Portals of Discovery:

A Primer on Conducting QI Projects at UVM Medical Center

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Definitions

- **Quality Improvement** (QI)
  - Systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups[1]

- **Six Domains of Healthcare Quality**[2]
  1. Safe
  2. Timely
  3. Effective (evidence based)
  4. Efficient (avoiding waste)
  5. Equitable (no variation in quality across patients)
  6. Patient-centered

- **Value** = [Quality / Cost]

1. http://www.hrsa.gov/quality/toolbox/methodology/qualityimprovement/
2. Institute of Medicine (IOM). Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, D.C: National Academy Press; 2001.

Scholarly QI&PS – Step by Step

1. Identify the problem
2. Form a team
3. Define the aims
4. Identify the drivers
5. Choose the interventions
6. Establish the measures
7. Seek approval
8. Implement (& implement again)
9. Analyze the data
10. Report the findings

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Identify the Problem

- Er…improvement opportunity
- Sources:
  - Clinical experience
  - Adverse event reports
  - Internal or external measures
  - Regulatory requirements

Identify the Problem

- Understand the problem
  - Stakeholder interviews
  - Literature review
  - Preliminary data / baseline data
  - Benchmarks / comparison data
- Check for alignment
  - Division, department or institutional initiatives
  - Regulatory requirements
  - Strategic goals

Identify the Problem

- Resources at UVM Medical Center
  - Fellowship director
  - Division chief
  - Division QI Committee
  - Department QI Committee representative: http://www.med.uvm.edu/medicine/qa_i_committee
  - Jeffords Institute

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Form a team

- Representatives from all major groups impacted
- Target 4-6; max 10 people
- Team leader
- Facilitator / Project Manager
- Recorder
- *Ad hoc* members as needed

- Clinical nursing staff
- Residents and Fellows
- Attending physicians
- Primary care physicians
- Other referring physicians
- Allied health professionals
- Quality improvement staff
- Social work
- Case management
- Pharmacists
- Informatics / IT
- Home care
- Data analyst
- Nutrition/dietary
- Patient & Family Representatives
- Senior leadership

Form a team

- Establish ground rules

- Set agendas

- Specify plans, responsibilities, and timelines

- Use meeting minutes or summaries

- Meet regularly

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Define the aims

- Global or General Aim
- SMART
  - **S**pecific
  - **M**easurable
  - **A**ttainable
  - **R**elevant
  - **T**ime bound
- Define population
- Specific aims to follow

> **Examples of General Aims**
> 1. Reduce the use of recurring daily laboratory orders in hospitalized adults by 50% within 1 year
> 2. Complete 100% of discharge summaries for patients discharged from the hospitalist service within 24 hours of discharge by September 2016

