

Preparing for Integration of Your Electronic Health Record with Your Smart Infusion Pumps

March 6, 2017

AAMI FOUNDATION

AAMI Foundation

Vision: To drive the safe adoption and safe use of healthcare technology

National Coalition for Infusion Therapy Safety

Quick Guides

Optimizing Patient Outcomes

Improving the Safe Use of Multiple IV Infusions

<http://www.aami.org/thefoundation>

2 more coming soon! How to Improve Compliance With Smart Pump Drug Libraries and.....Reducing Non-Actionable Smart Pump Alarms

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A Special Thanks



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Polling Questions

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Speaker Introductions

Tina M. Suess, MHA, BSN, RN-BC, CPHIMS
Manager Medication Safety Integration,
Lancaster General



Penn Medicine

Lancaster General Hospital

Lancaster General Health

Smart Pump Integration

 Penn Medicine
Lancaster General Health

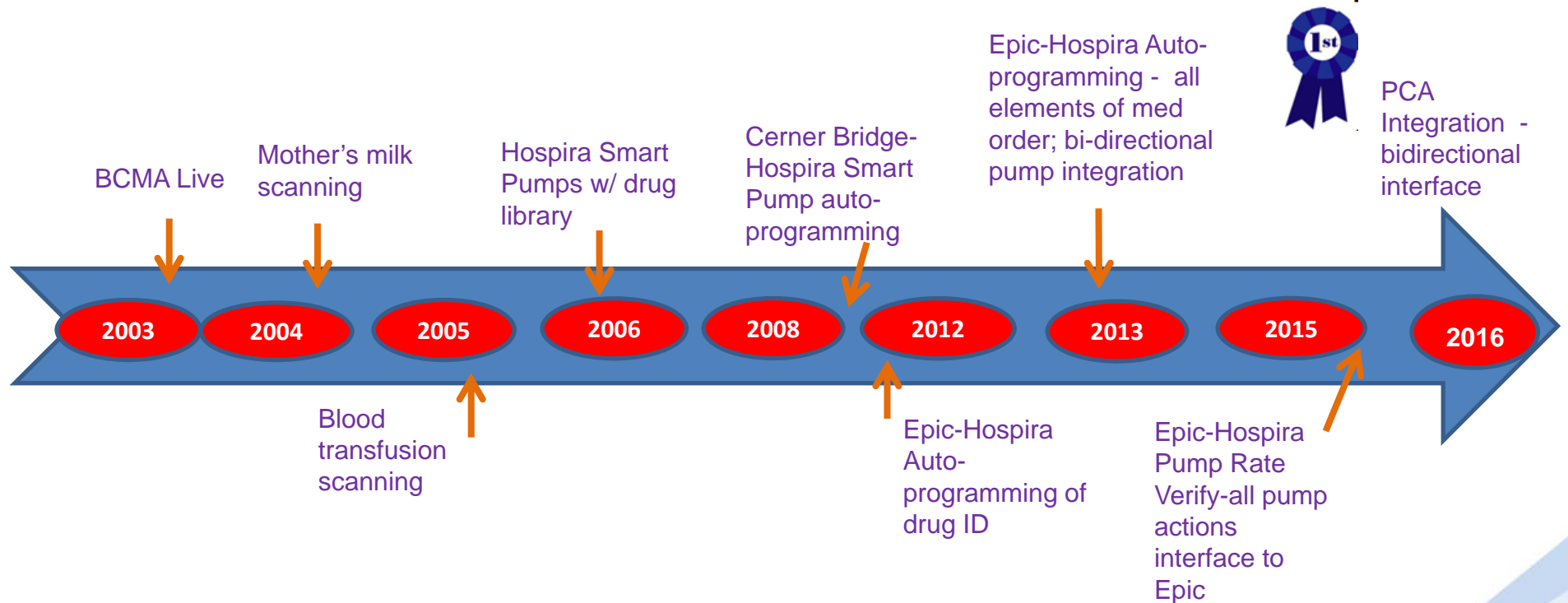
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Medication Safety and Infusion Pump Journey

