Dashboards: Please No More Green, Yellow and Red!

Lloyd Provost, API
Sandra Murray, CTConcepts
Pat O'Connor PhD, NHS Tayside

Session Objectives

- Identify why tabular or color coded methods of displaying key measures to senior leaders are inadequate for learning and improvement
- Identify the key design elements of a great Vector of Measures (VOM)
- Be able to analyze a Vector of Measures
Concept of an Organization’s Family of Measures

Understanding the performance of an organization (at Macro, Meso, or Micro level) requires the use of multiple measures.

No single measure is adequate to inform leadership of performance of a complex system.

The collection of measures used for this purpose has been called:

- Family of measures
- Balanced scorecard
- Report card
- Dashboard
- Clinical Value Compass
- Instrument panel
- Vector of measures

A Vector of Measures

- The concept of a vector provides a good analogy when we consider the purpose of this family of measures.
- A vector is an engineering concept that describes both magnitude and direction.
- The individual components of the vector are not useful by themselves, but when the components are combined, useful information is obtained.
Concept of Vector of Measures

Like the various dials on a car:
- Some measures describe the past (odometer reading),
- Some describe the present (speedometer),
- Some are there to indicate problems (oil pressure light), and
- Some describe the future (gas gauge).

The vector of measures brings together information from all parts and perspectives of the organization and thus provides a tool for leaders to focus learning, planning, and decision making on the whole system.

Some Categories Used to Develop VOM

<table>
<thead>
<tr>
<th>Balanced Scorecard (Kaplan and Norton)</th>
<th>Clinical Values Compass (Nelson)</th>
<th>IOM Dimensions of Quality</th>
<th>HEDIS (NCQA Healthcare Effectiveness Data and Information Set)</th>
<th>Hospital (Example)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>Group of Patients</td>
<td>Organization</td>
<td>Health Plans</td>
<td>Hospital</td>
</tr>
<tr>
<td>Customers</td>
<td>Functional</td>
<td>Safety</td>
<td>Effectiveness of Care</td>
<td>Employee</td>
</tr>
<tr>
<td>Learning and Growth</td>
<td>Satisfaction</td>
<td>Effectiveness</td>
<td>Access to Care</td>
<td>Clinical Excellence</td>
</tr>
<tr>
<td>Financial</td>
<td>Costs</td>
<td>Patient Centeredness</td>
<td>Satisfaction</td>
<td>Safety</td>
</tr>
<tr>
<td>Internal Business Processes</td>
<td>Clinical</td>
<td>Timeliness</td>
<td>Use of Services</td>
<td>Operational</td>
</tr>
<tr>
<td></td>
<td>Efficiency</td>
<td>Health Plan Descriptive Information</td>
<td>Patient Perspective (Service)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equity</td>
<td>Cost of Care</td>
<td>Community</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Health Plan Stability</td>
<td></td>
<td>Finance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Informed Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Choices</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Data Guide. Provost and Murray 2010
# Examples of Potential Measures for a Hospital

