Measurement for Improvement Workshop

Tuesday 14 November 2017
10:00am – 1:00pm

Presenters:
Carl Walker – Clinical Audit Manager, University Hospitals of Leicester NHS Trust
Richard Lea - Patient Safety Information Analyst, Patient Safety Team, University Hospitals of Leicester NHS Trust
Introduction to LIIPS

LIIPS is a collaboration between academia and the NHS. Our aim is to connect and share expertise, knowledge and support in service improvement across Leicestershire.
Programme

Introductions
Learning objectives
Presentation
Group discussions
Feedback
We are doing this session with leaders because.....

- Measurement for improvement is about delivering high quality patient care
- If you do not measure you do not improve
- But....data does not create improvement
- Vision, idea & execution create improvement
- .....so leaders need to understand the why/what and how of measurement
Learning objectives: K

Knowledge

• The importance of measurement – why, what
• Difference in measurement for: improvement, accountability and research
• Variation – common and special cause
Learning objectives: S

Skills

• How to measure (the question, the sample)?
• How to interpret the data (interpret variation and system stability)?
Learning objectives: A

Attitude

• Desire to understand by asking the right questions
• The need for the right data to improve, judge or research
• Must measure to improve
• Awareness of personal areas of strength and further development on data and measurement
Quality Improvement

“QI is better patient experience and outcomes achieved through changing provider behaviour and organisation through using a systematic change method and strategy”

Ovreveit
Leadership for QI

• Improvement knowledge and skills
• Managing the human dimensions of change
• Building and nurturing an improvement culture
• Working with groups
• Evaluating improvement
• Leading improvement
Adding Value:
- Contextualized
- Categorised
- Calculated
- Corrected
- Condensed

Quantitative
- Cost
- Speed
- Capacity
- Qualitative
- Timeliness
- Relevance
- Clarity

Data
Discrete
Objective facts
About an event

Information
A message meant to change receiver’s perception

Quantitative
- Connectivity
- Transactions
Qualitative
- Informativeness
- Usefulness

Knowledge
Experience values, context applied to a message

Quantitative
- Contractual
- Evaluative
Qualitative
- Inclusive
- Informative

Wisdom
Collective application of knowledge in action

Experience
- Grounded truth
- Complexity
- Judgement
- Heuristics
- Values & Beliefs

Adding Value:
- Action-orientated
- Measurable efficiencies
- Wiser decisions

Adding Value:
- Comparison
- Consequence
- Connections
- Conversations

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http://betterpractice.org/index.php/model-6-data-informationknowledge-wisdom/ by Sarah Fraser
3 measurements for:

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Improvement</th>
<th>Accountability</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim:</td>
<td>Improvement of care</td>
<td>Comparison, choice, reassurance, spur for change</td>
<td>New knowledge</td>
</tr>
<tr>
<td>Methods:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test observability:</td>
<td>Test observable</td>
<td>No test, evaluate current performance</td>
<td>Test blinded</td>
</tr>
<tr>
<td>Bias:</td>
<td>Accept consistent bias</td>
<td>Measure and adjust to reduce bias</td>
<td>Design to eliminate bias</td>
</tr>
<tr>
<td>Sample size:</td>
<td>“Just enough” data, small sequential samples</td>
<td>Obtain 100% of available, relevant, data</td>
<td>Just in case” data</td>
</tr>
<tr>
<td>Flexibility of hypothesis:</td>
<td>Hypothesis flexible, changes as learning takes place</td>
<td>No hypothesis</td>
<td>Fixed hypothesis</td>
</tr>
<tr>
<td>Testing strategy:</td>
<td>Sequential tests</td>
<td>No tests</td>
<td>One large test</td>
</tr>
<tr>
<td>Confidentiality of data:</td>
<td>Data used only by those involved in the improvement</td>
<td>Data available for public consumption</td>
<td>Research subjects' identities protected</td>
</tr>
</tbody>
</table>

Source: IHI
3 types of measures

- Outcome Measures: Voice of the customer or patient. How is the system performing? What is the result?

- Process Measures: Voice of the workings of the system. Are the parts/steps in the system performing as planned?

