (single-tenant)
- Cluster of dedicated customers
- Connectivity over the internet, fiber and private network

True or False?

Cloud computing is not HIPAA compliant

False!

Patient data security in the Cloud

The [HIPAA Omnibus Rule states](#)* that patients' privacy is protected, regardless of where it is being stored.

HIPAA compliant Cloud solutions exist for Private and Public Clouds, from both Amazon and Microsoft



*<https://www.gpo.gov/fdsys/pkg/FR-2013-01-25/pdf/2013-01073.pdf>
Accessed on December 13th, 2017.

Patient data security at the VA



Cloud-first strategy: Seamless, global, secure, cost effective, and reliable



Federal Risk & Authorization Program (FedRAMP) approved, Defense Information Systems Agency (DISA) Impact Level 4, Trusted Internet Connection 2.0 (TIC2) compliant cloud environments (Azure, Amazon S3)
• VA Enterprise Services Cloud Broker (ESCB) program



Encryption of data at rest, encryption of data in transit



De-identified to reduce security risk to patients



Hybrid cloud solutions for *pharmacy surveillance software* and data analytics

• Move to MSFT Azure Government (MAG) cloud environment



Problem Statement at Kansas City VAMC

Despite several reports, studies and guidance documents released in the last 2 decades there continues to be a lack of integration between pharmacy dispensing technology, clinical surveillance, quality assurance reporting and smart IV pumps with the electronic medical records used by the healthcare system.

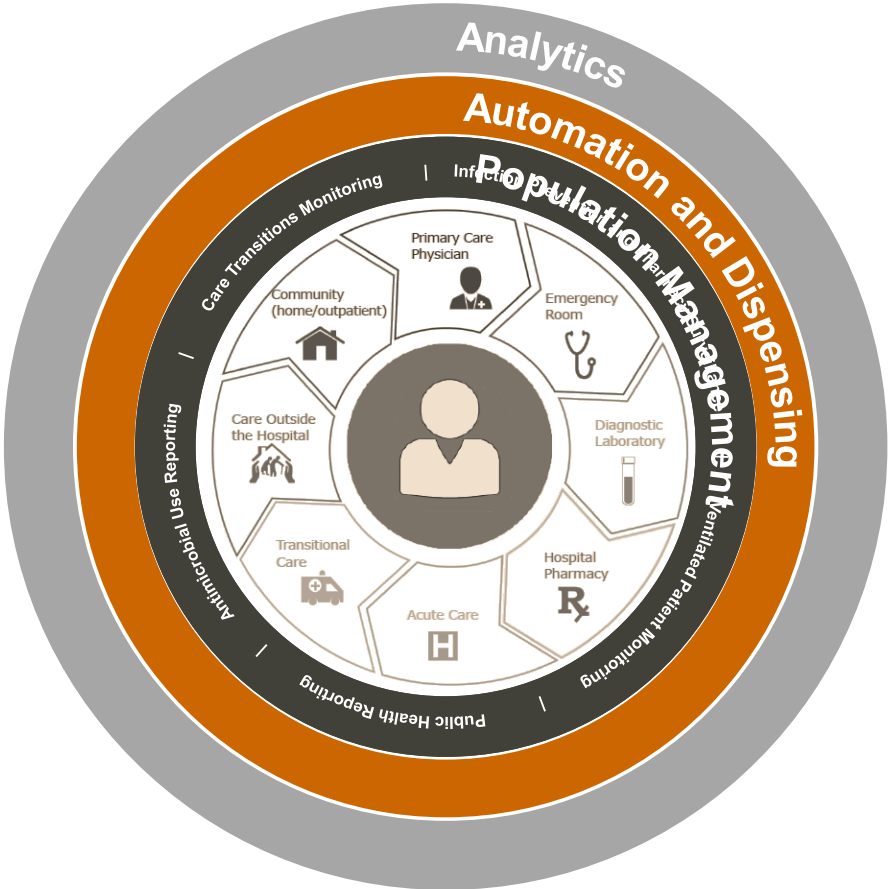
Now is the time to ACT!



