QI Training

Internal Medicine Residency Program

August 21, 2015

Learning Objectives

By the end of this workshop, participants will be able to:

- List 6 key domains of healthcare quality
- Select ideal quality problems as targets for QI
- Apply basic QI skills, including audit, process tools and improvement methodology
- Distinguish between measurement for QI as compared to evaluative research
- Work collaboratively with other healthcare providers to carry out a QI initiative

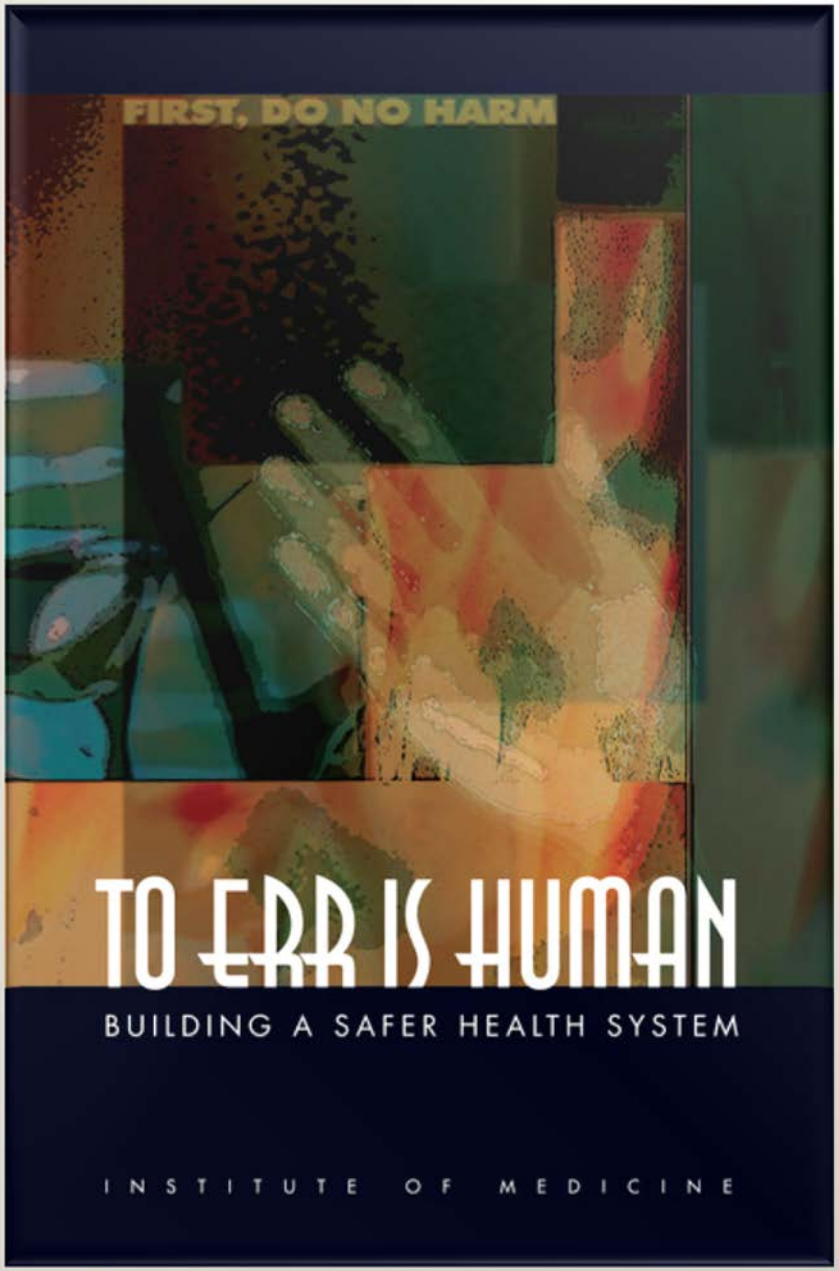
Workshop #1

- Introduction to Quality Improvement
- DMAIC Methodology
- Measurement in Quality Improvement
- Sample Size/ Pragmatic Audit
- Process Tools (Process Mapping, Cause-and-Effect Diagrams)
- Linking solutions to theories

Workshop #2

- Team QI Project Updates and Feedback
- DMAIC Methodology
- Trial, then Implement
- Displaying your Data
- How will you Sustain your Improvements?

What is Quality?

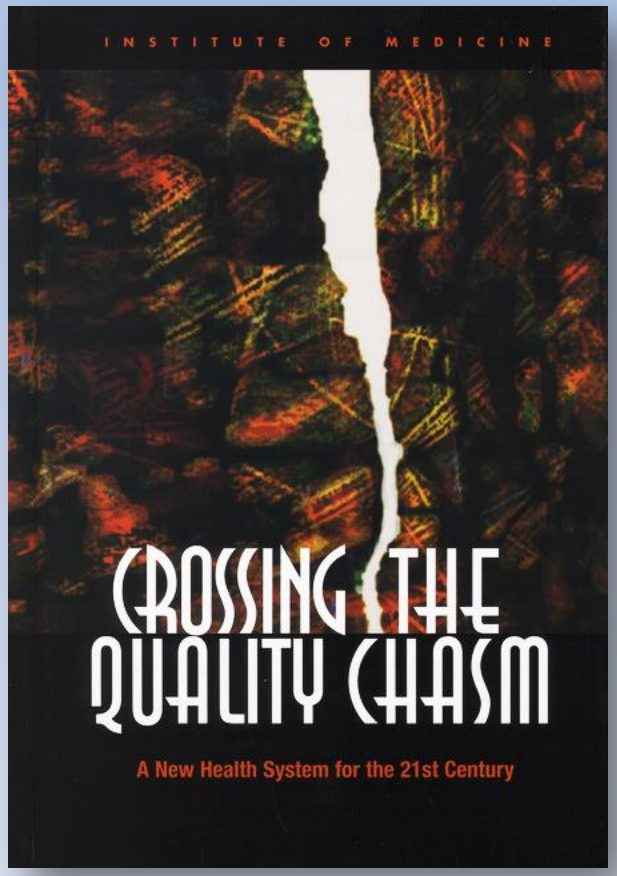

FIRST, DO NO HARM
TO ERR IS HUMAN
BUILDING A SAFER HEALTH SYSTEM
INSTITUTE OF MEDICINE

Quality Improvement is:

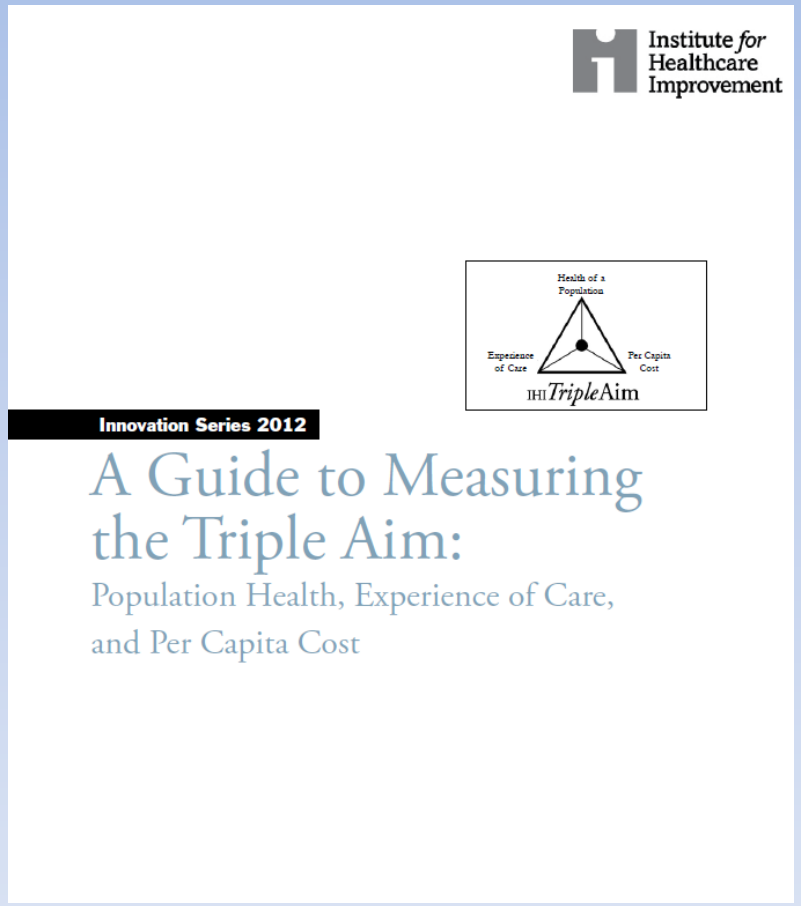
Providing the right care,
to the right patient,
at the right time

