

**CAHO ISQua International Webinar
Series # 29**

**KEY PERFORMANCE INDICATORS FOR
CLINICAL QUALITY IMPROVEMENT**



VALUE
BASED CARE

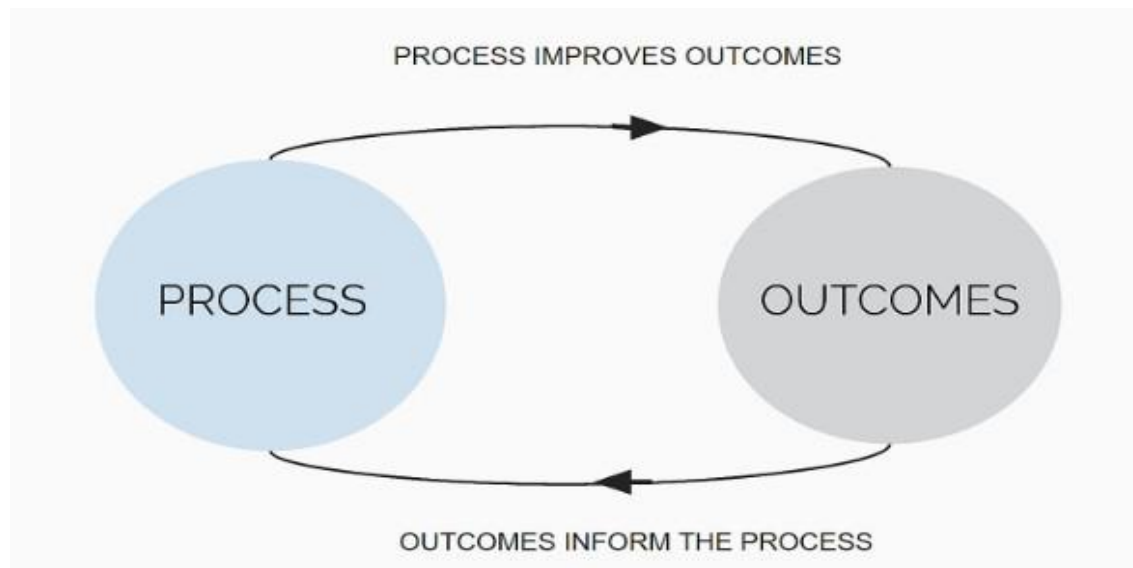
“If you cannot measure it, you cannot improve it.”



Measuring Quality of Care



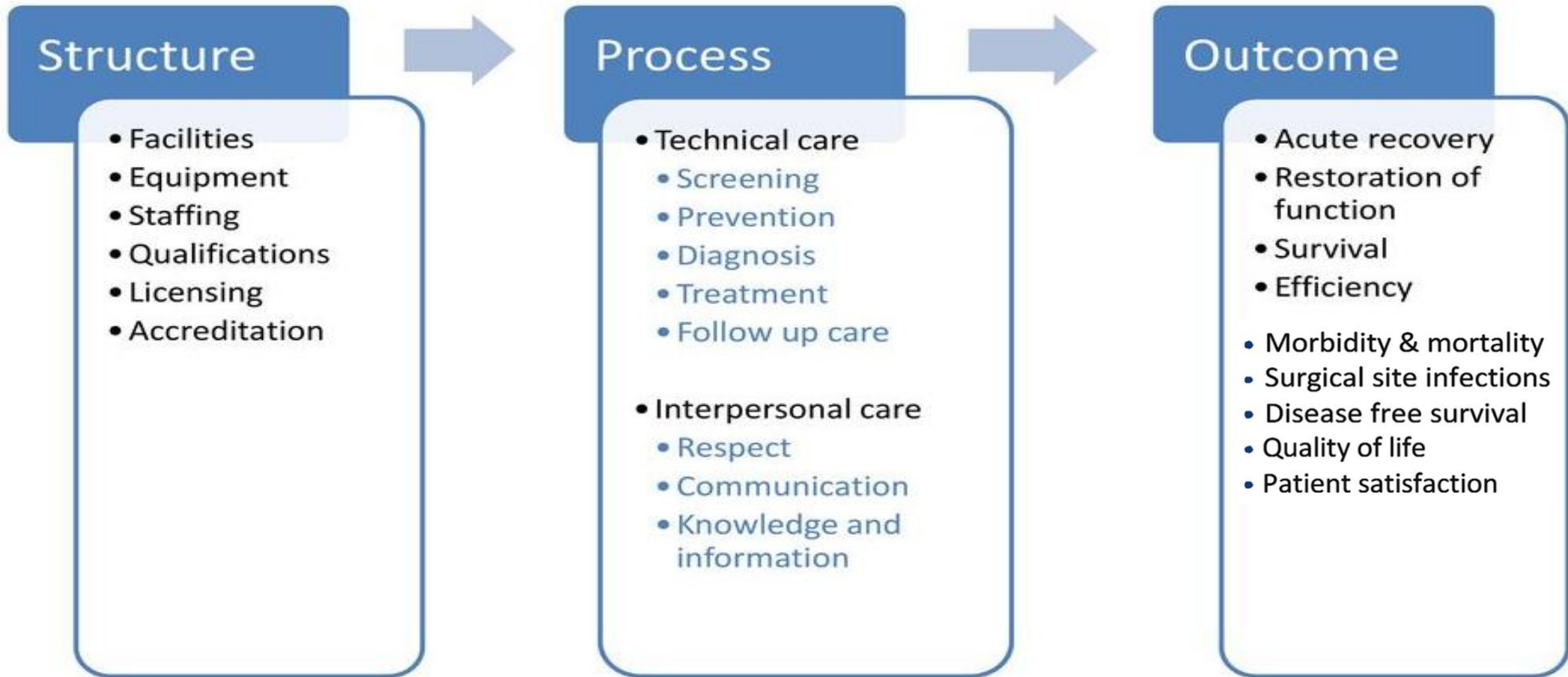
Avedis Donabedian



Measuring Quality of Care

- Quality Indicators/Key performance indicators - examples:
 - Efficiency – e.g. Utilisation rates
 - Service quality – e.g. TAT and patient feedback.
 - Patient safety – e.g. Surgical safety, medication safety and patient falls
 - Clinical quality
 - Generic measures – e.g. HAI, return to ICU/OT/ER.
 - Specific measures – Measures specific to a procedure or disease condition e.g. complications.
- Clinical Audits
- Quality Improvement Projects

