NATIONAL PERIOPERATIVE GUIDELINE

HEALTH SERVICE QUALITY DIRECTORATE

March, 2022

Forward

Ethiopia has been committed to ensuring that essential and emergency surgical care is accessible and affordable to its citizens. During the first Health Sector Plan, the Ministry of Health has developed and implemented two strategies- the National Healthcare Quality Strategy (NQS) and Saving Lives Through Save Surgery Strategy (SaLTS) - that mainly aimed to improve the quality and safety of surgical care. In addition, the SaLTS initiative was launched in response to the World Health Assembly resolution-68/15 and envisioned making accessible and affordable essential and emergency surgical and anesthesia care part of the universal health coverage.

Among the key pillars in the SaLTS strategy has been quality management. In line with quality improvement projects, improvement of surgical care has been initiated and has shown encouraging results. Improving the quality of surgical care will be strengthened by introducing the updated perioperative guideline. The perioperative guideline is a guideline, which incorporates the flow of surgical care starting from the pre-operative period, and throughout the post-operative period.

This guide, therefore, provides a detailed guide to execute surgical procedures in the process of perioperative care. In addition, it will help to improve quality of surgical care, surgical efficiency, and surgical safety practices among the facilities.

As improvement demands teamwork and a multidisciplinary approach, I would like to call upon all relevant stakeholders: Ethiopian surgical society, anesthesia and anesthesiologist society, and nursing society in addition to partner organizations, all care providers, and health managers/leaders at all level to work hand in hand towards standardizing the perioperative care delivery system, and implementing the guiding principles to perioperative continuum of care.

Finally, I would like to take this opportunity to extend my warm appreciation to all individuals and organizations who have actively participated in the development of this guideline.

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Acknowledgment

The Ministry of Health of Ethiopia would like to express its appreciation and gratitude to those who were involved in the preparation of this document. The Ministry of Health would also like to extend its acknowledgment to the teams, and their institution, who exerted their knowledge and technical skills throughout the preparation of the national perioperative guideline, as well as for contributing by providing various technical inputs during the development of the guide.

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Abbreviations

ALI= Acute Lung Injury

ALT= Alanine Amino Transferase

ARDS= Acute Respiratory Distress Syndrome

ASA= American Society of Anesthesiologists

AST= Aspartate Amino Transferase

BG= Blood Group

BMI= Body Mass Index

BP= Blood Pressure

Ca= Calcium

Cl= Chloride

CSD= Central Sterilizing Department

CVAT= Costo Vertebral Angle Tenderness

CVC= Central Venous Catheter

CVP= Central Venous Pressure

DHS= Demographic Health Survey

DM= Diabetes Mellitus

DOS=Day of Surgery

DVT= Deep Venous Thrombosis

ECG= Electro Cardio Gram

EFY= Ethiopian Fiscal Year

ETT= Endo Tracheal Tube

GA= General Anesthesia

GCS= Glascow Coma Scale

GI= Gastro Intestinal

HbA1C= Hemoglobin A1C

HCT= Hematocrit

HEENT= Head, Eyes, Ear, Nose, Throat

HDU= High Dependency Unit

HGB= Hemoglobin

HMIS= Health Management Information System

HR= Heart Rate

HSDP= Health Sector Development Program

HSTP = Health Sector Transformation Plan

ICU= Intensive Care Unit

IESO= Integrated Emergency Surgical Officer

INR= International Normalized Ratio

IPC= Infection Prevention and Control

K= Potassium

KPI= Key Performance Indicator

LFT= Liver Function Test

LL= Left Lower limb

LMA= Laryngeal Mask Airway

LMIC= Low to Middle Income Countries

LNMP= Last Normal Menstrual Period

LU= Left Upper limb

MDSR= Maternal Death Surveillance Report

MET= Metabolic Equivalent Testing

Mg= Magnesium

MoH=Ministry of Health

MRN= Medical Record Number

MSS= Musculoskeletal System

Na= Sodium

NPO= Nothing Per Os

NQS= National Quality Strategy

OPD= Out Patient Department

OR= Operating Room

OT= Operating Theatre

PACU= Post Anesthesia Care Unit

PLT= Platelet

PONV= Post-Operative Nausea and Vomiting

PR= Pulse Rate

PT= Prothrombin Time

PTSD= Post Traumatic Stress Disorder

PTT= Partial Thromboplastin Time

RFT= Renal Function Test

RL= Right Lower limb

RR= Recovery Room

RU= Right Upper limb

SaLTS= Saving Lives Through Safe Surgery

SASD=Surgical and Anesthesia Directorate

SDG= Sustainable Development Goals

SOP= Standard Operating Procedure

SPO_2= Saturation of Oxygen

SSC= Surgical Safety Checklist

T3= Triiodothyronine

T4=Thyroxine

TSH= Thyroid Stimulating Hormone

URTI= Upper Respiratory Tract Infection

VP= Ventriculoperitoneal

WBC= White Blood Count

WFSA= World Federation Society of Anesthesiologists

WHO= World Health Organization

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Background

Ethiopia is the tenth largest country in Africa, covering 1,104,300 square kilometers and is the major constituent of the landmass known as the Horn of Africa. It is bordered on the north and northeast by Eritrea, on the east by Djibouti and Somalia, on the south by Kenya, and on the west and southwest by Sudan.

According to the World Bank's projection figures for the year 2020, the estimated total population is **114,963,583**, making Ethiopia the second populous country on the African continent next to Nigeria. Ethiopia is the home of mosaic nations, nationalities, and peoples with more than 80 different languages. The country is among the least urbanized countries in the world with 78.3% living in rural areas whilst only 21.7% reside in urban areas, according to the World Bank report in 2021. The largest city in the country is Addis Ababa, the capital, with 4 million people accounting for nearly 4% of the total population. The average size of a household is 4.7.