Project Objective

- Drive Integrated Interoperability that Improves:
 - Clinical Workflow
 - Operational Efficiency
 - Patient Safety
 - Patient Outcomes
 - Reduced OI&T administrative and maintenance

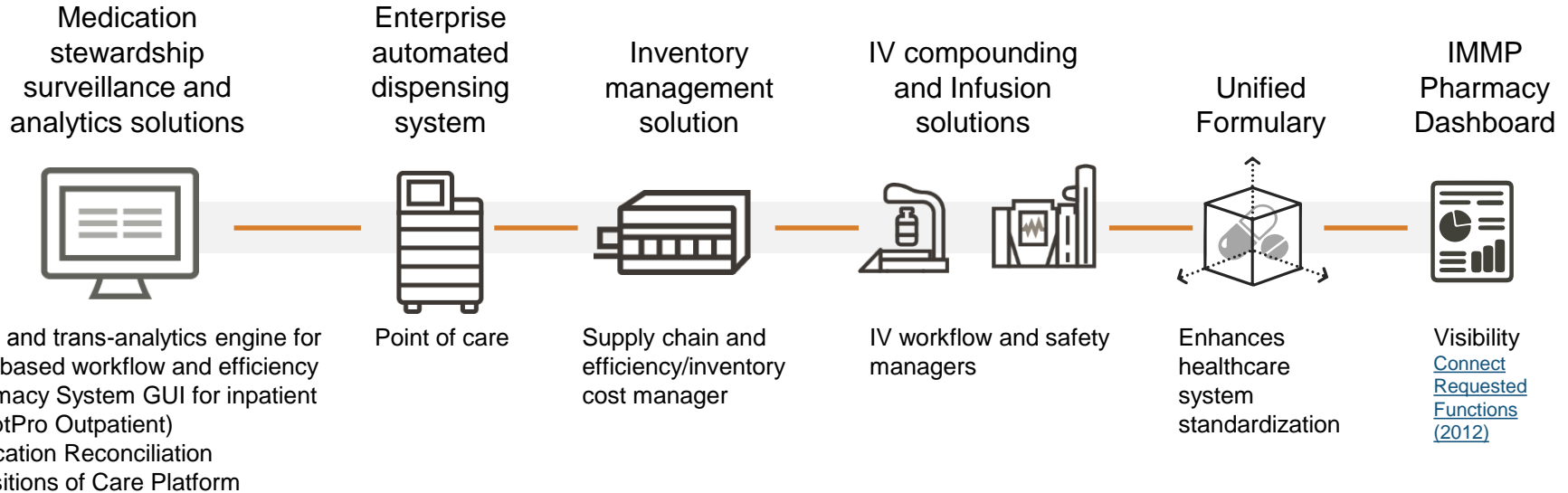
Framework



What happens now?

- Continued development and integration Medication Management and Disease State Monitoring Software, Data and Devices
 - Continual Medication Reconciliation including outside prescriptions
 - OSI, Antimicrobial, Metrics and etc real time monitoring and alerting
 - Set time based alerts, reports and notifications for defined follow up labs and procedures
- Standardizing and streamlining resources, SSOi authentication, hardware and software throughout the enterprise.