- Balancing Measures: Looking at a system from different directions/dimensions. What happened to the system as we improved the outcome and process measures? (e.g. unanticipated consequences, other factors influencing outcome, outcomes in other conditions that share processes)
3 questions for improvement

EVERY IMPROVEMENT IS A CHANGE

EVERY CHANGE IS NOT AN IMPROVEMENT

Source: IHI
Three Questions

Successful improvement efforts begin with a solid foundation to set up the project. The Model for Improvement poses three fundamental questions to guide the work:

1. **What are we trying to accomplish?** The team develops an aim statement that outlines what it is trying to accomplish, how much, and by when.
   
   *Example: By next February, we will cut our wait time in half for all 250 of our paediatric patients*

2. **How will we know if a change is an improvement?** The team identifies process and outcome measures it will collect over time to track and evaluate. Measures drawn from publications, reports or agreed within team.
   
   *Example: The average amount of time patients spend in the waiting room, patient satisfaction with waiting time, time to give antibiotics in sepsis*

3. **What changes can we make that will result in improvement?** The team brainstorms ideas and selects changes to test; these are piloted: 1, 5, 25, 125 etc.
   
   *Example: Use a new sign-in system or schedule new patients earlier in the morning*

The answers to the first two questions (aim and measures) should remain constant, while the ideas for potential changes will constantly evolve as the team repeatedly tests and improves on new ideas.
Establishing the Team’s Aims

Write a clear aim statement with specific numerical goals

• Make the targets for improvement unambiguous
• Make the targets achievable

Guidance

• Be clear on the boundaries
• Avoid aim drift (solving world hunger!)
• Be flexible and prepared to re-focus
• Include anything to keep the team focused
  (location, strategies, patient populations, office systems, previous efforts in this area, spread plans, etc.)
What are the Challenges of Measurement?

- Time consuming / added work
- Threatening, especially when it is used against you
- Making sure the data are accurate and consistent
- Too many indicators: not the appropriate indicators
- Using the data you collect to actually take action
- Manual versus automated data collection systems
- Results don’t match management’s view of reality
- The indicators were given to me by my manager and I had no input
- Ownership of the data collection process and the results
- Lack of training in data collection methods and analysis

Source: IHI
Measurement throughout the project cycle

Source: NHS improving Quality
13 Proven Health Benefits of Coffee (No. 1 is My Favorite)

By Kris Gunnars, BSc | 967,935 views

Coffee is actually very healthy.

It is loaded with antioxidants and beneficial nutrients that can improve your health.

The studies show that coffee drinkers have a much lower risk of several serious diseases.

Here are the top 13 evidence-based health benefits of coffee, that have been confirmed in
Group session
Develop a framework for measurement for LIIPS

The LIIPS Board has seen this grade A evidence to suggest that increased coffee drinking improves working lives – and has therefore asked us to develop a model for improvement to increase coffee drinking across the network

1. What are we trying to accomplish?
Each group to develop an aim statement that outlines what it is trying to accomplish, how much, and by when.

2. How will we know if a change is an improvement? Each group to identify process and outcome measures it will collect over time to track and evaluate.

3. What changes can we make that will result in improvement?
The answers to the first two questions (aim and measures) should remain constant, while the ideas for potential changes will constantly evolve as the team repeatedly tests and improves on new ideas.
What proportion of staff across LIIPS drink coffee in the morning?

• Can we use the poll we did earlier to answer this query?
• This is a poor measure for our framework
• Questioning introduces variation – needs to SMART (2 cups a day / strength / decaf)
• Data skew – providing coffee and then asking question
• Don’t be frightened of challenging what is requested
Improving systems

•Every system is perfectly designed to deliver the results it does........Paul Batalden
Was the change an Improvement?

1. By understanding the variation that lives within your data

2. By making good management decisions on this variation (i.e., don’t overreact to a special cause and don’t think that random movement of your data up and down is a signal of improvement
Variation......

“A fault in the interpretation of observations, seen everywhere, is to suppose that every event (defect, mistake, accident) is attributable to someone (usually the nearest at hand), or is related to some special event. The fact is that most troubles with service and production lie in the system. We shall speak of faults of the system as common causes of trouble, and faults from fleeting events as special causes.”

- Deming
If you do not understand variation......!