<table>
<thead>
<tr>
<th>Employee</th>
<th>Clinical Excellence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary employee turnover</td>
<td>Composite Index: Core Measures</td>
</tr>
<tr>
<td>Employee Satisfaction</td>
<td>Timely Childhood Immunization Rates</td>
</tr>
<tr>
<td>Employee Injury Rate</td>
<td>Unplanned Readmissions</td>
</tr>
<tr>
<td>Nursing Time at the Bedside</td>
<td>Composite Index of Screening Performance (Breast, Cancer, Colon)</td>
</tr>
<tr>
<td>Sick Time</td>
<td>Index: Diabetes Control (Timely Care and HbA1C)</td>
</tr>
<tr>
<td>Overtime</td>
<td>Percent of Patients Receiving Ideal Care</td>
</tr>
<tr>
<td>Days to Fill Vacancies</td>
<td>Newly Reported HIV Infections</td>
</tr>
<tr>
<td></td>
<td>Mental Health 30 Day Follow-up Rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety</th>
<th>Operational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Events</td>
<td>New Patients</td>
</tr>
<tr>
<td>Percent of Patients Developing a Pressure Ulcer</td>
<td>Number of Surgical Procedures</td>
</tr>
<tr>
<td>Hand Hygiene Compliance</td>
<td>Physician Recruitment</td>
</tr>
<tr>
<td>Days Between Ventilator Acquired Pneumonia</td>
<td>Average Length of Stay</td>
</tr>
<tr>
<td>Codes Outside the ICU</td>
<td>Caseload</td>
</tr>
<tr>
<td>Falls</td>
<td>Average Occupancy</td>
</tr>
<tr>
<td>Total Infections</td>
<td>Physician Satisfaction</td>
</tr>
<tr>
<td>Hospital Standardized Mortality Ratio (HSMR)</td>
<td>Success Rating of Key Improvement Projects</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient Perspective (Service)</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days Wait for Third Next Available Appointment</td>
<td>Community Service</td>
</tr>
<tr>
<td>&quot;Would You Recommend?&quot; Score</td>
<td>Budget Spent On Community Programs</td>
</tr>
<tr>
<td>Overall Patient Satisfaction Score</td>
<td>Media Coverage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Finance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Margin</td>
<td></td>
</tr>
<tr>
<td>Man-hours per Adjusted Patient Day</td>
<td></td>
</tr>
<tr>
<td>Cost per Adjusted Patient Day</td>
<td></td>
</tr>
<tr>
<td>Days in Accounts Receivable</td>
<td></td>
</tr>
</tbody>
</table>


## Example: IHI Whole System Measures

<table>
<thead>
<tr>
<th>IOM Dimension</th>
<th>Proposed System Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe</td>
<td>• ADEs/1000 doses</td>
</tr>
<tr>
<td>Effective &amp; Equitable</td>
<td>• HSMR</td>
</tr>
<tr>
<td>Patient-Centered</td>
<td>• Functional Outcomes (SF-6 for Chronic disease)</td>
</tr>
<tr>
<td>Timely</td>
<td>• Inpatient Satisfaction</td>
</tr>
<tr>
<td>Patient-Delayed</td>
<td>• % patients dying in hospital</td>
</tr>
<tr>
<td>Efficient</td>
<td>• Days to 3rd next available appointment</td>
</tr>
<tr>
<td></td>
<td>• Health care costs per capita</td>
</tr>
<tr>
<td></td>
<td>• Hospital costs per discharge</td>
</tr>
</tbody>
</table>
What is the problem.....

Organizations are largely looking at their family of measures as:

- Tables of numbers
- Current values are related to meeting goal or target
- Color codes for each measure:
  - Green - currently meeting goal
  - Yellow - not at goal but within an established distance to the goal (e.g. 75% of goal)
  - Red – not at goal and not “near” it or heading in wrong direction
- No focus on prediction

### FY 2009 Hospital System-Level Measures

<table>
<thead>
<tr>
<th>Goals</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
<th>FY 2009 Q2</th>
<th>FY 2009 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal Met (GREEN)</td>
<td>60%</td>
<td>80%</td>
<td>37.98%</td>
<td>48.98%</td>
<td>57.19%</td>
</tr>
<tr>
<td>Goal 75% Met (YELLOW)</td>
<td>65%</td>
<td>100%</td>
<td>53.5%</td>
<td>91.2%</td>
<td>54.3%</td>
</tr>
<tr>
<td>Goal Not Met (RED)</td>
<td>2</td>
<td>0</td>
<td>3.37</td>
<td>4.33</td>
<td>3.93</td>
</tr>
</tbody>
</table>