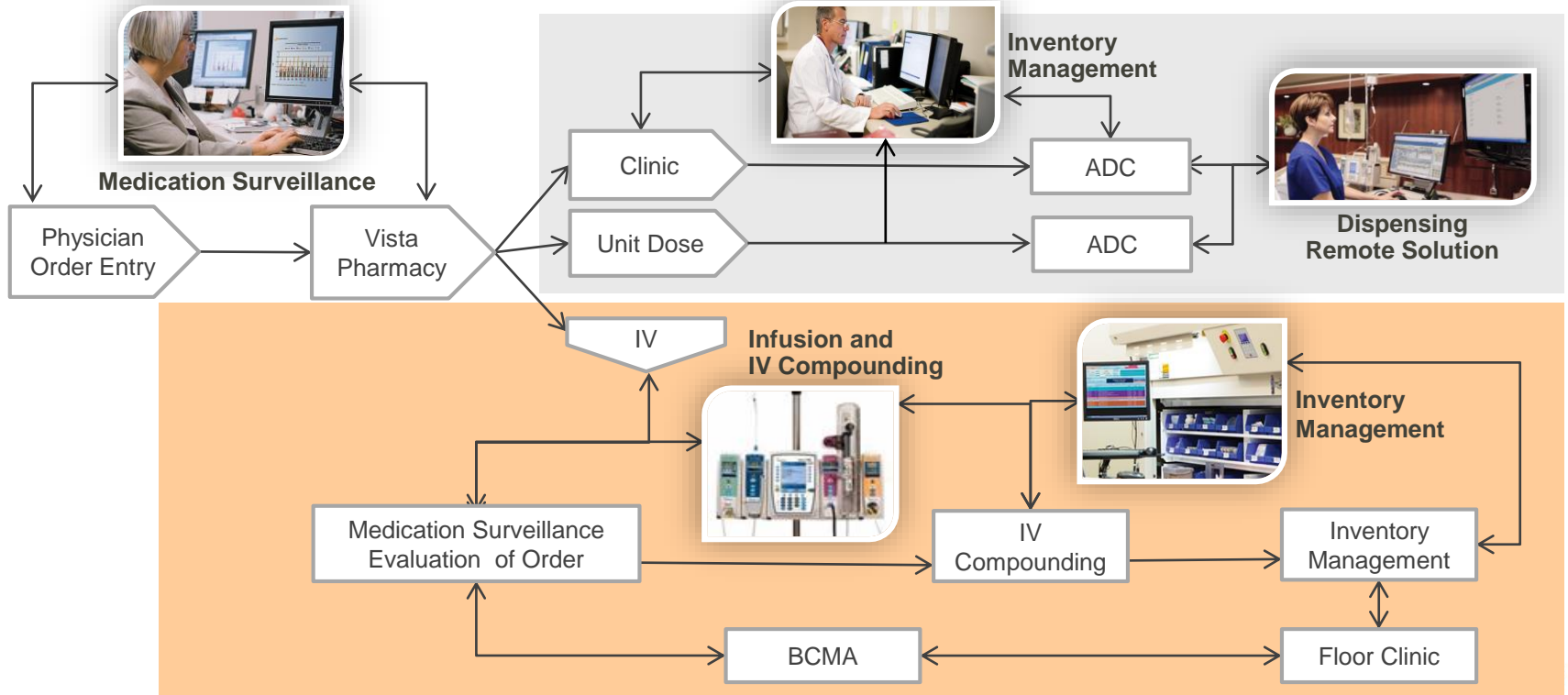
KCVA Integrated Medication Management Platform (IMMP): The time has come.



ENTERPRISE, ENTERPRISE, ENTERPRISE:

VHA FEDERAL MS AZURE and TRM! Bring up sites as iterations, not new systems

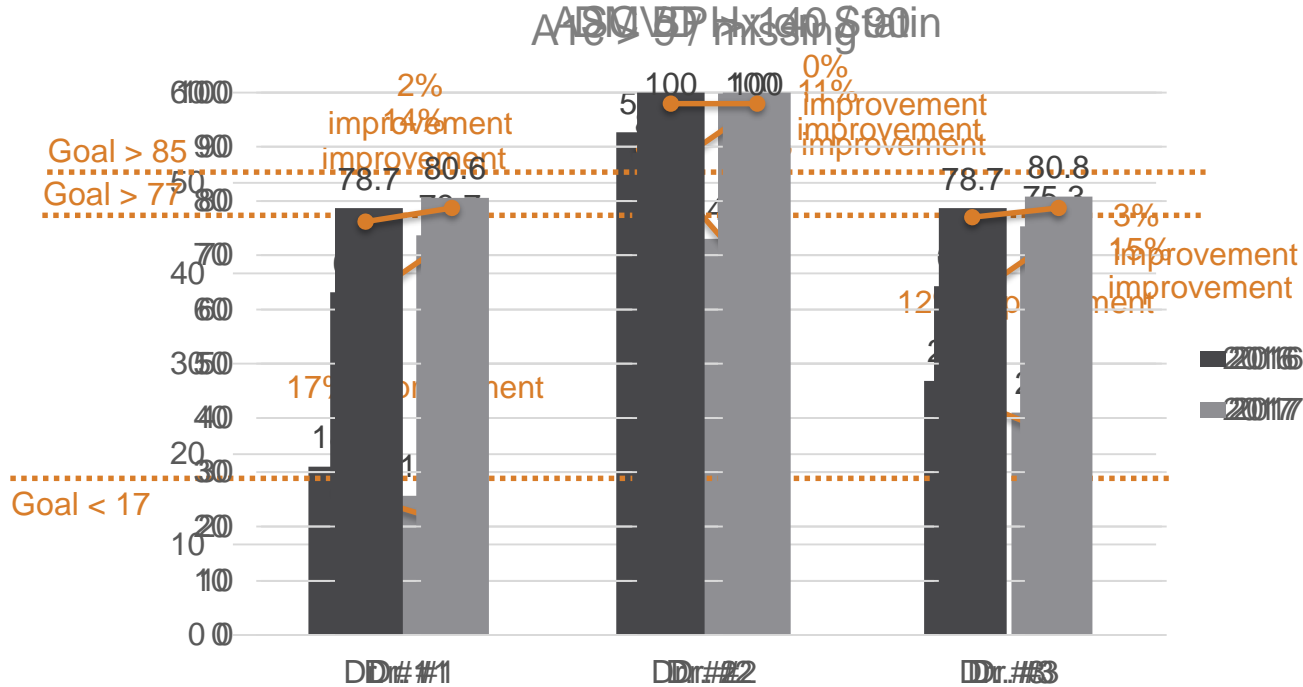
Lifecycle of a Medication Order



Why Now?

- Workflow is a key component population management and point of care must be integrated
- Multiple software - why is this good?
 - SSOi and CCOW allows seamless transitions
 - Enables vendors to focus on what “THEY DO BEST”
 - Leverage high quality, timely vendor support and requires only 2 RSS ISA/MOU’s that are already in place
- New enterprise opportunities with Cloud-based solution platforms
- Demonstrate value to ALL healthcare “teams” and “providers”

Population Management in PACT



Population Surveillance: Old vs New

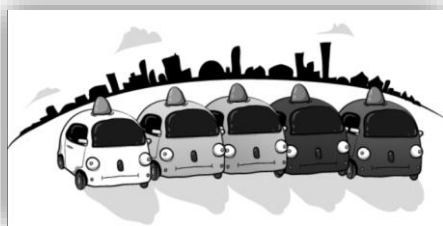
OLD



“Demolition Derby”

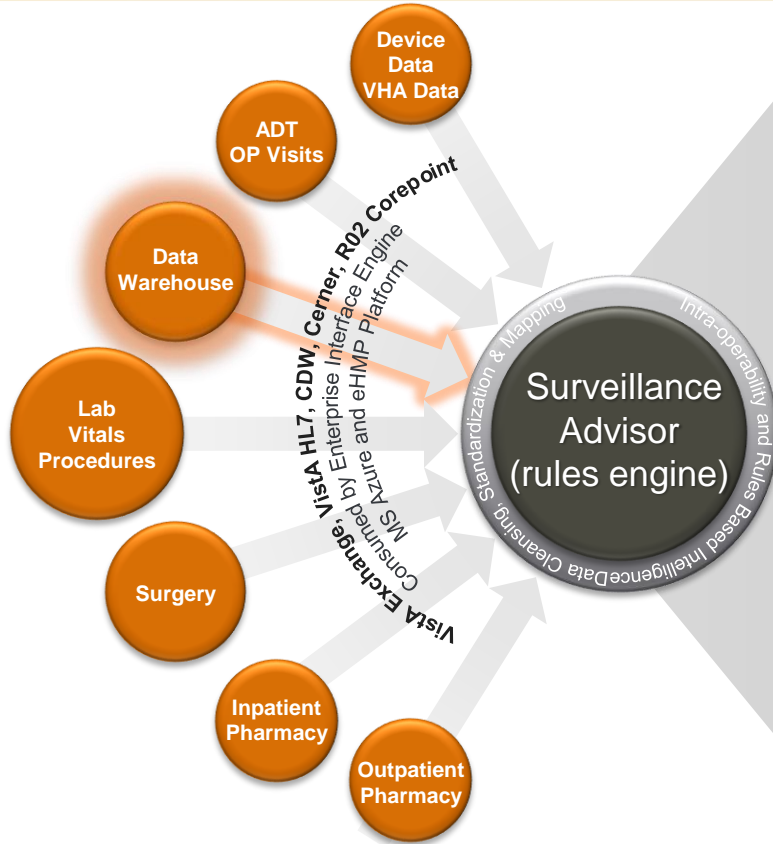


NEW



“Autonomous Driving”