Measuring Quality of Care



Quality Indicators

- Defined as measurable, objective indicators of quality.
- Offer fast and simple insight into the level of quality and its pattern over time.
- Should be monitored continuously, including trend monitoring and identifying OFI (Opportunities for Improvement)



Quality Indicators

- Quality indicators should be:
 - Objective.
 - Important
 - Relevant
 - Potential for use (when a problem is identified by measurement, it should be possible to respond to it and to upgrade the quality).
 - Reliable (each indicator should have clear numerator and denominator. Data collection should be uniform and comprehensible and the results obtained should be reliable to be correctly interpretable and comparable).
 - Validity (the indicator should be adequately related to the problem monitored)

Measuring Quality of Care

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Sample Dashboard

Parameter	H1		H2		H3		H4		H5		H6		H7		H8		H9		H10	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Cautery Burns (No.)	0	0.00	0	0.00	0	1.00	0	0.00	0	2.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
CAUTI* (No. per 1000 Catheter days)	0	0.00	0	2.55	0	0.00	0	3.61	0	1.38	0	0.00	0	0.71	0	1.57	0	0.00	0	2.73
CLABSI** (No. per 1000 Central line days)	1.63	0.00	1.41	8.40	1.47	1.69	1.52	0.00	1.48	0.00	1.52	1.97	1.50	0.00	1.52	0.00	1.52	3.65	1.63	0.00
CPR to ROSC*** (%)	0	100.00	0	60.00	0	0.00	0	100.00	0	90.91	0	87.50	0	0.00	0	100.0	0	0.00	0	50.00
Death in 48 hrs of any surgery (%)	0	0.00	0	0.00	0	0.00	0	0.12	0	0.21	0	0.00	0	0.00	0	0.14	0	0.00	0	0.00
Death within 48 hrs of PTCA (%)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.85	0	0.00	0	0.00	0	0.00	0	0.00
Return to ER within 72 hours (%)	0	0.00	0	0.00	0	0.56	0	0.32	0	0.00	0	0.00	0	0.00	0	0.00	0	0.53	0	0.09
HAPU**** (No. per 1000 Patient days)	0	0.00	0	0.31	0	0.18	0	0.00	0	0.19	0	0.43	0	0.00	0	0.00	0	0.00	0	0.00
Return to ICU within 48 hours (%)	0	1.67	0	0.53	0	0.63	0	2.40	0	1.72	0	0.58	0	0.44	0	1.01	0	0.48	0	0.93
Medication Errors (3% of in-patients per day) (No. per 1000 Patient days)	0	1.17	0	0.62	0	0.35	0	0.38	0	0.19	0	1.85	0	0.30	0	1.80	0	0.25	0	0.00
Unplanned Return to OT in 48 hrs (%)	0	0.00	0	0.00	0	0.74	0	0.36	0	0.21	0	0.45	0	0.97	0	0.14	0	0.52	0	0.59

- Note:**
- Other than for CLABSI and VAP, all targets have been taken as zero.
 - For CLABSI and VAP, targets are based upon CDC-NHSN (National Healthcare Safety Network) benchmarks.

Sample Dashboard

Parameter	H1		H2		H3		H4		H5		H6		H7		H8		H9		H10	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
Sharps Injury (NSI as per NABH QI definition) (%)	0	0.03	0	0.02	0	0.05	0	0.09	0	0.09	0	0.10	0	0.00	0	0.07	0	0.15	0	0.00
SSI (Surgical Site Infection - SUPERFICIAL) (%)	0	0.00	0	0.00	0	1.42	0	0.00	0	0.71	0	0.19	0	0.19	0	0.00	0	0.00	0	0.00
SSI (Surgical Site Infection - NON-IMPLANT, DEEP)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.24
SSI (Surgical Site Infection - IMPLANT excluding Pacemaker, DEEP) (%)	0	0.00	0	0.00	0	0.71	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
VAP (all ICUs, adult patients only) (No. per 1000 ventilator days)	1.70	0.00	2.08	4.63	1.57	5.92	2.10	4.31	2.10	0.00	2.10	0.00	1.70	0.00	2.10	3.04	1.88	0.00	1.30	0.00

Note:

- Other than for CLABSI and VAP, all targets have been taken as zero.
- For CLABSI and VAP, targets are based upon CDC-NHSN (National Healthcare Safety Network) benchmarks.

CAUTI
(Catheter Associated Urinary Tract Infection)

CLABSI
(Central line Associated Blood Stream Infection)

Death within 48 hrs. of any surgical intervention

Return to ER within 72 hours

Hospital Acquired Pressure Ulcers (HAPU)

Return to ICU within 48 hours

Medication Errors - TOTAL

Medication Errors - TOTAL (self reported events)

Unplanned Return to OT within 48 hrs

Sharps Injury (NSI)

SSI Superficial

SSI Deep (30 day)

SSI Deep (90 day)

VAP (Ventilator Associated Pneumonia)