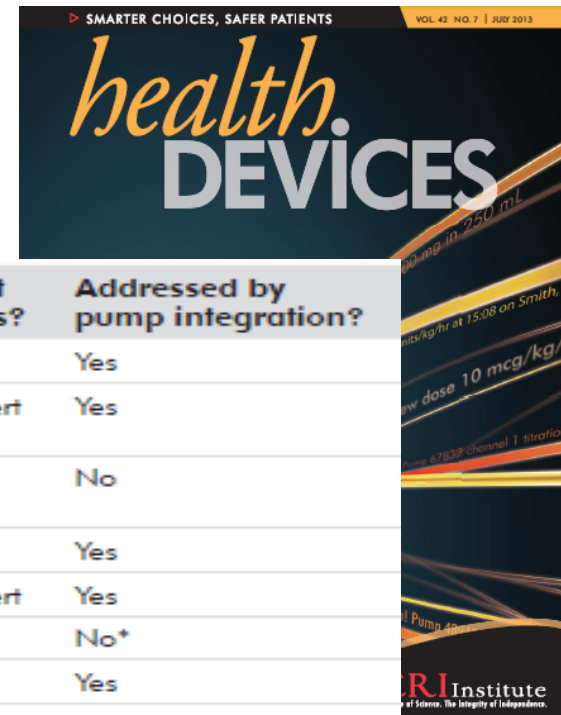


Learning From Smart Pump Data

CCA: Critical Care

Medication/Concentration	Frequency	Hard Limit Alerts				Soft Limit Alerts						Final Program						
		Total Alerts	Lower Total	Upper Total	Lower Total	Lower Override	Lower Edit	Upper Total	Upper Override	Upper Edit	Confirmed	Changed						
Infliximab 400 mg/290 mL	6	1	0	0	0	0	0.0%	0	0.0%	1	1	100%	0	0.0%	6	100%	0	0.0%
Infliximab 500 mg/300 mL	4	1	0	0	0	0	0.0%	0	0.0%	1	1	100%	0	0.0%	4	100%	0	0.0%
Infliximab 300 mg/280 mL	3	0	0	0	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	3	100%	0	0.0%
Infliximab 350 mg/265 mL	1	0	0	0	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	1	100%	0	0.0%
Infliximab 900 mg/340 mL	1	0	0	0	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	1	100%	0	0.0%
Insulin 100 units/100 mL	1267	55	0	12	0	0	0.0%	0	0.0%	43	43	100%	0	0.0%	1263	99.68%	4	0.32%
Iron Sucrose 300 mg/165 mL	24	5	0	0	5	5	100%	0	0.0%	0	0	0.0%	0	0.0%	24	100%	0	0.0%
Iron Sucrose 200 mg/160 mL	7	0	0	0	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	7	100%	0	0.0%
Iron Sucrose 100 mg/155 mL	1	0	0	0	0	0	0.0%	0	0.0%	0	0	0.0%	0	0.0%	1	100%	0	0.0%

