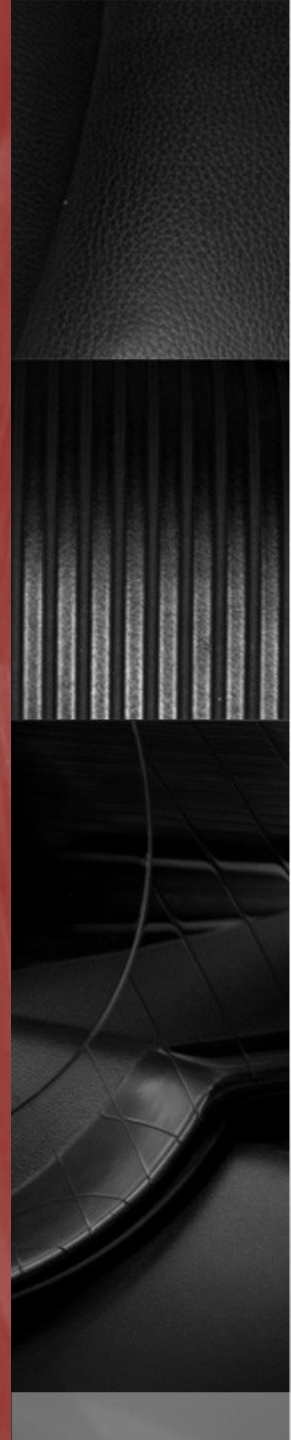
Sustaining high reliability in the face of hospital organizational change: A pilot study

Duke/University of North Carolina

Health Informatics Series Seminar

