Topic 7

Using quality-improvement methods to improve care
The objectives of this topic are to:

- Describe the basic principles of quality improvement
- Introduce students to the methods and tools for improving the quality of health care
Knowledge requirements

- The science of improvement
- Change concepts
- Improvement principles
- Role of measurement in improvement
Performance requirement

- Identify the opportunities for using safety science to analyse errors
- Appreciate the range of improvement methods available for reducing harm to patients
- Apply at least one improvement tool in a particular clinical context
- Participate in an improvement activity (if possible)
The science of improvement

- Appreciation of a system
- Understanding of variation
- Theory of knowledge
- Psychology

Source: Langley GL
Change concepts ...

... are general ideas, with proven merit and sound scientific or logical foundation that can stimulate specific ideas for changes that lead to improvement.

Source: Nolan TW, 1996
The model for improvement

What are we trying to accomplish?

How we will know that a change is an improvement?

What change can we make that will result in an improvement?

The quality improvement model: the PDSA cycle

- 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 an improvement?
**The PDSA cycle**

- **ACT**: Determines what changes are to be made
- **PLAN**: Change or test
- **STUDY**: Summarizes what was learned
- **DO**: Carry out the plan

*Source: Langley GL, Nolan, KM, Nolan, TW, Norman, CL & Provost, LP 1999*
# The Institute for Healthcare Improvement (IHI): different measures

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Measurement for research</th>
<th>Measurement for learning and process improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
<td>One large &quot;blind&quot; test</td>
<td>Many sequential, observable tests</td>
</tr>
<tr>
<td>Biases</td>
<td>Control for as many biases as possible</td>
<td>Stabilize the biases from test to test</td>
</tr>
<tr>
<td>Data</td>
<td>Gather as much data as possible, &quot;just in case&quot;</td>
<td>Gather &quot;just enough&quot; data to learn and complete another cycle</td>
</tr>
<tr>
<td>Duration</td>
<td>Can take long periods of time to obtain results</td>
<td>&quot;Small tests of significant changes&quot; accelerate the rate of improvement</td>
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Three types of measures

- Outcome measures
- Process measures
- Balancing measures
Three examples of improvement methods

- Clinical Practice Improvement methodology (CPI)
- Root Cause Analysis (RCA)
- Failure Mode Effect Analysis (FMEA)
The improvement process


SPC – statistical process control
Identify appropriate interventions
Implement changes identified in the diagnostic phase
Undertake one or more PDSA cycles

How to use the PDSA Cycle

- Use 'plan-do-study-act' cycles to conduct small-scale tests of change
  - Plan a change
  - Do it in a small test
  - Study its effects
  - Act on what learned

- Team uses and links small PDSA cycles for broader implementation

PDSA Cycles - single test

变化导致改进

Hunches, theories and ideas

PDSA cycle – multiple tests

Impact and implementation phase

1. Measure impact of changes/interventions
2. Record the results
3. Revise the interventions
4. Monitor impact

Impact and implementation phase

- Annotated run chart
- SPC charts
- Other graphs

NSW Department of Health (2002). Easy Guide to Clinical Practice Improvement
Sustaining and improvement phase

Once an intervention has been introduced, the intervention and any improvements need to be sustained.

This may involve:
- **Standardization** of existing systems and processes
- **Documentation** of policies, procedures, protocols and guidelines
- **Measurement** and review of interventions to ensure that change becomes past of “standard” practice
- **Training** and education of staff

_S sustenance phase

_Sustain the gains

- Standardization
- Documentation
- Measurement
- Training

Flowchart of process

Example of a flow chart for a project titled: Accelerated Recovery Colectomy Surgery (ARCS)
North Coast Area Health Service
Australia

Something amiss

Visit to general practitioner

Investigations

Referral to surgeon

Referral to hospital

Hospital admission

Return to life

Post-anaesthetic care

Operating theatre

Pre-op ward

Admitted to hospital

Preoperative clinic

Admissions office

Surgical ward

Allied health

Surgical team

Pain team

Discharge planner

Community health/Peripheral hospital

Home

Return to life
Cause and effect diagram

Social issues
- home support
- little family support

Staff attitudes
- length of stay
- mobility of patient
- pain control
- nutrition
- expect longer stay
- little knowledge of support services
- locus of control

Complications
- poor pain control
- wound complications
- weak/malnourished
- infection
- general practitioner
- community health
- family
- colon-care nurse

Procedure
- Accelerated Recovery Colectomy Surgery (ARCS), North Coast Area Health Service, Australia

Patient perception
- nil by mouth
- mobilization
- surgery
- pain control

Post discharge support
- Adequate nutrition of patient
- nil by mouth
- colonization

Accelerated Recovery Colectomy Surgery (ARCS), North Coast Area Health Service, Australia
Pareto chart

Average Length of Stay (days) per month

Made change here
Strategies for sustaining improvement

- Document and report each patient Length of Stay (LOS)
- Measure and calculate monthly average LOS
- Place run chart in operating theatre, update run chart monthly
- Bimonthly team meetings to report positives and negatives
- Continuously refine the clinical pathways
- Report outcomes to clinical governance unit
- Spread - all surgeons
  - left hemicolecotomy
  - all colectomy surgery
  - throughout North Coast Area Health Service