Opioid Safety and Abx Stewardship

Inpatient Medication Management

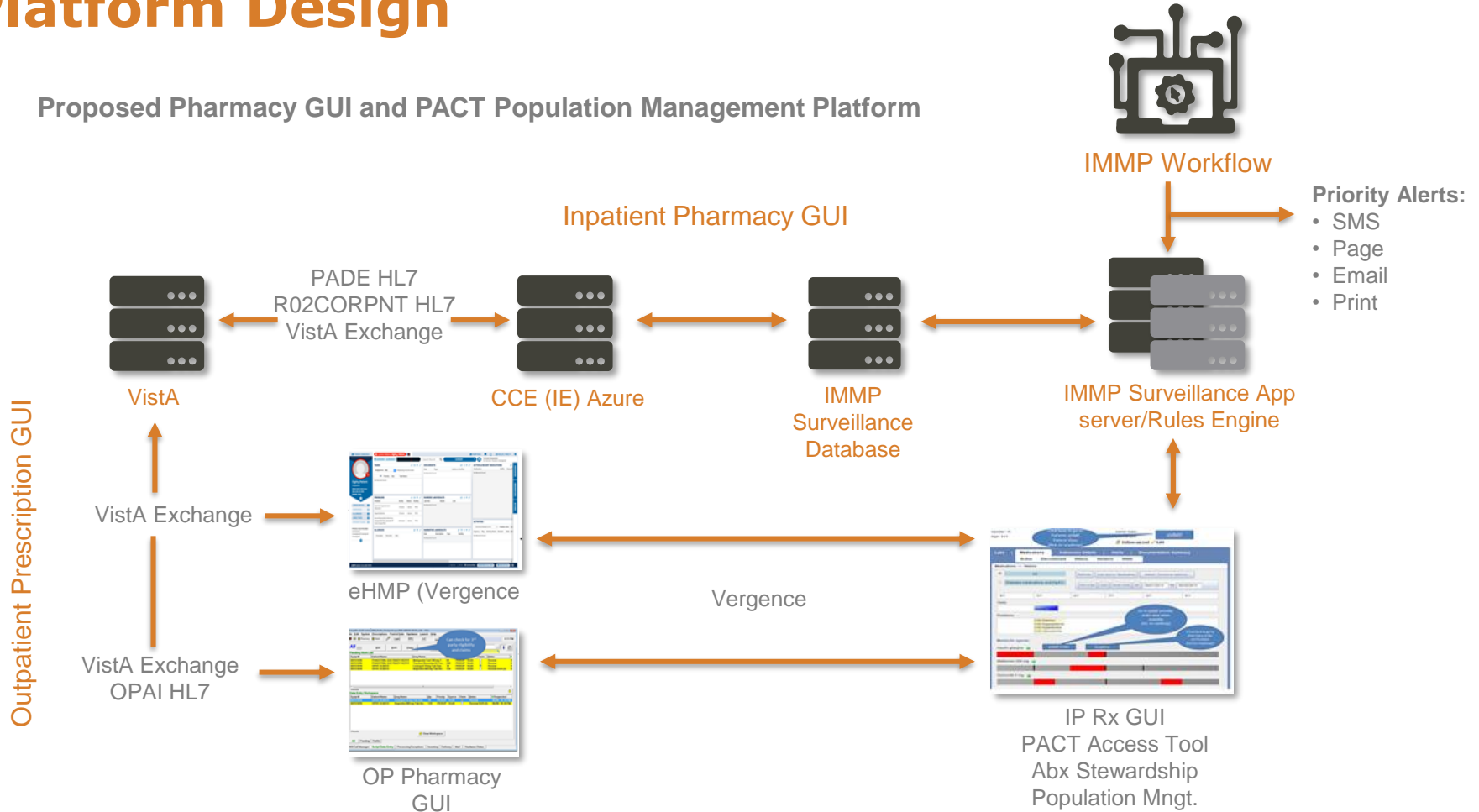
VA Innovations

Regulatory, Quality & Financial

PACT Huddle, Workflow & Population Mngt.