Crossing the Quality Chasm

- Safe
- Timely
- Efficient
- Effective
- Equitable
- Patient-centered



Quality Improvement is:



Providing the right care,
to the right patient,
at the right time,
at the right cost

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Get out for some fresh air. Find your closest green space. [Enter nearest intersection] Use current location

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CBC News Posted: Aug 12, 2013 1:02 PM AT | Last Updated: Aug 13, 2013 5:50 AM AT

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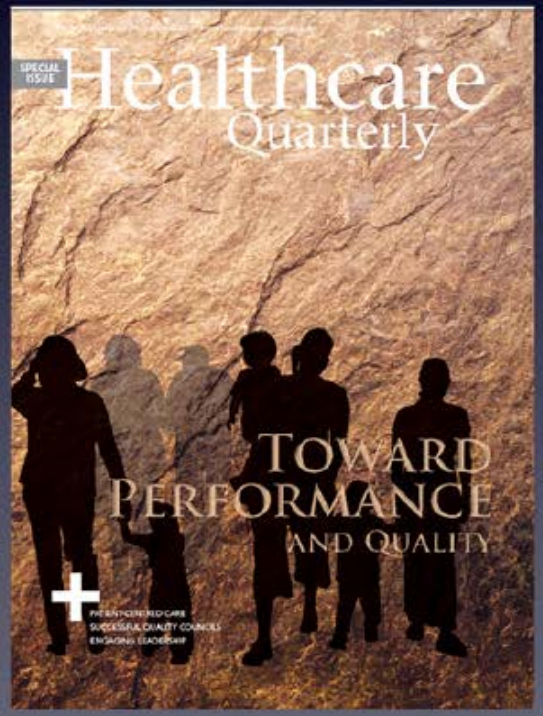
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 DECEMBER 28, 2006 VOL. 355 NO. 26

An Intervention to Decrease Catheter-Related Bloodstream Infections in the ICU

Peter Pronovost, M.D., Ph.D., Dale Needham, M.D., Ph.D., Sean Berenholtz, M.D., David Sinopoli, M.P.H., M.B.A., Haitao Chu, M.D., Ph.D., Sara Cosgrove, M.D., Bryan Sexton, Ph.D., Robert Hyzy, M.D., Robert Welsh, M.D., Gary Roth, M.D., Joseph Bander, M.D., John Kepros, M.D., and Christine Goeschel, R.N., M.P.A.



111TH CONGRESS
2d Session

LEGISLATIVE COUNSEL

PRINT 111–1

COMPILATION OF PATIENT PROTECTION AND AFFORDABLE CARE ACT

[As Amended Through May 1, 2010]

INCLUDING

PATIENT PROTECTION AND AFFORDABLE CARE ACT
HEALTH-RELATED PORTIONS OF THE HEALTH CARE AND EDUCATION RECONCILIATION ACT OF 2010

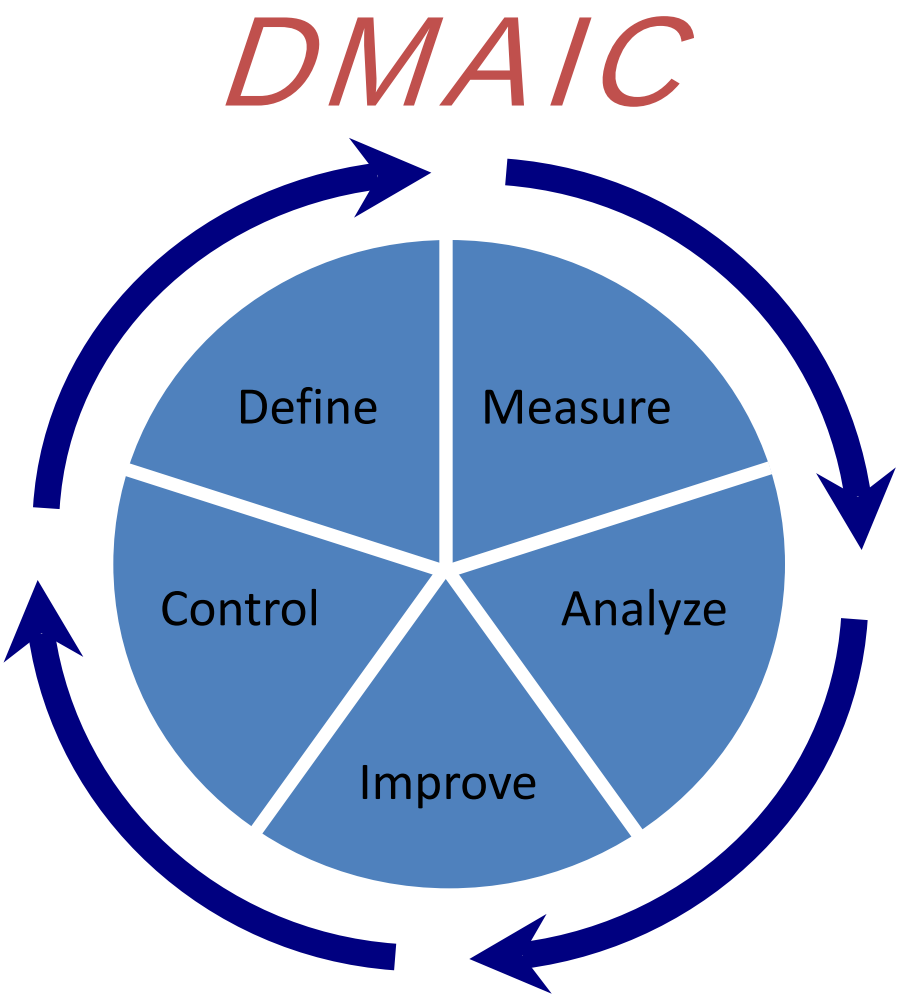
PREPARED BY THE
Office of the Legislative Counsel
FOR THE USE OF THE
U.S. HOUSE OF REPRESENTATIVES

MAY 2010

Selection Considerations

- Frequency and severity of the quality problem
- Is the problem under your direct control?
- Feasibility (Amount of re-organization required, associated costs)
- Possibility of unintended consequences
- Synergy with other improvement activities at the hospital/clinic

A Framework for Improvement



Why do I need a "framework"?