The Ethiopian population is currently suffering from a triple burden of communicable diseases, non-communicable diseases and injuries affecting all age groups, with a disproportionate burden on children and women of the reproductive age group. Analysis of the burden of disease in 2017 showed that the major causes of premature mortality are communicable, maternal, neonatal and nutritional diseases with neonatal disorders, diarrheal diseases, and lower respiratory tract infection constituting the top three.

The latest figures in World Health statistics indicators (Word Health statistics 2020) show a life expectancy of 57.5 years (58.9 years for females and 56.1 for males), infant mortality rate of 43/1000 and under-five mortality rate of 55/1000. More than 90% of child deaths are due to pneumonia, diarrhea, malaria, neonatal problems, malnutrition, and HIV/AIDS, and often to a combination of these conditions. These are very high levels, though there has been a gradual decline in these rates in the past 15 years. In terms of women's health, the country's maternal mortality rate of 412/100,000 (DHS 2016) remains high. According to the recent national MDSR report for 2012 EFY (2019 GC), the leading causes of maternal death were hemorrhage (37%), Hypertensive Disorders of Pregnancy (HDP) (11%), anemia (16%), and sepsis (6%). This pattern is broadly similar to the previous years, although there is a notable decline in HDP related deaths.

Currently the country is implementing the HSTP-II between 2013 and 2017 EFY- (July 2020 – June 2025 GC). The overarching objective of HSTP II is to improve the health status of the population through realization of the following objectives: accelerate progress towards universal health coverage; protect people from health emergencies; contribute towards transformation of households and improve health system responsiveness.

Following the launch of the HSTP I, which identified quality and equity as cornerstones of the transformation agenda, the National Quality Strategy (NQS) was developed to operationalize the quality and equity agenda. In the NQS I, essential and emergency safe surgical and anesthesia care became one of the five priority areas along with maternal, neonatal and child health, nutrition, chronic non-communicable diseases and infectious diseases. In line with this, Saving Lives Through Safe Surgery (SaLTS) was identified as the MoH's flagship initiative that was designed to respond to the World Health Assembly resolution of A68/15: making emergency and essential surgical and anesthesia care accessible and affordable as part of universal health coverage. The SaLTS initiative was implemented to ensure the delivery of quality, safe, essential, and emergency surgery throughout the country thereby alleviating the national burden of diseases, disability and death that are preventable through safe surgery.

Currently, the Ministry of Health is implementing the second national surgical and anesthesia care strategy, SaLTS II, with a principal objective of providing high quality, safe and affordable surgical care by improving access, efficiency, effectiveness, safety & quality of surgical care in Ethiopia. This strategic plan will mainly focus on essential and emergency surgical services as well as few specialty services, which are in high demand in the country and with significantly high referrals abroad.

Introduction

The world has made a commitment to achieving the SDGs by 2030. The provision of safe and affordable surgical care is inextricably linked to many of these goals, and is a key factor in their successful achievement. More specifically, it has been shown that surgical, obstetric and anesthesia care are the cornerstone for ensuring strong, resilient, and sustainable healthcare systems. Despite this reality, over 5 billion people and more than 90% of the world's population lack access to basic surgical care. Moreover, the lost economic output due to poor access to safe and affordable surgical care will cost low- and middle-income countries (LMICs) an estimated $12.3 trillion USD by the year 2030 unless access to surgical, obstetric and anesthesia care is improved.

According to data from the routine HMIS report, over 242,481 major elective surgeries have been performed by hospitals in Ethiopia in 2013 EFY. This is far below the WHO's estimate of 50 procedures per 1000 population. The average delay for elective surgical admission is 33 days with a prolonged waiting time for admission. The increasing demand for surgical care and the growing emphasis on the quality and safety of care are driving the need for the healthcare system to improve, and so is the level and quality of surgical care.

Problems related to quality and efficiency of the peri-operative system workflow can cause surgical delays, cancellations, adverse events/complications, unplanned return to theatre and sub-optimal care for surgical patients. These issues affect the experience and outcomes of surgical patients, the satisfaction of peri-operative personnel, patients, relatives and the community in general.

Perioperative care requires a considerable amount of planning, preparation, and coordination to ensure that patients receive safe and timely surgical care. In this guideline, the first thing we did was to enumerate and then categorize the different problems in patient flow into five major areas: teamwork and communication, leadership, pre- operative care, intra-operative care, and post-operative care. Subsequently, the problems were summarized and different mechanisms of averting these problems were designed. In the perioperative care of patients, the following major problems were identified: inefficient teamwork, poor engagement of multidisciplinary teams, poor communication, inefficient utilization of operation rooms, unclear leadership and management

structure, poor surgical workforce management, poor planning and execution, shortage of surgical supplies, prolonged surgical backlog and waiting list, inadequate patient preparation and counseling, lack of standardized and protocoled care, surgical efficiency enhancement problems, inadequate quality improvement implementation, poor critical incident monitoring, poor adherence and compliance to standards and guidelines, inadequate preparation, significant resource wastage, poor postoperative follow-up and poor interdepartmental integration for continual care.

Based on this assessment, several mechanisms were designed to overcome and alleviate these problems. Several checklists, guiding rules and working arrangements were designed and adopted. A perioperative guideline was developed in April 2014, and had helped to significantly improve and standardize the national perioperative care in Ethiopia. However, the development of new scientific thoughts on perioperative care in addition to lack of updates of concepts on safety and efficacy on the initial guideline mandated a revision.

1. Leadership and Management

Health Facility level

The health facility senior management team will establish and organize the facility's surgical and anesthesia services office. A surgeon, gynecologist, anesthesiologist, or IESO (at the health centers) in the facility staff will lead the office. The office will in turn establish and lead the SaLTS multidisciplinary team. The operation theater manager will serve as team secretary. Each health facility should design activities and tasks based on the need and relevance to the institutional and national surgical and anesthesia care plan.