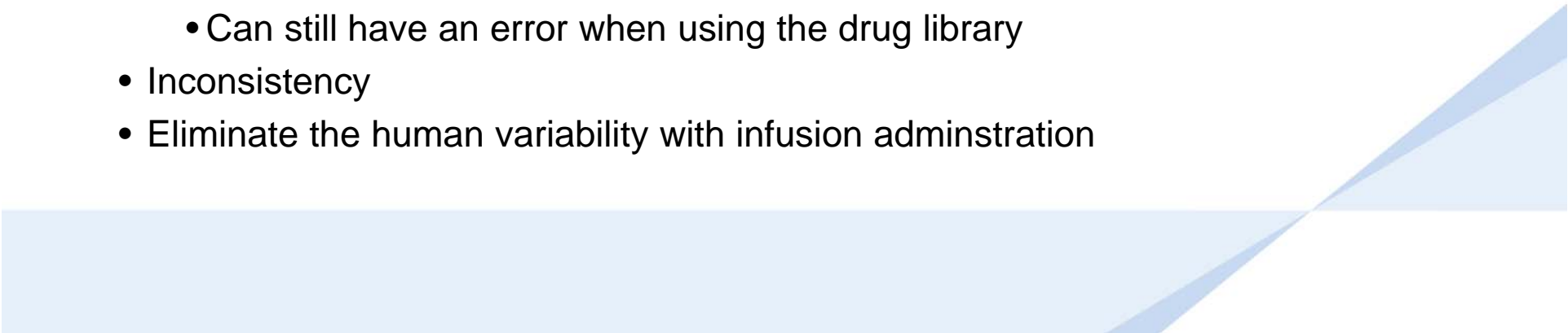
Smart Pump Integration



Problem	Number reported	Addressed by smart pump drug libraries?	Addressed by pump integration?
Wrong concentration	29	No	Yes
Wrong entry of more than one parameter	19	Yes, if it triggers an alert	Yes
Secondary (piggyback) infusion setup error	15	No	No
Wrong weight	8	No	Yes
Wrong rate	8	Yes, if it triggers an alert	Yes
Pump is not turned on	6	No	No*
Wrong drug	6	No	Yes
Set is not connected to patient	4	No	No
Wrong dose	1	Yes, if it triggers an alert	Yes

* Integrated pumps use Integrating the Healthcare Enterprise's Point-of-Care Infusion Verification (IHE PIV) messaging, which, while not enabling a pump to be turned on automatically, includes the capability for the pump server to return an error message to the BPOC system indicating that the pump is not turned on.

Goals & Opportunities

- Goals
 - Safety – Reduce/eliminate IV medication errors
 - Efficiency
 - Meaningful data capture
 - Link between patient, order, and pump
 - Opportunities (Realizations)
 - Manual pump programming...17 steps
 - Nurse can “document” one thing... but program pump differently
 - Drug Library Compliance
 - No connection to the order
 - Rule violation
 - Can still have an error when using the drug library
 - Inconsistency
 - Eliminate the human variability with infusion administration
- 

Bidirectional – Two Pathways

- From EMR to the Pump (Autoprogramming)
 - Elements of the IV Order “autopopulate” the pump
 - Drug
 - Concentration
 - Dose/Rate
 - Volume to be infused
 - Patient Weight
- From Pump to EMR (Pump Rate Verify)
 - Documentation of events that have happened on pump
 - Volume (what pump has actually pumped)
 - What is the role of this in infusion safety?



Pump Programming Steps

Manual Process (17 steps)