- A robust framework such as DMAIC is applicable to projects large or small, simple or complex
- Provides a structured approach to improvement
  - Identify underlying root causes
  - Offer methods for improvement

However…

- DMAIC is not a "cure-all"
  - Facilitates improvement of processes not meeting expectation
  - Usually not suitable for designing entirely new process

D (Define)

Define the Problem

- Verify that it exists
- Verify that it is important to customers
- Verify that improvement is reasonable

Define the Customer(s)

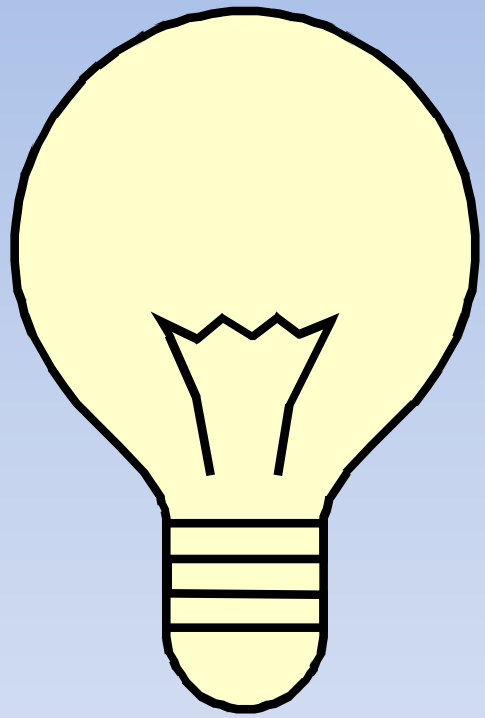
- Internal and external

Define Project Scope

- Start and end point of process you hope to improve

Define Team Roles/Expectations

- Team leader
- Team facilitator



M (Measure)

Document the Design of Current Process

- Create a detailed process or value stream map
- Identify process inputs, outputs, and sources of variation

Measure Current Performance (establish baseline)

- Create a detailed process or value stream map
- Collect data and establish baseline performance
- Analyze current process capability

Make Quick Hit Improvements

- If there is low hanging fruit – fix it right away!

A (Analyze)

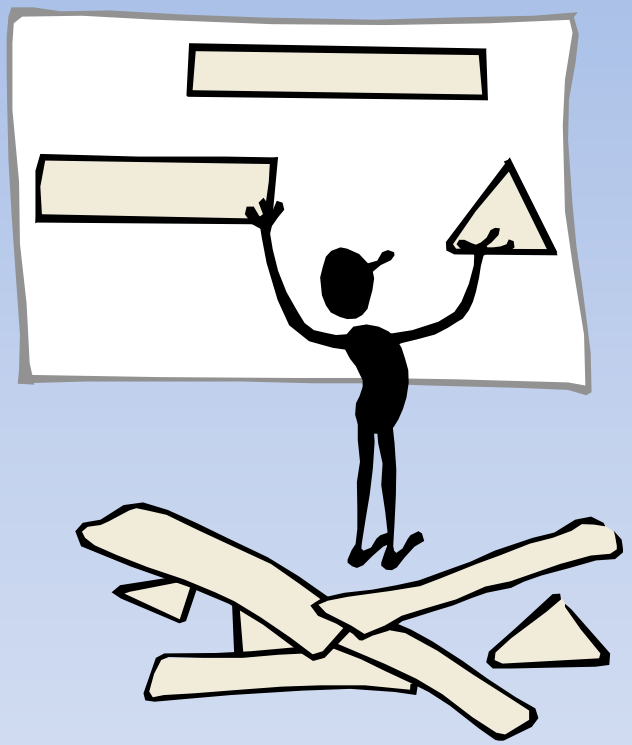
Perform Value Analysis

- Value adding steps
- Non-value adding steps
- Non-value adding but necessary steps

Identify bottlenecks, constraints, and “rework” points

- Generate theories to explain causes
- Prioritize focus areas for improvement

I (Improve)



Develop potential solutions

- Create “future state” process maps
- Evaluate, select, and finalize best options

Develop and implement process trials

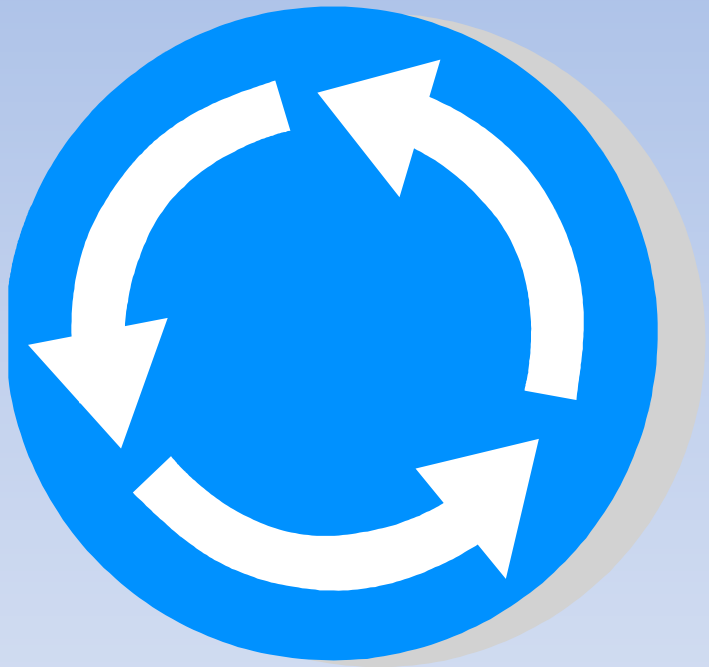
- Test new processes on a smaller scale before broader implementation
- Measure for success as defined by project goals

Create plan for larger scale implementation of new process(es)

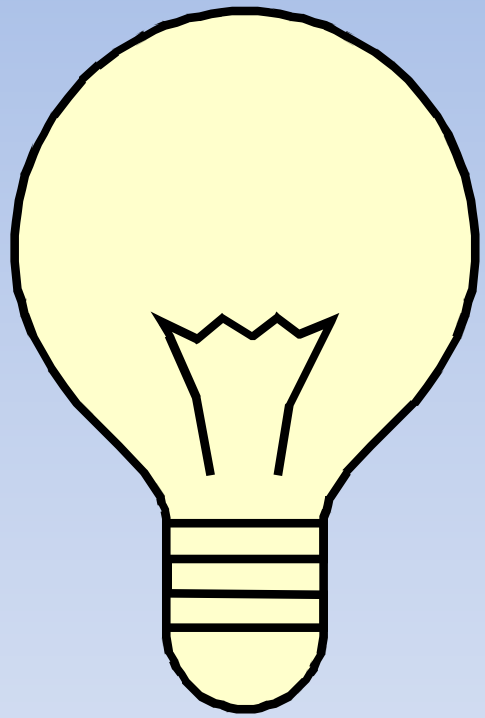
C (Control)

Make new processes permanent – don’t revert back to the “old way”!

- Pre and post project success metrics
- Documented standard operating procedures
  - Process maps and instructions
  - Documentation of training
  - Visual process controls
- System for monitoring and auditing process
- Final documentation including lessons learned and recommendations for additional opportunities



D (Define)



Project Aim

- What are you trying to accomplish?
- Aim statement can help to focus your project
- Ensure that all team members are on the same page

Writing an Aim Statement

Should answer three questions:

- What?
- By how much?
- By when?

A “so-so” aim statement

- We aim to reduce rates of ventilator-acquired pneumonia in the ICU

A “better” aim statement

- We aim to reduce rates of ventilator-acquired pneumonia in the ICU by 20%, by May 1, 2015

Think SMART

- Specific
- Measureable
- Achievable
- Relevant
- Time-Bound

Interactive Exercise #1

- Write an aim statement for your project

Improving

I’m Proving

Research vs. Improvement

	Research	Improvement
Aim	Creating new knowledge	Improving care
Context	Ideal conditions	Real-world conditions
Sample Size	Just in case data	Just enough data

M (Measure)

Types of Measures

- Outcome measures
- Process measures
- Balancing measures

Measurement Example

Aim: Increase the proportion of patients with diabetes who have a HbA1c , 7% by 50% in 12 months

Measure	Example
Outcome	% of patients who develop micro vascular complications (e.g. proteinuria)
Process	% of patients hat had their HbA1c level checked
Balancing	% of patients with hypoglycemic episodes

Interactive Exercise #2

For your project, try and come up with:

- One outcome measure
- One process measure
- One balancing measure

How big a sample do you need?