Scholarly QI&PS – Step by Step

1. Identify the problem
2. Form a team
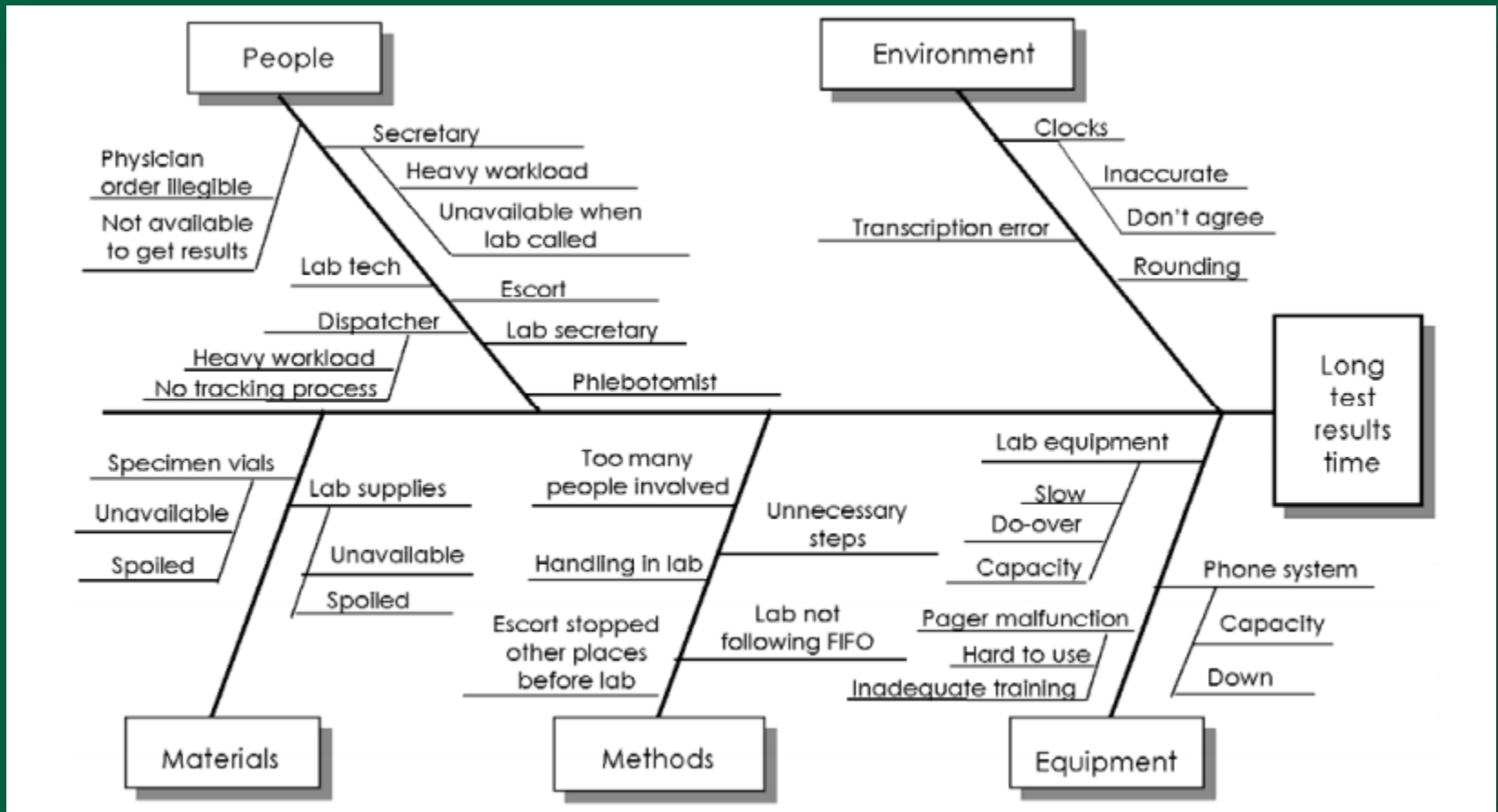3. Define the aims

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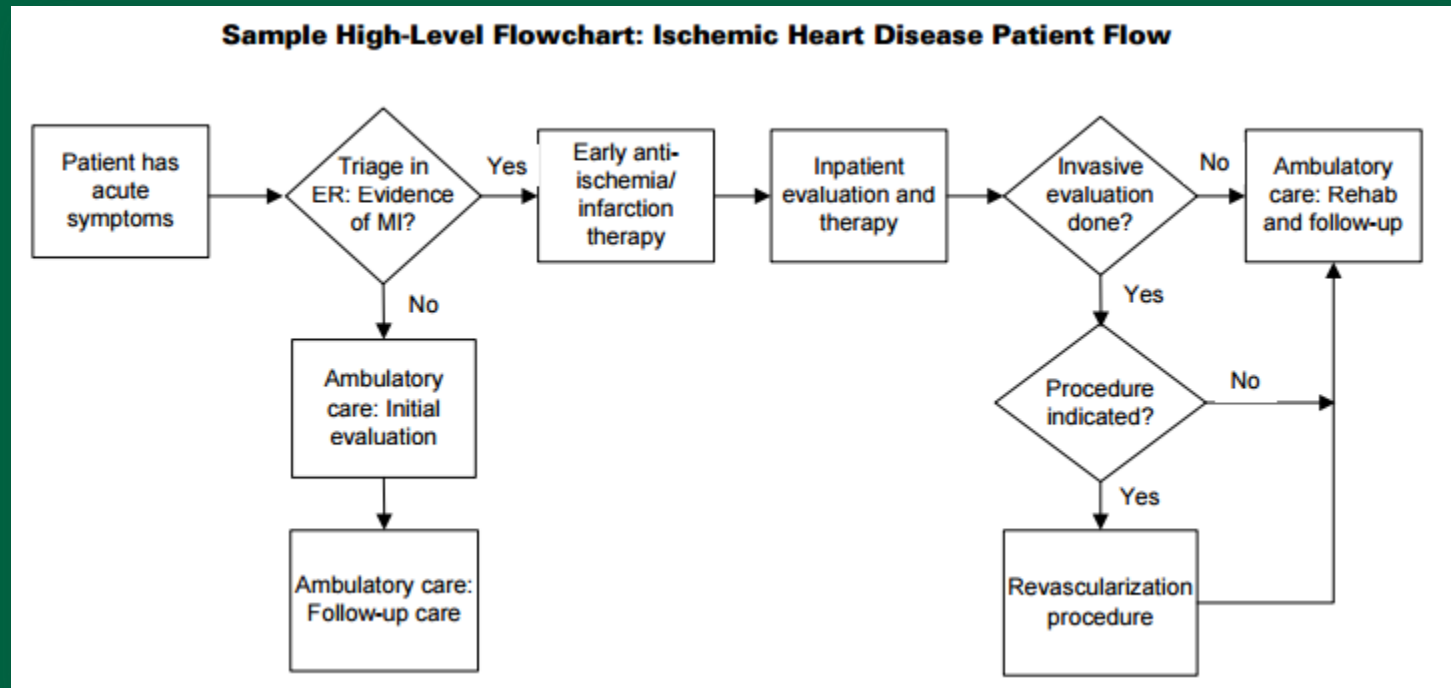
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Identify the drivers