The SaLTS multidisciplinary team will be represented by staff from:

- Heads of the different surgical specialties
- Obstetrics-gynecology department head
- Anesthesia department head
- Operating room manager
- Scrub nurse head
- Midwifery head
- Surgical ward head nurse
- Post-anesthesia care unit (PACU) head
- Pharmacy service head
- Laboratory service head
- Quality and data management unit
- Central sterilizing department (CSD) and infection prevention
- Biomedical engineering service head

The roles and responsibilities of the multi-disciplinary team and OR manager is annexed **(Annex 1)**.

Health Centers

To cascade the leadership structure at the health center level, a SASD office shall be established under the medical director and will be led by the surgical team leader.

Federal Health Facilities

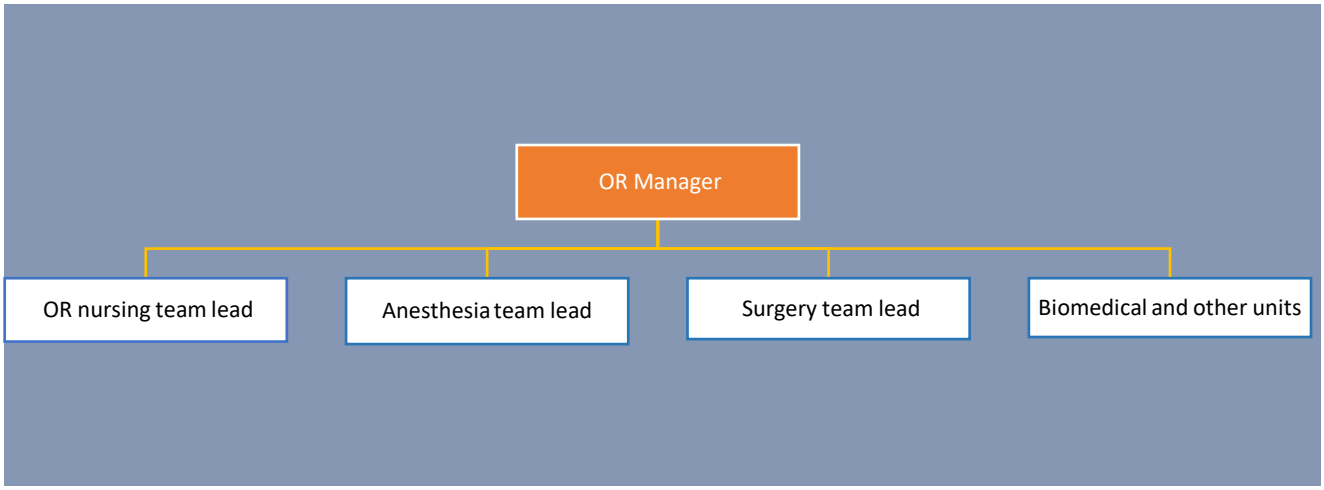
Hospitals under the federal government will directly communicate with the SASD office at the MoH. However, the structure in federal health facilities is similar to hospitals elsewhere.

University Hospitals

University hospitals shall establish a SASD office under the chief clinical director or medical service vice-provost. The organizational structure for a national surgical and anesthesia service shall be designed per the specialty/subspecialty surgical care provided in the hospital.

OR Manager

An operation room manager who is trained in OR management shall be assigned to oversee the overall surgical services.



Details of roles and responsibilities of each team lead are annexed **(Annex 2).**

2. Teamwork and Communication

2.1 Communication and relationship dynamics in the operating room

One of the cornerstones of effective teamwork is communication between team members to achieve anticipated results, especially in high-risk areas such as operating theatres/rooms. Surgical team members need not only clinical knowledge and technical skills, but also skills to engage in teamwork, to understand the complexity of the clinical situation, to make appropriate decisions and to act efficiently.

Principles of Teamwork in the OR

- All members need to be secure in their technical expertise
- All members must be socially capable of managing and interacting with their staffs: The team should understand that all team members are equally significant for a procedure and should respect each other's tasks for better surgical outcomes.
- The team must avoid blaming others for different mistakes; the senior in charge should be part of the solution when a problem or complication arises.
- The team should maximize the use of all surgical checklists to optimize communication and establish a shared mental model. The team should provide feedback in the form of debriefs after the surgical procedures
- All health professionals need to be open-minded to criticism
- Newly assigned OR staff should be mentored to ensure a smooth transition of the member to the OR team and culture
- All team members should be versed in the principles and protocols of key responsibilities of each member of the surgical work force team for clear division of tasks and to readily identify roles for shared tasks
- When an intra-operative conflict, misunderstanding or communication gap among the team members occurs, the OR team is obligated to report the incident and the team should readily discuss the incident, to create a conducive work environment.
- To strengthen inter professional communication, the surgical team shall use the following platforms:
    - Regular SaLTS multi-disciplinary team meetings

- Monthly multidisciplinary clinical audit forum (mortality and morbidity audit, surgical efficiency audit, audit on nursing process, SSI audit, pain management audit, general and regional anesthesia audit, surgical cancellation audit)
- Regular meetings between the OR manager and the team lead every week
- Regular meetings between the team lead and their respective health workforce

2.2 Consultation Process

Effective inter-professional communication and collaboration leads to safer patient care and enhanced workplace satisfaction. Communication happens in various forms throughout different departments, the commonest type being interdepartmental consultations. Consultation is defined here as one health provider seeking formal recommendations from another health provider regarding the care of a patient. Listed below are the crucial components to be included during consultations for proper and effective communication.