- Quality Improvement = Just enough …
- Research = Just in case ...

How big a sample?

- You want to assess your DVT prophylaxis rates on your clinical service
- You believe that your service is performing well if 85% of your patients receive appropriate DVT prophylaxis
- You decide to audit your practice

Sample Size

- You sample on one day
- Your clinical service admitted 10 patients
- 5 of 10 (50%) patients were ordered appropriate DVT prophylaxis
- How likely is it that your actual DVT prophylaxis rates is 85% or better?

$$p \pm 1.96 \times \sqrt{\frac{p(1-p)}{n}}$$

Another way to look at it

Sample Size	Audit Result	95% confidence interval
10	50%	19 to 81%
20	50%	28 to 72%
40	50%	35 to 65%
80	50%	39 to 61%
160	50%	42 to 58%
320	50%	45 to 55%
640	50%	45 to 54%

Sample Size

- You sample the next 10 patients who are scheduled in your HIV clinic
- 8 of 10 (80%) patients were screened for diabetes in the past year
- How likely is it that your actual diabetes screening rate is worse than 50% ?

Another way to look at it

Sample Size	Audit Result	95% confidence interval
10	80%	55 to 100%
20	80%	62 to 98%
40	80%	68 to 92%
80	80%	71 to 89%
160	80%	73 to 86%
320	80%	76 to 84%
640	80%	77 to 83%

Take care of your small sample

Take care of your small sample

Consider the following:

- **Inclusion / exclusion criteria**
  (Keep accurate reject log)
- **Sample strategy**
  (Consecutive eligible or random patients)
- **Operational definitions for measures**
  (Don’t change your measurement technique)
- **Ensure complete follow up**

Interactive Exercise #3

- What and How will you measure?

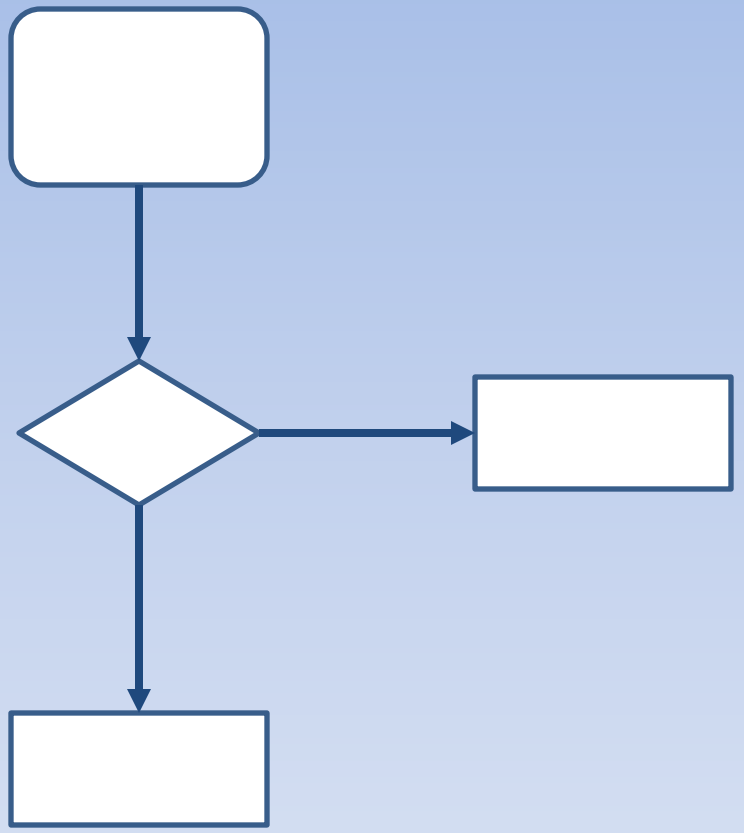
BREAK

Process Tools

Investigative QI Tools

- Process Mapping
- Cause and Effect analysis

Process mapping

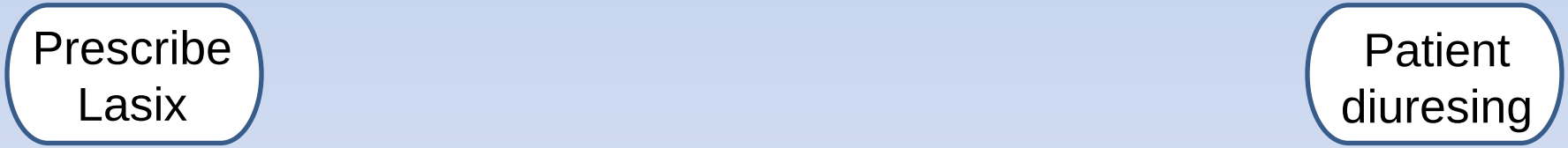


Visually captures how various activities relate to one another in a healthcare process.

Can be used to define an existing process or develop a new one.

