



CARDIOVASCULAR AND THORACIC SURGERY				
NO	INDICATOR	DIMENSION	STANDARD	SECONDARY DATA REPORTING FREQUENCY
1	Elective isolated Coronary Artery Bypass Grafting (CABG) surgery mortality rate	Effectiveness	$\leq 3\%$ (High volume centres) $\leq 7\%$ (Low volume centres)	6 Monthly
2	Incidence rate of pneumothorax following removal of chest drains	Safety	$\leq 5\%$	3 Monthly
3	Percentage of patients who underwent Coronary Artery Bypass Grafting (CABG) surgery within (\leq) 9 months from the time decision made	Efficiency	$\geq 90\%$	3 Monthly



Discipline	: Cardiovascular and Thoracic Surgery
Indicator 1	: Elective isolated Coronary Artery Bypass Grafting (CABG) surgery mortality rate
Dimension of Quality	: Effectiveness
Rationale	: <p>1. CABG is the most common open heart surgical procedure currently being performed. However, there are various co-morbid factors which influence the outcome of cardiac surgery – age, co morbid illness e.g. diabetes, renal impairment and impaired left ventricular function. Risk stratification is necessary to enable common standardisation. There are various predictive scoring methods e.g. Parsonnet, STS score and Euroscore, which allows for comparison with international standards.</p> <p>2. It has also been shown that high volume centres consistently perform better than low volume centres. Thus, such data will be important for human resource management and financial allocation.</p> <p>Reference: Krisstin Thorsteinsson et al. (2016, 1 February). Age-dependant trends in postoperative mortality and preoperative comorbidity in isolated coronary artery bypass surgery: a nationwide study. European Journal of Cardio-Thoracic Surgery (Volume 49, Issue 2, pp391-397).</p>
Definition of Terms	: <p>Emergency surgery: Surgery performed immediately following referral from the cath lab (e.g. coronary artery dissection).</p> <p>Urgent surgery: Patient with high risk anatomy (e.g. tight left main stem disease) that require surgery within the same admission.</p> <p>Elective surgery: Surgery for patients with stable coronary artery disease or disease controlled on medication and is usually discharged and readmitted later for elective surgery.</p> <p>Low volume centre: Centres which performs < 150 open heart procedures/ year.</p> <p>High volume centre: Centres which performs > 150 open heart procedures/ year.</p>
Criteria	: <p>Inclusion:</p> <ol style="list-style-type: none"> All elective isolated coronary artery disease patients requiring CABG. Good Left Ventricular (LV) function – Euro Score II (EF ≥ 30%). Good kidney function – Euro Score II (CC ≥ 85ml/min). <p>Exclusion:</p> <ol style="list-style-type: none"> Patients with previous cardiac surgery (e.g. redo surgery). Patients requiring concomitant procedure (e.g. valve procedures). All inter and intra hospital referral (inpatient) cardiac surgeries. Poor Left Ventricular (LV) function - Euro Score II (EF < 30%). Reduced kidney function - Euro Score II (CC < 85ml/min).
Type of indicator	: Rate-based outcome indicator
Numerator	: Number of deaths from elective isolated CABG
Denominator	: Total number of elective isolated CABG done
Formula	: $\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$
Standard	: ≤ 3% (High volume centres) ≤ 7% (Low volume centres)



Data Collection & Verification	: 1. Where: Data will be collected in Cardiothoracic Ward/ OT/ ICU/ CCU/ CRW/ NICU/ wards that cater for the above condition. 2. Who: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department/ unit. 3. How to collect: Data is suggested to be collected from patient's case notes/ OT notes/ OT record book. 4. How frequent: Monthly data collection within department. Validated summarised secondary data to be sent 6 monthly to Quality Unit of the respective hospital for monitoring. PVF to be sent 6 monthly to Quality Unit of hospital. 5. Who should verify:									
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Remarks	: *This indicator is also being monitored as an Outcome Based Budgeting (OBB) indicator.									

Discipline	: Cardiovascular and Thoracic Surgery
Indicator 2	: Incidence rate of pneumothorax following removal of chest drains
Dimension of Quality	: Safety
Rationale	: 1. Chest drains are routinely inserted following Cardiothoracic Surgery to remove any postoperative pleural fluids, blood or air leaks. Once its function is served and no further accumulation of fluid or air is expected, it is removed under a controlled situation. If performed correctly, the risk of developing pneumothorax is very small. 2. Studies indicate an incidence of < 10% and from that less than 10% may require reinsertion of chest drain. Reinsertion of chest drain may cause morbidity including increase risk of pleural space infection, anxiety and sometime may cause serious consequences if air leaks still present and not noticed. A recurrent pneumothorax of more than 15% or a symptomatic patient may necessitate reinsertion of chest drain. Reference: Ronald L Eisenberg (2011, July). Are chest radiographs routinely indicated after chest tube removal following cardiac surgery/ AJR: 197.
Definition of Terms	: NA
Criteria	: Inclusion: 1. All post cardiac surgery patients. Exclusion: 1. Patients who had undergone thoracic surgery.
Type of indicator	: Rate-based outcome indicator
Numerator	: Number of incidence of pneumothorax following chest drain removal
Denominator	: Total number of chest drains removed