Consultation Components (4Cs)

Contact

- ❖ State your name, service, and role on the team
- ❖ Confirm the consultant's name, service, and supervising attending/senior

Communicate

- ❖ Confirm the name, medical record number, and location of the patient/client
- ❖ State your suspected or confirmed diagnosis
- ❖ Provide a brief synopsis of the patient's history, pertinent to the question you are asking
- ❖ List any pertinent physical exam and laboratory findings
- ❖ State any interventions you have started, including the patient's response to these interventions
- ❖ State the reason you are requesting the consultation
- ❖ Establish a timeframe in which you expect the consultant service to evaluate the patient

Collaborate

- ❖ Ask the consultant what questions and recommendations they have

- ❖ Ask the consultant if they would like any additional studies or therapies to be initiated prior to their evaluation

Close the Loop

- ❖ Review the actions you will complete prior to the patient's evaluation by the consultant service
- ❖ Review the actions the consultant will complete
- ❖ Thank the consultant for his or her time

3. Preoperative Care

Preoperative care starts when a surgeon encounters a patient/client at the surgical referral clinic, emergency/regular OPD or from the wards and extends until the patient is transferred to the operation theatre on the day of surgery. The surgical team (surgeon, anesthesia and nurse) evaluates, optimizes and prepares the patient, required equipment and supplies for operation preoperatively.

The preoperative process for elective and emergency general surgery and gynecologic procedures is illustrated below:

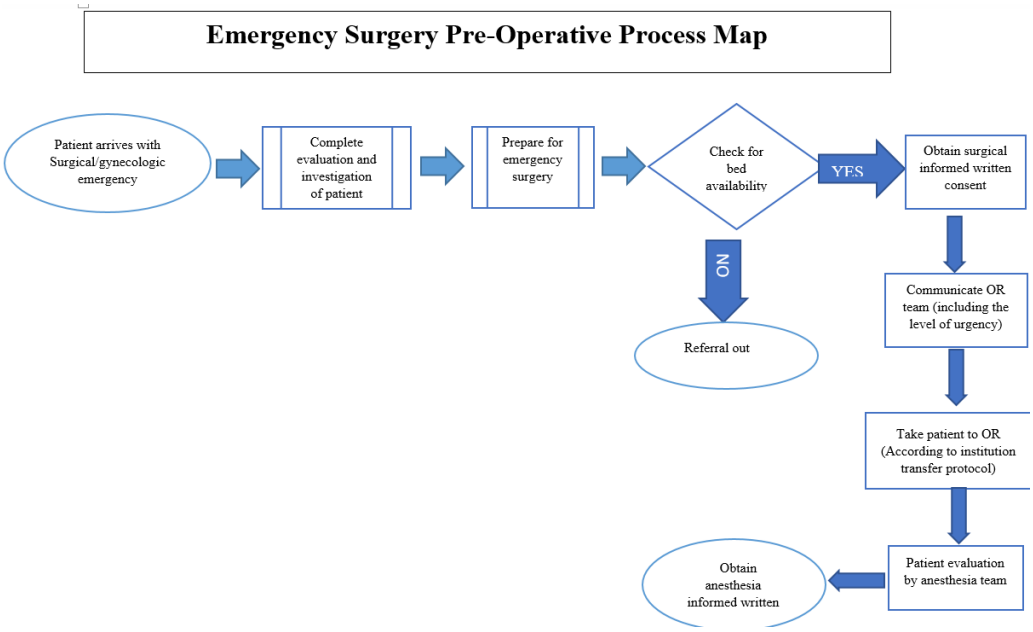


Figure 1: Emergency surgery pre-operative process map

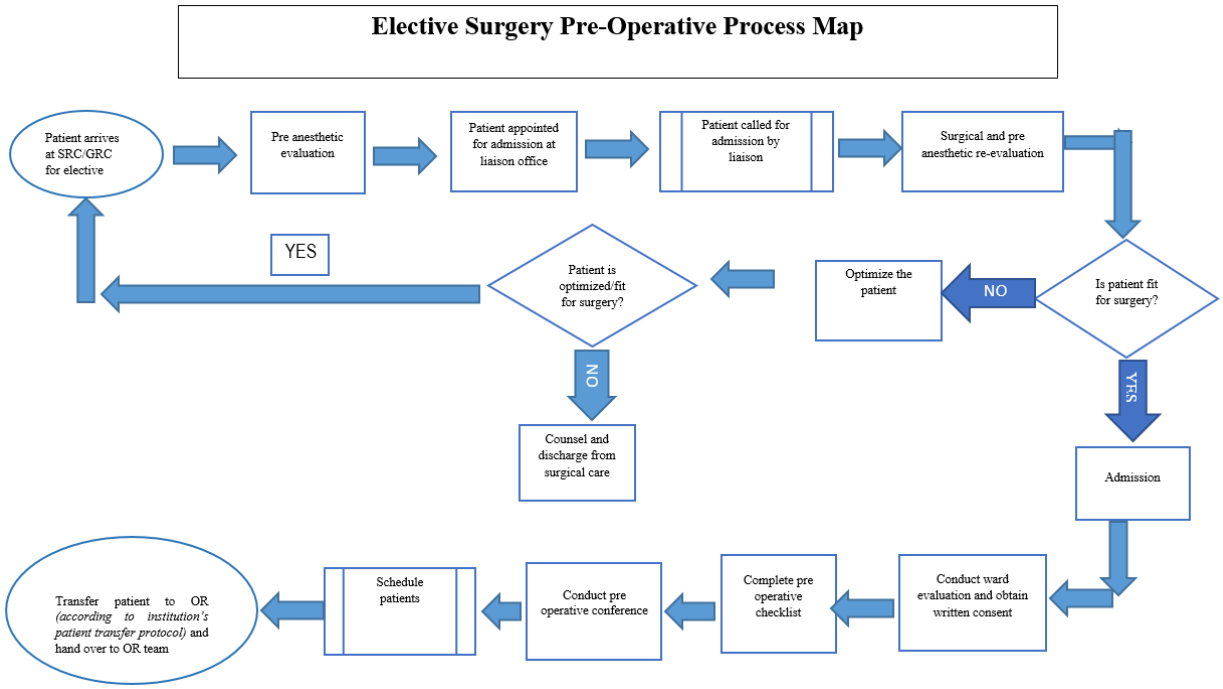


Figure 2: *Elective surgery pre-operative process map*

Note: The preoperative process map for emergency and elective cesarean section procedures is annexed (**Annex 3**).