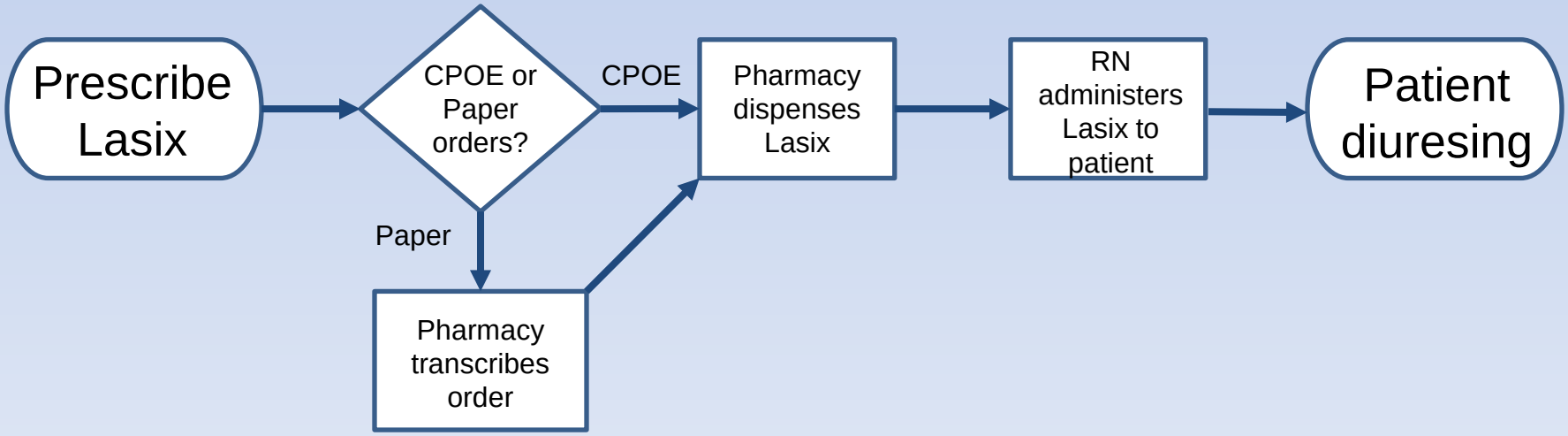
Constructing a Process Map

1. Establish the start and the end of the process and use an oval terminal symbol to depict these.



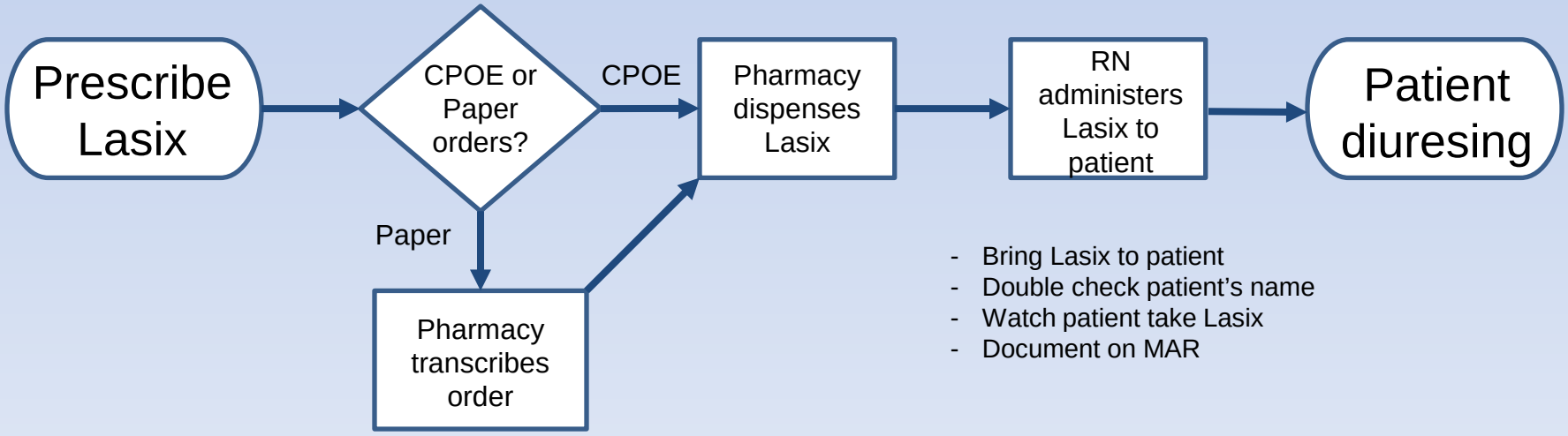
Constructing a Process Map

2. Start with major “high-level” steps in the process. Use **rectangles** to represent actions and **diamonds** to represent decisions.



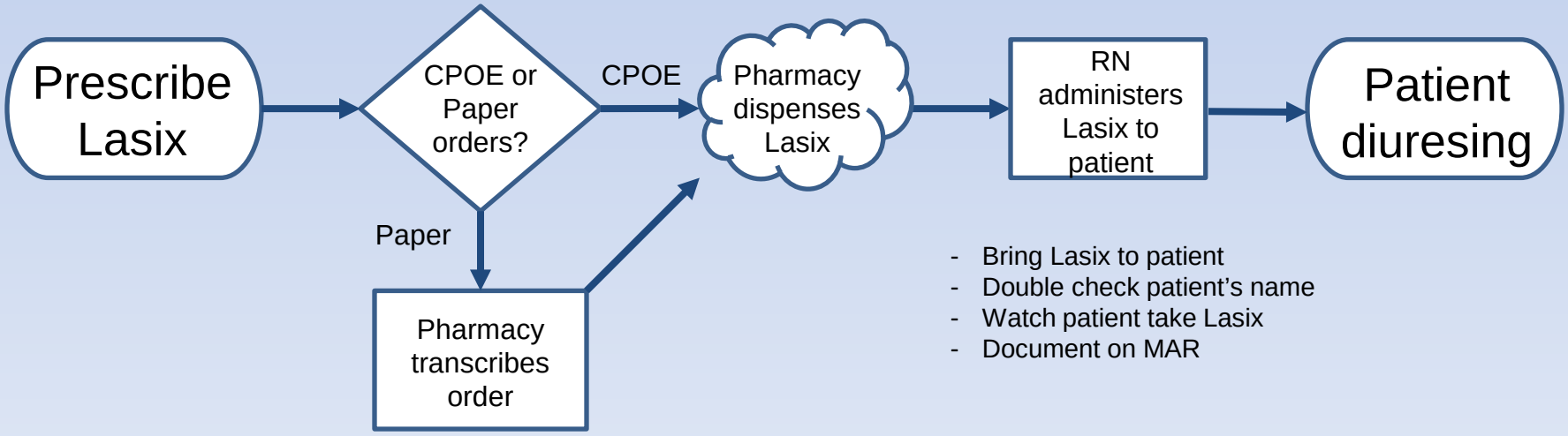
Constructing a Process Map

3. Add more detail about each major step of the process – can be mapped further to better understand specific step in a process.