Rebecca Kitzmiller, PhD, MHR, RN-BC



Objectives

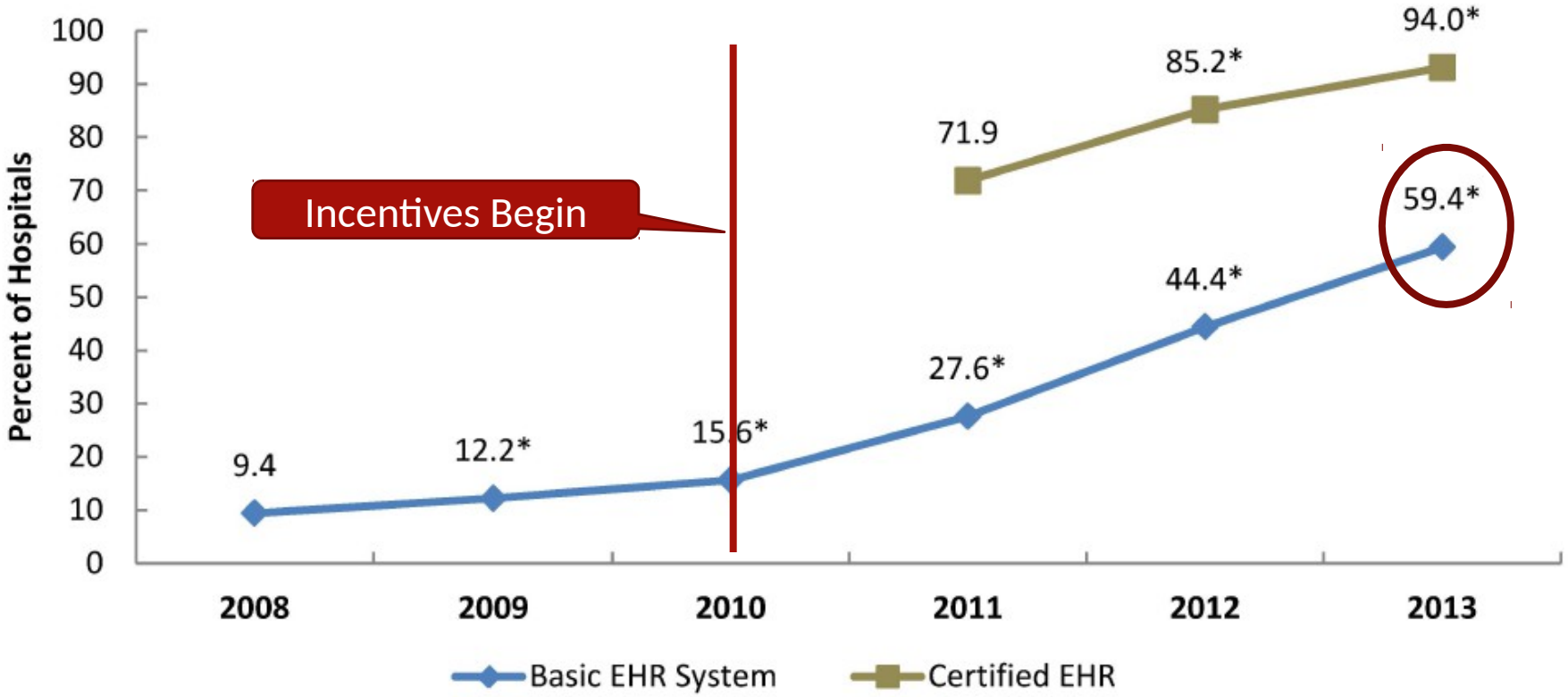
- Identify strategies that may help hospital staff maintain safe, effect care while mastering new work processes