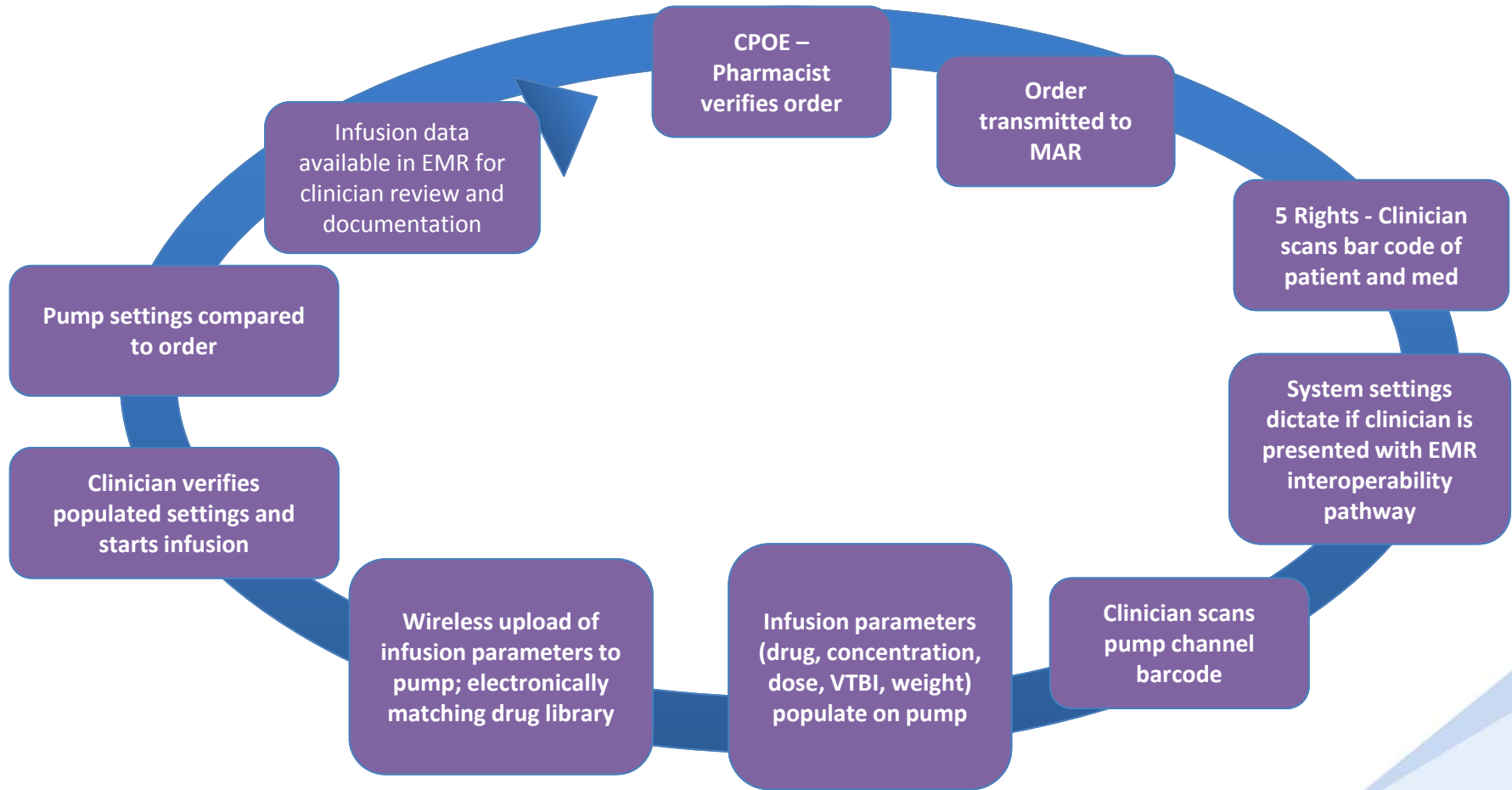
- Scan patient
- Scan medication and complete required fields
- Manually document in eMAR/BCMA

Program pump:

- Select CCA
- Select line
- Press drug list
- Scroll to find medication
- Press standard program
- Select dosing units
- Enter concentration (3 steps)
- Enter weight
- Enter dose
- Enter volume to be infused
- Press start
- Select 'Yes' to confirm

Auto-programming (7 steps)

- Select CCA
- Scan patient
- Scan medication and complete required fields
- Scan pump channel
- Press start
- Select 'Yes' to confirm
- Press 'OK' to document in eMAR/BCMA

