A Collaborative Approach to Supporting Integrated Devices

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Speaker Introduction

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Speaker Introduction

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Cedars-Sinai Medical Center
Established in 1902 and located in Los Angeles, CA.
886 licensed beds, Level I Trauma Center
Expanding scientific and medical knowledge through research that benefits patients
Educating healthcare professionals for the future
Improving the health status of the community
HIMSS Analytics Stage 7 facility
Primary service area includes 3.3 million people
Conflict of Interest

Roberto Torres, Jr., M.B.A.

Juan Lopez-Driotis, PMP

Have no real or apparent conflicts of interest to report.
Agenda

• Setting the Stage
• Case Study – Implementing anesthesia record application
  • Challenge
  • Approach
  • Outcomes/Result
• Future Optimizations/Innovation
• Lessons Learned
• QA
Learning Objectives

• Demonstrate a case study of an implemented model
• Describe challenges encountered when designing a support model
• Illustrate how to gain support from both technical team and clinical teams for supporting these systems
The STEPS™ Framework

**Satisfaction**
- Staff Satisfaction
- Provider Satisfaction

**Treatment/Clinical**
- Quality of Care
- Efficiencies
- Safety
- Increased Uptime

**Electronic Secure Data**
- Data Reporting
- Evidence-Based Medicine
- Data Sharing
Situation

You are involved in a device integration project.

Who do you include during the deployment phase?

Who do you include in the support phase?
Deploy Anesthesia Record house-wide

- Deploy an application that will help our anesthesiologist become paperless by charting in real-time on a workstation in their work space during live surgery.
- This would entail adding a workstation, keyboard and mouse to an already crowded anesthesia device system. Total of 95 anesthesia machines would be impacted.
- Develop a cross-functional support solution.
- Train anesthesiologists (approx. 180) and anesthesia techs (approx. 16)
Challenge

Segmented Teams and Areas

- Anesthesia
- Anesthesia Techs
- Nursing
- Applications
- Cabling
- Network
- Training

- Desktop
- Server
- Clinical Engineering
- Device Integration
- Epidemiology
- Vendor
Challenge

Legacy Hardware

• A hardware solution was needed that would mount onto the anesthesia machine. Existing computer work stations were too bulky.
• WOW’s were not an option as there was no floor space in the vicinity of the anesthesia machine in the OR’s.
• An all-in-one workstation mounted somehow on the anesthesia seemed to be the answer.
Challenge

Mounting Solution

- The mounted workstation had to enhance the anesthesiologist already busy workflow without getting in the way.
- Mounting the workstation to the anesthesia machine would be the first opportunity for collaboration.
- How to add a workstation to an already crowded anesthesia machine and still be functional?
Challenge

New Unproven Technology

• The selection process for the workstation was started with a multidisciplinary team to include the anesthesia, desktop team, applications, configurations, Clinical Engineering and Epidemiology.
• Two vendors were chosen and evaluated and all teams gave their input.
• There was uncertainty to using an all-in-one workstation with touchscreen capabilities.
Testing

- Needed to test the new all-in-one workstation.
- Needed to test a house-wide deployment.
- A test environment will only test certain elements of the entire system.
- How do you test in a live environment?
- How do you test for the unpredictable?
We needed to train the clinical staff.
We needed to train the anesthesia tech staff who support the anesthesiologists.
We needed to train the technical staff involved in support.
We needed to train everyone on how to call for help.
Challenge

Go-Live

• Needed an ‘all hands on deck’ approach with all teams represented.
• Needed additional help for elbow support for the anesthesiologists
• Needed 24 hour support in the beginning.

Support

• How will the end users call for help? (Pager, phone, ticket service)
• How do we route service calls?
• Is the team that can fix the problem able to respond:
  • In person?
  • Over the phone?
• If the appropriate team cannot respond can another team fill-in?
• What to do if the response/repair needs to happen during surgery?
• What are the fallback/worst case scenarios?
• Continuum was critical for success
• Implementation team members were retained in active roles
• Clinical Engineering Team
  • OR Clinical Eng
  • Device Integration Team
• Epic Optime/Anesthesia Team
• MD Champion, ad hoc collaborators
• Help Desk
• Epic Team (vendor)
• Ad-hoc resources from Desktop Engineering, Bridges, Systems Integration
Approach

Mounting Solution

• Conversations were held with the Chief Anesthesiologist and his colleagues to discuss needs and wants regarding their future workflow.
• It was decided to create three mock-up’s to physically evaluate ergonomics and practicality.
• Anesthesiologists, hardware, configuration and Clinical Engineering teams were brought together to evaluate at the same time and listen to each other.
• All teams contributed and one configuration was decided upon as the standard.
• Having the Chief Anesthesiologist make the final decision was key in creating a precedent for others to follow.
• The final solution involved mounting the workstation on an articulating arm that would stow away high when not in use or articulate down when needed.
Approach

Mounting Solution
Approach

Mounting Solution

Final Configuration
Approach

New Unproven Technology

- We gathered all stakeholders into our simulation lab and created failure scenarios.
- We asked questions as to who would be the best team to support each of the failure situations.
- We decided that at least one team needed visibility and understanding of the entire path of travel of the data.
Device integration overview – understanding the path of the data.

Possible Trouble Spots
- Total malfunction
- Wire/sensor
- Power
- Configuration

General Technical

What happens at this stage?