### Legend for Status of Goals (Based on Annual Goal)

- **Goal Met (GREEN)**
- **Goal 75% Met (YELLOW)**
- **Goal Not Met (RED)**

### FY 2009 Hospital System-Level Measures

<table>
<thead>
<tr>
<th>Patient Perspective</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
<th>FY 2009 Q2</th>
<th>FY 2009 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Satisfaction Rating: Percent Who Would Recommend (Includes inpatient, outpatient, ED, and Home Health)</td>
<td>60%</td>
<td>80%</td>
<td>37.98%</td>
<td>48.98%</td>
<td>57.19%</td>
</tr>
<tr>
<td>Wait for 3rd Next Available Appointment: Percent of Areas with appointment available in less than or equal to 7 business days (n=43)</td>
<td>65%</td>
<td>100%</td>
<td>53.5%</td>
<td>91.2%</td>
<td>54.3%</td>
</tr>
</tbody>
</table>

### Clinical

<table>
<thead>
<tr>
<th>FY 2009 Hospital System-Level Measures</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
<th>FY 2009 Q2</th>
<th>FY 2009 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 09 Goal</td>
<td>Long Term Goal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Met (GREEN)</td>
<td>60%</td>
<td>80%</td>
<td>37.98%</td>
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<td>0</td>
<td>3.37</td>
<td>4.33</td>
<td>3.93</td>
</tr>
</tbody>
</table>

### Financial Perspective

<table>
<thead>
<tr>
<th>FY 2009 Hospital System-Level Measures</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
<th>FY 2009 Q2</th>
<th>FY 2009 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Margin-Percent</td>
<td>1.2%</td>
<td>1.5%</td>
<td>-0.5%</td>
<td>0.7%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Monthly Revenue (Million) change so shows red--but sp</td>
<td>20.0</td>
<td>20.6</td>
<td>17.6</td>
<td>16.9</td>
<td>17.5</td>
</tr>
</tbody>
</table>
What is the problem..... Where is the opportunity?

- Moving from these views to one where:
  - Each measure is displayed on an appropriate Shewhart chart
  - All Shewhart charts are on same page to see the whole system
- Helps us:
  - More accurately assess progress of changes in system
  - Become aware of system interrelationships
  - Appreciate dynamic complexity as well as detail complexity

To Improve On This We Use Shewhart Charts to Display Measures:

What Is It?
Data is usually displayed over time

Shewhart chart will include:
- Center line (usually mean)
- Data points for measure
- Statistically calculated upper and lower 3 sigma limits
(Limits typically created with 20 or more subgroups)
Selecting the Appropriate Shewhart Chart

Type of Data

Count or Classification (Attribute Data)
- Count (Nonconformities)
  - Equal Area of Opportunity
    - C Chart
  - Unequal Area of Opportunity
    - U Chart
- Classification (Nonconforming)
  - Number of Nonconformities
  - Nonconformities Per Unit

Continuous (Variable Data)
- Subgroup Size of 1
- Unequal or Equal Subgroup Size
  - I Chart (X chart)
  - X-Bar and S chart
- Individual Measures
  - Average and Standard Deviation
- Other types of control charts for attribute data:
  1. NP (for classification data)
  2. T-chart [time between rare events]
  3. Cumulative sum (CUSUM)
  4. Exponentially weighted moving average (EWMA)
  5. G chart (number of opportunities between rare events)
  6. Standardized control chart

Other types of control charts for continuous data:
  7. X-bar and Range
  8. Moving average
  9. Median and range
  10. Cumulative sum (CUSUM)
  11. Exponentially weighted moving average (EWMA)
  12. Standardized control chart

Shewhart Chart Allows us to Distinguish Types of Variation

- **Common Cause:** causes that are inherent in the process, over time affect everyone working in the process, and affect all outcomes of the process
  - Process stable, predictable
  - Action: if in need of improvement must redesign process(es)
  - If we are testing changes and see only common cause it means our changes have not yet resulted in improvement

- **Special cause:** causes that are not part of the process all the time, or do not affect everyone, but arise because of special circumstances
  - Process unstable, not predictable
  - Action: go learn from special cause and take appropriate action
  - May be evidence of improvement (change(s) we tested working) or evidence of degradation of process/outcome
Rules for Detecting Special Cause

1. A single point outside the control limits.

2. A run of eight or more points in a row above (or below) the centerline.

3. Six consecutive points increasing (trend up) or decreasing (trend down).

4. Two out of three consecutive points near (outer one-third) a control limit.

5. Fifteen consecutive points close (inner one-third of the chart) to the centerline.

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Performance Better Than Target...but is all OK?