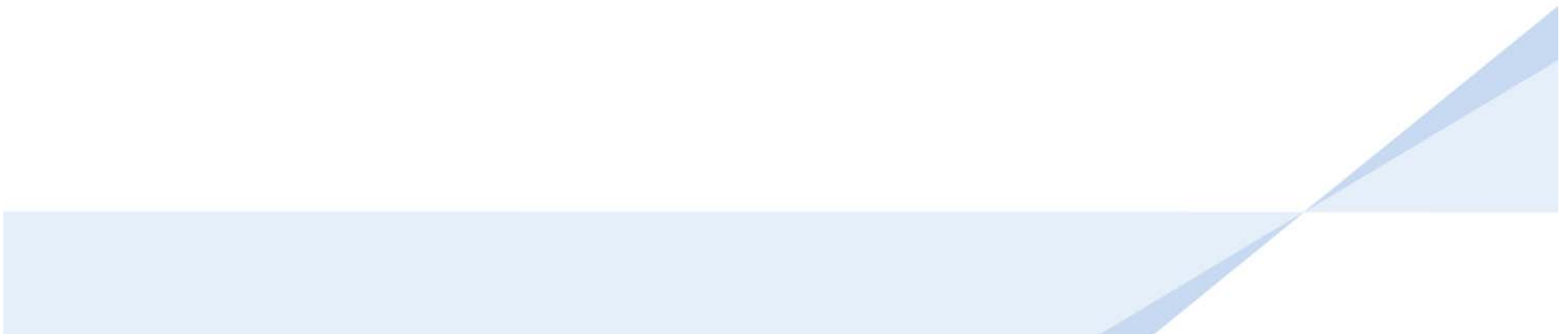


Improving Safety and ...

- Ability to accurately charge for IV Infusions
 - Med Admin Fee – Charge for the oversight of the infusion
 - ED to Inpatient
 - Observation Patients
 - Significant gap in our ability to charge based on missing or inaccurate stop times
 - Pump Integration ensures accurate documentation of pump stop time
 - Eliminates backcharting
 - Safety platform is the foundation
 - May 2016 = ED autoprogramming compliance averaged 30-40%
 - 80%

Compliance to Auto-programming

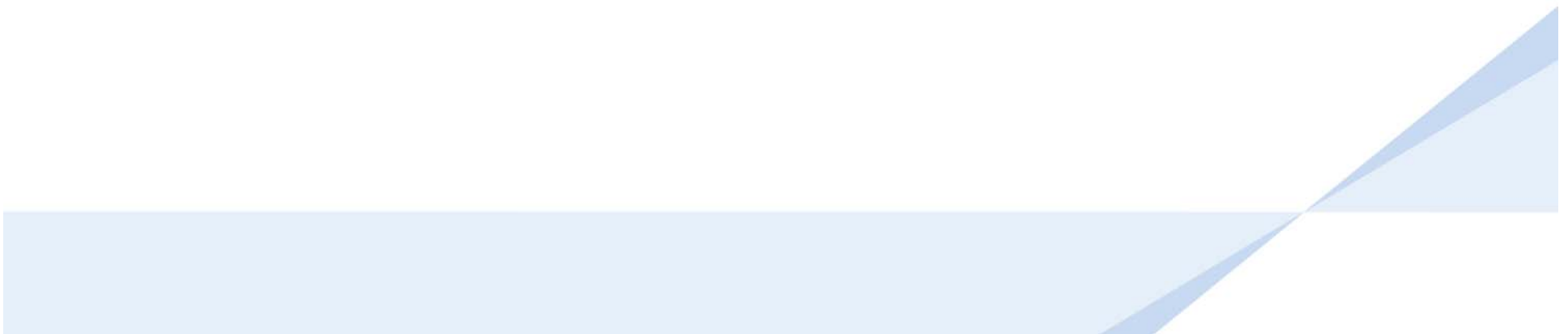
*Lancaster General proprietary image removed.
Please see presentation recording to view this chart.*



Moving the Potential Error Away from the Bedside

- Pump Edits – Occur when the pump programming violates a rule set for a specific medication and the pump is reprogrammed after the alert

*Lancaster General proprietary image removed.
Please see presentation recording to view this chart.*