3.1 Patient Assessment

3.1.1 Preoperative Surgical Assessment

The modern preparation of a patient for operation characterizes the convergence of the art and science of surgical discipline. The context in which pre-operative preparation is conducted ranges from the outpatient office visit to hospital inpatient consultations, or the emergency department evaluation of a patient. The approaches to pre-operative evaluation differ significantly, depending on the nature of the complaint and proposed surgical intervention, patient health and assessment of risk factors, and the results of directed investigations and interventions to optimize the patient's overall status and readiness for operation. Failure to make a proper assessment of the patient's condition is one of the commonest and most easily avoidable causes of mishap associated with surgical conditions. Such an assessment must include every aspect of the patient's condition, and not just the pathological problem requiring surgery. As such, a preoperative surgical checklist must be completed for all surgical patients by the surgeon/gynecologist at the SRC/GRC when the patient comes for admission. A template of the checklist for adults is displayed below:

Table 1: Surgical preoperative checklist for adult patients

Patient Name: _____ MRN: _____Age: _____Gender: ____Ward and Bed number: _____			
	Present	Absent	Not Applicable
HISTORY			
1. History of respiratory tract infections in the last two weeks (*runny nose, cough, fever*)			
2. History of fluid loss in the last 24 hours (vomiting, diarrhea, bleeding)			
3. History of COVID-19 vaccination			
4. History of recent skin rashes			
5. History of any current medication (*antibiotics, anticoagulants)*			
6. History of any chronic medical illness (*diabetes, hypertension, thyroid disorders, bleeding disorders, liver disease, cardiac disease, COPD, renal disease*)			
7. History of previous surgery			
8. History of known allergies			
9. History of substance abuse			
10. Last menstrual period			
PHYSICAL EXAMINATION	**Present**	**Absent**	**Not Applicable**
1. General appearance:			
Signs of respiratory distress:			
If **present**, specify:			
Signs of cardiovascular failure:			
If **present**, specify:			
2. Vital signs:			
Blood pressure 22			
PR			

(Regular/Irregular)			
Respiratory rate			
Temperature			
3. BMI			
4. Signs of anemia (assess conjunctiva, palm of hand)			
5. Abnormality in respiratory system			
If **present**, specify abnormality:			
6. Abnormality in cardiovascular system			
If **present**, specify abnormality:			
7. Colostomy washout adequate (*determined by nature of colostomy output*)- for patients on bowel preparation			
8. Presence of new skin lesions/rashes			
INVESTIGATIONS	**Done**	**Not Done**	**Not Applicable**
1. CBC within normal range and updated within the **last week**			
2. Blood group and Rh factor			
3. Fasting blood sugar			
4. Pregnancy test			
If **done**, specify result:			
5. Serum electrolyte within normal range and updated in the last **one** week			
6. RFT within normal range and updated in the last **two** weeks			
7. LFT within normal range and updated in the last **two** weeks			
8. Echocardiography done			
9. Chest X-ray done			

TREATMENT	Done	Not Done	Not Applicable
1. Patient/attendant counseled about the proposed procedure and has given written consent			
2. Patient/attendant counseled about keeping the patient NPO for at least six hours before surgery			
3. Required amount of cross matched whole blood prepared			
4. For Patients on bowel preparation:			
- Clear fluid diets started 24 hours before day of surgery			
- Cleansing enema BID started 48 hours before day of surgery - Antibiotic bowel preparation initiated			
5. Vitamin K administration (*only for patients with jaundice*)			
6. Anesthesiologists/senior anesthetist notified about subcritical/critical patients 24 hours prior to the day of surgery			
7. ICU bed reserved for patients requiring postoperative ICU care			

Diagnosis:_____

Is the patient fit for surgery?	**1. Yes**	**2. No**

If *no*, specify the reason: _____

Physician's Name: _____Signature: _____

Date (DD/MM/YY): _____

Once the surgical checklist is completed and the patient is deemed fit for surgery, the patient is sent to the anesthesia clinic for a preoperative anesthesia assessment.

The preoperative surgical checklist for pediatric patients is annexed (**Annex 4**).

3.1.2 Preoperative Anesthetic Assessment

The preoperative anesthetic assessment is the evaluation of the patients' medical, physical and mental status before taking the patient to the operation theater. Anesthetic drugs and techniques have profound effects on human physiology. Hence, a focused review of all major organ systems should be completed prior to surgery. Inadequate pre-operative planning and errors in patient preparation are the most common causes of anesthetic complications.

A pre-anesthesia assessment shall be done by the anesthetist or anesthesiologist, ideally at the pre-anesthesia clinic, prior to admission. Once the patient is admitted, a second assessment shall be done a day prior to surgery. An anesthesiologist/anesthetist should follow the following when conducting the pre-operative assessment:

1. The anesthesiologist/anesthetist shall perform the pre-anesthetic evaluation/assessment and decide the fitness of the elective patient for anesthesia at the OPD level, before admission.
    - In case of emergency and urgent surgery, the assessment should take place as early as possible.
2. The anesthesiologist/anesthetist should correctly identify the patient
3. The anesthesiologist/anesthetist should review the medical record
4. The anesthesiologist/anesthetist should interview and examine the patient to:
    - Discuss the medical history, family history, social history, drug history, allergies, previous anesthetic experiences and drug therapy
    - Assess those aspects of the patients physical condition that might affect decisions regarding pre-operative risk assessment and management, and classify the health status of the patient according to the ASA physical status and surgical risk classification system
        - Perform complete physical exam, including an airway assessment by using common airway assessment methods to determine difficulty in airway management

5. Obtain and/or review tests and consultations necessary to conduct anesthesia
6. Determine the appropriate prescription of pre-operative medications as necessary to the conduction of anesthesia
7. The anesthesiologist/anesthetist shall discuss possible plans of management with the patient and explains any options available, to enable the patient to make an informed choice
    - The responsible anesthesiologist/anesthetists shall verify that the above has been properly performed and documented in the patient's record
    - Prior to administration of any anesthesia medication, a written informed consent for the use of anesthesia shall be obtained and documented in the medical record
8. Decide the fasting/NPO time based on the type of ingested food (see the fasting guideline under **table 8**)
9. The patient shall be reassessed immediately prior to induction of anesthesia by an anesthesiologist or anesthetist. The plan shall be consistent with the patient assessment and shall include the anesthesia to be used and the method of administration
    - Patients with unstable conditions should be postponed for optimization prior to induction of anesthesia