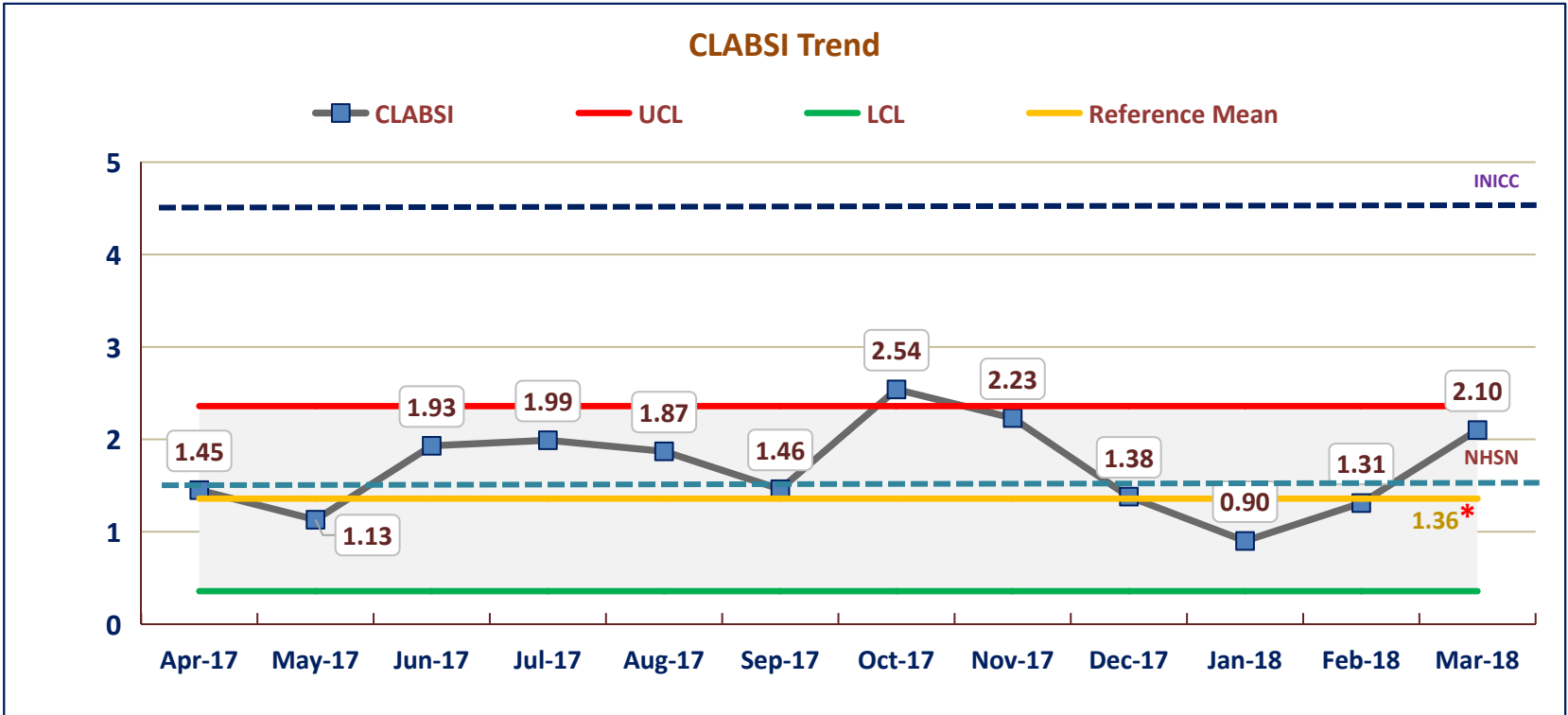
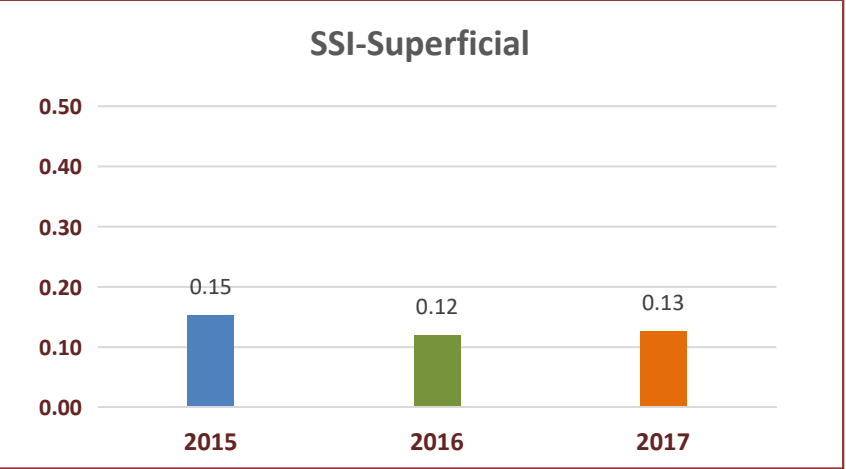
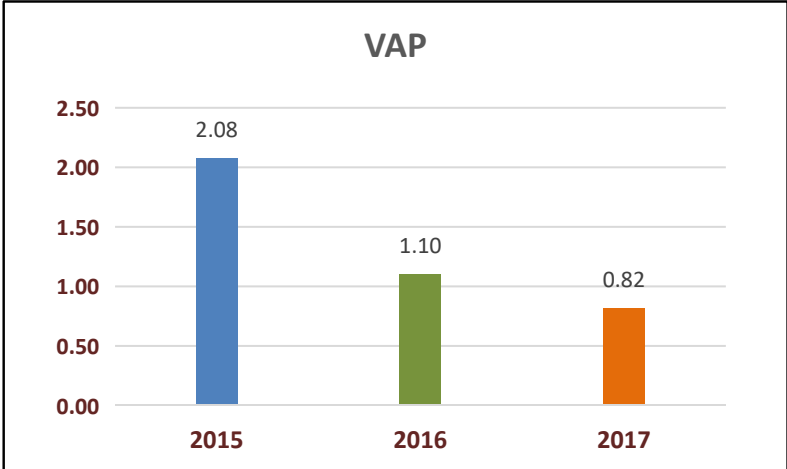
Patient Falls

Errors Prevented/Detected by use of SSCL

VTE (Venous Thromboembolism)

Reporting Errors (Imaging)

Lab Redo



Measuring Quality of Clinical Care

- Quality Indicators/Key performance indicators.
 - Efficiency – e.g. Utilisation rates.
 - Service quality – e.g. TAT and patient feedback.
 - Patient safety – e.g. Surgical safety, medication safety and patient falls.
 - **Clinical Quality**
 - Generic measures – e.g. HAI, return to ICU/OT/ER.
 - **Specific measures – Measures specific to a procedure or disease condition e.g. complications.**

Clinical Quality Indicators

- Clinical quality indicators have been in use by health services since the 1980s.
- Increased awareness of quality and safety issues coupled with accreditation has seen the expansion and development of clinical indicators for specific disease and procedure/therapy types.
- Clinical indicators are measures of the process, structure and/or outcomes of patient care.
- They allow clinical care to be monitored over time and to be **benchmarked against established care standards.**

Clinical Indicators

Clinical indicators have multiple purposes including:

- Benchmark care (To make comparisons over time and between services.).
- Make judgments about services.
- Set service or system priorities.
- Organise care.
- Document the quality of care.
- Support accountability, regulation and accreditation.
- Support quality improvement.

Clinical indicators may point to system level issues, however they are rarely specific enough to provide an insight into an individual doctor's clinical performance.

