EMS System Evaluation

Developing and Utilizing Quality Indicators

Today's Roadmap

Where are we going?

1. *Gaining Perspective*
2. *Defining what a Quality Indicator is?*
3. *Spec Sheet (ISS)*
4. *Developing a Quality Indicator (3 types)*
5. *Follow up Demonstration/Exercise*
6. *Reporting a Quality Indicator*
7. *Evaluating and Acting on Quality Indicators*
8. *Follow up Exercises/Report Out*

We are all quality teammates today!

Walk Away Objectives.

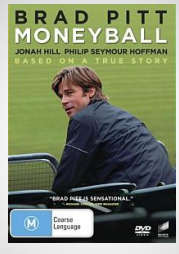
- *Describe how to integrate quality measures (indicators) within a structured EMS oriented CQI program.*
- *Demonstrate how to develop, define, and write a quality indicator specification sheet (ISS) with the consensus of a CQI-stakeholder group.*
- *Determine the most appropriate format to communicate and report out a quality measure to a constituent or quality stakeholder group.*
- *Identify the basic domains and steps of evaluating, reaching consensus and acting on quality measures within a EMS oriented CQI program.*

Putting It in Perspective

The concepts of quality improvement are mostly about motivating groups of people with common interests to do their best.

2012 World Champion San Francisco Giants

Improve Performance



Baseball and Indicators = $

A Little History of Our Journey

"Where did these quality indicators come from?"

- *1999 - rearranging the deck chairs on the Titanic – "DRG's"*
- *2000 - Grant; MVEMSA, EMSA, Children's Hospital San Diego,*
- *2001 - NHTSA, CEMSIS, NEMSIS - testing*
- *2001 - Peer review ; Journal of Quality Improvement; (JCAHO)*
- *2002 - Model Guidelines; Quality Indicators*
- *2005 – Davis Balestracci – Process control*
- *2011 - Institute for Health Improvement (IHI)*
- *2011 – Data Sanity Training – Patient Safety Centers - CEMSPI*
- *2012-13 – Core Measures Project*
- *2014 – "Healthcare Analytics" as a profession - UC Davis*

Center for EMS Performance Improvement

CEMSPI

Initiative for Professional Development in EMS Continuous Quality Improvement and Patient Safety

INSTITUTE FOR HEALTHCARE IMPROVEMENT

CONTRA COSTA HEALTH SERVICES

Dr. Deming

- "…W Edwards Deming who popularized the PDCA cycle took his ideas and philosophy of quality management to Japan in 1947 at the invitation of the McArthur administration
- A statistician by training, Deming applied a rigorous data-driven approach to quality improvement (using PDCA and statistical process control) and coupled this with a management philosophy based on a deep respect for the customer and the people who work within an organization.
- Deming's philosophy of quality management was based on a number of key principles, the first and most important being that the key task of the leadership of any organization is to 'establish constancy of purpose' towards continually improving the service to its customers…"

1950 – W. Edwards Deming gives his first seminar in Japan

Clark, D., Silvester, K., Knowles, S. (2013). Lean management systems: creating a culture of continuous quality improvement. Journal of Clinical Pathology. 66:638–643.

Accountable Care - Key Principles

- ACO's are an emerging concept of partnerships between physicians and hospitals to coordinate healthcare services with greater efficiency and quality
  - Concept introduced to Medicare's Payment Advisory Commission in Nov 2006.
  - Allowable by the Federal Trade Commission (FTC) as long as the involved providers share substantial financial risk


EMSWORLD

EMS 2020

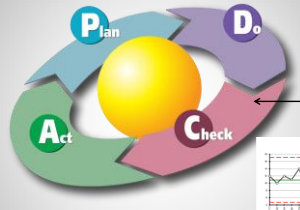
FERNO

An EMS Introduction to Accountable Care Organizations

"The primary thing we've learned is how to operate in their world."

Universal CQI Model

"Shewhart Cycle"



PDCA

plan–do–check–act

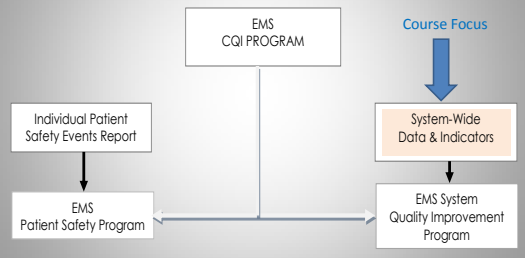
System Evaluation
Quality Indicators

The Quality Improvement Perspective

- *Soft vs. hard science*
- *Sometimes close is good enough*
- *Blame the process not the person*
- *The process is "perfectly designed" to get the outcome it deserves*

Recognizing Distinctions in Quality Programs

The vast majority of improvements in patient care come not from reacting to what went wrong, but from discovering what went right and then making it part of the culture

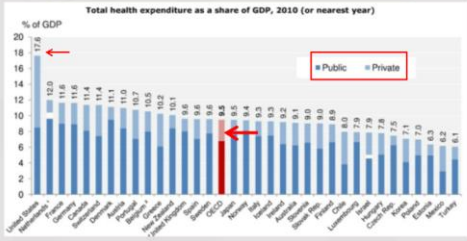


Healthcare Analytics in EMS

Is it important?

US Health Spending Much Higher Than Any Other Country

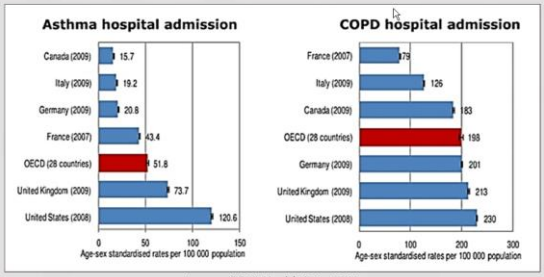
"At 17.6% in 2010, US Health spending is one and a half as much as any other country, and nearly twice the OECD average"



Source: OECD Health Data 2012

Kane, J. (2012).Health Costs: How the U.S. Compares with Other Countries. PBS News hour.
http://www.pbs.org/newshour/rundown/2012/10/health-costs-how-the-us-compares-with-other-countries.html

US Clinical Outcomes Often Low When Compared With Other Developed Countries



Source: OECD Health Data 2012

Kane, J. (2012).Health Costs: How the U.S. Compares with Other Countries. PBS News hour.
http://www.pbs.org/newshour/rundown/2012/10/health-costs-how-the-us-compares-with-other-countries.html

Context of US Healthcare Cost Growth

If other prices had grown as quickly as healthcare costs since 1945…

a dozen eggs would cost $55

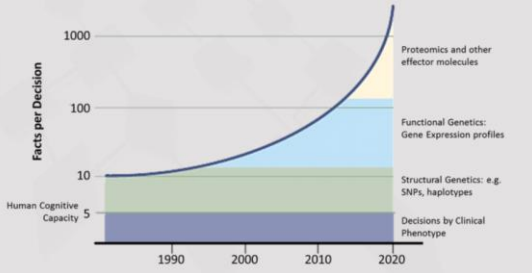
a gallon of milk would cost $48

a dozen oranges would cost $134

Institute of Medicine, Roundtable on Value & Science-driven health care. (2011). The Learning Health System and its Innovation Collaboratives, Update Report

Medical Decisions Becoming More Complex

William Stead, IOM Meeting, 8 October 2007. Growth in facts affecting provider decisions versus human cognitive capacity



Quality Improvement

↓

Healthcare Analytics

↓

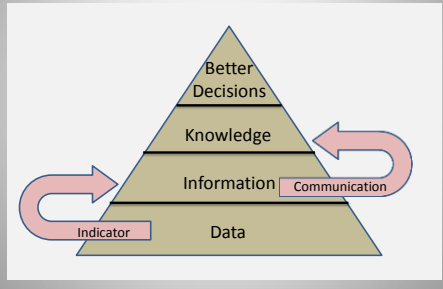
Quality Measures (Indicators)

↓

Data

A word or two about data….

"He who has data is king"



Be careful what you ask for…

- *What you put in is what you will get out..*
- *The system is perfectly designed to get the result…*

"The more you know what is wrong with your data, the more useful it becomes."

John Wilder Tukey, June 16, 1915 – July 26, 2000)
was an American mathematician best known for development of statistical data analysis

Don't torture the data until it confesses..

Better Data

Davis Balestracci

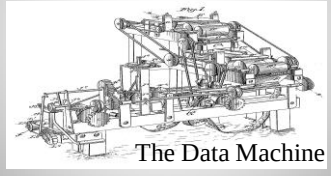
There are four key questions to any data collection that should always be clarified prior to beginning:

1. *Why collect the data?*
2. *What methods will be used for the analysis?*
3. *What data will be collected?*
4. *How will the data be measured?*

*There are four more questions relating to the **logistics** of the data collection process.*

1. *How often will the data be collected?*
2. *Where will the data be collected?*
3. *Who will collect the data?*
4. *What training is needed for the data collectors?*

Concept of
REVERSE ENGINEERING



The Data Machine

TRUST

In the end , the most important thing about data is not how it looks, or how sophisticated your data system was, or how scientific you felt your process for collecting the data was, or how it was collected, or even what it says……

In the end, the most important thing about data is, do you trust it? And more importantly, do the people who are going to use it, trust it?

*Data communication should be **people** oriented, not machine oriented…*

What are Quality Indicators?

"Getting the Nomenclature right"

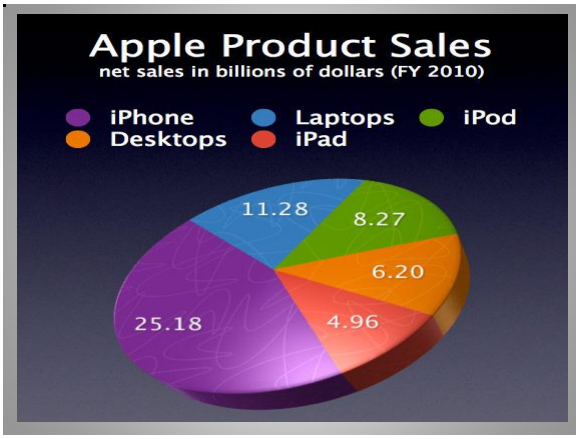
Quality Indicators
Quality Measures
Quality Metrics
Quality Benchmarks

apples in a basket?

Dow Jones of EMS Performance

Apple Product Sales

net sales in billions of dollars (FY 2010)



Customers
Patients
Clinicians
Subject Experts

Data Specialists
IT Support
Technical Experts
Interface Experts

Asking the question?

Answering the question.

Quality Indicator

The ISS – Part I

What is the question?

Customers
Patients
Clinicians
Subject Experts

CONSENSUS

Definitions
- *Name*
- *Description*
- *Type of measure*
- *Numerator*
- *Denominator*
- *Final value*
- *Reporting format*
- *Benchmarking*
- *References*

The ISS – Part II

How will it be answered?

Data Specialists
IT Support
Platform Experts
Technical Experts
Interface Experts

COLLABORATION

- ***Standardized** Data Approach*
  - *Inclusion-exclusion criteria*
  - *source*
  - *purpose and rationale*
  - *query and sampling*
  - *aggregation*
- *Testing*
  - *statistical*
  - *trending*
  - *process*
- *Reports*
  - *formulas*
  - *values*
  - *formats*

Classification by Attribute
Avedis Donabedian Model

Structure: *the things in a system*

Process: *the activities in a system make "stuff" happen*

Outcome: *the results of the things making the stuff happen.*

Quality Indicators (attributes) of an Quality-Baseball System

Structure + Process = Outcome

Things	+	Activities	= Results
Fields, Players	+	Hits, Runs	= Score
AED's	+	Defibrillations	= Survival

Functional Relationship

S + P = O

change in structure = change in outcome?

change in process = change in outcome?