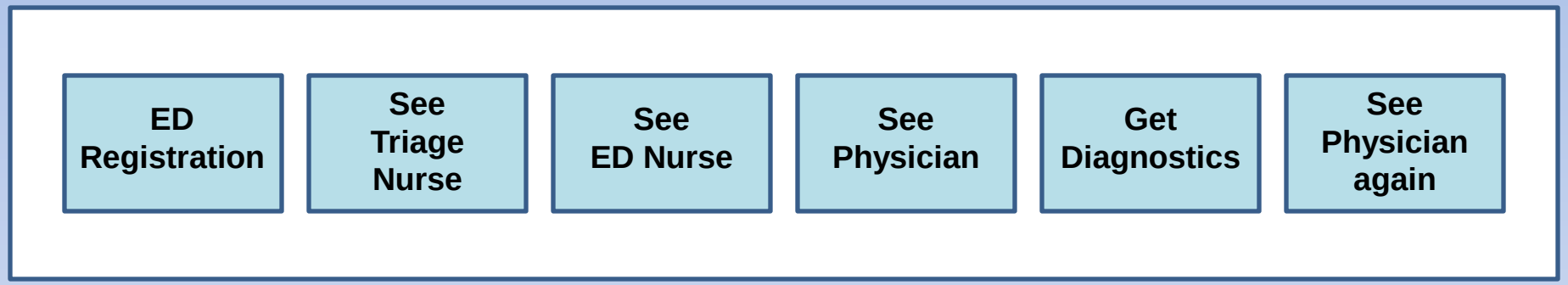


Constructing a Process Map

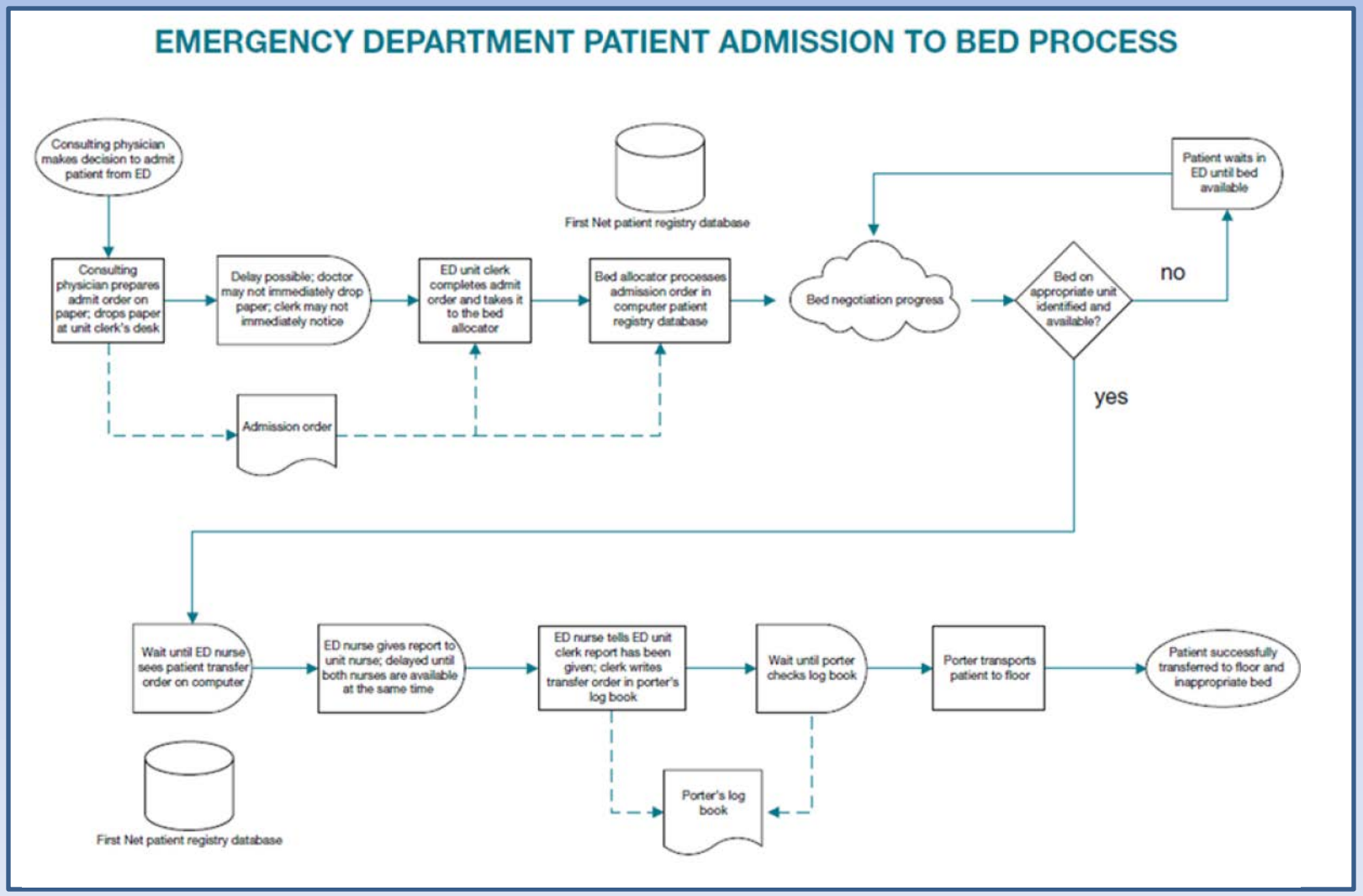
4. If you are unclear about a specific step, you can use a **cloud** as a placeholder and re-visit when more information is available.



High Level Process Map



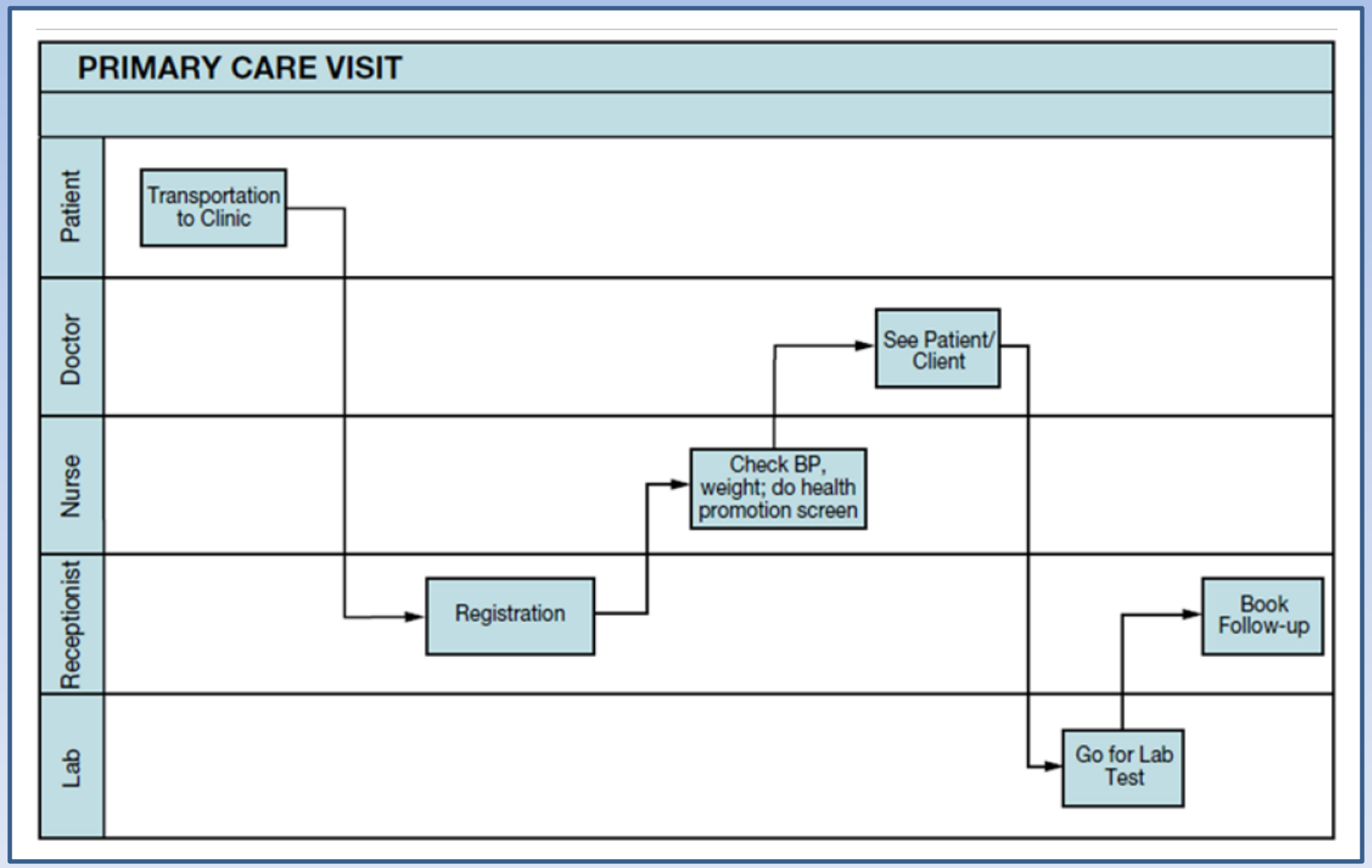
Detailed Process Map



High-Low Process Map

ED Registration	See Triage Nurse	See ED Nurse	See Physician	Get Diagnostics	See Physician again
• Enter personal information • Verify OHIP Status • Send to triage • Etc.	• Brief history • Check vitals • Send patient to waiting room	• History • Send for lab or X-ray if obvious	• History or Physical exam • Order tests	• Get lab or X-ray	• Final Diagnosis • Prescribe treatment

Swim Lane Process Map



Process mapping

Ways to make use of the information from a process map:

- Where are the bottlenecks?
- Where is there variation in practice?
- Are there opportunities to standardize?
- Can steps or handoff be eliminated?
- Where are the rework points?

Interactive Exercise #4

- Select a key step in the process that relates to your quality problem and construct a *high level* process map
- Include sufficient detail so that you have a clear understanding of the critical aspects of the process that involves your quality problem

A (Analyze)

Ishikawa (fishbone) diagram

Brainstorming tool used to organize the potential causes of a specific quality problem.

Also known as a cause and effect diagram.