Platform Design

Proposed Pharmacy GUI and PACT Population Management Platform



Indicator Management Dashboard

Dashboard
Alerts
Reports
Follow-up List
Patient Search
Alert Search
Admin Console

Locations All Alerts ▼

Location	Total	<input type="checkbox"/>
KC-LINWOOD-PACT PCP07	7	<input checked="" type="checkbox"/>
KC-HONOR-PACT RN08 PHONE-X	3	<input type="checkbox"/>
KC-RED	62	<input type="checkbox"/>
KC-PC-IOCO OUTRCH LAB		

Page size: 50 167 items in 4 pages

Alert Type

	Total	<input type="checkbox"/>
<input checked="" type="checkbox"/> CT-A1C Monitoring	3	<input type="checkbox"/>
<input checked="" type="checkbox"/> CT-ASCVD with Statin	3	<input type="checkbox"/>
<input checked="" type="checkbox"/> CT-PACT Team	1	<input type="checkbox"/>

Patients

Reports

Report Title	Last Run	Run N...
Alert Touch All Alerts	11/07/2017 8:12 AM	▶
Broad Spectrum ABX greater than 48 hrs spencer	9/22/2017 6:59 AM	▶
Active Vancomycin Patients	9/21/2017 8:29 AM	▶
Linwood PACT 01	8/14/2017 11:29 AM	▶

Follow-up ● My ● Global

Patient Name	MRN	Location
No records to display.		

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Medication Stewardship Alert Management

Dashboard **Alerts** Reports Follow-up List Patient Search Alert Search Admin Console

View Current Alerts | **Manage Alert Templates** | **Manage Custom Alerts**

All Active Alerts in Location KC-LINWOOD-PACT PCP07

Active Alerts
 Resolved Alerts
 Intervention Pending

	Alert Type	Description	Date/Time	Location	Active Labels	Follow-up List
<input type="checkbox"/> <input type="checkbox"/>	CT-PACT Team	589 - CT Has New CPS	11/28/2017 5:06:00 PM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	
<input type="checkbox"/>	CT-ASCVD with Statin	589 - ASCVDHxStatin	8/18/2017 3:19:00 AM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	
<input type="checkbox"/> <input type="checkbox"/>	CT-ASCVD with Statin	589 - ASCVDHxStatin	8/18/2017 3:17:00 AM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	
<input type="checkbox"/>	CT-ASCVD with Statin	589 - ASCVDHxStatin	8/18/2017 3:13:00 AM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	
<input type="checkbox"/> <input type="checkbox"/>	CT-A1C Monitoring Intervention: SHOT Follow-up	589 - A1COver9 Documentation: Drug Monitoring	8/18/2017 3:01:00 AM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	
<input type="checkbox"/> <input type="checkbox"/>	CT-A1C Monitoring	589 - A1COver9	8/18/2017 2:56:00 AM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	
<input type="checkbox"/> <input type="checkbox"/>	CT-A1C Monitoring	589 - A1COver9	8/18/2017 2:53:00 AM	KC-LINWOOD-PACT PCP07,	KC-LINWOOD-PACT 07 Add Label	



"After careful consideration of all 437 charts, graphs, and metrics, I've decided to throw up my hands, hit the liquor store, and get snookered. Who's with me?!"