Defining Indicators by Utility

Core, Tertiary, Adhoc

Core - Dow Jones Leaders
(Something's wrong somewhere…)
Tertiary - Used as Needed
Adhoc - Special Studies

3 Types of Indicators

Bi-variable Indicators *(Most Indicators)*

Reports a single attribute (%) or item (fraction) based upon **two separate variables** (numbers) related to each other – such as number of paramedics per ambulance (2:1 Ratio) or percentage of patients that receive bystander CPR (35%)

Continuous variable Indicators

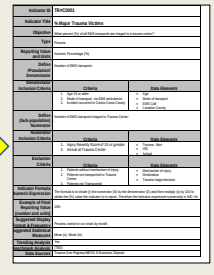
Reports that have an established minimum and maximum attribute and where the data values can fall anywhere in between. Generally, these reports have an established threshold or standard attached to them such as the **90th percentile**. Often used to report time intervals.

Single variable Indicators

Reports on a **single (one) item** based upon a single attribute or number of that item such as the number of accredited paramedics = 78. Only a denominator and no numerator is required.

The Indicator Spec Sheet (ISS)

Going from Brain to Paper



The Indicator Spec Sheet (ISS)

Measure Set	Cardiac Arrest	
Set Measure ID #	CAR-2	
Performance Measure Name	Out-of-hospital Cardiac Arrests Return of Spontaneous Circulation	
Description	Number of patients experiencing cardiac origin cardiac arrest who have Return of Spontaneous Circulation (ROSC) at any time (chtnhn) in a given period	
Type of Measure	Process	
Reporting Value	(N) Percentage	
Denominator Statement (population)	Total number of patients in a given period experiencing cardiac origin cardiac arrest	
Denominator Inclusion Criteria	Criteria	Data Elements
	Patients having a recorded NHTSA E11-01 "cardiac arrest" value of 2240	
Exclusion Criteria	Criteria	Data Elements
	Patients with NHTSA E06-14/E06-15 "age/age units" values, or NHTSA E06-16	
Numerator Statement (sub-population)	Number of patients experiencing cardiac origin cardiac arrest who have a return of spontaneous circulation (ROSC)	
Numerator Inclusion Criteria	Criteria	Data Elements
	Patients having a recorded NHTSA E11-01 "cardiac arrest" value of 2240	
Exclusion Criteria	Criteria	Data Elements
	None	
Indicator Formula Numeric Expression	The formula is to divide (/) the numerator (N) by the denominator (D) and then multiply (x) by 100 to obtain the (%) value the indicator is to report. Therefore the indicator expressed numerically is N/D=%	
Example of Final Reporting Value (number and units)	25%	
Sampling	No	
Aggregation	Yes	
Blinded	Yes	
Minimum Data Values	20	
Data Collection Approach	☐ Retrospective data sources for required data elements include administrative data and pre-hospital care records. ☐ Variation may exist in the assignment of Chief Complaint coding; therefore, coding practices may require evaluation to ensure consistency.	
Suggested Display Format & Frequency	Process control or run chart by month	
Suggested Statistical Measures	Mean (x); Mode (m)	
Trending Analysis	Yes	
Benchmark Analysis	(TBA)	
Rationale for Data Collection	☐ Definitive care for ACS ☐	
References	NEMSIS Core Measure Indicator 18	

Why the Indicator Specification Sheet (ISS) is so Important?

- *Tool for system stakeholders to reach **consensus** on the objective of the indicator.*
- *Tool for subject experts to reach **consensus** on operational definitions of the indicator.*
- *Tool for data specialists to **understand** how the data will be collected, reported and analyzed.*
- *The only way that your stakeholders know and **trust** what your talking about….*

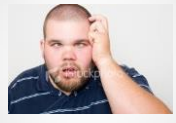
NEMSIS Indicator Format

1. Indicator ID	8(CC)
2. Question	What percentage of patients with suspected cardiac chest pain received an aspirin?
3. Indicator Name	Aspirin Administration for Chest Pain/Discomfort Rate
4. Key Process Path	Clinical Care: ACS > Aspirin Administration Rate
5. Patient/Customer Need	Definitive care for ACS
6. Type of Measure	Process
7. Objective	Increase rate in appropriate patients
8. Indicator Formula	Number of cardiac chest pain patients administered aspirin in a given period divided by total cardiac chest pain patients eligible to receive aspirin in that period
9. Indicator Formula Description	Percentage of patients having a recorded NHTSA E0915 "provider primary impression" or E0916 "provider secondary impression" value of 1785 "786.50 chest pain / discomfort" and have an E1803 "medication given" value for aspirin
10. Denominator Description	Number of patients creating a provider impression of chest pain/discomfort who are eligible for aspirin administration

Why are quality indicators valuable?

What percent (%) of patients that arrive at the ED via EMS are discharged within 1-4 hours of arrival?

Here's your answer…



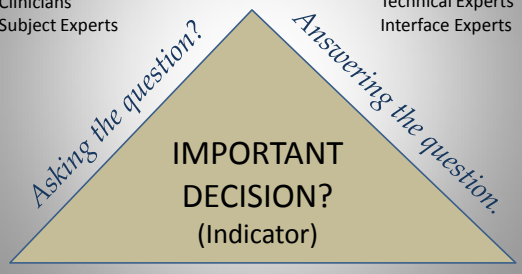
At some point,
your going to have to

"show what you know"…

Supports Better Decision Making

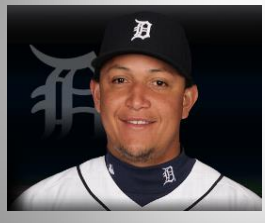
Customers
Patients
Clinicians
Subject Experts

Data Specialists
IT Support
Technical Experts
Interface Experts



Trimming down the "Touchy-Feely " stuff

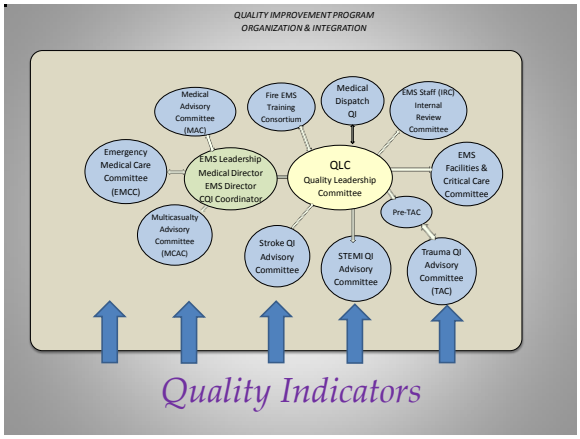
Who do you like?



Who's better?

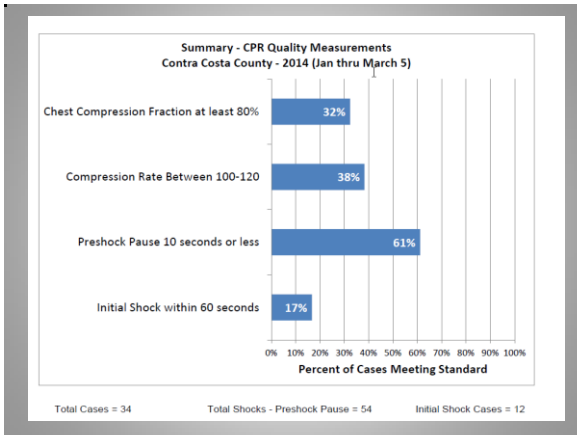
Who's the best?

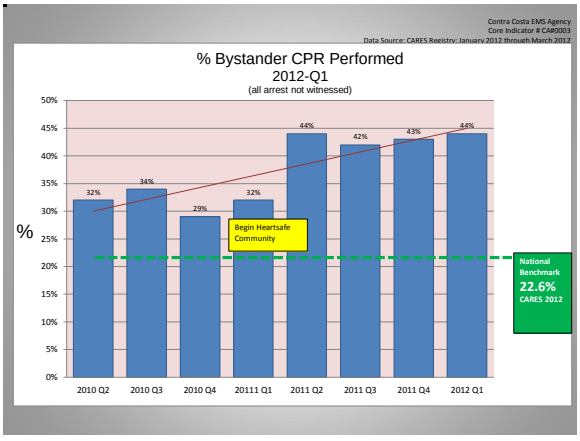
Integrating Quality Indicators into an EMS System

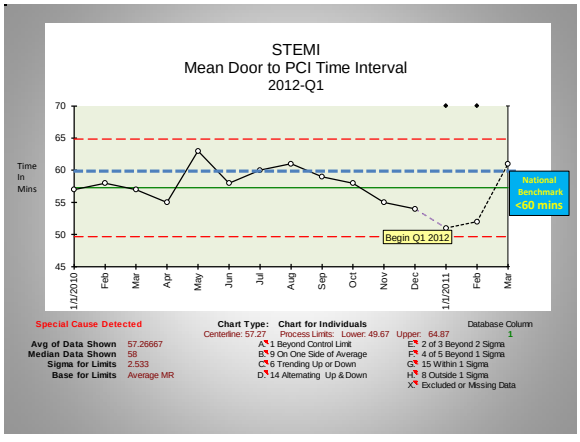


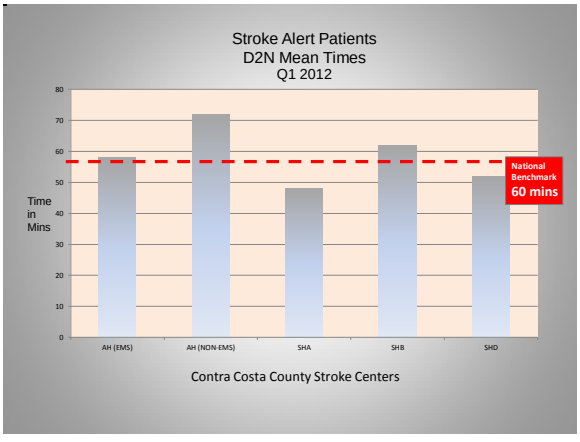
Example of EMS System Report Using Core Indicators