- What are the drivers of the problem?
  - Direct observation
  - Interview stakeholders (from variety of perspectives)
  - Use tools:
    - Process mapping
    - Fishbone (Ishikawa, Cause and Effect) diagram
    - Pareto
 - Map the ideal process

Cause & Effect Diagram

http://www.ihi.org/resources/pages/tools/causeandeffectdiagram.aspx

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Process Map / Flow Chart

Sample High-Level Flowchart: Ischemic Heart Disease Patient Flow

http://www.ihi.org/resources/pages/tools/flowchart.aspx

Pareto Table & Diagram

Sample Data Table: Types of Errors Discovered During Surgical Setup

Error Type	Frequency	Percent	Cumulative %
Wrong Supplier	67	46.5	46.5
Excess Count	24		
Too Few Count	17		
Wrong Size	10		
Wrong Sterile Instrument Set	10		
Missing Item	8		
Damaged Item	6		
Other	2		
TOTAL	**144**		

Sample Pareto Diagram: Types of Errors Discovered During Surgical Setup
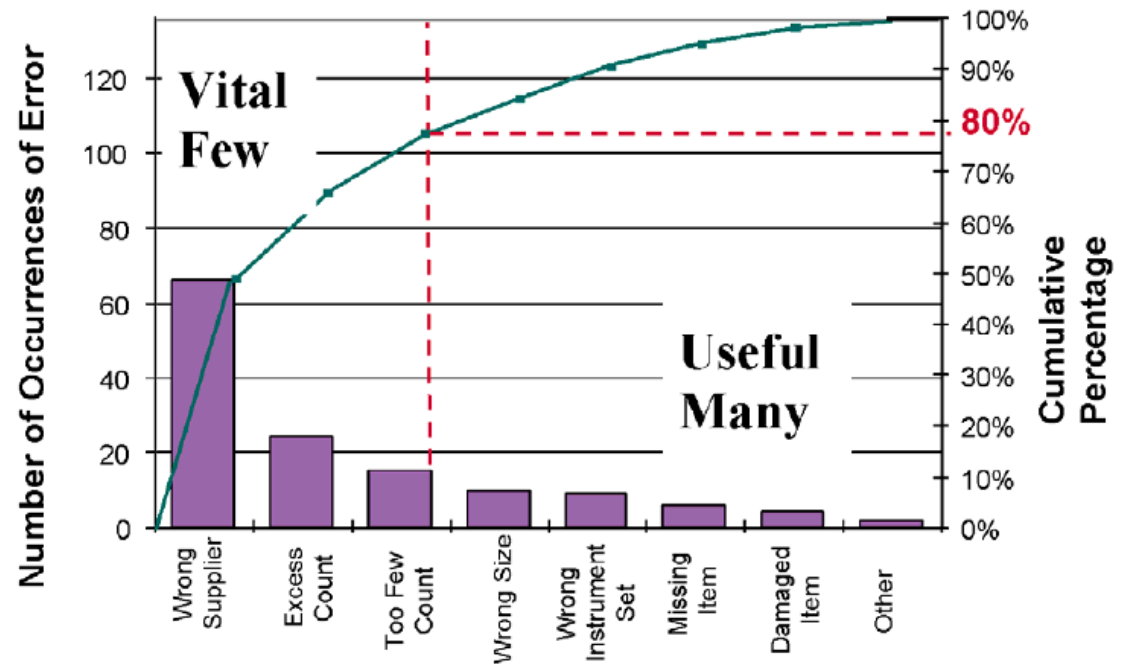
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Choose the interventions