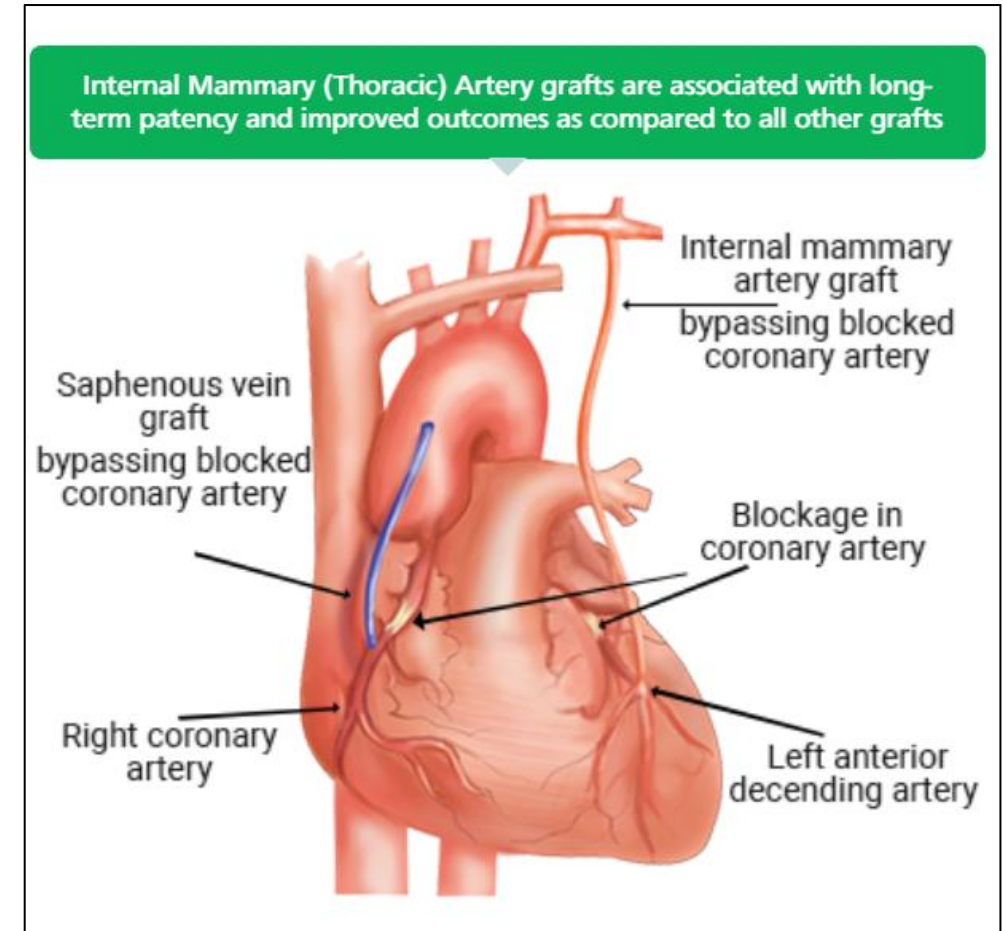
Clinical Indicators

An ideal clinical quality indicator should be:

- Evidence based, valid and reliable.
- Able to permit useful comparisons.
- Relevant to the important aspects of quality of care.
- Relevant to important aspects (effectiveness, safety and efficiency) and dimensions (professional, organisational and patient oriented) of quality of care.
- Feasible (that is, be appropriate, measurable and improvable) as well as valid and reliable.

Use of Left Internal Thoracic Artery Graft for CABG Surgery

An arterial graft is considered a Gold Standard for CABG grafts. These grafts have proven long term patency, whereas venous grafts tend to get blocked within few years.



Ann R Coll Surg Engl. 2006 Jul; 88(4): 367–369.

doi: [10.1308/003588406X98667](https://doi.org/10.1308/003588406X98667)

PMCID: PMC1964611

PMID: [16834857](https://pubmed.ncbi.nlm.nih.gov/16834857/)

Left Internal Mammary Artery Usage in Coronary Artery Bypass Grafting: A Measure of Quality Control

[S Karthik](#)¹ and [BM Fabri](#)²

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Conclusions

Go to:

We believe that LIMA usage is a vital quality assessment monitor in patients undergoing CABG. We recommend that LIMA usage and its counterpoint (*i.e.* reasons for non-usage) should be incorporated into the routine data collection strategies for cardiac surgery.

Numerator = No. of cases where LIMA used.

Denominator = No. of patients who underwent CABG during the period.

Formula = %, N divided by D multiplied by 100.

Benchmark = 85%*

Clinical Outcomes Indicators – Approach

Coronary Artery Bypass Graft (CABG)

- Was the best graft used?
- Peri-operative complications?
- Heart attacks witnessed post bypass?
- What were the number of stroke episodes following CABG?
- Mortality.
- Predicted mortality compared to observed mortality using internationally accepted Euroscore II model.
- Structural indicators – e.g. availability of cardiac anesthetist, perfusionist and heart lung machine.
- Duration of procedure.
- Timely use of blood thinners and aspirin.

Clinical Indicators – Procedure Specific

INDICATOR	QUALIFYING REMARKS	
Logistic Euroscore or Euroscore II		For Risk Categorisation
ICU Length of Stay (linked to Euroscore)	<=2 - 48 hours, 2 to 5 < 72 hours in ICU	Outcome
Use of LIMA graft		Process
Pre-op Prophylactic Antibiotic		Process
Bail out IABP		Outcome
Peri-operative MI	Any 2 of the 3 - Fresh Q waves in ECG Or MB>2.5 times normal Pre-op Or Fresh RWMA on 2D Echo	Outcome
Red Cell/Blood Product transfusion	Nil / 1 to 4 units RBC / > 4 units RBC	Outcome
Re exploration		Outcome
Post-operative stroke		Outcome
Post-operative dialysis	In patients with pre-op normal RFTs	Outcome
Deep sternal wound infection		Outcome
ICU readmission during same admission		Outcome
In-hospital mortality	Death of patient during same admission	Outcome

Importance Of Operational Definition

***New postoperative stroke:** A central neurologic deficit persisting postoperatively for >72 hours with evidence on an imaging study (ie CTSCAN, MRI) and/or neurologist confirmation.

***New requirement for postoperative dialysis:** A new postoperative requirement for hemodialysis (including any new renal replacement therapy –CRRT, CVVHD) at any time during the hospital stay (ie patients are excluded if they have had preoperative dialysis or isolated intraoperative dialysis).

***ICU readmission:** The requirement of a patient to be transferred to the intensive care unit after initial discharge to the ward (not including step down units, include date of readmission and date of discharge).

***Intensive care unit length of stay:** The total number of days spent in the intensive care unit after surgery (not including step down unit stays) including readmission stays to the ICU (include date of initial discharge from ICU).

Clinical Indicators – Procedure Specific

CANADIAN CORONARY ARTERY BYPASS GRAFT (CABG) SURGERY QUALITY INDICATORS



(This was funded by a research grant from the Heart and Stroke Foundation of Canada)

APPENDIX OF DEFINITIONS

- Those indicators recommended by the consensus panel members to be collected and included in CABG surgery performance reports for the purpose of quality improvement.
- The remaining indicators were rated by the panel as significantly related to quality of care and/or preventable death following CABG surgery.