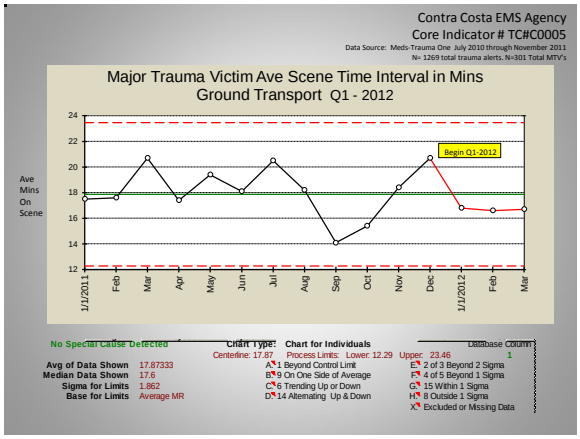
Q1 2012
Core Quality Indicators Report

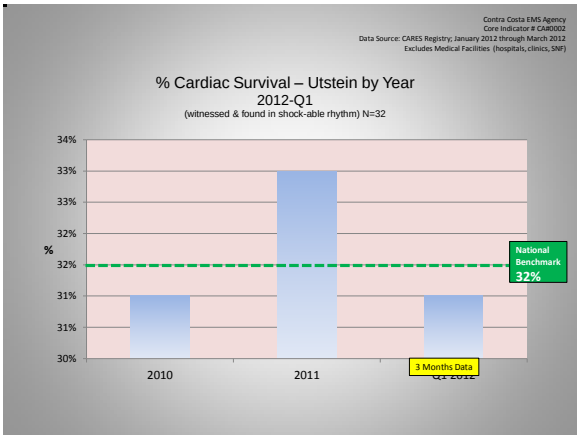


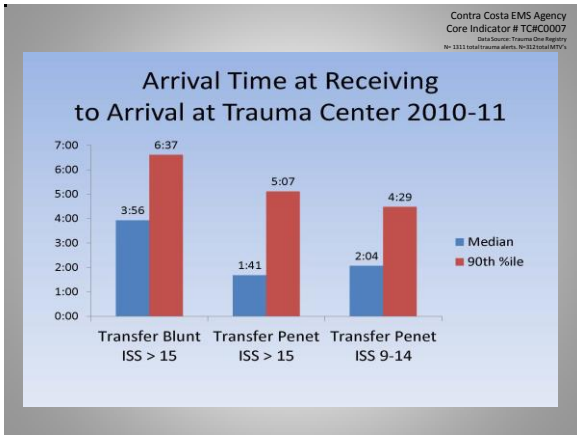












Lessons Learned

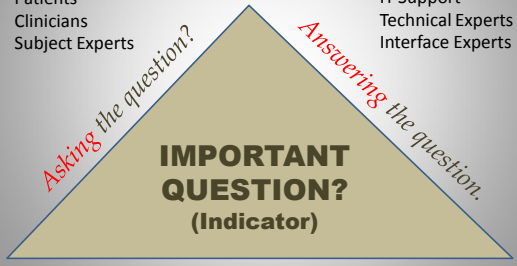
- *Keep it simple – stupid*
- *Indicators have to be formed by consensus of the stakeholders and subject experts*
- *Consensus among stakeholders is the key to trust*
- *Trust is the key to having meaningful indicators and data*
- *The more you know what is wrong with your data the more useful it becomes.*
- *Many times close is good enough*
- *It's the third or fourth time, that you start to get good*
- *The discussion is often more important than the outcome*
- *Cutting costs does not eliminate the cause of costs*

How do I make a Quality Indicator?

Building the Perfect Indicator

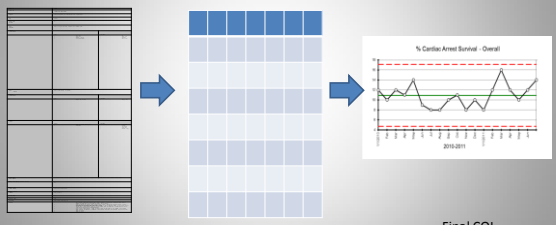
PART I
Customers
Patients
Clinicians
Subject Experts

PART II
Data Specialists
IT Support
Technical Experts
Interface Experts



Steps in Indicator Development

1 2 3



Indicator Specification Sheet

Data Reporting Table

Final CQI Reporting Format

"A Consensus Tool" Indicator Specification Sheet

SCENE TIME FOR SEVERELY INJURED TRAUMA PATIENTS

MEASURE SET	Trauma
SET MEASURE ID #	TRA-1
PERFORMANCE MEASURE NAME	Scene time for severely injured trauma patients
Description	On-Scene Time (90th percentile) of severely injured Trauma Patients who were transported from the scene by ambulance
Type of Measure	Process
Reporting Value and Units	Time (Minutes and Seconds)
Continuous Variable Statement (Population)	Time (in minutes) from time ambulance arrives at the scene until the time ambulance departs from the scene for Trauma patients, meeting criteria for transport to a trauma center (using revised trauma score or RTS=5), who received transport by ambulance to a trauma center by EMS personnel (EMT, AEMT, and Paramedic).

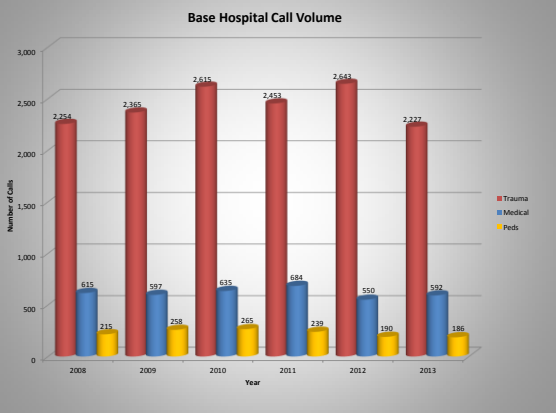
Inclusion Criteria	Criteria	Data Elements
	Patients with NHTSA E09_15 "provider primary impression" value 1740 "959.90-traumatic injury" or NHTSA E09_16 "provider secondary impression" value 1875 "959.90-traumatic injury" and NEMSIS E02_04 "type of service requested" value 30 Or Patients with CDMSIS/NEMSIS E14_27 "Revised Trauma Score" =5. or Patients with NHTSA E09_15 "provider primary impression" value 1740 "959.90-traumatic injury" or E09_16 "provider secondary impression" value 1875 "959.90-traumatic injury" and NEMSIS E02_04 "type of service requested" value 30 E14_19 "total GCS" value < 14; or < E14_04 "systolic blood pressure" value < 90; or < E14_11 "respiratory rate" value < 10 or > 29 for NHTSA E06_14/E06_15 "age/age units" values, or NHTSA E06_16 "date of birth" value minus NHTSA E05_07 "arrived at patient	• Provider Primary Impression (E09_15) • Type of Service Requested (E02_04) • Revised Trauma Score (E14_27) • Provider Secondary Impression (E09_16) • Systolic Blood Pressure (NHTSA E14_04) • Total GCS Value (NHTSA E14_10) • Respiratory Rate (NHTSA E14_11) • Age (NHTSA E06_14) • Arrived at Patient Day/Time (NHTSA E05_07) • Age Units (NHTSA E06_15) • Age (NHTSA E06_14)

3 Types of Spec Sheets

- *Bi-Variable*
  - *% = Numerator (sub population) over denominator (larger population) x 100 (20 successful IV's over / 100 attempts = 20% success)*
- *Continuous Variable*
  - *Measuring units that are continuous such as time and then establishing a threshold to determine – i.e. 90th percentile*
- *Single Variable*
  - *Count – number of paramedic engines. N = 10*

QUALITY INDICATOR SPECIFICATION SHEET
TEMPLATE - BLANK
SINGLE-VARIABLE

Indicator ID		
Indicator Name		
Description		
Type of Measure		
Reporting Value Units		
Denominator Statement (population)		
Denominator Inclusion Criteria	Criteria	Data Elements
Numerator Statement (sub-population)	NA	
Numerator Inclusion Criteria	Criteria	Data Elements
Exclusion Criteria	Criteria	Data Elements
Indicator Formula Numeric Expression		
Example of Final Reporting Value (number and units)		
Benchmarks		
References		



Bi-Variable

Two variables
*(**Numerator and Denominator**)*

Denominator (larger sample population)
Numerator (smaller-sub population)

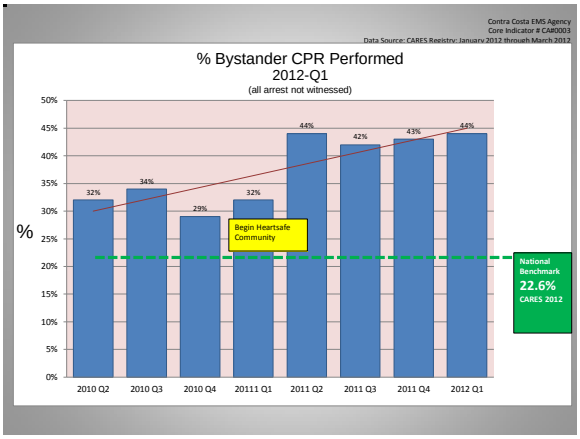
The Math
If the data says 20 successful IV's over / 60 attempts

20/60= .33 x 100 = 33% success rate

QUALITY INDICATOR SPECIFICATION SHEET
TEMPLATE - BLANK

BI-VARIABLE

Indicator ID		
Indicator Name		
Description		
Type of Measure		
Reporting Value Units		
Denominator Statement (population)		
Denominator Inclusion Criteria	Criteria	Data Elements
Numerator Statement (sub-population)		
Numerator Inclusion Criteria	Criteria	Data Elements
Exclusion Criteria	Criteria	Data Elements
Indicator Formula Numeric Expression		
Example of Final Reporting Value (number and units)		



Continuous Variable

Determining the percentile (%)

1 *data points N=14*

29	**28**
29	28
29	28
29	28
29	28
29	28
29	28

2 *Ranked in ascending order N=14*

14	36
13	34
12	32
11	32
10	31
9	30
8	30
7	29
6	28
5	28
4	28
3	28
2	27
1	24

3 ***The Math***

N=14

14 x .90= **12.5**

4 *Finding the 90% Value*

14	36
13	**34**
12	**32**
11	32
10	31
9	30
8	30
7	29
6	28
5	28
4	28
3	28
2	27
1	24

33

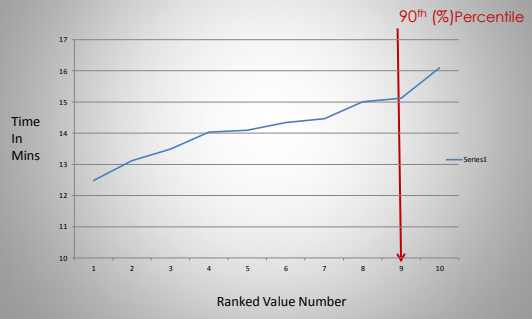
5

The 90th percentile

90% is **33**

On Scene Trauma Interval (90th Percentile)

Severely Injured Trauma Patient



QUALITY INDICATOR SPECIFICATION SHEET
TEMPLATE - BLANK

CONTINUOUS VARIABLE

SET MEASURE (INDICATOR) ID		
PERFORMANCE MEASURE (INDICATOR) NAME		
Description		
Type of Measure		
Reporting Value Units		
Continuous Variable Statement (population)		
Inclusion Criteria	Criteria	Data Elements
Exclusion Criteria	Criteria	Data Elements
Indicator Formula Numeric Expression		
Example of Final Reporting Value (number and units)		
Benchmark		
References		

Sections Completed by Initial Stakeholders and Subject Experts

- *Standardized definitions*
  - ✓*Name*
  - ✓*Description*
  - ✓*Type of measure*
  - ✓*Numerator*
  - ✓*Denominator*
  - ✓*Final Value*
  - ✓*Reporting format*
- *Benchmarking*
- *References*

Example – Part 1 Completed Indicator Spec Sheet (ISS)
(bi-variable)