Rate of Unplanned Returns to ED

<table>
<thead>
<tr>
<th>Rate per 1000 Discharges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Unplanned Returns to ED</td>
</tr>
</tbody>
</table>

- UCL = 8.32
- Target = 7.5 or Less
- LCL = 1.18
### FY 2009 Hospital System-Level Measures

<table>
<thead>
<tr>
<th>Patient Perspective</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
<th>FY 2009 Q2</th>
<th>FY 2009 Q3</th>
</tr>
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<td>60%</td>
<td>80%</td>
<td>37.98%</td>
<td>48.98%</td>
<td>57.19%</td>
</tr>
<tr>
<td>Patient Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Events per 10,000 Adjusted Patient Days</td>
<td>0.28</td>
<td>0.20</td>
<td>0.35</td>
<td>0.31</td>
<td>0.31</td>
</tr>
<tr>
<td>Percent Mortality</td>
<td>3.50</td>
<td>3.00</td>
<td>4.00</td>
<td>4.00</td>
<td>3.48</td>
</tr>
<tr>
<td>Percent Infections per 1000 Patient Days</td>
<td>2</td>
<td>0</td>
<td>3.37</td>
<td>4.33</td>
<td>4.39</td>
</tr>
<tr>
<td>Clinical</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Unplanned Readmissions</td>
<td>3.5%</td>
<td>1.5%</td>
<td>6.1%</td>
<td>4.8%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Percent Eligible Patients Receiving Perfect Care—Evidence Based Care (Inpatient and ED)</td>
<td>95%</td>
<td>100%</td>
<td>46%</td>
<td>74.1%</td>
<td>88.0%</td>
</tr>
<tr>
<td>Employee Perspective</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Voluntary Employee Turnover</td>
<td>5.80%</td>
<td>5.20%</td>
<td>5.20%</td>
<td>6.38%</td>
<td>6.10%</td>
</tr>
<tr>
<td>Average Rating Using 1-5 Scale (5 Best Possible)</td>
<td>4.00</td>
<td>4.25</td>
<td>3.90</td>
<td>3.80</td>
<td>3.96</td>
</tr>
<tr>
<td>Operational Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Occupancy</td>
<td>88.0%</td>
<td>90.0%</td>
<td>81.3%</td>
<td>84.0%</td>
<td>91.3%</td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td>4.30</td>
<td>3.80</td>
<td>5.20</td>
<td>4.90</td>
<td>4.60</td>
</tr>
<tr>
<td>Physician Satisfaction: Average Rating Using 1-5 Scale (5 Best Possible)</td>
<td>4.00</td>
<td>4.25</td>
<td>3.80</td>
<td>3.84</td>
<td>3.96</td>
</tr>
<tr>
<td>Community Perspective</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Budget Allocated to Non-recompensed Care</td>
<td>7.00%</td>
<td>7.00%</td>
<td>5.91%</td>
<td>7.00%</td>
<td>6.90%</td>
</tr>
<tr>
<td>Percent of Budget Spent on Community Health Promotion Programs</td>
<td>0.30%</td>
<td>0.30%</td>
<td>0.32%</td>
<td>0.29%</td>
<td>0.28%</td>
</tr>
<tr>
<td>Financial Perspective</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Margin—Percent</td>
<td>1.2%</td>
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<td>20.6</td>
<td>17.6</td>
<td>16.9</td>
<td>17.5</td>
</tr>
</tbody>
</table>

### What Does a VOM Look Like?

Source: The Health Care Data Guide. Provost and Murray 2011
How is Safety Error Rate Doing?…