Exciting Times

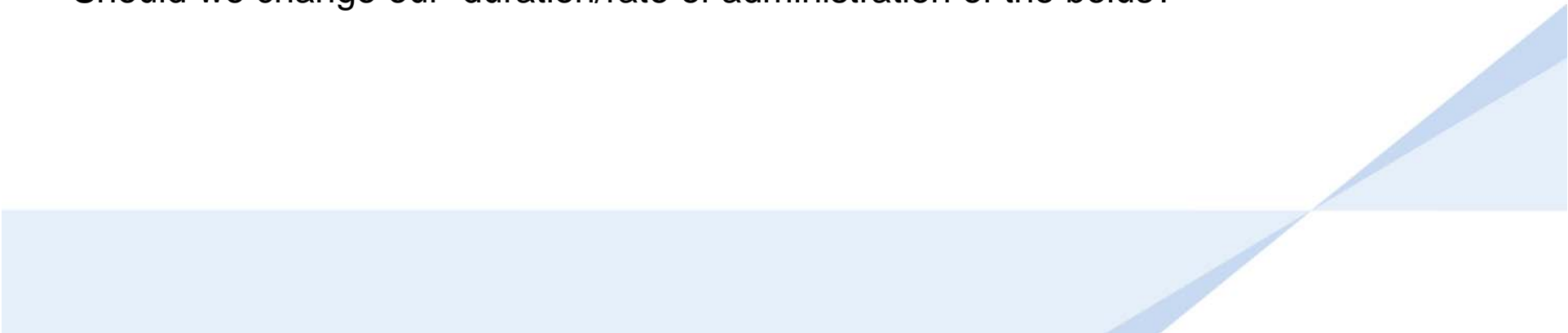
- Learning
 - Order
 - Patient
 - Pump



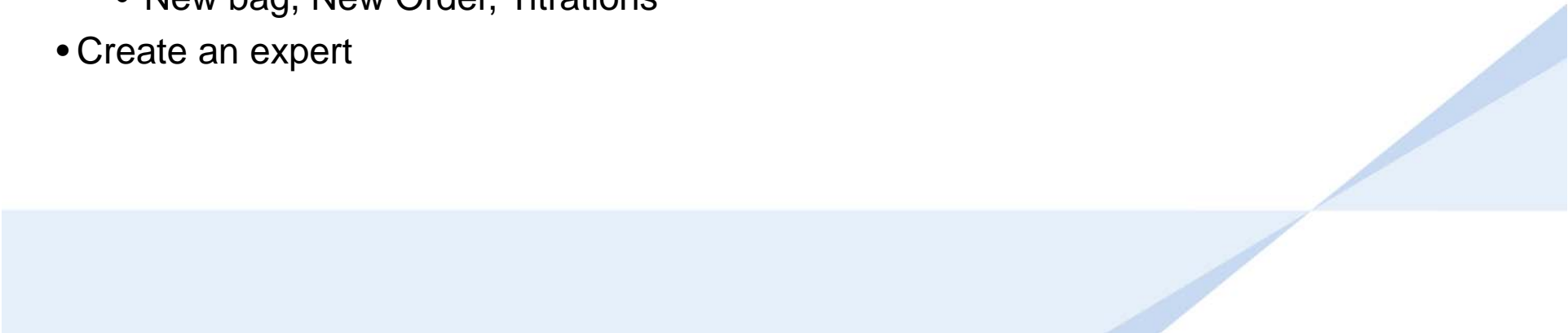
What really happened...

10/03/2014 20:12:52	Line: B, Begining Auto-Programming, Type=Dose Rate-Volume program
10/03/2014 20:12:58	Line: B, Attempted start: CCA: Critical Care, Drug: Amiodarone-bolus, 150 mg / 103 mL
10/03/2014 20:13:01	Line: B, Delivery Started , Callback: No, Mode: Piggyback, Therapy: , Max D.P.:6 PSI
10/03/2014 20:13:01	Line: B, Delayed Start: 00:00 hr:min, Patient Wt: 0 Kg
10/03/2014 20:13:01	Line: B, Step: 1, Duration: 00:10 hr:min, Dose: 618 mL/hr
10/03/2014 20:13:01	Line: B, Step: 1, Rate: 618 mL/hr, VTBI: 103 mL
10/03/2014 20:13:19	Line: B, Attempted start: CCA: Critical Care, Drug: Amiodarone-bolus, 150 mg / 103 mL
10/03/2014 20:13:20	Line: B, Step: 1, Dose limit override: YES, Programmed dose: 200 < limit: 617 mL/hr
10/03/2014 20:13:25	Line: B, Delivery Started , Callback: No, Mode: Piggyback, Therapy: , Max D.P.:6 PSI
10/03/2014 20:13:25	Line: B, Delayed Start: 00:00 hr:min, Patient Wt: 0 Kg
10/03/2014 20:13:25	Line: B, Step: 1, Duration: 00:30 hr:min, Dose: 200 mL/hr
10/03/2014 20:13:25	Line: B, Step: 1, Rate: 200 mL/hr, VTBI: 100 mL