Indicator ID	*TRA-2*	
Indicator Name	*Direct transport to Trauma Center for severely injured trauma patient*	
Description	*What % of Major Trauma Victims were transported from scene directly to a Trauma Center?*	
Type of Measure	*Process*	
Reporting Value Units	*(%)*	
Denominator Statement (population)	*All trauma patients meeting trauma criteria (using revised trauma score or RTS<5) for transport from scene to trauma center.*	
Denominator Inclusion Criteria	Criteria	Data Elements
	Revised Trauma Score <5	
Numerator Statement (sub-population)	*Trauma patients who meet trauma criteria and who were transported from scene directly to a trauma center.*	
Numerator Inclusion Criteria	Criteria	Data Elements
	Transported directly to Trauma Center	
Exclusion Criteria	Criteria	Data Elements
	None	
Indicator Formula Numeric Expression	*The formula is to divide (/) the numerator (N) by the denominator (D) and then multiply (x) by 100 to obtain the (%) value the indicator is to report. Therefore the indicator expressed numerically is N/D =%*	
Example of Final Reporting Value (number and units)	*98%*	
Benchmarks	*Trauma 1 Program – Seattle Program*	
References	*ACS*	

PART II – Indicator Spec Sheet (ISS) Data - Technical

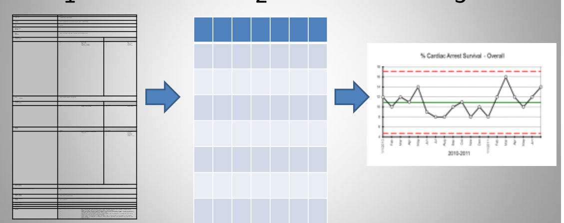
Denominator Inclusion Criteria	Criteria	Data Elements
	• Patients with E09_15 value 1730 value "neurological deficit (includes CVA/TIA)" or E09_16 value 1865 "neurological deficit (includes CVA/TIA)" • Patients aged 18 years of age or older	• Provider Primary Impression (E09_15) • Provider Secondary Impression (E09_16) • Age (E06_14) • Age Units (E06_15) • Date of Birth (E06_16)
Exclusion Criteria	Criteria	Data Elements
	• Pediatric pts age 14 or under • Seizure • OD	• Provider Primary Impression (E09_15) • Provider Secondary Impression (E09_16) • Age (E06_14) • Age Units (E06_15) • Date of Birth (E06_16)
Numerator Inclusion Criteria	Criteria	Data Elements
	• Patients with E09_15 value 1730 value "neurological deficit (includes CVA/TIA)" or E09_16 value 1865 "neurological deficit (includes CVA/TIA)" • Patients aged 18 years of age or older And • E20_01 "Destination Transferred To, Name" represents a stroke center	• Provider Primary Impression (E09_15) • Provider Secondary Impression (E09_16) • Destination/Transferred To (E20_01)
Exclusion Criteria	Criteria	Data Elements
	None	
Example of Final Reporting Value		
Sampling	Yes	
Aggregation	Yes	
Blinded	Yes	
Minimum Data Values	30	
Data Collection Approach	☐ Retrospective data sources for required data elements include administrative data and pre-hospital care records. ☐ Variation may exist in the assignment of coding; therefore, coding practices may require evaluation to ensure consistency.	
Suggested Display Format & Frequency	Process control or run chart by month	
Suggested Statistical Measures	Mean (x); Mode (m)	
Trending Analysis	Yes	
Benchmark Analysis	(TBD)	
Rationale for Data	☐ The rapid transport of suspected stroke patients directly to stroke centers has been well documented to improve access to diagnostic imaging and treatment. Prehospital assessment and advance hospital notification by EMS personnel also reduces the time to receive time sensitive diagnostics and therapy upon arrival at the emergency department. ☐ Improved access to diagnostic imaging assists clinicians in the decision making process and treatment plans. Over 143,579 people die each year from stroke (Stroke Center, 2009). Stroke is the third leading cause of death in the United States. Each year, about 795,000 people suffer a stroke. About 600,000 of these are first attacks, and 185,000 are recurrent attacks (AHA, 2009). Of all strokes, 87 percent are ischemic, 10 percent are intracerebral hemorrhage, and 3 percent are subarachnoid hemorrhage (NINDS, 2004). Because of the therapeutic time window for treatment possibilities, timely completion and results of the CT or MRI scan are imperative and will directly impact the quality of care a patient receives.	
References		

Demonstration of Indicator Development & Utilization at Statewide Level

Steps in the Process

CEMSIS INDICATOR RE2A: % Oxygen Administered:
Primary Impression: Pulmonary Edema

1 2 3



Indicator Specification Sheet

Data Reporting Table

Final CQI Reporting Format

The Indicator Spec Sheet (ISS)

Going from Brain to Paper

Indicator ID	TR#C0001	
Indicator Title	% Major Trauma Victims	
Objective	What percent (%) of all EMS transports are triaged to a trauma center?	
Type	Process	
Reporting Value and Units	Numeric Percentage (%)	
Define (Population) Denominator	Number of EMS transports	
Denominator Inclusion Criteria	Criteria	Data Elements
	1. Age 15 or older 2. Mode of transport via EMS ambulance 3. Incident occurred in Contra Costa County	• Age • Mode of transport • EMS Call • Location County
Define (Sub-population) Numerator	Number of EMS transports triaged to Trauma Center	
Numerator Inclusion Criteria	Criteria	Data Elements
	1. Injury Severity Score of 15 or greater 2. Arrival at Trauma Center	• Trauma Alert • ISS • Arrival
Exclusion Criteria	Criteria	Data Elements
	1. Patients without mechanism of injury 2. Patients not transported to Trauma Center 3. Patients not Transported	• Mechanism of injury • Destination • Trauma triage decision
Indicator Formula Numeric Expression	The formula is to divide (/) the numerator (N) by the denominator (D) and then multiply (x) by 100 to obtain the (%) value the indicator is to report. Therefore the indicator expressed numerically is N/D =%	
Example of Final Reporting Value (number and units)	10%	
Suggested Display Format & Frequency	Process control or run chart by month	
Suggested Statistical Measures	Mean (x); Mode (m)	
Trending Analysis	Yes	
Benchmark Analysis	(TBD)	
Data Sources	Trauma One Registry/MEDS 3/ Business Objects/	

Indicator Spec Sheet (ISS)

CORE INDICATOR Index # RE2A	SHORTNESS OF BREATH - SIGNS & SYMPTOMS OF FLUID OVERLOAD	
Measure	Oxygen: Frequency of Administration	
CORE INDICATOR REF #RE2	RESPIRATORY TREATMENT PROTOCOL UTILIZATION	
Objective	☐ to measure % of patients who exhibit signs & symptoms of shortness of breath with fluid overload and receive oxygen as part of treatment in the Prehospital setting	
Classification	☐ medical care - clinical	
Type of Measure	☐ Process	
Domain of Performance	☐ Compliance - frequency	
Indicator Reporting Value	☐ %	
Display Format	☐ Listing ☐ Cube Chart ☐ Bar Chart ☐ Line Graph ☐ Process Control Chart	
Frequency of Display	☐ Monthly x 12	
Measures of Central Tendency	☐ mean - Yes ☐ mode - No ☐ variance - No ☐ standard deviation - Yes	
Trending Analysis	☐ NA	
Minimum Data Values	☐ 30 values per measure	
Sampling	☐ Periodic - Rate	
Aggregation	☐ Yes	
Blinded	☐ Yes	
Beta Testing	☐ None to Date	
Population Denominator (D)	☐ patients who exhibit signs & symptoms of shortness of breath with fluid overload and are treated by EMS personnel in Prehospital setting	
Denominator	Inclusion Criteria	EMSA Data Elements
	☐ patient has reached age 15 ☐ patients who exhibit signs & symptoms of shortness of breath with fluid overload ☐ event was in prehospital setting	☐ EMSA #36 ☐ EMSA #54VTAC, 54VFIB ☐ EMSA #54C-A 52
Denominator Data Source	EMS Medical Records	
Population Subset Numerator (N)	☐ the number of patients who receive oxygen administered by EMS personnel in Prehospital setting	
Numerator	Inclusion Criteria	EMSA Data Elements
	☐ patient has reached age 15 ☐ patients who receive oxygen ☐ patients who exhibit signs & symptoms of shortness of breath	☐ EMSA#
Numerator Data Source	☐ EMS Medical Records	
Description of Indicator Formula	☐ numerator value (N) divided by denominator value (D) multiplied by 100 equals percentage (%)	
Indicator Formula Numeric Expression	☐ N / D = %	
Indicator Exclusion Criteria	☐ non-respiratory etiologies, ☐ respiratory etiologies where treatment not attempted by EMS personnel	

EMS Indicator Update Project

CEMSIS Data Table Request Form

The purpose of this form is to assist with the process of generating CEMSIS reports for EMS quality indicators. CAEMSQI project data will be provided in the form of a data table, and more than one table may be required to address a single indicator. To request a data table, a minimum of five form sections must be addressed:

Request Form Sections
1. Basic report information
2. Table population
3. Measures
4. Perspective and audience
5. Dimensions

1- Basic Report Information

#EMS163 Indicator Number
Indicator Name
Report Number (tbd)
Report Title
CAEMSQI group contact:

2- Table population

Using CEMSIS elements and field values, define the base population (i.e. denominator) for this data table. List specific exclusion criteria as needed.

3- Measures

Describe the base measure for this data table. Include a formula if applicable. Also, use CEMSIS elements and field values to define the numerator population as needed.

4- Perspective and audience

Report level (grain)	Audience	This report will be used by	
State	Identifiable data	EMSA	Hospital
Local EMS Agency	De-identified data	EMSAAC	
Hospital	Public data	Local EMS Agency	
Provider		Provider	

EMS Systems Data Request Form
last update April30, 2012

EMS Indicator Update Project

CEMSIS Data Table Request Form

The purpose of this form is to assist with the process of generating CEMSIS reports for EMS quality indicators. CAEMSQI project data will be provided in the form of a data table, and more than one table may be required to address a single indicator. To request a data table, a minimum of five form sections must be addressed:

Request Form Sections
1. Basic report information
2. Table population
3. Measures
4. Perspective and audience
5. Dimensions

1- Basic Report Information

#EMS163 Core Indicator
Sub-Indicator
ReportNumber
Report Title
CAEMSQI group contact:

2- Perspective and audience

Report level (grain)	Aud
✓ State	
Local EMS Agency	✓
Hospital	
Provider	

3- Table population

Using CEMSIS elements and field values, define the base population (i.e. denominator) for this data table. List specific exclusion criteria as needed.

3- Measures

Describe the base measure for this data table. Include a formula if applicable. Also, use CEMSIS elements and field values to define the numerator population as needed.

Denominator Data Table

RE2A demonstration table - May 8 2012
denominator population

Universe: NONE Population: RE2ADEMO_DENOMINATOR Repeat Set: NONE

RE2ADEMO_DENOMINATOR
Patient Count: 326
Processed Patients: 326

Incident Date From 01/01/2010 To 12/31/2010

Incident Date - Month And Year	Frequency	Percentage of all Denominators
JAN 10	29	8.90
FEB 10	20	6.13
MAR 10	27	8.28
APR 10	34	10.43
MAY 10	27	8.28
JUN 10	30	9.20
JUL 10	19	5.83
AUG 10	26	7.98
SEP 10	27	8.28
OCT 10	24	7.36
NOV 10	27	8.28
DEC 10	36	11.04
Total	326	100.00

Numerator Data Table

RE2A demonstration table - May 8 2012
numerator population

Universe: NONE Population: RE2ADEMO_NUMERATOR Repeat Set: NONE

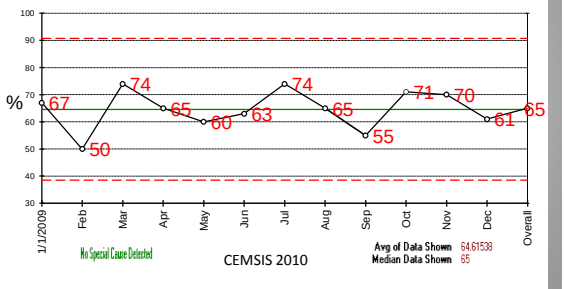
RE2ADEMO_NUMERATOR
Patient Count: 211
Processed Patients: 211

Incident Date From 01/01/2010 To 12/31/2010

Incident Date - Month And Year	Frequency	Percentage of all Numerators
JAN 10	20	9.48
FEB 10	10	4.74
MAR 10	20	9.48
APR 10	22	10.43
MAY 10	16	7.58
JUN 10	19	9.00
JUL 10	14	6.64
AUG 10	17	8.06
SEP 10	15	7.11
OCT 10	17	8.06
NOV 10	19	9.00
DEC 10	22	10.43
Total	211	100.00

Final Reporting Format

CEMSIS INDICATOR RE2A: % Oxygen Administered:
Primary Impression: Pulmonary Edema



Questions?