- Topics
  - Current state of EHR hospital implementation
  - Reframe implementation through a high reliability lens
  - Identify potential measures of care delivery

Background [1]

Hospital adoption of EHR systems has increased more than five-fold since 2008.

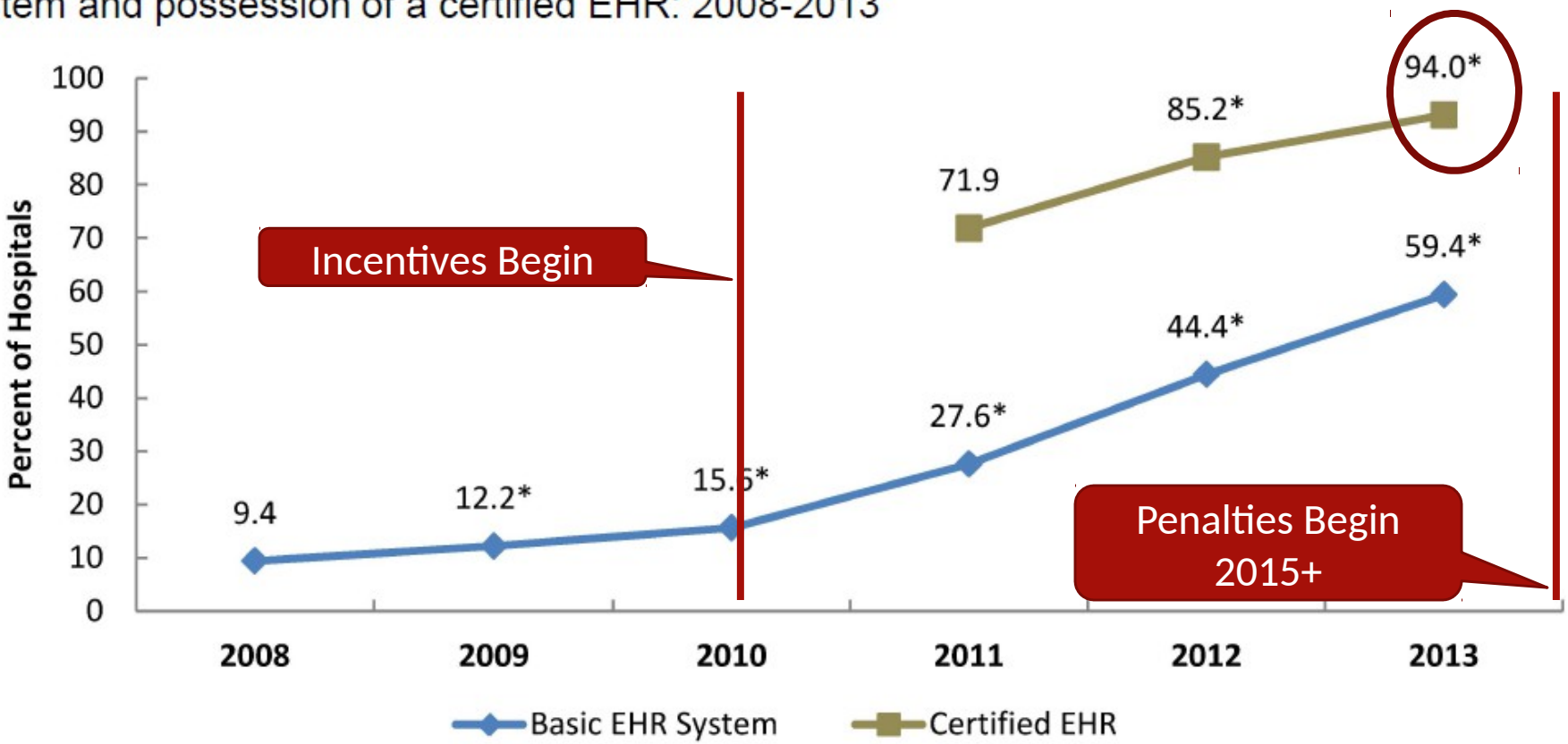
Figure 1: Percent of non-federal acute care hospitals with adoption of at least a Basic EHR system and possession of a certified EHR: 2008-2013