Clinical Indicators

Structure

- Availability of cardiac anesthetist.
- Availability of perfusionist.
- Availability of bypass pump.

Process

- Use of LIMA Graft.
- Prophylactic Antibiotic.
- Duration of procedure.

Outcome

- Use of IABP.
- Peri op MI.
- No. of packed cell units.
- ICU Length of Stay.
- Re-exploration.
- Post op Stroke.
- Post op Dialysis.
- SSI.
- Re-admission to ICU.
- Mortality – In hospital, up to 30 days.

CORONARY ARTERY BYPASS GRAFT (CABG)	Hosp A	Hosp B	Hosp C	Benchmarks
<i>Use of Left Internal Thoracic Artery graft</i>	64.71%	80.77%	100.00%	74.20%*
<i>Need for a Bail out Intra Aortic Balloon Pump (IABP)</i>	11.76%	0.00%	0.00%	¹ –
<i>Perioperative Myocardial Infarction</i>	0.00%	0.00%	0.00%	0.96 %**
<i>Post procedure neurological stroke</i>	0.00%	0.00%	0.00%	0.80 %*
<i>Need of Re-exploration surgery</i>	0.00%	1.92%	0.00%	3.50 %*
<i>Predicted mortality (using Euroscore II)</i>	3.9	2.36	1.04	¹ –
<i>Observed mortality</i>	0.00%	0.96%	0.00%	¹ –

References: * Cleveland Clinic Outcomes Report 2014, ** Texas Heart Institute 2014, ¹ No benchmarks exist at present

Percutaneous Transluminal Coronary Angioplasty (PTCA)*

- *Did any patient require emergency surgery post PTCA?*
- *What were the number of stroke episodes following PTCA?*
- *How many patients with normal kidney function required dialysis post PTCA?*
- *Subsequent to PTCA, how many episodes involving vessel occlusion were observed?*
- *Number of heart attacks due to stent blockage within 30 days of procedure?*
- *Deaths/ mortality witnessed during same hospital admission post PTCA?*

Percutaneous Transluminal Coronary Angioplasty (PTCA)*

Process indicators could be added based on Clinical Practice Guidelines e.g.

- D2B time
- Time to first ECG
- Time to Trop T test

Could be topic for Clinical Audit.

PERCUTANEOUS TRANSLUMINAL CORONARY ANGIOPLASTY (PTCA)	Hosp A	Hosp B	Hosp C	Benchmarks
<i>Emergency CABG for failed procedure</i>	0.00%	0.00%	0.00%	1.2 %*
<i>Vascular complication at puncture site requiring intervention (beyond simple compression)</i>	0.00%	0.00%	0.00%	1.1 %*
<i>Acute vessel occlusion requiring emergency re-intervention</i>	0.00%	0.00%	0.00%	¹ -
<i>Post procedure neurological stroke</i>	0.00%	0.00%	0.00%	0.284 %**
<i>Post procedure Renal failure requiring hemodialysis</i>	0.00%	0.35%	0.00%	¹ -
<i>Any Bleeding event requiring transfusion/intervention (within 72 hrs.)</i>	0.00%	0.00%	0.00%	4.0 %*
<i>Readmission with acute Myocardial Infarction within 30 days</i>	0.00%	0.00%	0.00%	¹ -
<i>Mortality during same hospital admission</i>	0.00%	0.69%	0.00%	1.7 %*

References: * US National Registry Data 2013, ** Cleveland Clinic Outcomes Report 2014, ¹ No benchmarks exist at present



EXAMPLE – MATERNAL AND NEONATAL UNIT

	Formula	Num	Den	Value	Benchmark	Reference
Post Operative DVT	Number of Inpatients Developing DVT after Surgery / Number of Surgical Obstetric Procedures *100	0	16	0	1-2%	RCOG Green Top Guidelines 37, 2009
Maternal Death Rate	Number of Direct Maternal Deaths / Number of Obstetrical Discharges (Including Deaths) *1000	0	16	0	0.28	WHO/UN/World Bank, 2014
Neonatal Death Rate	Number of Inpatient NB Deaths / Number of Discharges (Including Deaths) x1000	0	31	0	0.04	WHO/UN/World Bank, 2014
Rate of Still Births	Number of Still Births / Number of Total Deliveries x1000	2	35	57.14	0.297	CDCP, USA 2014
Excessive Blood Loss	Blood Loss Excessive (except with Abruptio Placenta or Placenta Previa; either a Red Cell Transfusion, < 22, a HGB < 7, or a Decrease in HCT of More than 11, or of HGB More than 3.5 / Total Number of Deliveries *100	1	35	2.85	2%	WHO, 2012
Third and Fourth Degree Obstetric Trauma	Obstetric Trauma of Third and Fourth Including uterine rupture associated with pelvic fracture, Including Coccyx, Laceration of Haematoma of Cervix, Vagina Vulva, Perineum and Anus / Vaginal Deliveries without Instrument *100	0	8	0	1%	RCOG (Green top guideline NO.29), 2007

	Formula	Num	Den	Value	Benchmark	Reference
Unexplained Fever During / Labor / Delivery and Post Partum Infection	Unexplained Fever During / Labor/ Delivery and Post Partum Infection / Total Number of Deliveries *100	0	35	0	6%	NIH, 2001
C - Section Rate	Number of Patients Undergoing C - Section / Total no. of Patients Delivered of a Live Term, (37 or More Weeks of Gestation Completed) (Exclude: Contra - Indications to Vaginal Deliveries) *100	6	19	31.57	USA - 33%	ACOG (USA) 2014
Birth Trauma / Live Birth	Number of New Borns with One or More of the Following Conditions: (i) Subdural and cerebral Hemorrhage Due to Trauma or to Intrapartum Anoxia or Hypoxia. (ii) Epicranial Subneurotic Hemorrhage. (iii) Injuries to Skeleton Excludes Clavicle. (IV) Injury to Spine and Spinal Cord. (v) Facial Nerve / Cranial / Peripheral Nerve Injuries / All New Borns *100	0	34	0	0.23%	AHRQ (USA), 2012



EXAMPLE – OPHTHALMOLOGY AND SUBSPECIALTIES

Department:	OPHTHALMOLOGY		
Indicator:	Percentage infectious endophthalmitis following cataract surgery		
Standard/Benchmark	≤ 0.2% (2 cases per 1000 operations)		
Numerator (N)	Number of patients developed infectious endophthalmitis following cataract surgery		
Denominator (D)	Total number of patients underwent cataract surgery		
Month	Numerator (N)	Denominator (D)	PERCENTAGE (N / D x 100)
Jan - Feb			
Mar - Apr			
May – Jun			
Jul – Aug			
Sep – Oct			
Nov - Dec			
GRAND TOTAL (Jan – Dec)			

Indicator:	Percentage of unplanned return to operating theatre within (\leq) one week after cataract surgery.
Standard/Benchmark	< 5%
Numerator (N)	Number of unplanned return to operating theatre within (\leq) one week after cataract surgery.
Denominator (D)	Total number of cataract surgeries performed.