Table 2: Preoperative anesthesia checklist

<table>
<tr><td colspan="4">Name of patient :</td><td colspan="2">Date:</td></tr>
<tr><td colspan="6">Age(Years) : Sex : Weight (Kg): Height (Meters):
BMI:</td></tr>
<tr><td colspan="2">Card number:</td><td>Ward:</td><td colspan="3">Surgical Diagnosis:</td></tr>
<tr><td colspan="3">Planned Procedure:</td><td colspan="3">Presentation:</td></tr>
<tr><td>Past surgical illness</td><td>Yes</td><td>No</td><td colspan="3">If yes, document illness:</td></tr>
<tr><td>Past medical illness</td><td>Yes</td><td>No</td><td colspan="3">If yes, document illness:</td></tr>
</table>

Current medical illness	Yes	No	If yes, document illness:							
Current medications	Yes	No	If yes, document medications:							
Known allergy	Yes	No	If yes, document allergy:							
Smoking	Yes	No	If yes, document number of pack year							
Alcohol	Yes	No	If yes, specify how much	Other substance						
Previous History of air way/ anesthesia complications	Yes	No	If yes document details:	Functional status (MET)						
Vital signs: BP(Sys/Dia)= PR= RR= SPO_2= T^o= Pain score=										
Air way assessment	MG= TMD= Mouth opening=									
	Neck mobility= Dentations=									
	HE EN T	Conjunctiva: Pink Pale	Dehydration	Yes	No	For pediatric age group: capillary refill	<2 sec	>2 sec		
Cardio vascular system	Abnormal heart sounds heard	Yes	No	If yes write :						
	Arrhythmias	Yes	No	If yes write:						
	Cardiac devices	Yes	No	If yes write:						
Respiratory system	Abnormal/decreased/ absent breath sounds	Yes	No	If yes what/where?						
Abdomen	Hepatomegaly/ascites /tenderness	Yes	No	If yes what/where?						
Genito-urinary system	Catheterized	Yes	No	If yes UOP=	CVAT:	YES	NO			
	Hematuria	Yes	No	UTI	Yes	No	For females LNMP=			
Musculoskeletal system	DVT	Yes	No	If yes write medication:						
	Edema	Yes	No	If yes grade and cause:						
Central nervous	GCS=	Pupillary response=	Power: RU= RL= LU= LL=							

system								
Investigations	Electrolytes	Na+=	K+=	Ca+2=	CL-=	Mg+2=		
	CBC	BG&RH=	HGB=	HCT=	PLT=	WBC=	Neutrophil %=	
	OFT	Cr=	BUN=	ALT=	AST=	Bilirubin=	Albumin=	
	Endocrine	RBS=	HbA1C=	TSH=	T3=	T4=	Others=	
	Coagulation	INR=	PT=	PTT=	Others=			
ECG if any								
Echocardiography If any								
CXR if any								
CT Scan report if any								
Final Assessment								
Anesthesia Plan	Mode of anesthesia	GA with ETT	GA with LMA	GA with sedation with mask	IV sedation	Spinal /Epidural	L/A	
	Medications to be hold	Yes	No	If yes document details:				
	Medications to be continued	Yes	No	If yes document details:				
	Premedication needed	Yes	No	If yes document details:				
	Blood & blood products needed	Yes	No	If yes document details:				

	NPO Time				
Post-operative disposition			Analgesia plan		
Anesthesia evaluator Name=				Signature	

Preoperative Laboratory and Diagnostic Studies

The indications for testing should be based on information obtained from medical records, patient interview, physical examination, and type and invasiveness of the planned procedure.

Table 3: Recommended pre-operative screening test

Test	Procedure	Disease of Condition
ECG	CVS	CVS disease, Hypertension, Diabetes
Chest radiograph	Thoracic	Respiratory disease, CVS disease Heavy smoker (relative)
Hemoglobin	>500ml blood loss	CVS disease, Renal disease ,Malignancy Diabetes ,Aspirin use ,NSAID use, Full dose anticoagulation
Creatinine	Possible perioperative renal failure	Use of drugs with renal excretion, Renal disease, CVS disease, Hypertension, Diabetes, NSAID use
Glucose		Diabetes, Steroid use
Urinalysis	Genitourinary Orthopedic implant Valve replacement	Use of drugs with renal excretion, Renal disease (relative), CVS disease (relative) , Hypertension(relative), Diabetes
Pregnancy	….	Female in reproductive age
Coagulation studies	….	Bleeding risk by history, Plan full dose, Anticoagulation

Risk Assessment and Stratification

Standardized patient risk assessment and stratification should be done before any surgical procedure. One can use the American Society of Anesthesiologists (ASA) anesthesia risk classification system to assess the risk of perioperative morbidity and mortality. Surgical procedures can also be classified as low, intermediate and high-risk procedures depending on the expected perioperative cardiovascular morbidity. Accurate risk assessment and stratification is important for patients to make an informed decision for consent. It is also useful for caregivers to plan ahead of time in terms of human resource, equipment, supplies, drugs and any alternative treatments.

A perioperative plan including patient optimization should be devised based on risk assessment and stratification. One should also take in to consideration if a certain type of patient or procedure can be cared for in a specific setup, requiring high-level professionals or special equipment/supplies.

