Break Out Session E: Quality Engineering

WHAT SHOULD BE: Defining Quality

I. What is Quality?: Working Definitions:
   i. Quality = failure-free processes
   ii. Quality = creating highly reliable and safe processes that are designed to achieve desired outcomes (from patient perspective)
   iii. Quality = variance minimization in unnecessary variation in outcomes, practices, and processes
WHAT IS: What We Know

What we know: Mature area of knowledge - no need to reinvent wheel

• Quality Improvement in healthcare systems is highly reactive. Quality Control is often lacking, while Quality Planning does not exist.
WHAT IS: What We Need to Know

Central Questions in Building a Research Agenda:

1. How do we know what variation between systems is ‘customization’ and what is ‘unnecessary variance’
2. What can systems engineers do to close knowing/doing gap?
3. Which variation in inputs, practices, and processes have cause greatest outcome variation (i.e. the largest coefficients)?
4. What is the appropriate level of analysis? AND/OR Where do we focus our research efforts?
5. What is our model for testing in multiple environments and cultures?
6. How do we spread what works?
7. What is the ease of compliance in regard to processes? We may need to sacrifice a complex optimal model for a less complicated near-optimal model.
8. How do we ‘incentivize’ implementation?
9. How would an implementation model to capture medical errors?
HOW DO WE GET THERE: Areas for Further Exploration

1. How can we develop interventions that maximize outcomes?
2. How do we test which interventions have any utility?
3. How do we test which interventions have the most ‘bang for the buck’
4. We need increased T4 funding
5. Research into ‘forcing functions’ (i.e. OR door will not open before soap is dispensed)
6. There is a potential opportunity for stochastic optimization and human factors mathematics modeling with respect to quality and safety. Could you have a simulation model where parameters included opportunities for error and interaction of events?
   • Could you use this model to discover driving failure points?
   • What are the elements/sub-processes that need to be 10 sigma to get whole system to 6 sigma?
   • Non-intuitive causes/ indicators must be addressed/included in any model