Indicator:	Percentage of patients with post-operative visual acuity of 6/12 or better within 3 months following cataract surgery in patients without ocular co-morbidity.
Standard/Benchmark	> 85%
Numerator (N)	Number of patients without ocular co-morbidity obtained visual acuity 6/12 or better within (\leq) 3 months following cataract surgery.
Denominator (D)	Total number of patients without ocular co-morbidity underwent cataract surgery.

Indicator:	Percentage of Patient with Unplanned Readmission within 24 hours of Discharge.
Standard/Benchmark	$\leq 2\%$
Numerator (N)	Number of patient with unplanned readmission to the ward within 24 hours of discharge.
Denominator (D)	Total number of patient discharged during the period of data collection.

Department:	SURGICAL RETINA SUBSPECIALITY, OPHTHALMOLOGY
Indicator:	Percentage of port related break during vitrectomy.
Standard/Benchmark	$< 5\%$
Numerator (N)	Number of port related break during vitrectomy performed.
Denominator (D)	Total number of vitrectomy performed.

Department:	CORNEA SUBSPECIALITY , OPHTHALMOLOGY
Indicator:	Percentage of unplanned return to operating theatre in 24 hours post corneal transplant.
Standard/Benchmark	< 5%
Numerator (N)	Number of wound leak and return to operating theatre within 24 hours for corneal transplant surgery performed.
Denominator (D)	Total number of corneal transplant surgery performed.

Department:	GLAUCOMA SUBSPECIALITY,OPHTHALMOLOGY
Indicator:	Percentage of buttonhole of conjunctiva in primary trabeculectomy.
Standard/Benchmark	< 5%
Numerator (N)	Number of cases with buttonhole of conjunctiva in primary performed.
Denominator (D)	Total number of primary trabeculectomy performed.

Department:	PAEDIATRIC OPHTHALMOLOGY SUBSPECIALITY, OPHTHALMOLOGY
Indicator:	Percentage of muscle slip for strabismus surgery.
Standard/Benchmark	< 5%
Numerator (N)	Number of cases with muscle slip in strabismus surgery performed.
Denominator (D)	Total number of strabismus surgery performed.

Department:	OCULOPLASTIC SURGERY SUBSPECIALITY , OPHTHALMOLOGY
Indicator:	Skin wound break down within one month after elective oculoplastic surgery.
Standard/Benchmark	< 5%
Numerator (N)	Number of cases with skin wound break down within one month after elective oculoplastic surgery performed.
Denominator (D)	Total number of elective oculoplastic surgery involving skin performed.

Department:	NEUROOPHTHALMOLOGY SUBSPECIALITY , OPHTHALMOLOGY
Indicator:	Incorrect placement of botulinum toxin therapy.
Standard/Benchmark	< 5%
Numerator (N)	Number of cases with incorrect placement of Botulinum toxin performed.
Denominator (D)	Total number of Botulinum toxin therapy performed.



QUALITY INDICATORS FOR GI ENDOSCOPIC PROCEDURES



Quality indicators for ERCP

JAG
Joint Advisory Group
on GI Endoscopy

BSG Quality and Safety
Indicators for Endoscopy

ASGE – USA, JAG - UK

Complications (Objective Criteria to be Defined for Each)

- a) Bleeding – (Drop in Hb level, need for transfusion)
- b) Pancreatitis - mild / severe (S Amylase or Lipase level > 3 times normal with pain)
- c) Perforation (requiring stenting or surgery)
- d) Morbidity –
 - Length of hospital stay
 - Need for additional procedure – YES/NO
 - If YES – Mention name of procedure (Text Field)
- e) Mortality 7 days (or 14 days as mentioned in the ASGE article or 30 days as per JAG article?)
- f) Cholangitis

ASGE – USA, JAG - UK

Resources For Indicator Selection



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Performance Measures

Patient Safety

Surgical Checklists

Performance Measures

STS continues to develop and maintain quality performance measures in the areas of adult cardiac, general thoracic, and congenital heart surgery. STS measures have either been endorsed or are being considered for endorsement by the [National Quality Forum](#). In addition, many of these measures are included in CMS's [Merit-Based Incentive Payment System](#).

Adult Cardiac Surgery Measures - Participant Level

Measure	NQF #	Procedure(s)	Measure Type
CABG Composite Score	0696	Isolated CABG	Outcome, Process, Composite
Postoperative Renal Failure	0114	Isolated CABG	Outcome
Surgical Re-exploration	0115	Isolated CABG	Outcome



St. Luke's Medical Center

CLINICAL OUTCOMES

VOLUME 2



Lung cancer clinical outcomes publication 2016 (for the 2014 audit period) December 2016



SCIENTIFIC
REGISTRY OF
TRANSPLANT
RECIPIENTS

Saint Marys Hospital (Mayo Clinic)
Center Code: MNSM
Transplant Program (Organ): Heart
Release Date: July 6, 2017
Based on Data Available: April 30, 2017

SRTR Program-Specific Report
Feedback?: SRTR@SRTR.org
1.877.970.SRTR (7787)
<http://www.srtr.org>

C. Transplant Information

Table C5D. Adult (18+) 1-month survival with a functioning deceased donor graft
Single organ transplants performed between 01/01/2014 and 06/30/2016
Deaths and retransplants are considered graft failures

	MNSM	U.S.
Number of transplants evaluated	37	5,584
Estimated probability of surviving with a functioning graft at 1 month (unadjusted for patient and donor characteristics)	94.59%	96.13%
Expected probability of surviving with a functioning graft at 1 month (adjusted for patient and donor characteristics)	95.87%	--
Number of observed graft failures (including deaths) during the first month after transplant	2	216
Number of expected graft failures (including deaths) during the first month after transplant	1.54	--
Estimated hazard ratio*	1.13	--
95% credible interval for the hazard ratio**	[0.31, 2.48]	--

* The hazard ratio provides an estimate of how Saint Marys Hospital (Mayo Clinic) (MNSM)'s results compare with what was expected based on modeling the transplant outcomes from all U.S. programs. A ratio above 1 indicates higher than expected graft failure rates (e.g., a hazard ratio of 1.5 would indicate 50% higher risk), and a ratio below 1 indicates lower than expected graft failure rates (e.g., a hazard ratio of 0.75 would indicate 25% lower risk). If MNSM's graft failure rate were precisely the expected rate, the estimated hazard ratio would be 1.0.