Background [1]

Hospital adoption of EHR systems has increased more than five-fold since 2008.

Figure 1: Percent of non-federal acute care hospitals with adoption of at least a Basic EHR system and possession of a certified EHR: 2008-2013



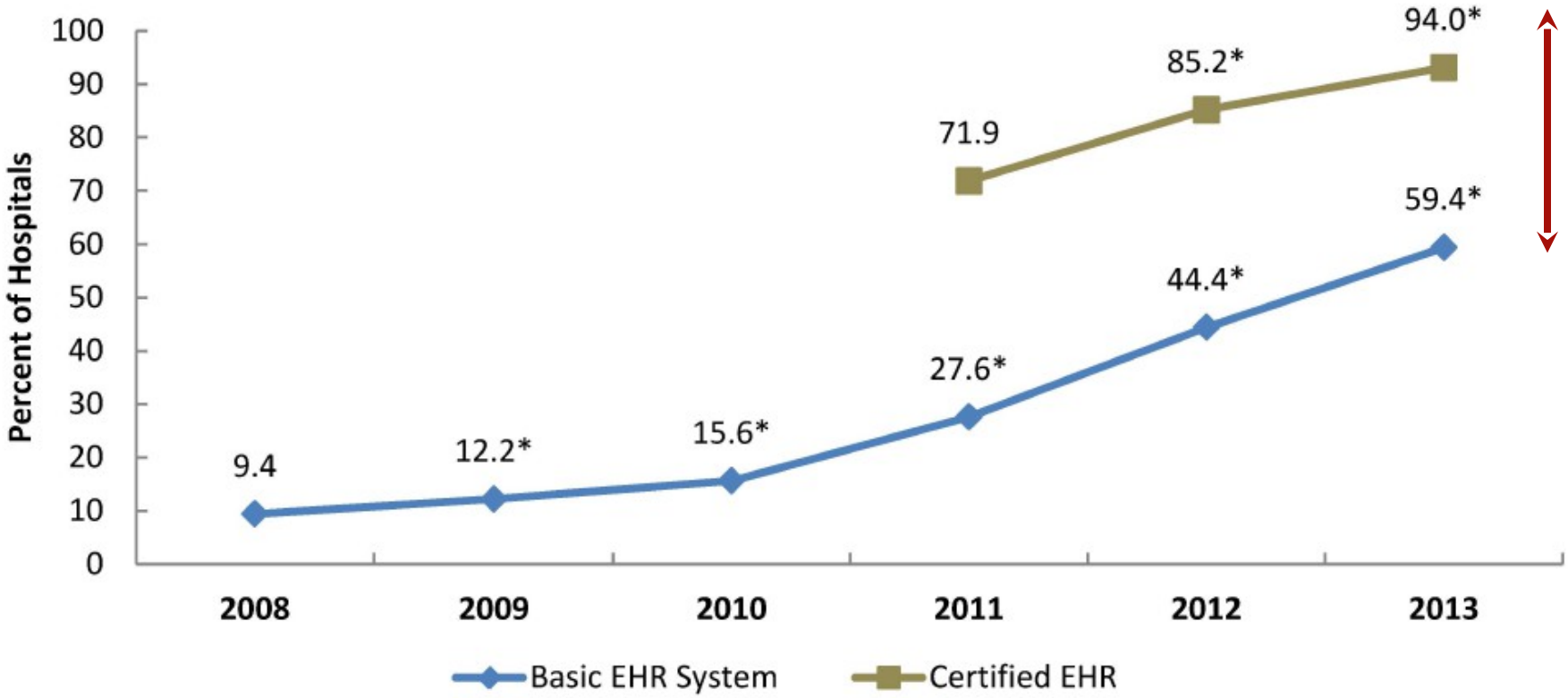
One Implementation Journey: UNCHS

- 2013 – Under Contract
- 2014 – Go Live
  - UNC Hospitals (Chapel Hill)
  - Rex Hospitals
- 2015
  - New applications (Cardiology, Transplant, Laboratory Services)
- 2016
  - Highpoint/Johnston/Cadwell/Pardee community hospitals
  - New applications: (Case Management, Home health, triage)
- 2017
  - Nash Community Hospital

Background [1]

Hospital adoption of EHR systems has increased more than five-fold since 2008.

