“However beautiful the strategy, you should occasionally look at the results.”

Winston Churchill
Center for Health Care Improvement Science

- Evaluate Lean Virginia Mason Production System
- Publish and share QI projects
- Point improvements ➔ system transformation
- Since 2012, 50 publications on QI
- Understand and improve
- Learning health care system

Antibiotics for Bronchitis

Mean = .57
Mean = .36

Research

Usual Care

Randomized

Treatment A ? Treatment B

Quality Improvement

Usual Care

New Treatment

Control for all confounders

Uncontrolled

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[Image of a forested area]

[Image of a waterfall and greenery]
Is there a difference?
Did we cause it?

Quality Improvement Research

Change over time
• No control group (sometimes)
• Act as own control
• Other changes
• Causality?
Waste!!!

- Processing: Unnecessary processes and operations. Traditionally accepted as necessary.
- Waste: Time - Waiting for people or services to be provided; Time when processes, people or equipment are idle.
- Waste related to costs for inspection of defects in materials and processes, customer complaints and repairs.
- Overproduction: Producing what is unnecessary, when it is unnecessary, and in unnecessary amounts.
- Transportation: Conveying, transferring, picking up, setting down, piling up and otherwise moving unnecessary items.
- Motion: Unnecessary movement or movement that does not add value. Movement that is done too quickly or slowly.

Sustainability

Outcome

Before | After | Sustainable
Before/After/Sustain

Outcome

Before | After | Sustainable

Time Series

Outcome

Time

Baseline

Intervention

Sustainability
Antibiotics for Bronchitis

Is there a difference? Did we cause it?
Antibiotics for Bronchitis


Contrafactual Argument

Exclude confounders
Complex contrafactual arguments
Causality?

What else happened (temporal trend)
- hospitalist staffing
Who we study (selection)
- complex spinal surgery
How we measure (instrumentation)
- cure for the common cold
Learning (maturation)
- resident glycemic control

Shadish, Cook, Campbell, Experimental and quasi-experimental designs, Wadsworth 2002

Contrafactual Argument

Exclude other causes
Complex contrafactual arguments
Time Series Analysis
CT Scan With and Without Contrast

Difference in Difference
Multiple control groups

Kamo, J Am Geriatrics Soc 2017;65:973-979

Step Design

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GI Procedural Anesthesia

Challenges

What is the intervention?
When does implementation occur?
RPIW and Kaizen Events

- Goal setting
- Process flow map
- Nemawashi
- Root cause analysis
- Event planning
- Implementation
- Spread
- 30, 60, 90 day report outs
- Home team report out
- Current state measurement

Challenges

When does implementation occur?
- Signed contract?
- RPIW
- Implementation curve
- Map of where and when implementation occurs
- Cultural change v. toolkit
What is the intervention?

Local culture!
When does the intervention start?

![Graph showing intervention and control groups over time]

Kamo, J Am Geriatrics Soc 2017;65:973-979

Multiple Interventions

- Long intervention period
- Effectiveness of components
- Difficult to exclude confounders
- Real world
- Culture change
### Delirium and Falls

Ferguson, J Nurs Care Qual 2017; epub

### Glycemic Control

Local culture!

Franco, T, BMJ Open Qaulity 2017;e000059

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What does it all mean?

“However beautiful the strategy, you should occasionally look at the results.”

Winston Churchill
Lessons

• Understanding QI is challenging
  • What and when is intervention
  • Causality
  • Tools/culture
• Must understand
  • Cannot improve without understanding
  • Opportunity cost/burnout
  • Waste
• Learning health care system

Thank you!