** The 95% credible interval, [0.31, 2.48], indicates the location of MNSM's true hazard ratio with 95% probability. The best estimate is 13% higher risk of graft failure compared to an average program, but MNSM's performance could plausibly range from 69% reduced risk up to 148% increased risk.

Cath Lab Dashboard Parameters - Sample

Operational	Financial	Clinical
<ul style="list-style-type: none">▪ First case on-time starts (delay in minutes).▪ Average procedural time/case type.▪ Pre-procedure pre-admission testing (PAT) completed day before testing.▪ Turnaround time (TAT) between cases.▪ Average time in pre- and post-procedure holding area by procedure.	<ul style="list-style-type: none">▪ Overall volume/procedure.▪ Payor mix – Cash/Credit/CGHS.▪ Average payment/case.▪ Average cost/case.▪ Average length of stay.	<ul style="list-style-type: none">▪ In-hospital mortality.▪ Vascular/bleeding complications.▪ Renal complications.▪ ST-elevation myocardial infarction (STEMI) patients with door-to-balloon (D2B) time ≥ 90 minutes.▪ Patient satisfaction with care.▪ 30-day readmissions for acute myocardial infarction (AMI).

Cath Lab – Sample Dashboard

1. Exec. Summary	2. Perf. Measures	3. PCI Process	4. PCI Outcomes	5. Dx Cath	6. Util./Data Quality
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Metric Name	My Hospital	US Hospitals 50th Pctl	Metric Name	My Hospital	US Hospital 50th Pctl	
PCI Performance Measures						
1 - PCI in-hospital risk adjusted mortality (all patients)	0.90	▲	1.34			
PCI Process Metrics			PCI Outcome Metrics			
2 - Proportion of elective PCIs with prior positive stress or imaging study	75.1	▲	60.1	11 - Proportion of PCI procedures with vascular access site injury requiring treatment or major bleeding	0.8 ▲ 1.0	
3 - Median time to immediate PCI for STEMI patients (in minutes)	52.5	▲	62.8	12 - Proportion of PCI patients with emergency CABG	0.4 ▼ 0.1	
4 - Proportion of STEMI patients receiving immediate PCI w/in 90"	91.8	▲	91.5	13 - Proportion of PCI procedures with a post procedure MI (among hospitals routinely collecting post-PCI biomarkers)		3.1
5 - Median time from ED arrival at STEMI transferring facility to ED arrival at STEMI receiving facility among transferred patients.	73.5	▲	84.7	14 - Proportion of PCI procedures with post procedure MI (among hospitals who do not routinely collect post-PCI biomarkers)	1.3	1.3
6 - Median time from ED arrival at STEMI transferring facility to immediate PCI at STEMI receiving facility among transferred patients (in minutes)	96.0	▲	116.8	15 - Proportion of PCI procedures with acute kidney injury		2.1
7 - Median fluoro time (in minutes)	6.2	▲	9.2	16 - Proportion of PCI procedures with post procedure stroke	0.4 ▼ 0.0	
8 - Proportion of patients with aspirin prescribed at discharge	99.4	▲	98.2	17 - Composite: Proportion of PCI patients with death, emergency CABG, stroke or repeat target vessel revascularization.	2.1 ▲	2.3
9 - Proportion of patients with thienopyridine prescribed at discharge	99.9	▲	99.2	18 - PCI in-hospital risk adjusted mortality (patients with STEMI)	3.99 ▲	5.23
10 - Statins prescribed at discharge	90.2	▼	92.1	19 - PCI in-hospital risk adjusted mortality (STEMI patients excluded)	0.30 ▲	0.63
			25 - Proportion of PCI procedures with transfusion of whole blood or RBCs			
			1.5 ▲ 1.7			
Diagnostic Cath Process \ Outcomes Metrics			Utilization Metrics \ Data Quality Metrics			
20 - Incidence of non-obstructive CAD (elective patients only)	54.7	▼	43.9	22 - Median post-procedure length of stay (in days) for PCI patients with STEMI	2.0 ▲ 2.7	
21 - Proportion of Diagnostic Catheterization procedures with vascular access site injury requiring treatment or major bleeding	0.2		0.2	24 - Proportion of PCI procedures with creatinine assessed pre and post PCI	58.4 ▼ 86.5	

Objective

Monitor clinical quality through:

- Measuring and monitoring select clinical outcomes indicators.
- Set targets, develop action plans and deliver superior outcomes.



Implementation Plan

Phase 1

- PTCA, CABG, TKR.
- Outcomes to be recorded and reviewed.
- Set targets, develop improvement plans and review progress.

Phase 2

- KTP
- Set targets, develop improvement plans and review progress.

Key Indicators

PTCA:

- Emergency CABG.
- Acute occlusion requiring emergency re-intervention.
- Renal failure requiring hemodialysis.
- Re-admission with acute MI within 30 days.
- Mortality within 30 days.

CABG:

- Use of left internal thoracic artery graft.
- Peri-operative MI.
- Prolonged ventilation.
- Post-operative dialysis.
- Operative mortality.

Key Indicators

TKR:

- Peri-operative blood transfusion.
- Incidence of venous thromboembolism (VTE).

KTP:

- Graft survival rate.
- Readmission (disease related).