Table 4: Surgical risk classification

Low risk (<1%)	Intermediate risk (1-5%)	High risk (>5%)

• Superficial surgeries
  ○ Breast
  ○ Dental
  ○ Thyroid
  ○ Eye
• Reconstructive/ plastic
• Gynecologic: minor
• Orthopedic: minor
• Urologic: minor
	• Abdominal/ Intra-peritoneal(for example, cholecystectomy)
	• Head and neck surgeries
	• Peripheral vascular surgeries
	• Neurosurgery
	• Gynecologic: major
	• Urologic: major
	• Orthopedic: major
	• Renal transplant
	• Intra-thoracic: non major
		• Aortic and major vascular
		• Open lower limb revascularization
		• Thromboembolectomy
		• Duodeno-pancreatic surgery
		• Liver resection, transplantation, bile duct surgery
		• Repair of perforated bowel
		• Adrenal resection
		• Intra-thoracic: for example pneumonectomy, esophagectomy, pulmonary transplant

Table 5: American Society of Anesthesiologists physical status classification system (ASA classification)

ASA Class	Criteria	Pooled mortality (%)
I	A normal healthy patient	**0-0.3 %**
II	A patient with mild disease that does not limit activity (e.g., controlled Hypertension, Asthma, Diabetes)	**0.3 -1.4 %**
III	A patient with severe systemic disease that limits activity (e.g., angina pectoris, uncontrolled hypertension)	**1.8 – 5.4 %**
IV	A patient with severe systemic disease that is a constant threat to life (e.g. Congestive heart failure, renal failure)	**7.8 – 25 %**
V	A moribund patient who is not expected to survive with or without operation (e.g., rupture aortic aneurism)	**9.4 – 57.8 %**
VI	A declared brain-dead patient	
E	Emergency case	

3.2 Surgical Patient Admission

The surgical patient admission is the process whereby patients are admitted to the hospital and have surgery/an operation. Surgical admissions should be arranged through the liaison service, which should provide service 24 hours a day, 7 days a week and 365 days a year, including holidays and weekends for emergency surgery. The hospital should have a written protocol for the surgical admission of patients that includes all steps to be taken in the admission process, including how to arrange admissions, in addition to the activities to be undertaken when the patient arrives.

Upon arrival on the ward, the patient should be received by a nurse who will initiate the ward admission process, provide an orientation of the available facilities (such as toilet and showers), and provide instructions for caregivers and so forth. The receiving nurse should in addition assess the patients/clients condition on arrival in the ward and inform the on-duty physician, as per the nursing preoperative checklist attached below.

3.2.1 Elective Admission Process

The liaison officer has to book elective admissions:

- When a patient requires elective admission. A clinical member of the relevant case team should send the following minimum patient information:
    - Patient name, phone number and medical record number
    - Summary of the clinical history and reason for admission
    - Urgency of admission (set criteria related to pathology of the disease)
        - Details of criteria to determine urgency of admission for a patient are annexed (**Annex 5)**
- The liaison officer should book the admission date, provide an appointment card and assign a medical record number to the patient. The officer should take the contact information of the patient (and/or caregiver) and give his/her office contact address to the patient so that the patient can be informed about his/her admission schedule.
    - The officer will remind the patient of admission a week prior to the date of admission
    - The officer will inform the patient if there is a change in schedule
    - The officer shall adjust the waiting list accordingly when there is a cancellation for admission
- On the day of admission, the patient should report to the liaison officer and from there he/she will be assisted to make any payment/free stamp and will be directed to the relevant surgical case team/ward.
- On a daily basis, the liaison officer should inform the surgical ward case team of planned admissions for the following day to ensure that the required service is available and allow the case team to make all necessary preparation for the admission.

The following key requirements have been identified to facilitate effective elective admission practices:

- All patients should have a treatment plan within 24 hours of admission
- Having a centralized waiting list management system
- Agreement on the parameters for scheduling operation theatre lists with the OR team

3.3 Preoperative Preparation

At the surgical ward, a ward nurse shall accept admitted surgical patients from the liaison office, check identity, orient and assess the patient and confirm if the preoperative surgical and anesthesia evaluation was done or not. If done, the nurse shall perform the initial nursing assessment and document patients' chart.

3.3.1 Pre-scheduling Checklist

The pre-schedule screening is to be completed by the surgical team, anesthesia team and nursing team respectively, to assure patient, facility and staff readiness for surgery.

The ward nurse shall notify the operating surgeon and/or the assigned resident to evaluate the patient and perform the pre-schedule screening.

The surgeon, after evaluating the patient, shall notify the anesthesia team for the pre-schedule anesthesia screening.

Once the surgical team (surgeon, ward nurse, OR nurse and anesthesia member) confirms that all necessary preparation is completed during the preoperative conference (see **section 3.3.4**), the patient can be scheduled for surgery.

Pre-scheduling Checklist

Identification

Patient Name_____ MRN _____

Age ____Sex _____Weight_____ Height_____ BMI_____ Blood group_____

Covid test _____Ward_____ Bed number_____

Surgical related

Date surgical evaluation is done_____

Surgical diagnosis_____

Planned procedure_____

Alternative procedure (if applicable) _____

Estimated blood loss_____

Number and type of blood products required and prepared _____

Surgical instrument availability confirmed(Y/N) _____

Surgical equipment functionality confirmed (Y/N _____

Special surgical instrument/equipment (if needed) is made available(Y/N) _____

Surgical informed consent is taken (Y/N) _____

Patient understands about the surgical procedure including (but not limited to) amputation, insertion of implants, temporary or permanent stoma, drainage tube, nasogastric tube, tracheostomy (Y/N) _____

Imaging required in the OR is ready to be sent with the patient(Y/N) _____

Prophylactic antibiotics (if applicable) is ordered (Y/N) _____

Surgical readiness complete (Y/N) _____

Name and signature of responsible surgeon _____

Anesthesia related

Date pre-anesthesia evaluation is done _____ASA status _____

Comorbid conditions_____

Medications patient is taking _____

_____

Known allergy (Y/N) _____

Risk stratification _____

Planned type of anesthesia_____

Any alternative plan of anesthesia(Y/N) _____

Difficult air way anticipated(Y/N) _____

Preparation for difficult airway management is complete, If applicable (Y/N) _____