<table>
<thead>
<tr>
<th>Goals</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
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</thead>
<tbody>
<tr>
<td>Safety Events per 10,000 Adjusted Patient Days</td>
<td>FY 09 Goal</td>
<td>Long Term Goal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.28</td>
<td>0.20</td>
<td>0.35</td>
<td>0.31</td>
<td>0.30</td>
</tr>
</tbody>
</table>

3. Safety Error Rate per 10,000 Adj. Bed Days

How is Percent Perfect Care Doing?…

<table>
<thead>
<tr>
<th>Goals</th>
<th>FY 2007</th>
<th>FY 2008</th>
<th>FY 2009 Q1</th>
<th>FY 2009 Q2</th>
<th>FY 2009 Q3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Eligible Patients Receiving Perfect Care—Evidence Based Care (Inpatient and ED)</td>
<td>FY 09 Goal</td>
<td>Long Term Goal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>95%</td>
<td>100%</td>
<td>46%</td>
<td>74.1%</td>
<td>93.2%</td>
</tr>
</tbody>
</table>

7. Percent Eligible Patients Given Perfect Care

Source: The Health Care Data Guide. Provost and Murray 2011
How is 3rd Next Available Appointment Doing?...

| Source: The Health Care Data Guide. Provost and Murray 2011 |

Same Approach With Monthly Data...

| Source: The Health Care Data Guide. Provost and Murray 2011 |
How are we doing
Can you tell?

Pat O'Connor PhD
Clinical Director of Research Development
Honorary Professor School of Business Dundee University

How can we tell how well we are doing?

• How will we know?
• What are our goals and our plan to get there?
• Is the system stable enough to maintain and improve performance?
• Is the system capable of further improvements?
All patients have a unique patient identifier DOB + 4 digits

14 health Boards
150,000 staff

Shetland
Grampian
Highland
Western Isles
Greater Glasgow Clyde
Lanarkshire
Ayrshire & Arran
Orkney
Tayside
Fife
Forth Valley
Borders
Dumfries & Galloway

NHS Tayside Profile

- Population - 400,000

- Services; Acute/Teaching Hospital, Mental Health, Community Services, Primary Care & Regional Services

- 22 Hospitals – 1192 Beds

- 68 GP Practices - 322 GPs

- 3 Local Authorities

- Budget c£800m

- Efficiency Savings Target 2012/13 - £21M2 – £27m
NHS Tayside Governance Dashboards: Manager Reports Starting to Look at Data Over Time

**ASSURANCE**
Validated Data for 6 domains:
Access, Efficiency, Infection & Prevention, Quality & Patient Experience, Patient Safety and Data Quality

**PERFORMANCE**
Validated and un-validated data across 6 domains:
Clinical Excellence, Finance & Activity, Valuing Staff, Capacity & Activity Planning, Patient Experience and Patient Safety

**IMPROVEMENT**
Un-validated data provided in real time through Unified Patient Tracking, Clinical Portal and operational dashboard with metrics covering Patient Flow, Inpatient Activity, Out Patients, Waiting Times, Patient Safety, Infection Control, Clinical Outcomes

"focusing on information and data to provide assurance on improvement and quality to deliver better, safer care."

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### EFFICIENCY TARGETS

**Board Performance Update, as at end September 2012**

<table>
<thead>
<tr>
<th>Same Day Surgery</th>
<th>Target Performance</th>
<th>On Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Facility Patient Days</td>
<td>64%</td>
<td>67%</td>
</tr>
<tr>
<td>Same Day Surgery Rate</td>
<td>79.7%</td>
<td>78.8%</td>
</tr>
<tr>
<td>Patient Flow</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Elective Average Length of Stay in Days – Acute Services</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td>Emergency Average Length of Stay in Days – Acute Services</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>Delayed Discharges as at census date (1st of the month)</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>

**Output Activity**

<table>
<thead>
<tr>
<th>Outpatient Activity</th>
<th>Target Performance</th>
<th>On Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient Acute Services, New</td>
<td>2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Outpatient Acute Services Did Not Attend Rate</td>
<td>0.8%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

**Analysis**

The current focus for Delayed Discharges is trajectory towards the Local Delivery Plan and Scottish Government target for April 2013 which is to have no-one delayed over 28 days by then. The following actions are being implemented across the 3 partnerships, rollout of enablement model for social care, enhancing tele-health and tele-care options for patients, and closer analysis of the health, environmental and social factors preventing discharge to inform test of change.