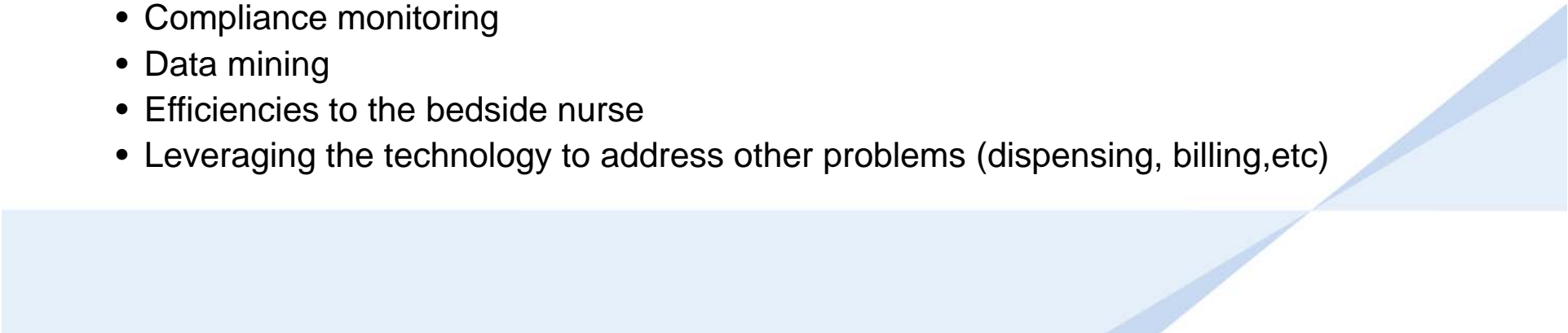
Correlating Pump to Clinical Effects

- Nursing perception
 - Variation in documentation
 - Variation in workflow
 - How tubing was primed
 - 17% occurrence of hypotension when all variables removed when bolus administered as ordered
 - Should we change our duration/rate of administration of the bolus?
- 

Never Too Soon To Start

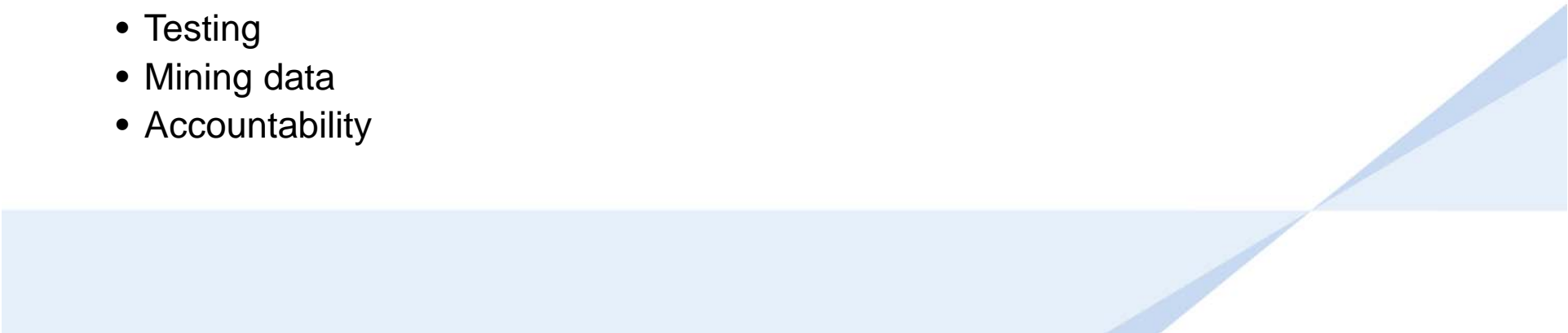
- Build your team
 - Lots of moving parts
 - Nursing must own
 - Scope may feel threatened
 - Changes workflow
 - Pump is now a computer
 - Standardization
 - Concentration, Dosing Units
 - When to use
 - New bag, New Order, Titrations
 - Create an expert
- 