• Deny the data (It doesn’t fit my view of reality!)
• See trends where there are no trends
• Try to explain natural variation as special events
• Blame and give credit to people for things over which they have no control
• Distort the process that produced the data
• Kill the messenger!
“Plot the dots!!!!!!”
Given 2 different numbers, one will always be bigger than the other!

What action is appropriate?

Last month

This month
Plot the Dots! Run Charts

EMERGENCY ADMISSIONS
UNDERSTANDING VARIATION

• ALL WORK IS PROCESS

• PROCESSES HAPPEN OVER TIME
  • Plot the Dots!

• VARIATION IS NORMAL
  • (Write your name ten times)
RUN CHARTS

STATISTICAL PROCESS CONTROL

And ‘DATA SANITY’
• “A phenomenon will be said to be controlled when, through the use of past experience, we can predict, at least within limits, how the phenomenon may be expected to vary in the future”
Break
My trip to work

Consecutive trips

Min.

Lower process limit

Upper process limit

TARGET

Mean

Courtesy of Dr Richard Lendon – Modernisation Agency
A typical SPC chart – Natural Variation
Special cause variation
- an unstable process - out of control

"ASSIGNABLE" SPECIAL CAUSES
THE TWO TYPES of VARIATION

NATURAL (common cause) variation

Is due to random or chance causes of variation
– IN CONTROL – process variation is predictable

SPECIAL CAUSE variation

Is due to irregular or unnatural causes
– OUT OF CONTROL – process because variation is not predictable

Walter A. Shewhart
(early 1920’s, Bell Laboratories)
Common Cause

• Is inherent in the design of the process
• Is due to regular, natural or ordinary causes
• Affects all the outcomes of a process
• Results in a “stable” process that is predictable
• Also known as random or unassignable variation
Special Cause Variation

• Is due to irregular or unnatural causes that are not inherent in the design of the process
• Affect some, but not necessarily all aspects of the process
• Results in an “unstable” process that is not predictable
• Also known as non-random or assignable variation
Process Improvement

Special causes present

Process out of control - unpredictable

Common cause variation reduced

Special causes eliminated

Process under control - predictable

Nominal

Then improve nominal
Non-Random Rules for Run Charts

**Rule 1:** A Shift: 6 or more

**Rule 2:** A Trend: 5 or more

**Rule 3:** Too many or too few runs

**Rule 4:** An astronomical data point

Greater Manchester & Cheshire Coronary Heart Disease Collaborative

Rochdale Door to Needle Times

Time in Minutes

Number of patients

Electrode Project

Special Cause Variations

Spread of Project

20 min Goal
“If I had to reduce my message for management to just a few words, I’d say it all had to do with reducing variation.”

Dr. W. Edwards Deming
Group work

• Review examples

• Think of own setting and what measure could you use ‘plot the dots’ for
What other tools can we use?

What are the pitfalls to watch for?
Quality Improvement – should be built into all services with time for colleagues to talk / share
Dashboard

<table>
<thead>
<tr>
<th>Project</th>
<th>Current RAG</th>
<th>Previous RAG</th>
<th>Sponsor</th>
<th>Project Manager</th>
<th>Budget</th>
<th>Actuals</th>
<th>ETC</th>
<th>Var</th>
<th>Benefits</th>
<th>Executive Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project 1</td>
<td>Green</td>
<td>Amber</td>
<td>S</td>
<td>PM 1</td>
<td>£1,000</td>
<td>£700</td>
<td>£200</td>
<td>£100</td>
<td>£500</td>
<td>Project reporting green. Delivery of new product on target for 1 Nov</td>
</tr>
<tr>
<td>Project 2</td>
<td>Amber</td>
<td>Amber</td>
<td>Sponsor 2</td>
<td>PM 2</td>
<td>£500</td>
<td>£400</td>
<td>£150</td>
<td>£50</td>
<td>£200</td>
<td>Reporting Amber as delays due to overrun on testing.</td>
</tr>
<tr>
<td>Project 3</td>
<td>Red</td>
<td>Amber</td>
<td>Sponsor 3</td>
<td>PM 3</td>
<td>£2,100</td>
<td>£600</td>
<td>£700</td>
<td>£300</td>
<td>£1,000</td>
<td>Reporting Red as original approach does not work and new approach is being developed.</td>
</tr>
<tr>
<td>Project 4</td>
<td>Green</td>
<td>Green</td>
<td>Sponsor 4</td>
<td>PM 4</td>
<td>£100</td>
<td>£80</td>
<td>£18</td>
<td>£2</td>
<td>-</td>
<td>Project on track to deliver by 30 Oct.</td>
</tr>
<tr>
<td>Project 5</td>
<td>Green</td>
<td>Amber</td>
<td>Sponsor 5</td>
<td>PM 5</td>
<td>£1,700</td>
<td>£1,200</td>
<td>£400</td>
<td>£100</td>
<td>£1,500</td>
<td></td>
</tr>
<tr>
<td>Project 6</td>
<td>Red</td>
<td>Red</td>
<td>Sponsor 6</td>
<td>PM 6</td>
<td>£750</td>
<td>£800</td>
<td>£50</td>
<td>£100</td>
<td>£100</td>
<td>Reporting Red as major problems with solution resulting in significant cost and schedule over run.</td>
</tr>
</tbody>
</table>

