**Using Metrics for Improvement**

How will we know a change is an improvement? Proper measurement provides an objective gauge of the project success (or failure)

**WHY**

* Evidence-based - Metrics (or measures) focus on objective evidence rather than feelings or opinions.
	+ To quantify the magnitude of the problem
	+ To assure that a change is actually an improvement - tracking progress over time.
* Outcome-oriented - Metrics focus on the outcome articulated in the project aim statement. As the saying goes, “What gets measured, gets fixed.”
* Visual - Metrics, when presented graphically, tell a powerful story. Visible data, displayed and tracked over time, is key to attracting and sustaining the engagement of the team and stakeholders in the improvement work.

**WHEN**

Throughout the DMAIC process

* Define/Measure - to understand the magnitude of the problem
* Analyze - to assist in assessing the root cause
* Improve - to test & select the solution
* Control - to insure sustainability by monitoring the metric over time

**HOW TO**

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| METRIC SELECTION |
| 1. | Select the most appropriate metrics* Refer to the fundamental questions in The Model for Improvement
* Brainstorm with the team to get the best ideas
* See Metric Primer below
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| 2. | Clearly define the specifics for each selected metric. For example:* If measuring errors (or the lack thereof), specify the meaning of “error free.”
* If measuring whether or not the requirements are met, clarify if all of the requirements have to be met, or only a percentage of the requirements?
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| **METRIC PRIMER** |
| **Types of measures** | **What can you measure?** |
| Improvement relies on measuring the following aspects of the process:* ***Inputs*** – What is needed to execute the process & deliver the outputs?
* ***Process*** – Steps within the process
* ***Outcome*** – Big picture, high-level goals; What does this process do or produce?
* ***Balancing or Counterbalance*** – Side effects or unintended consequences in upstream or downstream steps or processes
 | Consider the following (not an exhaustive list):* Time – hours, minutes, days, months, length of stay, turn-around time, wait time, etc.
* Errors or defects
* Number of events, people, etc.
* Satisfaction
* Efficiency
* Productivity
* Cost
* Value
* Throughput / Flow
* Access
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| **What makes an ideal metric?** | **Key components of a metric** |
| The best metrics have the following characteristics:* Direct linkage to the desired outcome or process (or a closely linked proxy)
* Powerful enough to demonstrate the effects of the change
* Meaningful to the project and stakeholders
* Realistic to collect
 | A metric must have:* ***A numerator*** – The proportion of the study population that met the set requirements. *Example: # of patients with viral load testing ordered*
* ***A denominator*** – The entire study population, or all subjects reviewed in a selected sample. *Example: # of patients eligible for viral load testing according to country algorithm*
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| DATA COLLECTION |
| 1. | Create a data collection log (see Data Collection Log Example)Make sure you include all data needed to calculate the metrics. Consider the following: * + The numerator (data to assure that the subjects meet the requirements of the study) and the denominator (data to assure all the eligible population is accounted for):
* If evidence is required for an eligibility determination, consider a descriptive subheading or including an additional column in the log to verify the presence of that evidence
	+ If the eligibility determination requires several steps, consider including a column in the log for each step required
* Any *demographic data* deemed important, such as sex, age, pregnancy status
* Any *medical record or national identification numbers* needed to trace back to the patients in the future
* Any *site identification or site-specific data* (e.g., a specific specialty clinic within the site)
 |
| 2. | Collect Baseline DataUsing the data collection log, at the initiation of the project, collect baseline data to understand the magnitude of the issue * Collected before any changes are made in the current process
* Data Source – Specify source of data
	+ Depending on the process, data may be collected retrospectively (i.e., chart review) or prospectively
	+ Potentially may be abstracted from data already being collected
* At least 25 data points are needed
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| **Tips:*** Include definitions on the log so staff who may not be members of the team will be able to easily interpret and use the log
* Use small tests of change - Create a paper-based log first. Test the log through multiple iterations before finalizing or transferring to an electronic format.
* Make sure you have all the information needed to calculate the study metric
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| 3. | Create a data collection plan (see the Data Collection Plan template)[Instructions for creating Plan included in the template in gray print] |
| DATA DISPLAY |
| 1. | Create a run chart to track the metrics over time |
|  | * A run chart is a graphical representation of change over time
* It is one of the best ways to display Quality Improvement (QI) data
 |
|  | Steps to create a run chart:* + - Title the chart and label the axes
			* Place the selected metric on the vertical or y-axis
			* Place time on the horizontal or x-axis
		- Plot your metric over time
		- Include a goal line (frequently shown in red ink), indicating the team’s goal for the selected metric
		- Annotate the run chart, marking the tests of change along the timeline (See examples in PowerPoint presentation)
		- Keep the data up-to-date, posting weekly or as frequently as possible

You may also use the Excel Run Chart Template to create run charts automatically |  |
| 2. | Display the data on the project learning board (See Project Management Tools – Learning Board) |
| 3. | Review and update the data regularly (daily, weekly or monthly) with the staff & the QI team (See Project Management Tools - Meeting Facilitation templates)* When reviewing the data, assess the trend and determine what additional “tests of change” need to be conducted to continue a desired trend or reverse an undesired trend. (See Model for Improvement – PDSA)
* Obtain input from the front-line workers. What is working well? What is not working well?
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**Templates:**

* Quality Improvement Project Outline
* Data Collection Log Example
* Data Collection Plan
* Run Chart Template (Excel)

**Resources:**

IHI QI Essentials Toolkit:

Run Chart & Control Chart

Data Collection: Key Planning Questions

Microsoft Excel Workbook: Insert 🡪 Chart 🡪 Line Chart

**Data Collection Log Example**

**High Viral Load (HVL) Patients with Follow-Up Appointment**

**Metric = # of appointments made within 48 hours of receiving HVL results / All HVL Results**

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| Patient ID | Age | SEX | VL Results (cp/ml) | Date of VL Testing | Date of VL Results at CTC | HVL(YES/NO) | Phone Call Made /Appointment Date | Follow-up Visit for EAC |
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**Data Collection Plan**

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| **Who** | * Who is responsible for the collection, display and analysis of the data?
* If a series of data needs to be collected by different cadres, map the process of data collection from beginning to end
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| **How Often** | * Specify data collection frequency - hourly, daily, weekly or monthly
* Determine the collection cutoffs for the time frame selected.
* Consider the project metric and what makes sense in the collection cycle. When must the data be submitted for each cycle?
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| **What** | * Specify what is included or excluded
* Determine the data source and sample size
* Draw the data collection log showing what data will be captured
 |
| **Where** | Specify a location – e.g., a clinic, unit or department |
| **How** | Given the log, will data be collected at time of seeing the patient or actual event (real-time) or collected retrospectively through chart or record review? |
| **Training** | Who will be responsible for training the staff about the data collection? Specify how, when and where. |
| **Sustainability – See Control Plan** | Early in the project, determine who will own the process and the metric at project completion.How will the metric be monitored when the project is complete? (See Control Plan) |

**Data Display - Run Chart Template (Excel)**

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