Know What Your Vendors Can Do

- Functionality drives standardization... Standardization drives adoption
 - Can your vendors autoprogram
 - New order with new bag
 - New order (rate change) without a new bag
 - Rate change over a running infusion (critical med titration)
 - What are their roadmaps ?
 - Other devices (PCA, Syringe, Epidural)
 - Complex orders
 - PCA
 - How will they handle multi-step infusion
 - How are they making things better?
 - Compliance monitoring
 - Data mining
 - Efficiencies to the bedside nurse
 - Leveraging the technology to address other problems (dispensing, billing,etc)
- 

Build it Well...Test it A LOT

- Smart Pump Library
 - Drug Record – ERX
 - Grouper Build
 - Infusion Group
 - MAR – MAR actions
 - Interfaces
 - Devices
 - Pump Barcodes

 - Must have organizational commitment
 - Testing
 - Mining data
 - Accountability
- 

Not Just Another Device Interface

- Testing devices for all environments
- Test and understand
 - Drug library match – do rules vary?
 - Concentrations can be tricky
 - Information populated correctly
 - Bidirectional – pulling information in from the pump
 - IV intake accurate
 - Duration based testing
 - Real life
 - Order sets
 - Piggyback with concurrent delivery
- Frequent
 - Change control
 - Upgrades

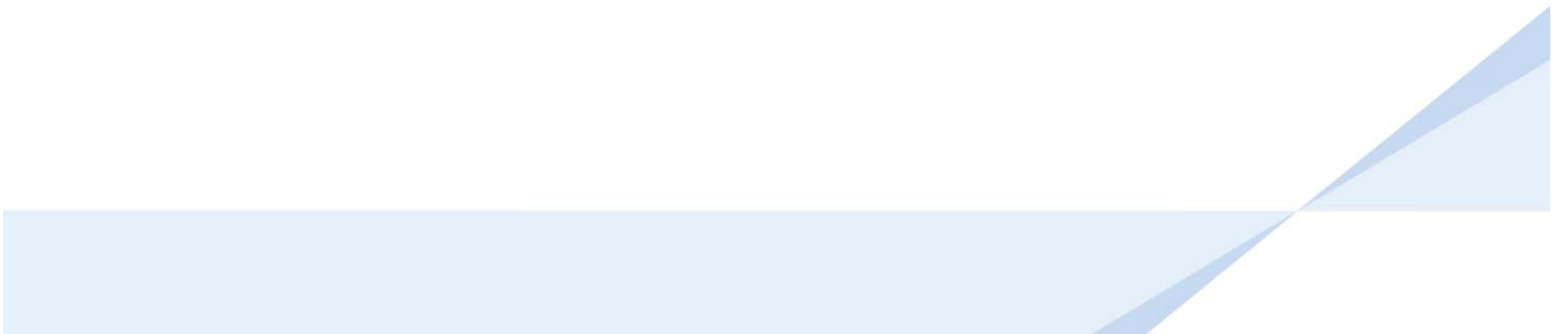
Exciting Times

Dream
Big!

- What can we learn
 - Unique link between pump, order and patient
- Vendor partnership
 - Pump Vendor, Epic and your organization
 - Push and Develop
 - Safety, Accuracy, and Efficiency
- What does the future look like
 - Additional Devices
 - Role of the Drug Library
 - How does the administration workflow continue to change
 - Role of the independent verification

Questions

Contact Information:
tmsuess@lghealth.org



Future/Ongoing Initiatives

Mark Your Calendars!

April 17th; 12pm to 1pm EST

<http://www.aami.org/thefoundation>

**Stephanie D. Orr DNP, RN, CCRN
NeuroScience Intensive Care Unit
Rush University Medical Center**

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Slides and Recording:

<http://www.aami.org/PatientSafety/content.aspx?ItemNumber=3694&navItemNumber=3084>

Your Certificate of Participation is on the final slide

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CERTIFICATE OF PARTICIPATION

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Name:

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Marilyn Neder Flack
Executive Director
AAMI Foundation