Governance Structure

Clinical Outcome	National Lead	Unit Lead
PTCA	Dr XXXXXXXX	HOD, Cardiology
CABG	Dr XXXXXXXX	HOD, Cardiac Surgery
TKR	Dr XXXXXXXX	HOD, Orthopedics
KTP	Dr XXXXXXXX	HOD, Nephrology

Data Collection Portal - Example

Clinical Outcome Indicators

Home PCI CABG TKR ONCO KIDNEY Report Settings

From Date To Date Risk Category Pending

Parameter	Value
Total PCI	0
Emergency CABG	0
Puncture site vascular complication requiring intervention	0
Any Bleeding event requiring transfusion/intervention	0
Acute MI	0
Acute occlusion requiring emergency re-intervention	0
Renal failure requiring hemodialysis	0
Mortality during same hospital admission	0
Re-Admission with Acute MI within 30 Days	0
Delayed vascular complication at puncture site	0
Mortality within 30 Days	0

Parameter	Value
Total CABG	0
Use of left Internal Thoracic artery graft	0
Bail out IABP	0
Perioperative MI	0
Re exploration	0
Post-operative stroke	0
Post-operative dialysis	0
ICU readmission during same hospital admission	0
Mortality during same hospital admission	0
Deep sternal wound infection	0
Operative mortality within 30 Days	0
Predicted Mortality	
Observed Mortality	0.00

Data Collection Portal - Example

Caregiver - Overview

Caseload Dashboard Population Management Dashboard

Population Management Dashboard

Start Date

End Date

Department

Risk Category All Low Risk
 Medium Risk High Risk
 Very High Risk

Status All Incomplete
 Completed Missed

Export Type PDF Excel

Generate report

Export

ICHOM CABG | All : 119

Parameter	Value
Use of left Internal Thoracic Artery graft	98
Bail out IABP	1
Perioperative MI	0
Re-exploration	2
Post-operative stroke	0
Renal failure requiring dialysis (post procedure)	0
ICU readmission during same hospital admission	3
Deep sternal wound infection	1
Mortality during same hospital admission	2
Operative mortality within 30 days	2
Predicted Mortality	2.22
Observed Mortality	1.68

ICHOM PTCA | All : 268

Parameter	Value
Emergency CABG	0
Vascular complication at puncture site requiring intervention	0
Any bleeding event requiring transfusion/intervention	1
Acute MI Post PTCA	5
Acute occlusion requiring emergency re-intervention	0
Renal failure requiring dialysis	3
Re-admission with Acute MI within 30 days	2
Delayed vascular complication at puncture site	0
Mortality during same hospital admission	1
Mortality within 30 days	1
Post-procedure stroke	0
Primary PTCA	7

Report Generation And Visualisation



Remember Statistics



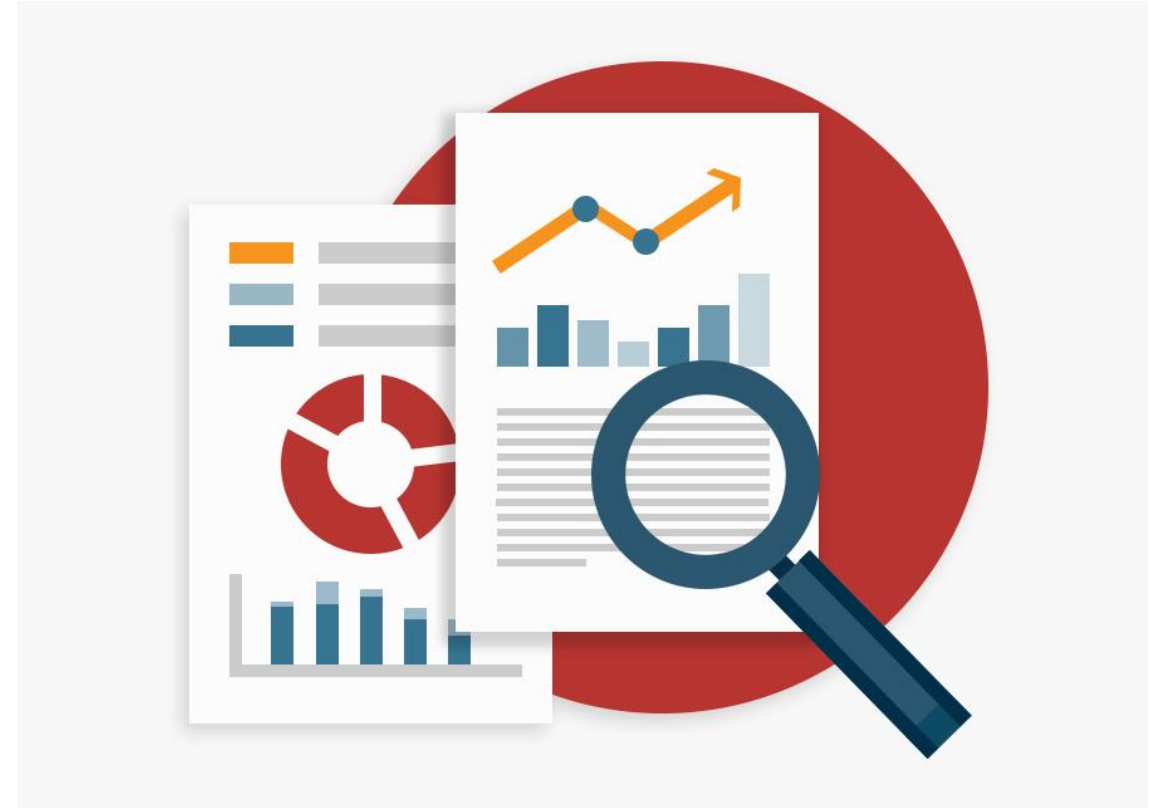
Number of cases



Risk adjustment

Challenges

- *Standardisation*
- *Data collection*
- *Accuracy*
- *Adherence to follow up*
- *Organisation culture*
- *Clinician ownership, validation and WIFM*



Some Common Myths

- So clinical indicator means success rate of a procedure?
- So clinical indicator means measuring the complication rate of a procedure?
- So purpose is to compare hospitals and doctors with each other?
- So it is a clinical audit?



Healthcare quality should not be measured solely from provider's perspective; it should include factors important to the patient.

The logo features a stylized human figure in teal, centered within a circular graphic composed of four segments in teal, orange, and light blue. To the right of the figure is a teal circle containing a white checkmark.

Patient Reported Measures

OUTCOMES THAT MATTER TO PATIENTS

Ten Commandments

Prepare well -
information,
groundwork

Engage - build
consensus

Reassure -
purpose

Start small

Monitor and
analyse

Teamwork

Advocacy –
internal
customers

Standardise

Patience - and
perseverance

Build culture

References

- J Perinatol. 2011 November ; 31(11): 702–710. doi:10.1038/jp.2011.12
- American Academy of Pediatrics
- Society of Thoracic Surgeons
- Joint Commission International (JCI)
- International Consortium for Health Outcomes Measurement (ICHOM)

References

- <https://www.safetyandquality.gov.au/publications-and-resources/resource-library/hospital-acquired-complications-hacs-list-specifications-version-30>
- <http://www.health.vic.gov.au/clinicalengagement>
- Canadian coronary artery bypass graft (CABG) surgery quality indicators; Heart and Stroke Foundation
- cathlabdigest.com
- www.fortishealthcare.com/clinicaloutcomes

Thank You!