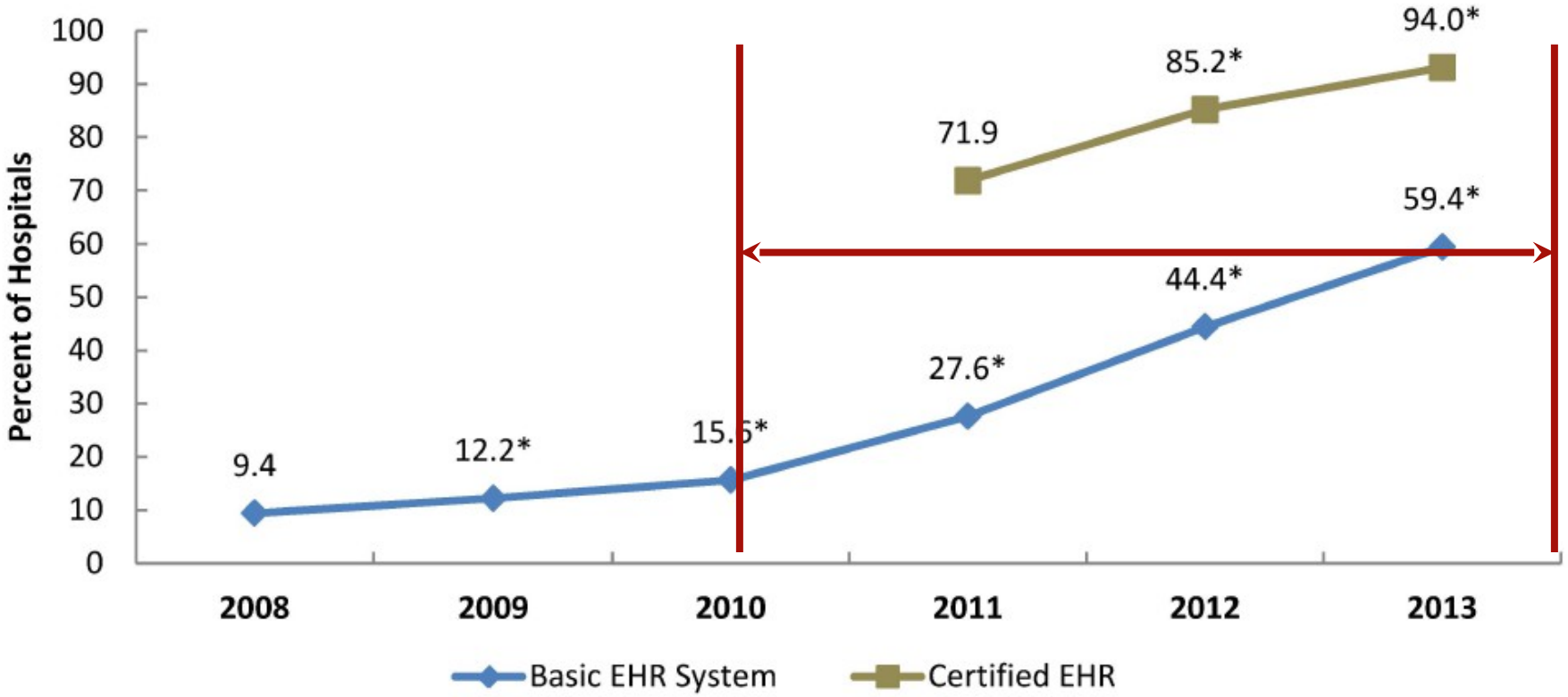
Figure 1: Percent of non-federal acute care hospitals with adoption of at least a Basic EHR system and possession of a certified EHR: 2008-2013



Background [1]

Hospital adoption of EHR systems has increased more than five-fold since 2008.

Figure 1: Percent of non-federal acute care hospitals with adoption of at least a Basic EHR system and possession of a certified EHR: 2008-2013



Organization Outcomes

- Increased cost / decreased reimbursement [2,3]
  - EHR investment
    - Duke- $700 million
    - Boston Partners $700 million
    - UCSF $150 million
  - Unexpected impact on charge capture
- Failed interoperability [4]
  - Barriers to expected care coordination

Patient Outcomes

- No Effect
  - Mortality rates: CABG, Stroke, Pneumonia [5]
  - Chemotherapy orders [6]
- Marginal improvements in care
  - Hospital acquired pressure ulcer [7]
- Increase incidence of harm
  - Pressure ulcer, Falls [5, 8]
  - Leave without being seen [9]
  - Medication errors [10, 11]
  - Failure to rescue [5]

Negative End User Experience

- Staff burden [12]
  - Cognitive effort
  - Time diversion
  - Increased multitasking
- Fragmented workflow [13]
- Disrupted care processes [10]