Formula	:	$\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$									
Standard	:	≤ 5%									
Data Collection & Verification	:	<ol style="list-style-type: none"> Where: Data will be collected in Cardiothoracic Ward/ Operation Theatre/ ICU/ CCU/ CRW/ NICU/ wards that cater for the above condition. Who: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department/ unit. How to collect: Data is suggested to be collected from patient's case notes/ OT notes/ procedure book. How frequent: Monthly data collection within department. Validated summarised secondary data to be sent 3 monthly to Quality Unit of the respective hospital for monitoring. PVF to be sent 6 monthly to Quality Unit of hospital. Who should verify: <table border="1" data-bbox="560 703 1421 871"> <thead> <tr> <th></th> <th>Prepared by</th> <th>Validated by</th> </tr> </thead> <tbody> <tr> <td>Primary Data</td> <td>Officer/ Paramedic/ Nurse in-charge</td> <td>Supervisor of the person who prepared the data</td> </tr> <tr> <td>Secondary Data</td> <td>Officer/ Paramedic/ Nurse in-charge</td> <td>Head of Department/ Specialist in-charge</td> </tr> </tbody> </table> <p>PVF must be verified by Head of Department, Head of Quality Unit and Hospital Director.</p>		Prepared by	Validated by	Primary Data	Officer/ Paramedic/ Nurse in-charge	Supervisor of the person who prepared the data	Secondary Data	Officer/ Paramedic/ Nurse in-charge	Head of Department/ Specialist in-charge
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Remarks	:										

Discipline	:	Cardiovascular and Thoracic Surgery
Indicator 3	:	Percentage of patients who underwent Coronary Artery Bypass Grafting (CABG) surgery within (≤) 9 months from the time decision made
Dimension of Quality	:	Efficiency
Rationale	:	<ol style="list-style-type: none"> Coronary Artery Bypass Grafting (CABG) is a common cardiac surgical procedure being performed worldwide. Despite the advances in catheter based therapies, there are still a large group of patient who requires CABG. As new patients are being referred for surgery, some may require emergency or even urgent surgical intervention it has necessitated a need for prioritization. It is also a reflection of shortage of surgical, intensive care and financial resources necessitating the creation of a waiting list. A waiting list for CABG candidate indicates prioritization according to clinical condition and is generally categorised as emergency, urgent and elective. Along waiting list may result in mortality, increased morbidity as the heart weakens following a long period of ischemia. It is generally regarded that a waiting list more than 6 months would indicate a need to review the provision, utilisation and funding of resources. <p>Reference: Rexus H et al. (2005, February). Waiting and mortality after elective Coronary Bypass Grafting, Ann Thoracic Surg. (79(2): pp 538-543).</p>
Definition of Terms	:	<p>Emergency: Surgery performed immediately following referral from the cath lab (e.g. coronary artery dissection).</p> <p>Urgent: Patient with high risk anatomy (e.g. tight left main stem disease) that require</p>



	<p>surgery within the same admission.</p> <p>Elective surgery: Surgery for patients with stable coronary artery disease or disease controlled on medication and is usually discharged and readmitted later for elective surgery.</p> <p>Time decision made: It is the time patient was seen in Cardiothoracic Clinic/ Ward and decision was made for operation by the Cardiothoracic team.</p>									
Criteria	<p>Inclusion:</p> <ol style="list-style-type: none"> 1. All patients electively admitted for isolated CABG (outpatients). 2. Stable angina with good left ventricular function and normal kidney function. 3. Good Left Ventricular (LV) function – Euro Score II (EF ≥ 30%). 4. Good kidney function – Euro Score II (CC ≥ 85ml/min). <p>Exclusion:</p> <ol style="list-style-type: none"> 1. Inter and intra hospital referrals (inpatient) requiring surgery. 2. Patients requiring concomitant procedure (e.g. valve procedures). 3. Patients who were postponed after given operation date/ after admission to ward for operation because their comorbid conditions were not optimised (e.g. smoking, uncontrolled diabetes). 4. Patients who refused surgery. 5. Poor Left Ventricular (LV) function - Euro Score II (EF < 30%). 6. Reduced kidney function - Euro Score II (CC < 85ml/min). 									
Type of indicator	: Rate-based process indicator									
Numerator	: Number of patients underwent CABG within (\leq) 9 months from the time decision made									
Denominator	: Total number of patients who were decided for CABG for the same period									
Formula	: $\frac{\text{Numerator}}{\text{Denominator}} \times 100\%$									
Standard	: $\geq 90\%$									
Data Collection & Verification	<ol style="list-style-type: none"> 1. Where: Data will be collected in Cardiothoracic Clinic. 2. Who: Data will be collected by Officer/ Paramedic/ Nurse in-charge of the department/ unit. 3. How to collect: Data is suggested to be collected from patient's case notes/ CABG record book/ OT list/ OT record book. 4. How frequent: Monthly data collection within department. Validated summarised secondary data to be sent 3 monthly to Quality Unit of the respective hospital for monitoring. PVF to be sent 6 monthly to Quality Unit of hospital. 5. Who should verify: <table border="1" data-bbox="560 1543 1421 1717"> <thead> <tr> <th></th> <th>Prepared by</th> <th>Validated by</th> </tr> </thead> <tbody> <tr> <td>Primary Data</td> <td>Officer/ Paramedic/ Nurse in-charge</td> <td>Supervisor of the person who prepared the data</td> </tr> <tr> <td>Secondary Data</td> <td>Officer/ Paramedic/ Nurse in-charge</td> <td>Head of Department/ Specialist in-charge</td> </tr> </tbody> </table> <p>PVF must be verified by Head of Department, Head of Quality Unit and Hospital Director.</p> 		Prepared by	Validated by	Primary Data	Officer/ Paramedic/ Nurse in-charge	Supervisor of the person who prepared the data	Secondary Data	Officer/ Paramedic/ Nurse in-charge	Head of Department/ Specialist in-charge
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Remarks	: Data collection to be done by 9 months retrospective cohort of data. For data January 2021, it will be patients who were decided for CABG in April 2020. Both numerator and									



	denominator will be patients of April 2020 who were decided for CABG.
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