**Figures £000**

- **Scope**: Green, Amber, Green, Amber
- **Schedule**: Green, Amber, Red, Amber
- **Costs**: Red, Red, Red, Red
- **Benefits**: Green, Amber, Green, Amber

Total: £6,150, £3,780, £1,518, £352, £3,300
Results from 2 spot check audits:

What conclusion would you make from this result?
Did we improve by 30%?

• Answer – No / Impossible to tell based on this info
• Annual Spot check audits are for assurance / judgement – not measuring improvement
Clinical Audit –
2 questions to help decide if project needed and if yes type / method (Quality Improvement or Assurance):

**Question 1**
- **Yes**: Do we know how we are performing against our standards?
- **No**: Should we know how we are doing?

**Question 2**
- **Yes** – Quality improvement – rapid cycle audit / PDSA
  - Do we need to improve?
    - **Yes**: Quality improvement – rapid cycle audit / PDSA
    - **No**: no project required
  - Should we know how we are doing?
    - **Yes**: Quality Assurance - classic clinical audit (1st cycle)
    - **No**: no project required

**Analysis style**
- **RUN**
- **RAG**

web: www.nqican.org.uk  e: nqican@gmail.com  @nqican  [LinkedIn icon]
Clinical audit for improvement: rapid cycle

• If we know we have a problem – use rapid cycle approach (timely data to monitor effectiveness of interventions taken)
• Measure continuously until improvement certain
• E.g. number of cases reviewed before you find a ‘fail’ (or non-compliance if what you are measuring to improve should happen 100% of the time)
• Use data that is already routinely collected if possible
Bob Lloyds 7 points for measurement

- Life is messy! A+B does not always = C as X,Y,Z...intervene or join in
- Why are you measuring? Improvement, Judgement (Accountability) or Research
- Where are you entering the improvement journey? The “ramp”
- What are your aims (and hence, measures)? Data without right context and frame is meaningless as it forms the basis for improvement on that continuing journey
- Understanding variation – conceptually
- Understanding variation - statistically
- How do you link improvement to data? (PDSAs) The data allows us to move across the trajectory and understand its alignment with our improvement strategy therefore allowing us to make changes to our PDSAs.
Further Information

- Considering chance in quality and safety performance measures: an analysis of performance reports by boards in English NHS trusts, BMJ Qual Saf
  http://qualitysafety.bmj.com/content/early/2016/03/31/bmjqs-2015-004967

- The seven steps to measurement for improvement, clip by Mike Davidge
  http://www2.le.ac.uk/partnership/liips/measurement

- A framework for measuring and monitoring safety, Health Foundation

- The measurement and monitoring of safety, Health Foundation

- Guide to quality improvement methods, Healthcare Quality Improvement Partnership
Thank you for attending

Please complete the evaluation form

If you want any help after today’s session please contact us using the following:
Carl Walker 0116 250 2345 Carl.Walker@uhl-tr.nhs.uk @cwwalker10
Richard Lea 0116 250 2445 Richard.Lea@uhl-tr.nhs.uk

Email liips@le.ac.uk			Twitter @LIIPSLeics