The new outpatient acute service did not attend rate is greater than the 5% local target however there is no national HEST target for DA's.
Outcome & Process Measures:
- Denominator = total population
- Assess the state of care and outcomes over a period of time (e.g., prior quarter, year)
- Ultimate measures of overall system quality
  - Shewhart Charts

‘Current Process’ Measures:
- Denominator = patients seen in most recent measurement period (week, month)
- Assess current efforts to improve processes & other drivers
  - P, U, XbarS Charts

‘PDSA’ Measures:
- Focus on single patients & events
- X charts to test for immediate process change
- RCA for change ideas

Our Organization Appreciates Viewing Data Over Time....

- Aggregate measures alone do not lead to predictions about future performance or insights to explain past variations

- Displaying data over time (using run charts or control charts) allows prediction based on the past and current activity
ICU now admitting all neuro patients following closure of neuro ICU

Chlorhexidine oral gel introduced over previous 12 months

Summary: Hospital leaders like red amber green

- But measuring in this way gives a snapshot of the current status only (good and bad data!!)
- Data over time with SPC charts and control limits have the following advantages
  - We can see what (if anything) is changing
  - We can tell if the system is stable and capable of a different level of performance
  - We can explain with annotations when changes new interventions occurred and their impact on performance
  - We can predict to an extent future data (if we do nothing but observe the dots)
  - You can tell a story with your data
Growing the vector concept in this red amber and green world

- Clinicians love data and Clinicians make the dots move
- Invest in teaching clinicians how to use data over time, daily weekly to begin with to see the system change as practice changes…… breakfast sessions short 10 mins, join the rounds, find out where the opportunities for improvement are
- Don’t jump to fancy IT if you cant do it on paper……
- Create a learning system of data from ‘C’ suite
- Customise data requirements at local level building ownership
- Connect to the organizations BIG DOTS Aims
More information

- pat.oconnor@nhs.net
- www.isdscotland.org/
- http://www.scottishpatientsafetyprogramme.scot.nhs.uk/programme
- http://www.gcph.co.uk/ population health
- http://www.nhstayside.scot.nhs.uk/about_nhstay/committees/01_nhs_tayside_board/papers.shtml NHS Tayside board papers performance reporting

System Level Measures at Cincinnati Children’s Hospital Medical Center

- ACCESS
  - 3rd Next available appointment
  - % of eligible patients with delays
- FLOW
  - Adverse drug events (ADE) per 1,000 doses
  - Nosocomial infection rates
  - Bloodstream infection rate
  - Nosocomial infection rates
  - Surgical site infection rate
  - Nosocomial infection rates: VAP
  - Services Satisfaction Events
- PATIENT SAFETY
  - % of eligible patients with delays
- CLINICAL EXCELLENCE
  - Codes outside the ICU rate 1000 days
  - Standardized PICU Mortality Ratio – Expected/Actual
  - % use of Evidence-Based Care for eligible patients
  - Functional Health Status
- REDUCE HASSLES
  - Touch Time for care givers
- TEAM WELLBEING
  - Staff Satisfaction
  - Staffing Effectiveness
  - Physician Satisfaction
- FAMILY CENTERED CARE
  - Overall Rating
  - Patient Satisfaction
  - Voluntary staff turnover rate
  - Accident rate for staff with Work days lost

Maria T. Britto,
James M. Anderson Center for Health Systems Excellence

Risk Adjusted Cost per Discharge
CCHMC Central Venous Catheter (CVC) Associated Laboratory Confirmed Bloodstream Infections (LCBIs)

**Laboratory Confirmed bloodstream infections (LCBIs)**

- Description of the chart type: u-chart
- Directed Development of Change

### Table

<table>
<thead>
<tr>
<th>Infected Days</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
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</tbody>
</table>

### Graph

- Updated Thu, 31 Jul 10 by Kate Rich, Division of Health Policy & Clinical Effectiveness
- Source: Infection Control Dept.