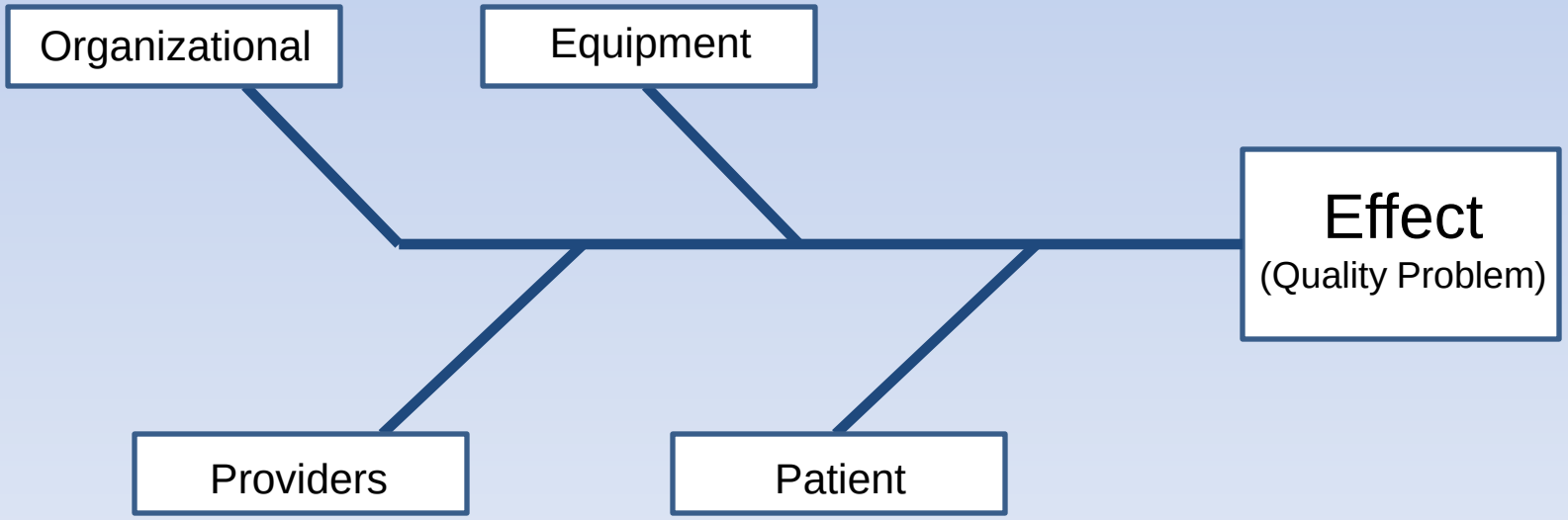
Ishikawa diagram

1. Write the quality problem in a box at the right of the diagram (the “**effect**”).

Effect
(Quality Problem)

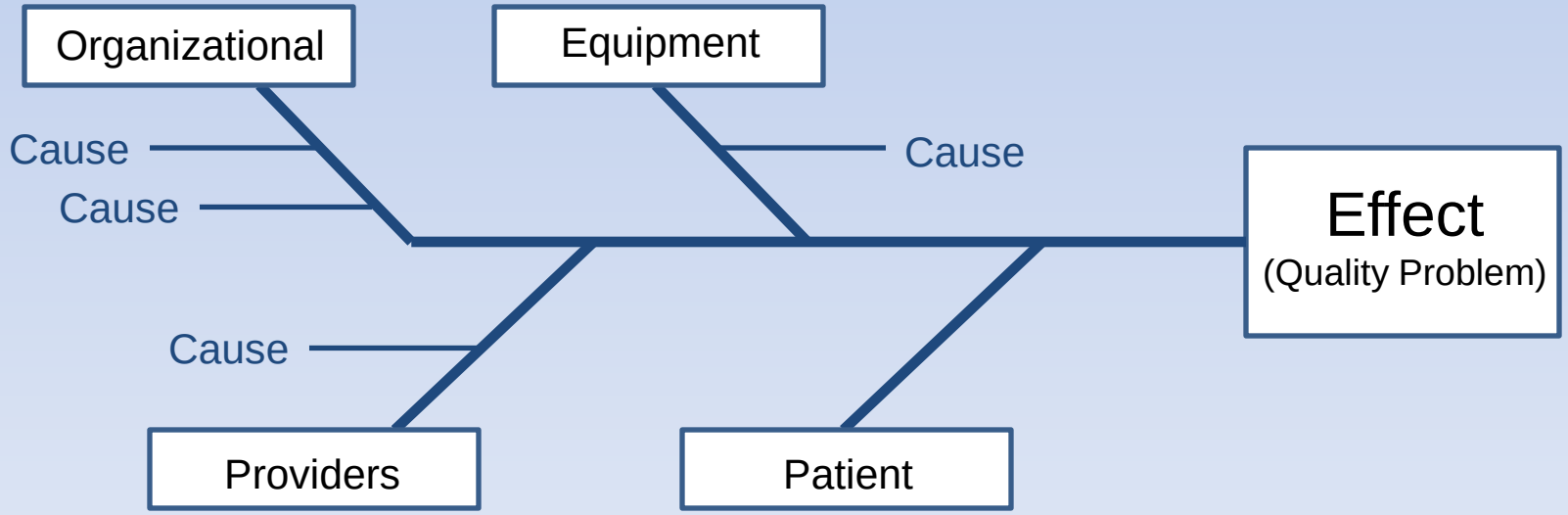
Ishikawa diagram

2. Draw a central line, and from this line, diagonal lines that represent the different **categories** of causes or contributing factors.