Medication Utilization and diversion detection reporting

Executive Summary Make this my default application

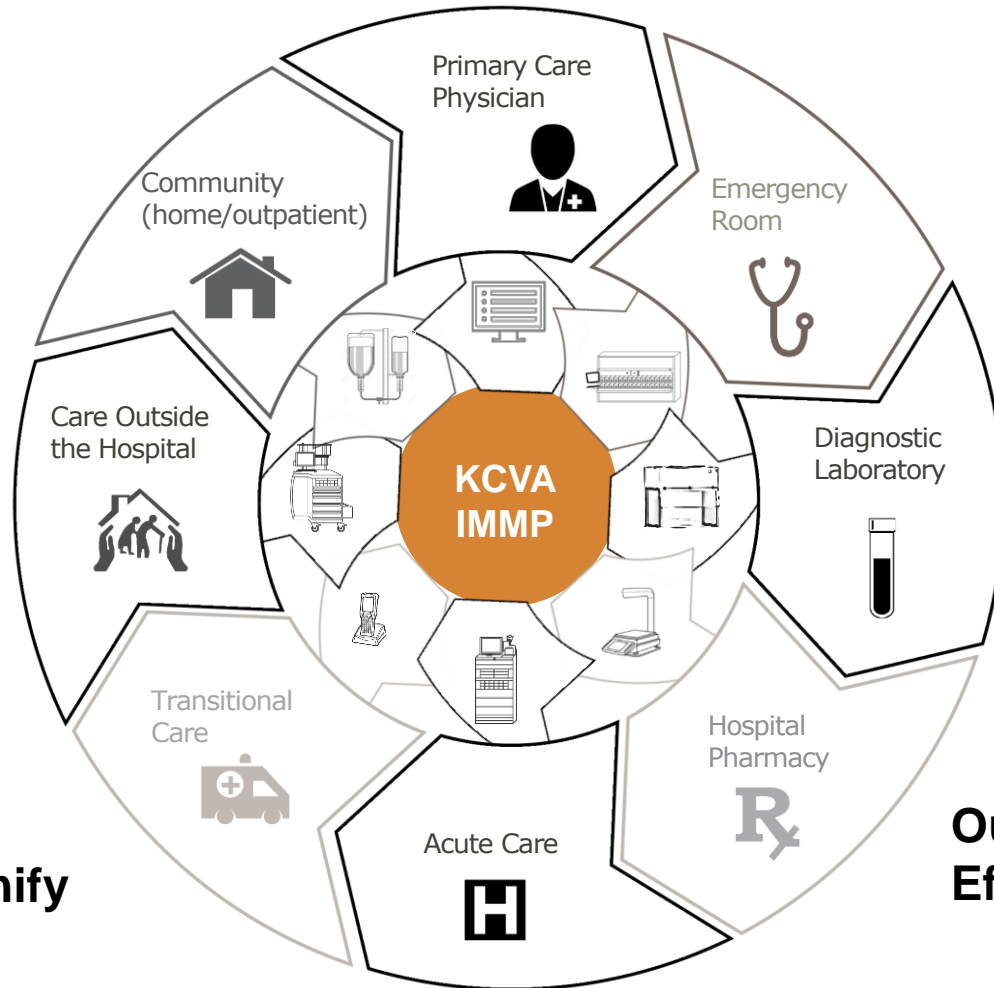
Description: **Performance Scorecard for All Infusion Systems**
 Data Source Infusion Safety Software

Criteria:
 Summary by **Month**
 Previous Period **Apr. 2012**
 Current Period **May. 2012**

[Manage Library](#)
[Edit Criteria](#)

Executive Summary					
Key Performance Indicators (KPIs)		Current Period	Previous Period	Difference	
Infusion Alarms and Status Events					
Total Infusion Alarms		42252	38374	3878	Trend ?
Total Infusion Status Events		17941	15726	2215	Trend ?
All Infusion Reporting					
Total Infusion Safety Software Infusions	■	81.9%	81.9%	0.0%	Trend ?
Infusion Safety Software Infusions and Alerts		5.1%	4.6%	0.5%	Trend ?
Patient ID Usage		28.0%	24.1%	3.9%	Trend ?
Percentage of Devices with Infusion Starts		88.7%	87.7%	1.0%	Trend ?
Alert Overview					
Total Infusion Safety Software Alerts	!	2729	2298	431	Trend ?
Total Potential Cost Avoided from Severe Harms Averted	!	\$140,000	\$315,000	\$-175,000	Trend ?
Severe Harms Averted		16	36	-20	Trend ?
Canceled Infusions		261	190	71	Trend ?
All Other Alerts		482	433	49	Trend ?
Infusion Safety Software Compliance					
Total Suite Usage	■	91.6%	91.5%	0.1%	Trend ?
Estimated Potential Events Avoided for 95% compliance		0	0	0	Trend ?
Potential Cost Avoided for Severe Harm Events Avoided		\$0	\$0	\$0	Trend ?
Good Catches					
Reprogrammed Infusions		311	351	-40	Trend ?
Total "Good Catches"	!	19	17	2	Trend ?
Override Management					
Total Override Alerts		2157	1757	400	Trend ?

**Patient
Journey**



Automation

Unify

**Outcomes
Efficiency**

Bibliography/References

Proceedings From the ISMP Summit on the Use of Smart Infusion Pumps: Guidelines for Safe Implementation and Use. Philadelphia, PA: Institute for Safe Medication Practices; 2009.
<http://www.ismp.org/tools/guidelines/smartpumps/printerVersion.pdf>

Keohane CA, Hayes J, Saniuk C, Rothschild JM, Bates, DW. Intravenous medication safety and smart infusion systems: Lessons learned and future opportunities. *J Infus Nurs*. 2005;28(5):321-328.

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Wilson K, Sullivan M. Preventing medication errors with smart infusion technology. *Am J Health Syst Pharm*. 2004;61(2):177-183.

Questions?



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