Converting your data to a report…

Month	%
1 -11	26
2- 11	22
3-11	23
4-11	21
5-11	24
6-11	25
7-11	24
8-11	21

The Final Touches…
Choosing the right reporting format

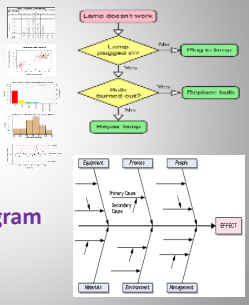
Exploring Data Visualization

Common Uses for Visualizations in Health Analytics	
Relationship	• Highlights a correlation between two or more data points
Comparison	• Contrasts different variables
Composition	• Shows a complete picture for a variable (i.e., a count of all surgical procedures, where done, types of tests ordered for those procedures, etc..)
Distribution	• Show data points distributed throughout a data set (i.e., show wait-time distributions for ED)
Trend Over Time	• Plot events across a time series (i.e., patient visits over the past 30 days)
Deviation	• Detect when values deviate from baseline

Strome, Trevor. "Healthcare analytics for quality and performance improvement". Wiley. 2013

Seven Basic CQI Tools

1. Check Sheets
2. Scatter Diagrams
3. Pareto Diagram
4. Histogram
5. Control Charts
6. **Flowcharts**
7. **Cause-Effect Diagram**

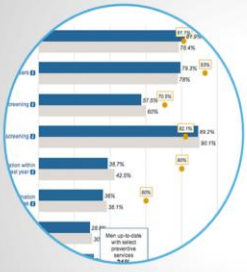


To Compare

What it means? You want to compare one set of value(s) with another.
Examples:
•Performance of Product A vs. Product B in 5 regions
•Interview performance of various candidates
Charts that can be used for this reason:

•Bar Charts,
•Column Charts
•Scatter Plots
•Pie Charts
•Line Charts
•Data Tables
•Box Plots

CLICK TO VIEW



Source: Use of Preventive Services Among People 50-64 years of age, California vs. US national average, AARP.

Bar Charts

Highlight independent elements and compare values

- An excellent choice for highlighting disparities
- Horizontal bars allow for the inclusion of more metrics
- Bar charts play on humans' inherent ability to draw quicker conclusions based on side-by-side lengths

AARP Chart: Why It Works

This stacked chart allows the eyes to easily compare state and national averages.

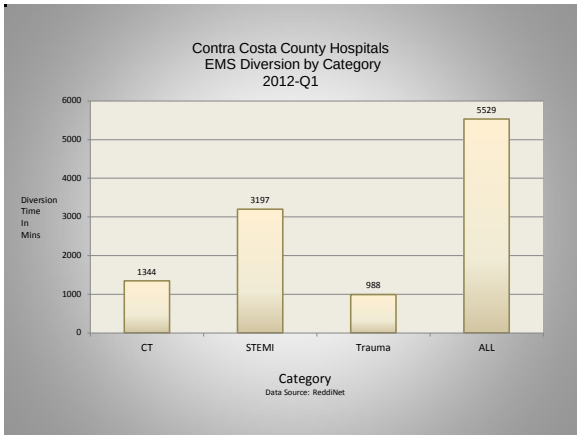
Bright orange dots showing federal targets offer another access point, clearly indicating the differences in usage rates and target goals.

To Show the Distribution

What it means? You want to show the distribution of a set of values (to understand the outliers, normal ranges etc.)
Examples:
•Distribution of Call waiting times in a call center
•Distribution of bugs found in 10 week software testing phase

Charts that can be used to show distribution:

•Column Charts
•Scatter Plots
•Line charts
•Box Plots

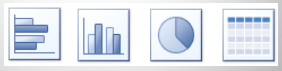


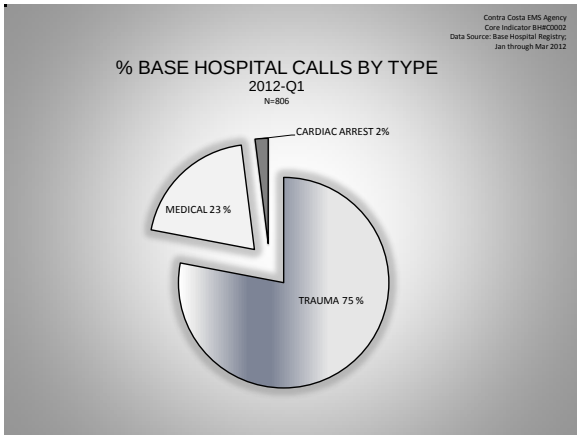
To Show Parts of Whole

What it means? You want to show how various parts comprise the whole
Examples: Individual product sales as a percentage of whole revenue
•Browser types of customers visiting our website

Charts that can be used to show Parts of Whole:

•Column Charts
•Bar Charts
•Pie Charts
•Data Table



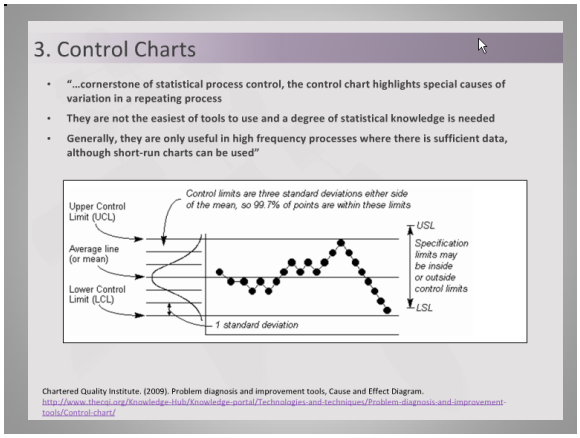


To Show Deviations

What it means?
You want to see which values deviate from the norm.
Examples:
•Failures (or bugs) in the context of Quality Control
•Sales in Various Stores

Charts that can be used to show Deviations:

•Column Charts
•Bar Charts
•Line Charts
•Data Table
•Run Charts
•Process Control Charts



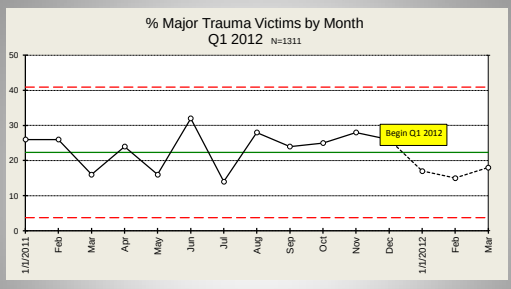
To Show Trend Over Time

What it means?
You want to understand the trend over time of some variable(s).
Examples:
•Customer footfalls on the last 365 days
•Share price of MSFT in the last 100 trading sessions

Charts that can be used to show Trend Over Time:

•Column Charts
•Line Charts
•Data Table
•Run Chart
•Process Control Chart

Process Control Chart Showing "No Special Cause"

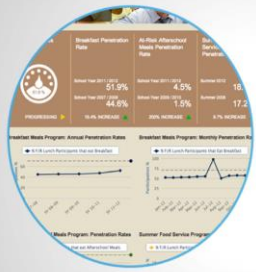


No Special Cause Detected

Centerline: 5.859 Process Limits: Lower: 2.368 Upper: 9.350 1

Avg of Data Shown	5.858824	A	1 Beyond Control Limit	E	2 of 3 Beyond 2 Sigma
Median Data Shown	6.3	B	9 On One Side of Average	F	4 of 5 Beyond 1 Sigma
Sigma for Limits	1.164	C	6 Trending Up or Down	G	15 Within 1 Sigma
Base for Limits	Average MR	D	14 Alternating Up & Down	H	8 Outside 1 Sigma
				X	Excluded or Missing Data

CLICK TO VIEW



Dashboards

Summarize key data points on one page

- Valuable in communicating quick snapshots of key figures on a single page
- Contain tables, charts, graphs, and other data visualizations
- Odometers are a popular dashboard style. For example, this dashboard uses an odometer with clear percentages to detail progress in ending childhood hunger in Maryland
- Less is more: Create clean designs with limited data points
- Use minimal visualizations to avoid confusion and force focus

Source: Maryland StateStat, Goals for Ending Childhood Hunger.

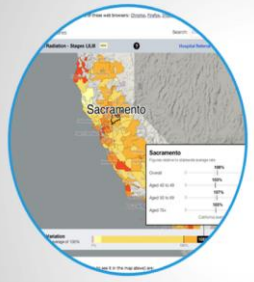
2. Check Sheet

- "The Check Sheet is a simple document that is used for collecting data in real time and at the location where the data is generated.
- The document is typically a blank form that is designed for the quick, easy, and efficient recording of the desired information, which can be either quantitative or qualitative
- A defining characteristic of a check sheet is that data is recorded by making marks – checks - on it
- Ttypical check sheet is divided into regions, and marks made in different regions have different significance. Data is read by observing the location and number of marks on the sheet"

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Wrong orders	///	////	//// //// ///	/	//	////	//// //
Reworked orders		/	//	///		/	//
Late deliveries	//// ///	/	///	//		///	//
Shipping damage						//// ////	//// //// ///
Late payments		/					
Totals	11	8	27	6	2	28	19

Six Sigma Daily, http://www.sixsigmadaily.com/methodology/check-sheets-five-basic-types

CLICK TO VIEW



Chloropleth Maps

Define and compare geographic areas

- Also known as "heat maps," these allow quick comparison of data geographically to show relative performance
- Color can divide areas into two or more categories
- Instead of using different colors, more subtle gradients of the same color also can show key differences, as shown by this density map on varying rates of elective procedures in California

Source: All Over the Map: Elective Procedure Rates in California Vary Widely, California HealthCare Foundation.

CLICK TO VIEW

Animated Visualizations

Demonstrate changes over time

- Can incorporate icons and other visualization options
- This example shows obesity rates in a chloropleth map
- The movement in animated graphics is more engaging to viewers
- Users can roll the data back to 2000 and play the animation to view changes in the map and data through 2010

Source: Obesity Prevalence Among Adults, DataHub, Robert Wood Johnson Foundation.