Negative End User Experience

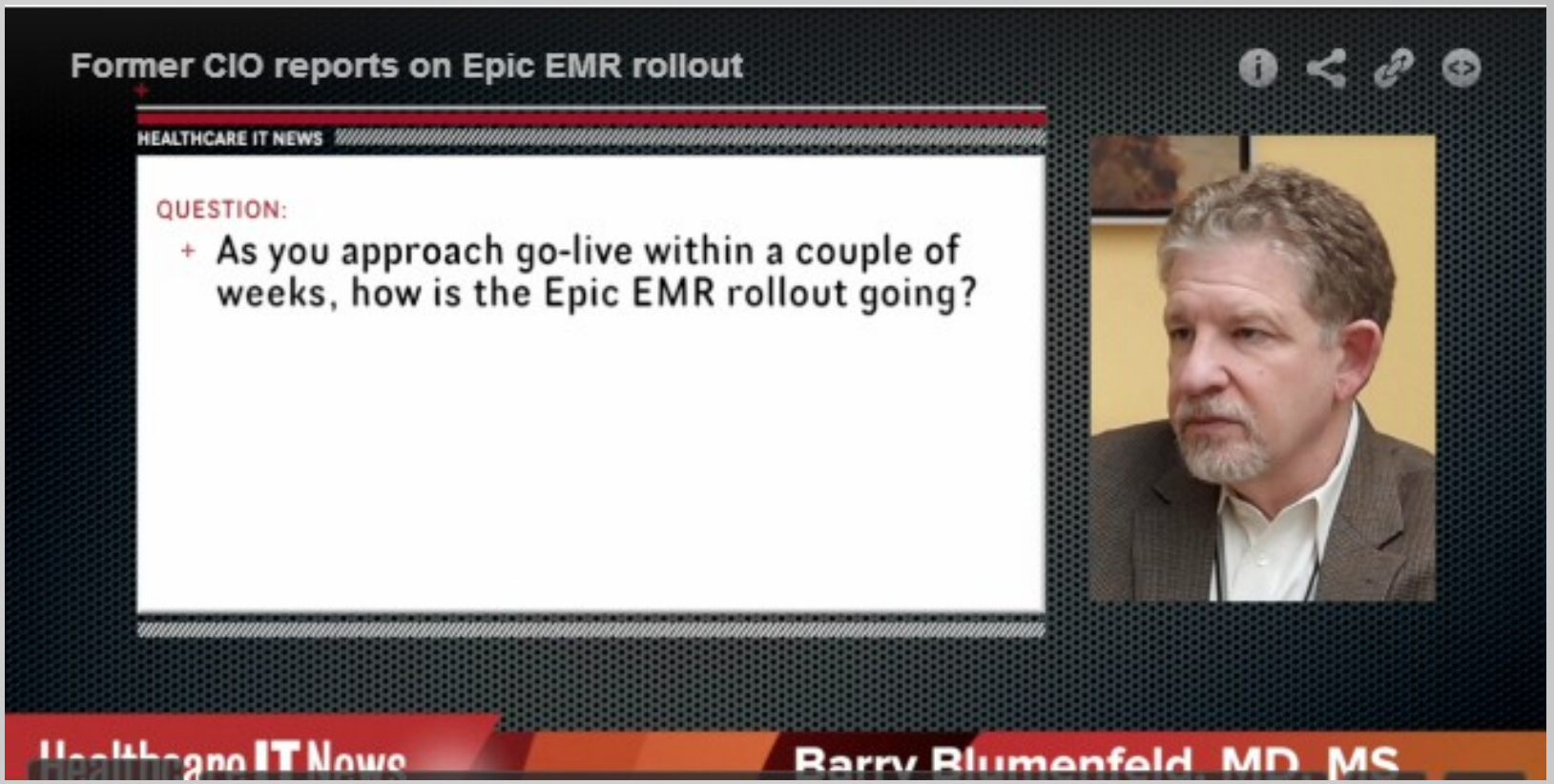
Physicians (n=1,200)[14]

- 59% cost ≠ benefit
- 49% not designed for physicians

Nurses (n=14,000)[15]

- 92% nurses dissatisfied
- 85% nurses struggle
- 90% disrupt communication with patients
- 89% work around the system

Assumptions at Work [2]



http://bcove.me/578nbdii

Unsubstantiated Support Strategies 2, 15, 16, 17, 18

- Management/supervisor support during Go-Live12
  - Command center
  - Application specialists

    Speedy fixes
  - Roving teams

    Early ID of problems
  - ~ 7 days duration

- End user training
  - One on one
  - Just in time
  - Scenario based
  - < 30 days prior to go live
- Superuser
  - Just in time peer coach
  - 1-2 weeks

Reframing Implementation: HRO [19, 20]

- High Reliability Organizations
  - High-risk
  - High potential for error
  - Errors → Significant drastic consequences