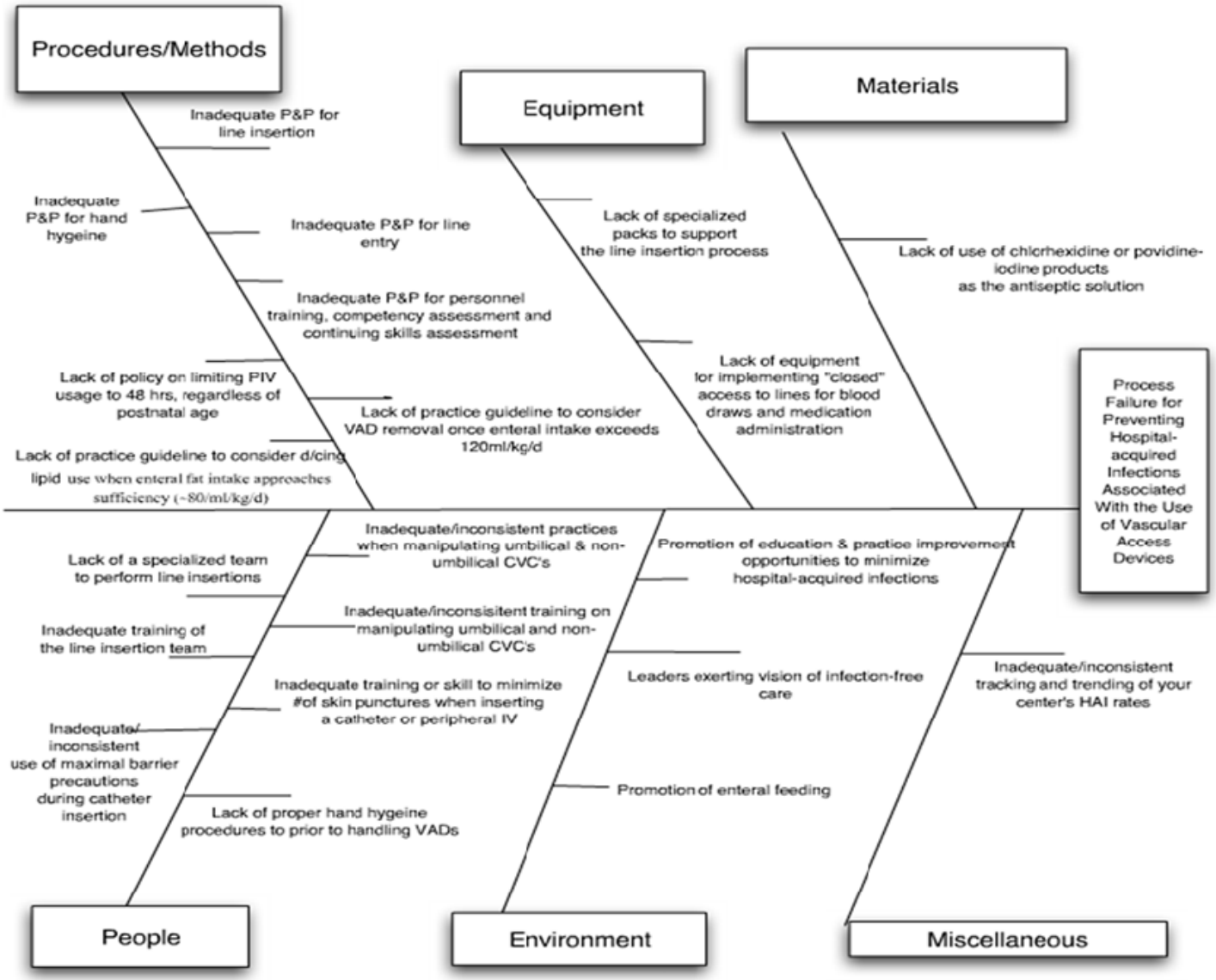


Ishikawa diagram

3. Identify different causes and categorize them under the most appropriate grouping.



Fishbone Diagram
Process Failure for Prevention of Hospital-Acquired Infection



Interactive Exercise #5

- Using the quality problem that you have decided to tackle, construct an Ishikawa diagram to identify a variety of contributing factors to your problem.

Mapping solution to problems

Generate a Theory

- It is important to generate a theory that ties your proposed solution with the problem that it aims to solve

Change concepts vs. change ideas

- **Change concept**: the general notion or approach to change
- **Change idea**: the specific idea or intervention you might implement in your practice, to lead an improvement

Example 1

- **Problem**: High no-show rate in clinic
- **Theory**: Patients forgetting their appointment date and time
- **Change concept**: Reminders
- **Change ideas**:
  - Send the patients a reminder in the mail
  - Phone call reminder the day before

Example 2

- **Problem**: Inpatients mistakenly received concentrated KCl IV solutions
- **Theory**: RNs are taking wrong IV solution bags from medication store cabinets on the unit
- **Change concept**: Forcing functions
- **Change ideas**:
  - Remove concentrated KCl bags from the unit
  - RNs are forced to ask pharmacy to bring up KCl bags when needed

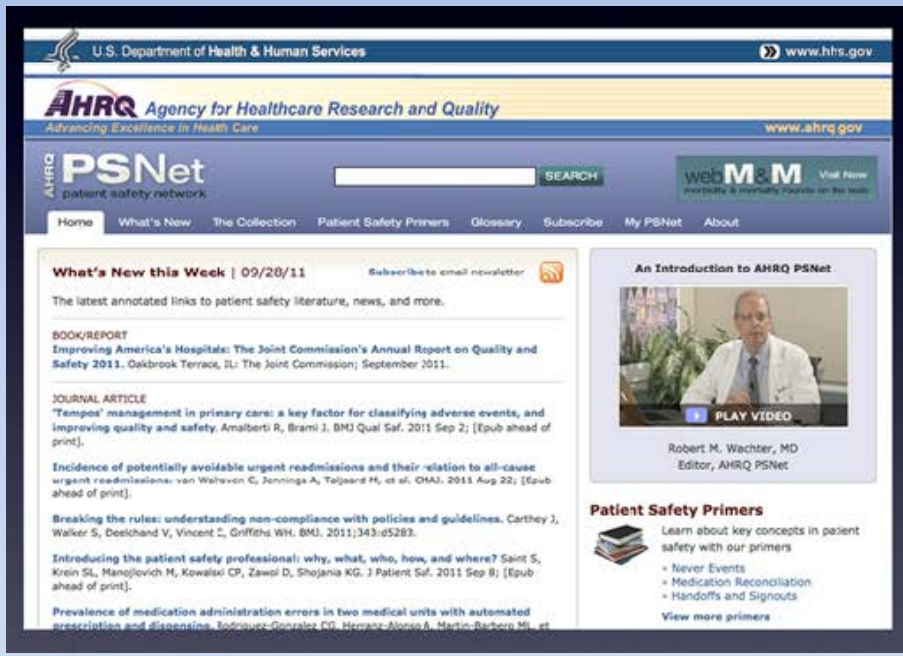
Example 3

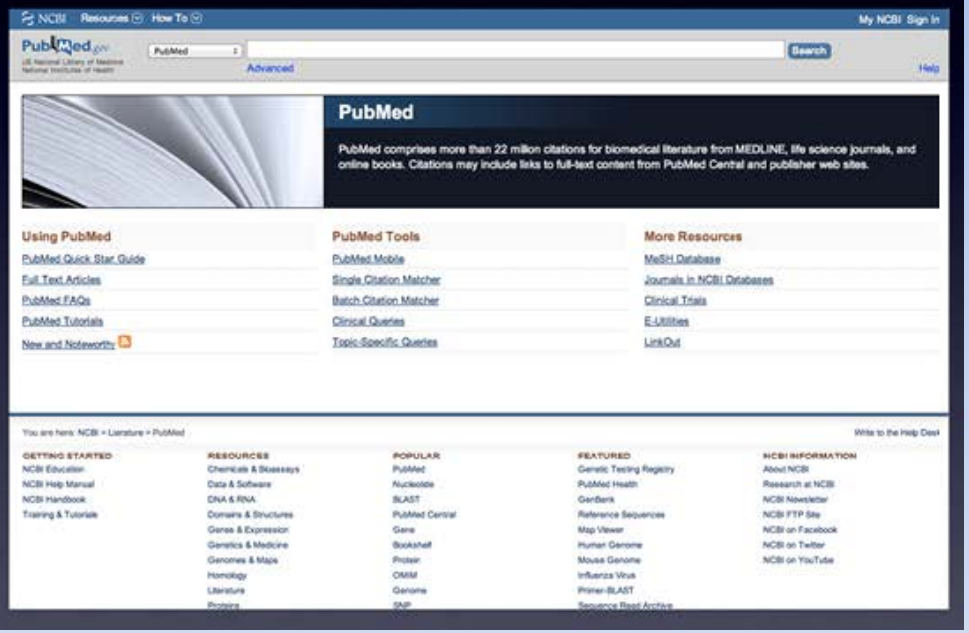
- **Problem**: Excessive ED wait times
- **Theory**: Patients of moderate acuity are inappropriately occupying ED beds
- **Change concept**: Re-organize the work environment and improve workflow
- **Change ideas**:
  - Create a Rapid Assessment Zone (RAZ) to divert less critical patients

Some common change concepts

- **Eliminate waste** – remove unnecessary steps
- **Error proofing** – forcing functions, standardization, reminders
- **Manage time** – reduce delays, wait times

Where to find solutions?





www.psnet.ahrq.gov

www.pubmed.org

Literature Review

Interactive Exercise #6

- Consider your cause and effect analysis and process map and identify one important contributing cause to your QI problem
- For this problem:

    1. Articulate a theory
    2. Apply a change concept
    3. Come up with change ideas

Summary

- Target quality problems that are important, feasible, and that are mostly under your direct control
- Investigate your quality problems thoroughly (Data, Fishbone, Process Map)
- Articulating a theory can help identify solutions that map to your quality problem

Next steps – Project Milestones

Month	Tasks
Aug/Sept	• Choose project/Write aim statement • Define project measures • Submit IRB
Sept/Oct	• Conduct a small audit • Establish baseline • Understand current state
Oct/Nov	• Process Mapping • Cause-and-Effect Analysis
Dec	• Identify potential theories/solutions to test in pilots