- Single device
  - Expired Desflurane = 4.8 L/min

- Multiple devices
  - Expired Desflurane, BP, RR, Temp, ST

- Message Processing
  - OBX6(ST|593)|4.8|19|16I|20131

- Message Translation
  - OBX6(ST|593)⇒ FLO 593

Approach
Leveraging Clinical Engineering for in-OR Issue triage

Approach

Success criteria:
- Leadership support
- Clear expectations
- Continuous training
- Clin Eng on-site
- Solid Clin Eng & Clinical Systems collaboration

Anesthesiologist calls Clin Eng

Clin Eng arrives and triages within 10 minutes

DI Analyst collaborates and resolves

Monitor to DataCaptor issue?

Workstation issue?

Desktop Support Collaborates and resolves

Anesthesia Analyst collaborates and resolves

Validates resolution with Anesthesiologist

Anesthesiologist validates resolution with Anesthesiologist
Testing

- In addition to unit and integrated testing, three separate shadow testing sessions were implemented.
- All test phases included multi-disciplinary teams for immediate analysis, fast resolution and proper planning.
- All hardware, application, network and chronicled events clinical staff might encounter during various types of failures including user errors.
- Testing was detailed to the point of including portable systems and remote/unique locations such as MRI or CT that required special installations due to our full Device Integration in MRI rooms.
Training

• Training was focused on real world scenarios focused on Cedar-Sinai workflows, the end result was based on reality not theory.
• Curricula was developed by Anesthesiologists and aided by Clinical Applications Team and Epic.
• Training for Clinical Engineering was performed collaboratively (device integration, applications, desktop) in order to instantly and effectively answer multi-disciplinary questions.
• Training for the anesthesia techs was performed by Clinical Engineering to help them be first look responders.
• Additionally, our phone response team was trained to address triage and direct calls effectively.
Approach

Go-Live

• Implemented a 24-hour command center and a hotline for the first couple weeks.
• Kept track of types of calls; user error, hardware issue, application issue, network issue, etc.
• Made notes of requests and ideas to better support the end users. Here are a few:
  • Idea #1 – create a quick reference troubleshooting card and attach to the anesthesia machines
  • Idea #2 – label the workstations with the 24-hour hotline number
  • Idea #3 - develop EMR functionality to properly alert Anesthesiologists of connection issues
  • Idea #4 – develop automated connection reports to address machines that may be down prior to the start of day
Support

• Implemented a 24-hour hotline that included leveraging our existing Clinical Engineering on-call services. Our Clinical Engineering staff were trained on how to triage these calls over the phone after hours and escalate.
• Kept track of types of calls; user error, hardware issue, application issue, network issue, etc. We created a specific service code in our computer system just for these anesthesia record calls.
• Kept track of requests and ideas to better support the end users.
• Quickly implemented helpful support ideas from go-live
Outcomes

- Clinical Engineering is able to respond faster to calls than the I.T. staff.
- Because the workstation was on an anesthesia machine the Clinical Engineering staff were seen as the responsible triage team for this new technology.
- Clinical Engineering staff have access to the read-only template in Epic.
- Our Clinical Engineers were taught how to resolve the most common issues to include user errors and navigating the application.
- This additional training allowed our Clinical Engineering team to resolve over 95% of calls related to this new application both from hardware and user sides.
- Supporting the application even at a limited capacity educated and empowered our staff and raised their confidence levels.
- Clinical Engineering is now seen not only as a hardware support team but a system support team.
- An unexpected outcome was that other Applications teams have reached out to us for support for their systems such as PACS and Imaging support.
Outcomes

Devices integrated per machine:
- Philips monitor
- Anesthesia machine
- BIS monitor
- CCO monitor
- INVOS monitor
- Tangent workstation
- Neuron (as the data concentrator)

Total in-OR Anesthesia devices integrated with EMR: 490

In the first 3 months - total calls – 132
  - Tangent computer issues – 65
  - Neuron reset – 24
  - Server – 12
  - Neuron failure – 12
  - Damaged cables – 11
  - Operator Error – 8

Deployed user resources: Dedicated phone number for DI issues, quick reference guide.
Into our third year of having gone live our Anesthesiologists and staff have become familiar enough with the application and hardware that they are now offering ideas on how to improve on what was installed originally. Ideas have included optimizations in the application and hardware as well.
Lessons Learned

• Having support from top leadership proved to be crucial to the success of both the deployment and support of the project.
• Having a champion sponsor the project at both the implementation but support phases was indispensable.
• Always include all team members starting from planning, implementation, go-live and on-going support.
• Be open to ideas from staff for innovative solutions.
• Collaboration is good for everyone.
A Summary of How Benefits Were Realized for the Value of Health IT

Satisfaction
• Staff Satisfaction - staff feel safe and secure with live person on the phone or in person within minutes.
• Provider Satisfaction - Our anesthesiologists are also very grateful for the immediate phone and less than 5 min in person response times from the support model.

Treatment/Clinical
• Quality of Care – doctors can focus on patient care and not on charting.
• Efficiencies – charting is done automatically
• Safety – eliminate human error.
• Increased Uptime – faster response times when systems fail.

Electronic Secure Data
• Data Reporting – no manual entries
• Evidence-Based Medicine – computer based trending
• Data Sharing – data is available immediately for fellow physicians to view.
Questions

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- Please remember to complete the online session evaluation