Rule of Thumb

- ***Structures*** *(things) - usually are best represented by bar or* ***pie*** *graphs*
- ***Processes*** *(activities) - are almost always best to show over time in in line graph. My favorites are* ***process charts or run charts***
- ***Outcomes*** *(end results)- work best usually in a* ***bar or column*** *graph.*
- *Yes, there are exceptions….*

Exercise #1
Making a Quality Indicator

Instructions

1. *Develop a indicator spec sheet (ISS).*
2. *Using the objective of determining the percentage (%) Acute Coronary Patients (ACS) who received 12 Lead ECG by paramedics*
3. *Use your group to reach consensus and enter the following information on your abridged ISS worksheet.*
    1. indicator name,
    2. description,
    3. reporting value
    4. type of measure,
    5. denominator statement & inclusion criteria
    6. numerator statement & inclusion criteria
    7. exclusion criteria
    8. example formula numeric expression
    9. example of final reporting value

Bi-Variable Indicator Template

Indicator ID		
Indicator Name		
Description		
Type of Measure		
Reporting Value Units		
Denominator Statement (population)		
Denominator Inclusion Criteria	Criteria	Data Elements
Numerator Statement (sub-population)		
Numerator Inclusion Criteria	Criteria	Data Elements
Exclusion Criteria	Criteria	Data Elements
Indicator Formula Numeric Expression		
Example of Final Reporting Value (number and units)		

Rules of Engagement

- *Respect time – move on*
- *Establish leadership*
- *Take turns speaking and listening*
- *Postpone side conversations*
- *Silence your devices*
- *Keep an open mind*
- *Participate constructively*
- *Blame the process, not the person*
- *Do what you say you'll do*
- *Don't get hung up on technical data details at this point - we will address that later*
- *Utilize facilitators when stuck*

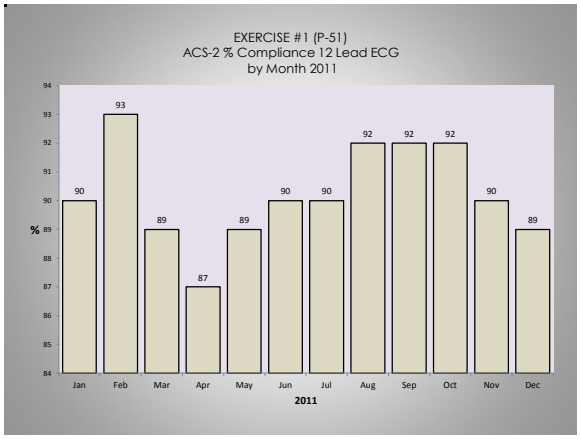
Example of Completed ISS Exercise #1

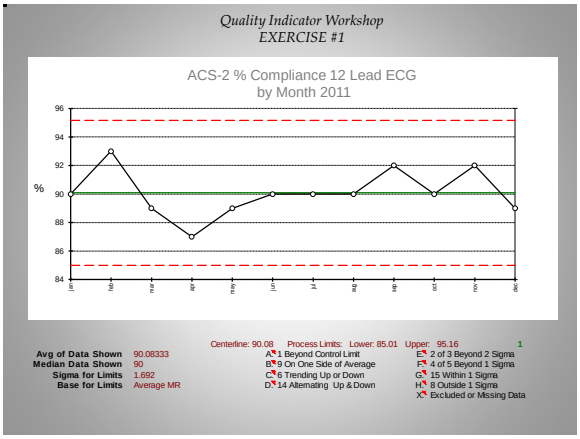
Indicator ID	*Acute Coronary Syndrome (ACS-2)*	
Indicator Name	*12 Lead ECG Performance*	
Description	*What % of Acute Coronary Syndrome (ACS) Patients receive 12 Lead ECG by Paramedics*	
Type of Measure	*Process*	
Reporting Value Units	*(%) Percentage by month Jan to Dec 2011*	
Denominator Statement (population)	*Number of patients creating a provider impression of chest pain or discomfort*	
Denominator Inclusion Criteria	Criteria	Data Elements
	• *Chest Pain/Discomfort* • *Cardiac chest pain*	
Numerator Statement (sub-population)	*Number of patients who have a 12 lead ECG performed by paramedics*	
Numerator Inclusion Criteria	Criteria	Data Elements
	• *Procedures* • *12 lead ECG*	
Exclusion Criteria	Criteria	Data Elements
	• *none*	
Indicator Formula Numeric Expression	*The formula is to divide (/) the numerator (N) by the denominator (D) and then multiply (x) by 100 to obtain the (%) value. Indicator is expressed numerically is N/D =% per each month*	
Example of Final Reporting Value (number and units)	*Jan = 90% Apr = 87% Jul = 90%* *Oct = 92% Feb = 93% May =89%* *Aug= 90% Nov =90% Mar = 89%* *Jun = 90% Sep = 92% Dec = 89%*	

Demo Control and Bar Chart Conversion
EXERCISE #1
Indicator ACS-2
Corresponding Data Table

DATA TABLE
(P-50)
% numerator over denominator by month 2011
N=280

MTh	n	d	%
Jan	21	24	90
Feb	23	25	93
Mar	19	22	89
Apr	18	21	87
May	19	22	89
Jun	19	21	90
Jul	23	26	90
Aug	21	24	90
Sep	23	25	92
Oct	21	23	92
Nov	20	22	90
Dec	22	25	89
Total	249	280	89





Break

Part II

Evaluating Quality Indicators

"Someone's gonna have to pay"

Tony Soprano

85% of all work problems are controlled by the processes and only approximately 15% are caused by direct involvement of people working in the process, yet we tend to lay "blame" on the person responsible.

Donald Berwick M.D.
Institute for Healthcare Improvement

"Each system (process) is perfectly designed to get the results it is already getting"

Donald Berwick, IHI

So…how are we doing?

If American industry defines quality as: "the degree of which a system is free from bugs and flaws", then it would seem that Emergency Medical Services (EMS) as a relatively young industry, appears to be at a tolerable level?

Truth is…….

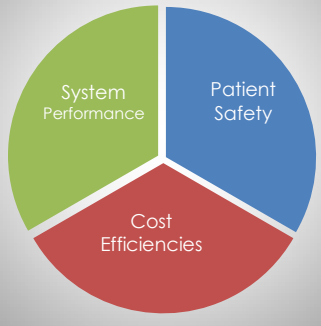
We don't really know.

Engaging Stakeholders

objective, evidence based, stratification, The five (5) whys?

Consensus leads to standardization Standardization leads to trust

Three Primary Domains of Evaluation



Indicator Evaluation Tool

CQI
INDICATOR EVALUATION FORM

INDICATOR # _____

INDICATOR TITLE: _____

	YES	NO
Does the indicator show special cause or potentially unsafe results	_____	_____
Is the indicator below performance expectations?	_____	_____
Does the indicator need further review or stratification?	_____	_____
Should an Action Plan initiated?	_____	_____

Please explain any "YES" answer below;

_____

_____

_____

_____

_____

_____

LEAD REVIEWER NAME _____ DATE: _____

COMMITTEE GROUP NAME: _____

ATTACH ACTION PLAN AS INDICATED

Looking at "Our Stuff"
A Four Step CQI-Decision Making Process

Visualize
Analyze
Compromise
Actualize

Process Analysis

Evaluation of data by using graphic representations of activities which show trends and variations over time.

Here is some wisdom from Dr. Donald Berwick -- from almost 20 years ago:

"Plotting measurements over time turns out, in my view, to be one of the most powerful devices we have for systemic learning...Several important things happen when you plot data over time. First, you have to ask what data to plot. In the exploration of the answer you begin to clarify aims, and also to see the system from a wider viewpoint. Where are the data? What do they mean? To whom? Who should see them? Why? These are questions that integrate and clarify aims and systems all at once. Second, you get a leg up on improvement. When important indicators are continuously monitored, it becomes easier and easier to study the effects of innovation in real time, without deadening delays for setting up measurement systems or obsessive collections during baseline periods of inaction. Tests of change get simpler to interpret when we use time as a teacher...So convinced am I of the power of this principle of tracking over time that I would suggest this: If you follow only one piece of advice from this lecture when you get home, pick a measurement you care about and begin to plot it regularly over time. You won't be sorry."

[from Berwick's 1995 Institute for Healthcare Improvement Forum plenary speech "Run to Space"]

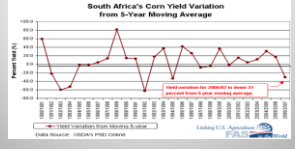
Trending

The process of showing by plot or process control chart, the upward, downward or level movement of an activity over a specified period of time.

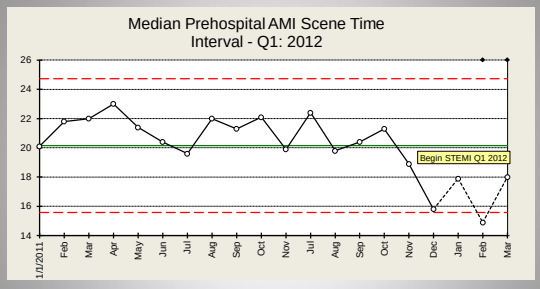
Variation

Special Cause

A source that causes a fundamental change in a process. Special cause variation signals a change in a process and can usually be traced back to a single source.



Process Control Chart Showing Special Cause



Special Cause Detected

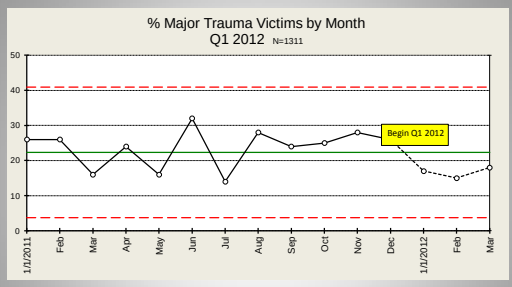
Chart Type: Chart for Individuals — Database Column

Centerline: 20.15 Process Limits: Lower: 15.57 Upper: 24.73 1

Avg of Data Shown	20.15
Median Data Shown	20.4
Sigma for Limits	1.526
Base for Limits	Average MR

A 1 Beyond Control Limit
B 9 On One Side of Average
C 6 Trending Up or Down
D 14 Alternating Up & Down
E 2 of 3 Beyond 2 Sigma
F 4 of 5 Beyond 1 Sigma
G 15 Within 1 Sigma
H 8 Outside 1 Sigma
X Excluded or Missing Data

Process Control Chart Showing "No Special Cause"

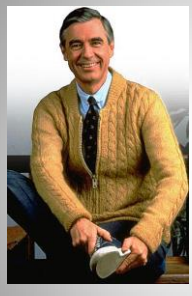


No Special Cause Detected

Centerline: 5.859 Process Limits: Lower: 2.368 Upper: 9.350 1

Avg of Data Shown	5.858824
Median Data Shown	6.3
Sigma for Limits	1.164
Base for Limits	Average MR

A 1 Beyond Control Limit
B 9 On One Side of Average
C 6 Trending Up or Down
D 14 Alternating Up & Down
E 2 of 3 Beyond 2 Sigma
F 4 of 5 Beyond 1 Sigma
G 15 Within 1 Sigma
H 8 Outside 1 Sigma
X Excluded or Missing Data



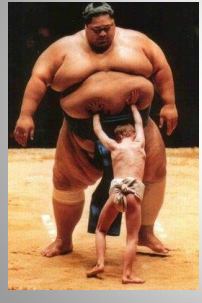
Numbers are our friends…

Statistically Speaking

Only four things really matter…

1. *The sample size*
2. *The average*
3. *How things are spread around the average*
4. *How a things change over time.*

Sample size does matter!



Sampling

Rule of thirty (n=30)
Rate vs. Sentinel

Measures around the Average (Central Tendency)

Mean = *sum of all values / total number of values*

Median = *middle value when data arranged in numeric order*

Mode = *most common (repeated) value*

Measures outside the Average (Dispersion)

Range
the maximum value minus the minimum data value.