- Brainstorm change ideas

- Prioritize change ideas

- Focus initial intervention(s)
    - Highest impact
    - Most feasible
    - "Best practice" / evidence based

Choose the interventions

- Common types of interventions
  - Education
  - Audit and feedback
  - Clinical decision support
    - Smartphrases
    - "Best Practice Advisories"
    - More sophisticated logic
  - Other EMR changes
    - Order set changes
    - Pathways
  - Policy changes
  - Incentives

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Choose the interventions: Study designs

- Before-after
  - Average performance in the year before and the year after intervention

- Time series
  - Multiple time periods (for example, monthly outcomes over at least one year before and after the intervention)
  - Represents background variation and historical trends

- Controlled before-after
  - Before-after measurements with an intervention and control group (e.g., Baird 4 vs Baird 6)

- Randomized controlled trial

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Establish the measures

- Structure, Process, Outcome (Donabedian model)
  + Balancing (IHI Model)

Structure (Resources / Inputs)	Process (Activities)	Outcome (Results / Outputs)	Balancing (Consequences)
• People • Infrastructure • Materials • Technology • *e.g., ratio of endocrinologists to DM patients*	• What is done • How is it done • *e.g., percentage of DM patients with A1c measured within past year*	• Change in clinical outcome • Change in behavior • Patient satisfaction • *e.g., average A1c level of patients* • *e.g., mortality of DM patients*	• Workarounds • New problems • *e.g., episodes of significant hypoglycemia*

Establish the measures: Pearls

- Measures are no good if you can't get them
- GIGO: Garbage In, Garbage Out
- Don't be a DRIP: Data Rich, Info Poor
  - Prioritize what you collect
  - Collect just enough data to determine if you are making a difference
- Show your work
  - Track performance longitudinally
- Outcomes are the holy grail
  - But processes are often more feasible to measure
- Visualize success
  - Draft your final manuscript figures before you start
- Methods and measures will evolve over time

https://www.hospitalmedicine.org/Web/Quality___Innovation/Quality_101/Establishing_Measures/Key_Principles.aspx

Establish the measures

- Based on interventions and measures, create Specific Aims / Targets
  - "We will [increase / decrease] the [amount / percentage] of [measure] from [baseline] to [goal] by [date]."

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Establishing the measures:
Data sources and tools

- **Jeffords Institute for Quality**
  - Pam Stevens, RN, Quality Consultant
  - Allison Kaigle Holm, PhD, Sr. Research Specialist
  - Statit dashboard application

- **Business Intelligence**
  - Matt Griffin, Director of Business Intelligence

- **Pharmacy**
  - PYXIS, prescription data
  - Discuss with the pharmacist in your area (e.g., Amanda Kennedy in rheum, derm)

- **OneCare Vermont***
  - Leah Fullem, Director of Accountable Care Analytics
  - *Federal regs currently preclude Medicare Shared Savings Program data from research use

- **Chart review** – REDCap (Research Electronic Data Capture)
  - REDCap: electronic collection and management of research and clinical trial data
  - Diantha Howard, M.S., Informatics Core Manager

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Get approvals & buy-in

- Jeffords Institute
  - Research Resource Request: https://www.uvmhealth.org/medcenter/Pages/Clinical-Trials-and-Research/Research-at-The-University-of-Vermont/Research-Resource-Request.aspx
- IRB
  - Complete tutorial
  - Complete application:
    - http://www.uvm.edu/irb/
    - Most true QI projects will receive "Not Research" determination
- PRISM
  - PRISM Enhancement Request: http://intranet.fletcherallen.org/Computer_Systems/PRISM/Pages/Issues_and_Enhancements.aspx

Research vs QI

	Measurement for Research	Measurement for Learning and Process Improvement
Purpose	To discover new knowledge	To bring new knowledge into daily practice
Tests	One large "blind" test	Many sequential, observable tests
Biases	Control for as many biases as possible	Stabilize the biases from test to test
Data	Gather as much data as possible, "just in case"	Gather "just enough" data to learn and complete another cycle
Duration	Can take long periods of time to obtain results	"Small tests of significant changes" accelerates the rate of improvement

http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementEstablishingMeasures.aspx

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Implement (and Implement again)

Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in improvement?