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**NHS Quality Dashboard**

- Originated from the instruction to National Quality Board (NQB)
- Carried forward in the guidance on "Maintain Quality during the transition" May 2012
- Viewable across the whole System: Executive Regional Area Teams Local Area Teams
- Used in Quality Surveillance Group meetings
- Used by Trust Development Authority in reviewing quality of Non-Foundation Trusts
- Used by others Monitor, CQC, Health Education England to inform their work

Blythin Peter, Richard Wilson, NHS National Quality Team
Key Principles behind the Dashboard

- **Keeping it focused**
  - Small number of SYSTEM LEVEL metrics

- **Keeping it timely**
  - Data may not be perfect, merely good enough to make a decision

- **Don’t lose sight of the patient**
  - Reporting not just the rate, but also how many patients are affected
  - Net promoter score (Friends and Families Test)

- **Drop the judgement and focus on understanding variation**

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**SYSTEM LEVEL INDICATORS**

- Preventing Premature Death
- Ambulatory Care Sensitive Conditions (Adults)
- Ambulatory Care Sensitive Conditions (Children)
- Clinically Unexpected Emergency Admissions to Hospital
- Emergency Readmissions
- Net Promoter Score
- A&E Waits
- Referral to Treatment Times
- Urgent Cancer Waits
- Infection Free
- Serious Incidents
- ‘Never Events’
- Harm Free Care
- Unexpected Mental Health Deaths
- Bed Occupancy
- Nurse to Bed Ratio
- Doctor to Patient Ratio
- Staff Sickness Rates

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**CONTRIBUTORY MEASURES**

- Disease specific <75 mortality
- Cancer Deaths
- Baby / Child Deaths
- Learning Disability / Mental Health Premature Deaths
- Self Care
- Employment of those with LTCs
- Quality of Life for those with Mental Illness & Dementia
- Caring for Carers
- PROMS
- Recovering from Injury & Trauma
- Stroke Recovery
- Restoring Mobility & Independence
- Service Specific and Patient Group Specific Experiences
- End of Life Care
- Maternity Safety
- Safe Care to Children in Hospital
- Nurse to Patient ratio
- Agency rates
NHS Quality Dashboard

Step 1: Quality Dashboard
At-a-glance view of Quality throughout the Organisation

Data Warehouse
Historic & Current Values

Generate Statistical Alerts
Statistical Process Control

Data processing

Step 2: Organisation Navigation
Navigate through the NHS Organisation

Step 3: Root cause analysis
Drill down into the detail of the relevant Metrics.

Continuous Improvement

Analyse
Review Metrics using Trend Charts, Data Tables, Funnel Charts, Toyota Charts, Alerts, Performance vs. Peer Groups and Performance vs. Peers...

Collaborate
Makes notes and record actions and Status against Metrics and Organisations

Review Statistics and Alerts
Take Action
Exercise

- Evaluate the VOM
- Have any measure(s) shown special cause in the desired direction (improvement)?
- Have any measures shown desirable special cause?
- What potential interrelationships do you see?
Some Important Administrative Issues with VOM

- Ideally graph data monthly rather than quarterly
- If less that 12 data points use run chart rather than Shewhart chart
- When graph has 12 data points may make “trial” mean and limits and extend them into future
- When graph has 20-30 data points update the limits
- When special cause has occurred indicating a new level of system performance update the limits
- Show “some future time periods” on the chart to encourage prediction.
- When graph too crowded always show minimum of 24 data points
References