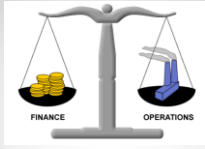
Standard Deviation
a measurement which shows how widely spread (dispersed) data is around the mean

Analyzing Performance

- *Compared to what?*
  - *Benchmarks*
  - *Best Practices*

- *What if there are no best practices available?*
  - *Local community and stakeholders determines performance standards*

Analyzing Costs



Cost–Benefit Analysis
Cost per Unit (CPU)
Cost-Performance Analysis (CPA)

Cost-effectiveness Analysis (CEA)

- Measuring the costs and effects of a particular program, or intervention
- Average cost-effectiveness ratio (ACER)
  - One divides the net cost of the program by the net effects of the program (ie, lives saved)
  - Example - measles vaccination outreach program costs $50,000 and is estimated to prevent 100 cases of measles. The average cost effectiveness ratio is $50,000/100 = $500 per measles case prevented
- Incremental cost-effectiveness ratio (ICER) - compares the differences in both costs and outcomes for two interventions that compete for resources.

Actualizing

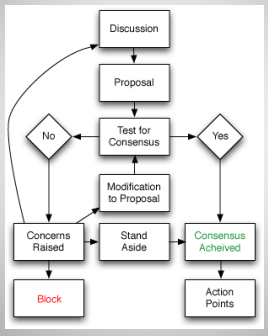
The Decision Process

to act or not to act?
draft problem statement
action oriented objectives

Consensus-Oriented Decision-Making, 7 key steps.

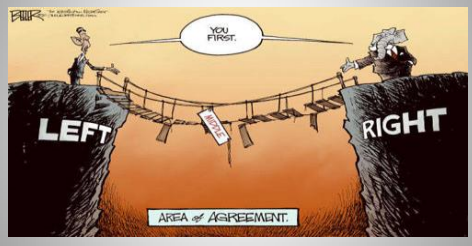
1. *Framing the topic*
2. *Open discussion*
3. *Identifying underlying concerns*
4. *Collaborative proposal building*
5. *Choosing a direction*
6. *Synthesizing a final proposal*
7. *Closure - ownership*

Consensus Flow Diagram



Compromising

Using Practical Consensus



Exercise #2

Developing & Utilizing an EMS Quality Indicator (Outcome)

Developing and Utilizing Quality Indicators Workshop

EXERCISE #2

(P-53)
CQI TASK TEAM
Activation Form
Problem/Issue Recognition

Initiative Project # #0125

Project Name: % Out of Hospital Cardiac Arrest Survival to Hospital Discharge-2012 (Utstein)

Problem/Issue Statement:
Our CQI task Group needs to determine if our percentage (%) of cardiac arrest survival meets or exceeds the national benchmark for year 2012. The group would like to see the % survival by month for the twelve months of 2012.

References and benchmarks
Use Utstein Model to help determine standards and definitions..

National benchmark of 27% based upon Cardiac Arrest Registry to Enhance Survival (CARES) Q4 2012 Report

Proposed Team Lead name: _____

Proposed Team Facilitator name:_____

Date: _____

Exercise #2 Instructions

1. *Develop a indicator spec sheet to determine the % cardiac arrest survival to hospital discharge per Utstein definitions and benchmarks.*
2. *Use your group to reach consensus on the details and definitions of what data you will need.*
3. *Use only the information available to you.*
4. *Consult with facilitator as needed.*

QUALITY INDICATOR SPECIFICATION SHEET
TEMPLATE - BLANK
BI-VARIABLE

Indicator ID		
Indicator Name		
Description		
Type of Measure		
Reporting Value Units		
Denominator Statement (population)		
Denominator Inclusion Criteria	Criteria	Data Elements
Numerator Statement (sub-population)		
Numerator Inclusion Criteria	Criteria	Data Elements
Exclusions Criteria	Criteria	Data Elements
Indicator Formula Numeric Expression		
Example of Final Reporting Value (number and units)		
Benchmarks		
References		

Example of Completed ISS Exercise #2

OUT-OF-HOSPITAL CARDIAC ARRESTS SURVIVAL TO HOSPITAL DISCHARGE

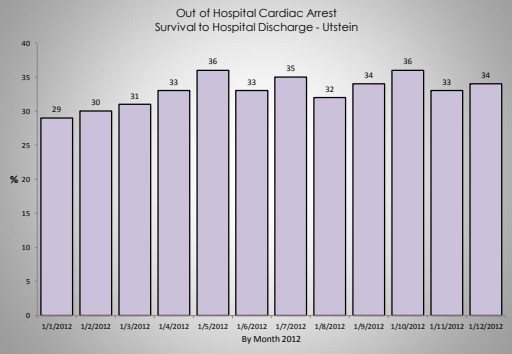
Indicator ID	CA-4	
Indicator Name	% Cardiac Arrest Survival to Hospital Discharge (Utstein) 2012	
Description	What is the percentage (%) of cardiac arrest patients who survive per Utstein definitions for the years 2009-2011?	
Type of Measure	Outcome	
Reporting Value Units	%	
Denominator Statement (population)	Patients who suffer cardiac arrest witnessed by bystanders.	
Denominator Inclusion Criteria	Criteria	Data Elements
	❑ Patients over age 14 ❑ Cardiac arrest ❑ Found in Shockable Rhythm ❑ Cardiac Arrest witnessed ❑ Bystander CPR Administered	
Numerator Statement (sub-population)	Patients who survive to hospital discharge	
Numerator Inclusion Criteria	Criteria	Data Elements
	Survival to hospital discharge	
Exclusion Criteria	Criteria	Data Elements
	❑ Patients under age 14 ❑ Non-cardiac etiology	
Indicator Formula Numeric Expression	Numerator value/denominator value x 100 = %	
Example of Final Reporting Value (number and units)	% by calendar quarters 1-4 for years 2010 and 2011	
Benchmarks	AHA Scientific Abstract 2004: Utstein Cardiac Arrest CARES – National Report 2012	
References	CARES 2012	

EXERCISE #2

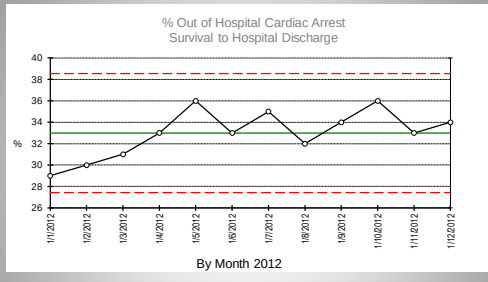
EMS QUALITY IMPROVEMENT DIVISION
INDICATOR SPEC SHEET CA-4
DATA TABLE
(P-55)
% numerator over denominator by month 2012
N=436

MTh	n	d	%
Jan	9	33	29
Feb	10	35	30
Mar	10	32	31
Apr	14	41	33
May	9	33	36
Jun	12	36	33
Jul	12	33	35
Aug	11	36	32
Sep	13	40	34
Oct	15	43	36
Nov	12	36	33
Dec	13	38	34
Total	150	436	34

EXERCISE #2



EXERCISE #2



No Special Cause Detected

Avg of Data Shown 33
Median Data Shown 33
Sigma for Limits 1.854
Base for Limits Average MR

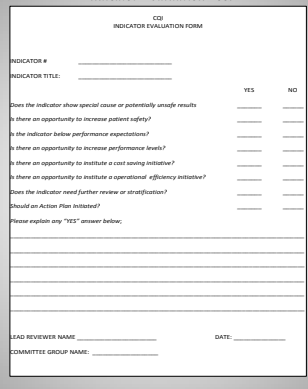
Chart Type: Chart for Individuals
Centerline: 33.00 Process Limits: Lower: 27.44 Upper: 38.56
Database Column 1

A 1 Beyond Control Limit
B 9 On One Side of Average
C 6 Trending Up or Down
D 14 Alternating Up & Down
E 2 of 3 Beyond 2 Sigma
F 4 of 5 Beyond 1 Sigma
G 15 Within 1 Sigma
H 8 Outside 1 Sigma

Evaluation of Cardiac Arrest Indicator

1. *Was the process safe and in control?*
2. *Is there an opportunity to increase patient safety?*
3. *Did it meet performance expectations?*
4. *Is there an opportunity to increase performance levels?*
5. *Is there an opportunity to institute a cost saving initiative?*
6. *Is there an opportunity to institute a operational efficiency initiative?*
8. *Was an Action Plan Initiated?*

Indicator Evaluation Tool



CQI
INDICATOR EVALUATION FORM

INDICATOR #: _____
INDICATOR TITLE: _____

	YES	NO
Does the indicator show special cause or potentially unsafe results	____	____
Is there an opportunity to increase patient safety?	____	____
Is the indicator below performance expectations?	____	____
Is there an opportunity to increase performance levels?	____	____
Is there an opportunity to institute a cost saving initiative?	____	____
Is there an opportunity to institute a operational efficiency initiative?	____	____
Does the indicator need further review or stratification?	____	____
Should an Action Plan Initiated?	____	____

Please explain any "YES" answer below;

LEAD REVIEWER NAME _____ DATE: _____
COMMITTEE GROUP NAME: _____

EMS Quality Improvement 101
Taking Action

"I will now proceed to untangle the entire area"

Taking Action

- ✓ *by far the weakest link in process*
- ✓ *takes the most energy*
- ✓ *developing the "Action Plan"*

Developing an Action Plan

- ✓ *answers the problem statement*
- ✓ *choose a model (RCI; QISD, JIT, PDCA)*
- ✓ *clear and achievable objectives*
- ✓ *define steps in process*
- ✓ *define timelines & deadlines*
- ✓ *accountability (who is responsible?)*

Action Plan Form

CQI

Action/Implementation Plan

CQI Project #

CQI Project Name:

Implementation Statement and deadlines:

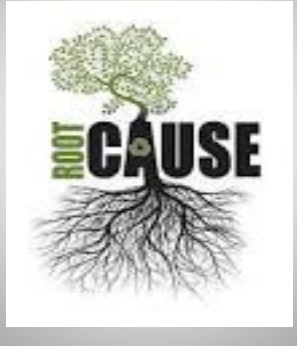
Action Steps: Who? & by When?

Team Leader Name:

Team Facilitator Name:

Date:

Part I: Root Cause Analysis



Contra-Costa EMS CQI Initiatives Board

PROJECT TITLE	OUTCOME STATEMENT	Phase I Staff Research & Review	Phase II Task Team QLC Review	Phase III Approval & Planning	Phase IV Implement	Phase V Monitoring	Phase VI Sustainability
Pediatric Medication Safety	*To reduce pediatric medication errors less than 5%*	*-Data received & reviewed by EMS Staff -Published in EMS Best Practices*	*-Completed 3-Lo review June 14, 2011. -Task team assigned and action planned approved July 8,11*	*-New weight based medicating prototype and pod to cards Approved 7-2011, costs determined and ordered placed.*	*Meeting to be determined to provide directions on implementation.*		
Bariatric Resources	*To enhance the Prehospital resources and response for Bariatric patients in CCC*	*-Staff/Task Team appointed -existing resources, equipment and nurse management protocol researched and presented to Team*	*-Task Team has met on 7/1/11; 7/27/11 and 8/22/11to review and make final recommend. actions to EMS for improving Bariatric Resources*	*Final recommendations and report submitted to EMS on*			

Survey of Action Models

- ✓ Traditional Plan-Do-Check-Act (PDCA)
  - ✓ Lean
  - ✓ Six Sigma
- ✓ Rapid Cycle Improvement (RCI)
- ✓ Quality Incident Stress Debrief (QISD)
- ✓ Just in Time Training (JIT)
- ✓ CE and Remediation

Thinking Outside the Box

Rapid Cycle Improvement (RCI) for EMS

What is rapid cycle improvement ?