    Loss of life or limb
- Highly Reliable
  - Systematic systems
  - Consistent goal achievement
  - Obsessed with anticipating and avoiding problems

High Reliability Organizations [19, 20]

- Sensitive to operations
- Reluctant to accept “simple” explanations
- Preoccupation with failure
- Defer to expertise not rank, power, position
- Resilient, responsive, improvising

High Reliability Organizations [19, 20]

- Reluctant to accept “simple” explanations
  - Dig deep to find the real source of problems
- Sensitive to operations
  - Observe effect of processes and systems on the organization
  - Identify what is/is not working
  - Observations communicated
- Preoccupation with failure
- Defer to expertise not rank, power, position
- Resilient, responsive, improvising

Pilot: Developing measures

- Setting
  - Single health system
  - 12 months use of Certified EHR
  - Consistent implementation strategies
- Sample
  - Adult Intensive care & step down units

Methods: Data

- Nursing documentation
  - Execute tasks on behalf of others
  - Timed care tasks
  - Shift workers
- Examples
  - Pain medication efficacy documentation
- Controls
  - Staff composite (skill mix, education)
  - Patient composite (case mix, ADT)

Methods: Data (Missed Care) [21, 22]

- Comfort patients
- Nursing care plans
- Education
- Oral hygiene
- Document nursing care
- Conduct patient surveillance
- Plan care
- Reposition patient
- Skin care
- Prepare discharge
- Admin medications
- Pain management
- Treatments/procedures

Methods: Data

- Feasibility
  - Availability, quality and validity of the data

    (Future-may vary across vendors and vendor installs)
- Single unit trend
  - Average number missed per shift
  - Trends in association with go live
- Cross unit comparison

Next steps

- Prevalence and trends of missed care
- Determine the association between missed care, patient safety outcomes and satisfaction.
  - How these change over time
  - How they differ across different types of change (disruption)

    HIT: version release, upgrades, new functionality

    Non-HIT: emergent crises, care process changes
- Identify interventions that promote care completion

References

1. Charles, D., Gabriel, M. H., & Furukawa, M. (2014). Adoption of electronic health record systems among U.S. non-federal acute care hospitals: 2008-2013 (Vol. 16, pp. 9). Washington, DC: The Office of the National Coordinator for Health Information Technology.
2. Monegain, B. (July, 2013). Go-live gone wrong. Healthcare IT News. Retrieved from http://www.healthcareitnews.com/news/go-live-gone-wrong.
3. Moukheiber,Z. (Jun 18, 2012). The staggering cost of of an epic electronic health record might not be worth it. Forbes. Retrieved from http://www.forbes.com/sites/zinamoukheiber/2012/06/18/the-staggering-cost-of-an-epic-electronic-health-record-might-not-be-worth-it/
4. Wears, R. L. (2015). Health Information Technology and Victory. *Annals of emergency medicine*, *2*(65), 143-145.
5. Spetz, J., Burgess, J. F., & Phibbs, C. S. (2014). The effect of health information technology implementation in Veterans Health Administration hospitals on patient outcomes. *Healthcare*, *2*(1), 40-47. doi: http://dx.doi.org/10.1016/j.hjdsi.2013.12.009
6. Mattsson, T. O., Holm, B., Michelsen, H., Knudsen, J. L., Brixen, K., & Herrstedt, J. (2015). Non-intercepted dose errors in prescribing anti-neoplastic treatment: a prospective, comparative cohort study. *Annals of Oncology*. doi: 10.1093/annonc/mdv032
7. Dowding, D. W., Turley, M., & Garrido, T. (2011). The impact of an electronic health record on nurse sensitive patient outcomes: an interrupted time series analysis. *Journal of the American Medical Informatics Association*. doi: 10.1136/amiajnl-2011-000504
8. Furukawa, M. F., Raghu, T. S., & Shao, B. B. M. (2010). Electronic medical records, nurse staffing, and nurse-sensitive patient outcomes: evidence from California hospitals, 1998-2007. *Health Services Research*, *45*(4), 941-962. doi: 10.1111/j.1475-6773.2010.01110.x
9. Kennebeck, S. S., Timm, N., Farrell, M. K., & Spooner, S. A. (2012). *Impact of electronic health record implementation on patient flow metrics in a pediatric emergency department* (Vol. 19).