ACT — PLAN — STUDY — DO

- Prioritize interventions
- Conduct iterative PDSA cycles

http://www.hrsa.gov/quality/toolbox/metho dology/testingforimprovement/part2.html (developed by Associates in Healthcare Improvement)

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Implement (and Implement again)

- Measure impact of each intervention
  - e.g., control charts
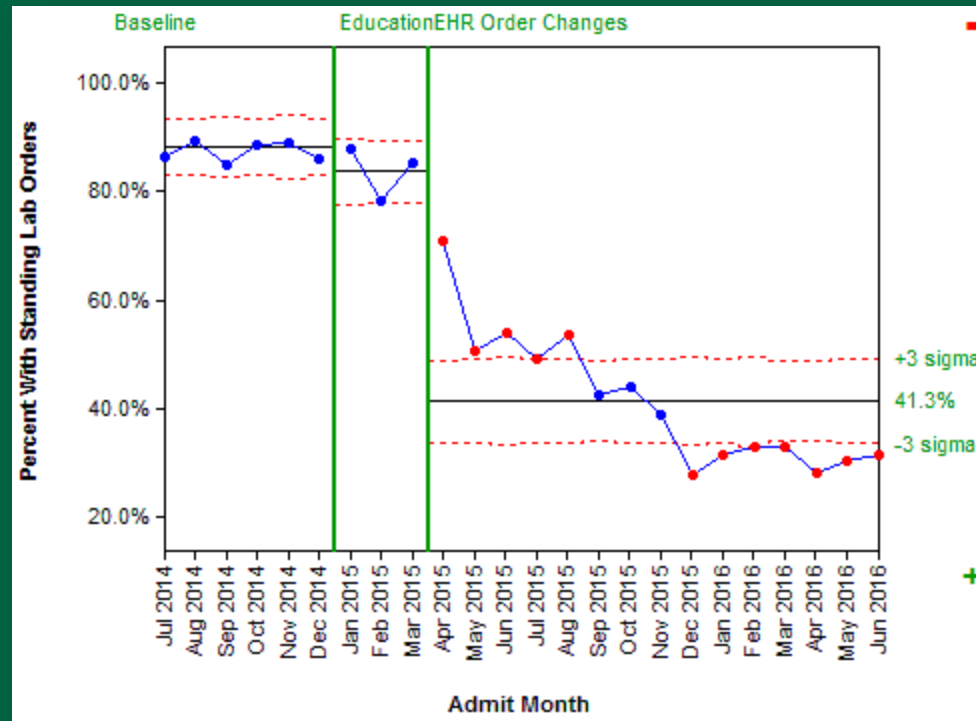
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Analyze the data

- Engage biostatistics early in project, if possible
  - Assist with project / research design
  - Specify preferred data formatting
- Ensure data security
  - No PHI on personal computers, e-mail, thumb drives
- Real time reports to assess impact of intervention
- Summary / statistical analyses to assess impact of project

Analyze the data: Resources

- Stats software packages at UVM
  - http://www.uvm.edu/it/software/
  - JMP, JMP Pro, SPSS
- Statistician through your project / PI
- Biostatistics Consultation Program in Dept of Medicine
  - http://www.med.uvm.edu/medicine/biostatistical-consultation-program
  - *Application cycle currently closed*
- Statistical Consulting Clinic at UVM
  - http://library.uvm.edu/services/statistics/newclinic.php
  - "Free service that offers statistical consultation and advice to the students and faculty"

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Report the findings

- **Internal**
  - Regular feedback & updates to the participants
  - Periodic reports to committees and leadership
  - UVMHN Quality Forum & Quality Symposium
- **External**
  - Share your work!
  - Abstracts & posters at professional society meetings
  - Tiered list of journals:
    - http://www.ihi.org/education/IHIOpenSchool/resources/Pages/WhereToSubmitYourWritingQIFriendlyPeerReviewedJournals.aspx
  - SQUIRE – "guidelines for reporting new knowledge about how to improve healthcare"
    - http://www.squire-statement.org/index.cfm?fuseaction=page.viewPage&pageID=471&nodeID=1

Gratuitous Advice

- Be passionate…and realistic
  - Scope the project
- Identify a mentor
- Project manage
  - Set goals, milestones and timelines
- Check out the Dept of Medicine website:
  - http://www.med.uvm.edu/medicine/subspecialty/qualityinpc
- I'm here to help

Thank you