Rapid cycle improvement (RCI) is traditional quality improvement (PDCA) process except the work is accelerated to be ready to implement within a 90 day cycle.

When should RCI be initiated?

RCI is most applicable to issues within a system which require timely resolution due to their high risk or high frequency attributes. RCI is highly suitable for EMS.

Quality Incident Stress Debrief (QISD)

- Real Time
- Field based
- Supportive
- Collegial
- Defuse
- Follow up

"Almost" Real-Time Training

- On the Job
- Work Environment
- Urgency
- Simplicity
- Tailgate
- MCI
- Effectiveness

CE and Remediation

- traditional response
- easy to implement
- individual
- punitive?

Checking Action

- what it is?
- how it is measured?
- what is the benchmark or end point?
- how will it be reviewed?

Sustaining the Gain

- it's what you learn after you know everything that counts.
- barriers and aids
- level of difficulty - tedious, boring
- dealing with attrition
- stakeholder apathy
- top-down support vs. apathy

Watching Out for Innovation

- Every persons opinion counts
- Thinking outside the box
- Collateral benefits
- Finding our way home again

Exercise #3

Evaluating and Acting on an EMS Quality Indicator

(Continuous Variable)

CQI TASK TEAM
Activation Form
Problem/Issue Recognition

Initiative Project # 00124
-
Project Name: Trauma- On Scene Time Interval Reduction Project

Problem/Issue Statement:

Your LEMSA CQI Committee needs to determine what is the on-scene time interval (in minutes and seconds) at least 90 % of the time - when a transporting ALS unit responds and transports a severely injured trauma patients?

They have requested your CQI Task Team develop and indicator to obtain and monitor this activity. The indicator should show the results by each quarter of 2010 and 2011 so they can see if there are any trends.

Additional Information

Major Trauma Victim is defined as a Injury Severity Score 15 or greater. And where a "Trauma Alert" has been activated.

Proposed Team Lead name: _____

Proposed Team Facilitator name:_____

Date: _____

Instructions
Exercise #3

1. Review and approve the indicator spec sheet.
2. Review the data and chart showing the monthly 90% percentile of on scene trauma time intervals for severely injured trauma patients transported by paramedics. (Continuous Variable)
3. Your group should try to reach consensus on the details and definitions of what ISS and charts say.
4. Use only the limited information sheet that has been handed to you, complete an evaluation and develop a draft action plan .

Example of Completed ISS Exercise #3

SCENE TIME FOR SEVERELY INJURED TRAUMA PATIENTS

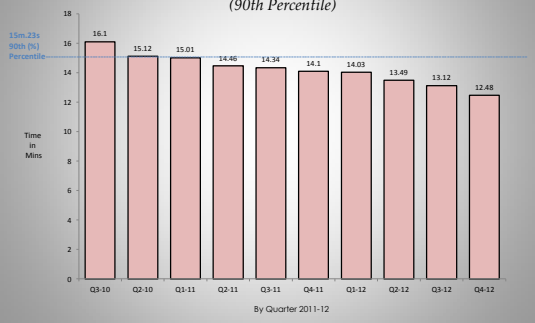
SET MEASURE ID #	TRA-1
INDICATOR NAME	Scene time for severely injured trauma patients
Description	On-Scene Time (90th percentile) of severely injured Trauma Patients who were transported from the scene by ambulance
Type of Measure	Process
Reporting Value and Units	Time (Minutes and Seconds)
Continuous Variable Statement (Population)	Time (in minutes) from time ambulance arrives at the scene until the time ambulance departs from the scene for Trauma patients, meeting criteria for transport to a trauma center (using revised trauma score or RTS<5), who received transport by ambulance to a hospital by EMS personnel (EMT, AEMT, and Paramedic).
Inclusion Criteria	Criteria / Data Elements
Exclusion Criteria	Criteria / Data Elements
	None
Indicator Formula Numeric Expression	The formula is the 90th Percentile of the given numbers or distribution in their ascending order. Obtain all interval numbers. Rank in ascending order. Select the numbers (in mins and sec) which is at the 90th percentile level.
Example of Final Reporting Value (number and units)	14 minutes, 34 seconds (14:34)
Benchmarks	
References	

EMS QUALITY IMPROVEMENT DIVISION
INDICATOR SPEC SHEET TRA-1
DATA TABLE
EX #3
Time in min-sec by quarter 2011-12
90th percentile
N=624

Q - Yr.	Time Min-Secs
Q3 10	14-46
Q4 10	16-10
Q-1 11	14-34
Q-2 11	15-12
Q3-11	12-48
Q4-11	13-49
Q1-12	13-12
Q2-12	14-03
Q3-12	15-01
Q4-12	14-10
Mean	14-22

Don't forget to **RANK !** the data high to low

On Scene Time Interval
Severly Injured Trauma Patients
(90th Percentile)



Evaluation of Trauma On-Scene Interval Indicator

1. *Was the process safe and in control?*
2. *Is there an opportunity to increase patient safety?*
3. *Did it meet performance expectations?*
4. *Is there an opportunity to increase performance levels?*
5. *Is there an opportunity to institute a cost saving initiative?*
6. *Is there an opportunity to institute a operational efficiency initiative?*
8. *Was an Action Plan Initiated?*

Indicator Evaluation Tool

CQI
INDICATOR EVALUATION FORM

INDICATOR #: _____
INDICATOR TITLE: _____

	YES	NO
Does the indicator show special cause or potentially unsafe results		
Is there an opportunity to increase patient safety?		
Is the indicator below performance expectations?		
Is there an opportunity to increase performance levels?		
Is there an opportunity to institute a cost saving initiative?		
Is there an opportunity to institute a operational efficiency initiative?		
Does the indicator need further review or stratification?		
Should an Action Plan Initiated?		

Please explain any "YES" answer below;

LEAD REVIEWER NAME _____ DATE: _____
COMMITTEE GROUP NAME: _____

Action Plan Form

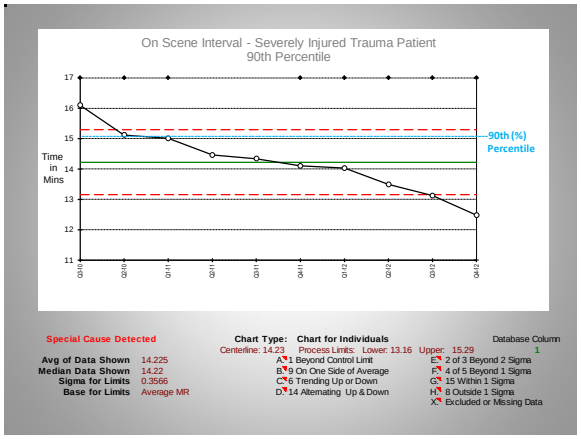
CQI

Action/Implementation Plan

CQI Project #: _____
CQI Project Name: _____
Implementation Statement and deadlines:

Action Steps: Who? & by When?

Team Leader Name: _____
Team Facilitator Name: _____
Date: _____



Action Plan Form

CQI

Action/Implementation Plan

CQI Project #

CQI Project Name:

Implementation Statement and deadlines:

Action Steps: Who? & by When?

Team Leader Name:

Team Facilitator Name:

Date:

Patient Safety Events

Center for Patient Safety
Delivering EMS Solutions

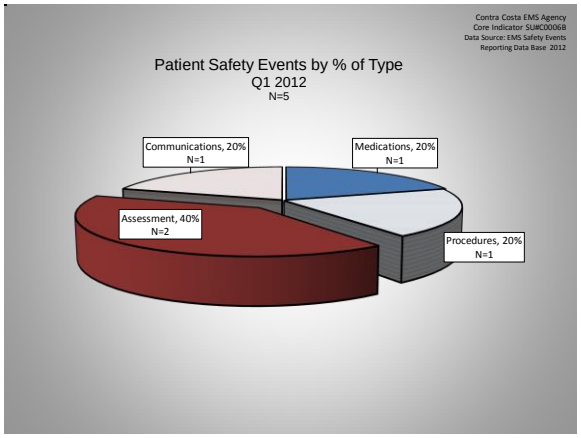
EMS PS Providing Federal Confidentiality Protection for Your Safety and Quality Improvement Work

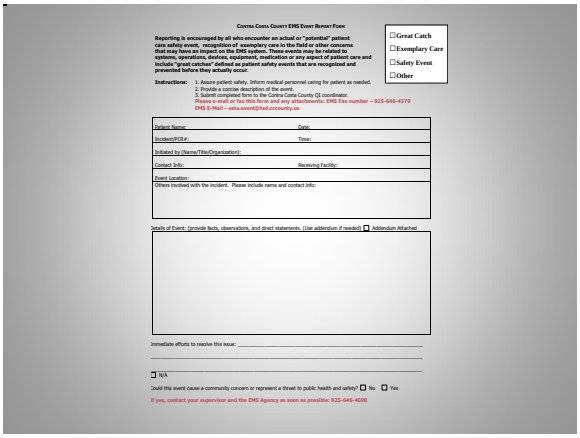
SAVE THE DATE! Upcoming EMS Patient Safety Conference in May 2013! Find out more

INSTITUTE FOR HEALTHCARE IMPROVEMENT

CEMSPI

Center for EMS Performance Improvement




Contra Costa County EMS Event Report Form

Great Catch
Exemplary Care
Safety Event
Other

Reporting is encouraged by all who encounter an actual or "potential" patient care safety event, recognition of exemplary care in the field or other concerns that may have an impact on the EMS system. These events may be related to systems, operations, devices, equipment, medication or any aspect of patient care and include "great catches" defined as patient safety events that are recognized and prevented before they actually occur.

Instructions: 1. Assure patient safety. Inform medical personnel caring for patient as needed.
2. Provide a concise description of the event.
3. Submit completed form to the Contra Costa County QI coordinator.
Please e-mail or fax this form and any attachments: EMS Fax number – 925-646-4379
EMS E-Mail – ems.event@hsd.cccounty.us

Patient Name: Date:
Incident/PCR #: Time:
Initiated by (Name/Title/Organization):
Contact Info: Receiving Facility:
Event Location:
Others involved with the incident. Please include name and contact info:

Details of Event: (provide facts, observations, and direct statements. Use addendum if needed) Addendum Attached

Immediate efforts to resolve this issue:

N/A

Could this event cause a community concern or represent a threat to public health and safety? No Yes

If yes, contact your supervisor and the EMS Agency as soon as possible: 925-646-4690

Some Final Thoughts

- *still a place for quality assurance (QA)*
  - ✓ *chart review*
  - ✓ *individual counseling*
- *keeping an open mind*
- *standardized CQI training*
- *accreditation for EMS Quality*
- *enrichment at all future CQI meetings*

Summary and Review

Walk Away Objectives

- *Describe how to integrate quality measures (indicators) within a structured EMS oriented CQI program.*
- *Demonstrate how to develop, define, and write a quality indicator specification sheet (ISS) with the consensus of a CQI-stakeholder group.*
- *Determine the most appropriate format to communicate and report out a quality measure to a constituent or quality stakeholder group.*
- *Identify the basic domains and steps of evaluating, reaching consensus and acting on quality measures within a EMS oriented CQI program.*