References

10. Koppel, R., Wetterneck, T., Telles, J. L., & Karsh, B. T. (2008). Workarounds to barcode medication administration systems: Their occurrences, causes, and threats to patient safety. *Journal of the American Medical Informatics Association*, *15*(4), 408-423. doi: 10.1197/jamia.M2616
11. Redley, B., & Botti, M. (2013). Reported medication errors after introducing an electronic medication management system. *Journal of Clinical Nursing*, *22*(3-4), 579-589. doi: 10.1111/j.1365-2702.2012.04326.x
12. Coleman, J. J., Hodson, J., Thomas, S. K., Brooks, H. L., & Ferner, R. E. (2014). Temporal and other factors that influence the time doctors take to prescribe using an electronic prescribing system. *Journal of the American Medical Informatics Association*, amiajnl-2014.
13. Zheng, K., Haftel, H. M., Hirschl, R. B., O'Reilly, M., & Hanauer, D. A. (2010). Quantifying the impact of health IT implementations on clinical workflow: a new methodological perspective. *Journal of the American Medical Informatics Association*, *17*(4), 454-461. doi: 10.1136/jamia.2010.004440
14. Hagland, M. (2013). Nationwide Survey: Physician Views on EHRs Remain Mixed and Complex *Healthcare Informatics*. Retrieved from http://www.healthcare-informatics.com/article/nationwide-survey-physician-views-ehrs-remain-mixed-and-comple
15. Blackbook. (2014). Hospital Nurses Forced to Develop Creative Workarounds to Deal with EHR System Flaws; Outdated Technologies and Lack of Interoperability, Reveals Black Book. Retrieved from http://www.prweb.com/releases/2014/09/prweb12182208.htm

References

16. Ash, J. S., Stavri, P. Z., Dykstra, R., & Fournier, L. (2003). Implementing computerized physician order entry: the importance of special people. *International Journal of Medical Informatics*, *69*(2-3), 235-250. doi: Doi: 10.1016/s1386-5056(02)00107-7
17. Edwards, G., Kitzmiller, R. R., & Breckenridge-Sproat, S. Innovative Health Information Technology Training: Exploring Blended Learning. [Article]. *CIN: Computers, Informatics, Nursing*.
18. Halbesleben, J. R. B., Wakefield, D. S., Ward, M. M., Brokel, J., & Crandall, D. (2009). The Relationship Between Super Users' Attitudes and Employee Experiences With Clinical Information Systems. *Medical Care Research and Review, 66* (1), 82-96. doi: 10.1177/1077558708325984
19. Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the Process of Sensemaking. *Organization Science*, *16*(4), 409.
20. Gamble, M. (April, 2013). 5 Traits of high reliability organizations: How to hardwire teach in your organization. Becker's Hospital Review. Retrieved from http://www.beckershospitalreview.com/hospital-management-administration/5-traits-of-high-reliability-organizations-how-to-hardwire-each-in-your-organization.html
21. Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E., & Griffiths, P. (2013). 'Care left undone'during nursing shifts: associations with workload and perceived quality of care. *BMJ quality & safety*, bmjqs-2012.
22. Ausserhofer, D., Zander, B., Busse, R., Schubert, M., De Geest, S., Rafferty, A. M., ... & van Achterberg, T. (2014). Prevalence, patterns and predictors of nursing care left undone in European hospitals: results from the multicountry cross-sectional RN4CAST study. *BMJ quality & safety*, *23*(2), 126-135.