Risk of aspiration anticipated(Y/N) _____

Aspiration prophylaxis ordered(Y/N) _____

If yes, what was ordered? _____

Medication that shall be continued through the perioperative period is continued(Y/N) _____

Which ones? _____

Medication that shall not be continued through the perioperative period is discontinued(Y/N) ___

Which ones? _____

Substitute medications (if applicable) is given(Y/N) _____

Which ones? _____

Instruction on how to take medications is provided to the patient(Y/N) _____

Premedication (if applicable) is ordered(Y/N) _____

If yes, what was ordered? _____

Fasting time is ordered(Y/N) _____

DVT prophylaxis (if applicable) is ordered(Y/N) _____

Anesthesia supply availability is confirmed (Y/N) _____

Anesthesia equipment functionality is confirmed (Y/N) _____

Special equipment or supply (if needed) is made available: for example invasive line, medications (Y/N)

If yes, which equipments/supplies were made available?

_____

Number and type of blood product required and prepared _____

Pertinent IX labs are ready to be sent to OR (Y/N) _____

Difficulty for IV access anticipated(Y/N) _____

If yes, alternative plan for IV access_____

Acute pain service required (Y/N) _____

Postoperative disposition planned (ICU/ Ward) _____

ICU bed availability (if needed) (Likely/unlikely) _____MV availability_____
(NB: If ICU bed /or MV/ is unlikely to be available do not schedule the patient)
Anesthesia readiness complete (Y/N) _____

Name and signature of anesthesia provider_____

Administrative related

Ward _____ Bed No. _____

Patient has admission card (availability confirmed) (Y/N) _____

Patient has deposited the required payment or has free patient stump (Y/N) _____ (confirm by seeing admission card)

Surgical, anesthesia and administrative readiness is complete (Y/N) _____

Name and signature of ward nurse _____

3.3.2 Preoperative Supplies and Equipment Preparation

Pharmacy

The OR pharmacy shall notify the OR team on the available surgical and anesthesia supplies weekly. This shall preferably be done electronically.

Blood Bank

The blood bank shall notify availability of blood products to the OR nurse before the patient is scheduled. This shall be in a written form as a response to blood product and cross match requests from the ward. This information shall be made available on time. Availability of cross-matched blood products will be confirmed by a signature and stamp of the blood bank head or delegate on a written document, which shall be attached in the patient's chart.

Biomedical Unit

The biomedical unit shall be responsible to check the functionality of OR equipment daily and report weekly to the OR coordinator. Any equipment malfunction shall be corrected as it occurs or an alternative solution should be sought out on the spot.

3.3.3 Informed Consent

Informed consent is a document a patient signs to verify that he/she has engaged in a discussion with a health care practitioner about a proposed medical treatment. Obtaining informed consent is an opportunity to guide a patient to the right decision for themselves, and dispel any unrealistic expectations regarding the procedure.

The patient informed consent form should include the following:

- Type of the surgery/anesthesia
- Site of operation/anesthesia including laterality or level
- The expected benefits
- Risks and adverse effects
- Alternate treatments available
- The consequences of not having the surgery

A template of an ideal consent form in the local language of Amharic can be found below:

የቀዶ ህክምና ስምምነት ቅፅ

የታካሚው ሙሉ ስም...ፆታ.......እድሜ......

አድራሻ፡ ክ/ከ/ክልል...............ወረዳ............ቀበሌ..........የቤት/ቁ.........ስልክ ቁጥር.....................

የታካሚው እድሜ ከ18 አመት በታች/እራሱን የሳተ/የአእምሮ ህመምተኛ ከሆነ ብቻ በሚመለከተው የሚሞላ

ቤተሰብ/ሞግዚት/ተወካይ ሙሉ ስም...............................

አድራሻ፣ክ/ከ/ክልል.....................ወረዳ..................ቀበሌ...................የቤት/ቁ................

የበሽታው(የህመሙ) አይነት...

የታቀደወ የቀዶ ህክምና አይነት____

አኔ ስሜ ከዚህ በላይ የተጠቀሰው ታካሚ ስላለኝ የጤና ችግር (ከላይ የተገጸው) እና ስላሉት የህክምና አማራጮች በቂ ገለጻ ተደርጎልኛል:: ለጠየኩዋቸው ጥያቄዎች በቂ ማብሪያሪያ ተደርጎልኛል፡፡ለበሽታዬ ቀዶ ህክምና ባይደረግ ሊያመጣ የሚችለው ችግር የተገለጸልኝ ሲሆን በማንኛውም ቀዶ ህክምና ወቅት እርግጠኛ የሆነ ውጤት ሊኖር እንደማይችል እና በዚህ ቀዶ ህክምና ላይም እንደዚሁ እርግጠኛ ውጤት እንደሌለ በምረዳው ቋንቋ ተነግሮኝ ተገንዝቤአለሁ፡፡በቀዶህከምናው ጊዜና ከዚያ በኍላ ሊያግጥሙ ስለሚችሉ

የሚጠበቁ ¬¬

¬¬

ሆነ የማይጠበቁ ____

ተያያዥ የጤና ችግሮችም በበቂ ሁኔታ ተገልጾልኝ ተረድቻለሁ፡፡

ስለሆነም በዶ/ር .... እና በስራ ባለደረቦቹ የቀዶ ህክምና እንደሚያስፈልገኝ በሚገባኝ(በምነጋገርበት) ቋንቋ በተገልጸልኝ መሰረት በሙሉ ፈቃዴ የቀዶ ህክምናው እንዲደረግልኝ ተስማምቻለው፡፡ ዶ/ር...........................ከአቅም በላይ በሆነ ምክንያት ቀዶ ህክምናውን ለማከናወን ባይችሉ ወይም የባለሙያ እርዳታ ቢያስፈልጋቸው ሌሎች እርሳቸው የመረጡዋቸው ባለሙያዎች ቀዶ ህክምናውን ካለምንም መዘግየት እንዲያደርጉልኝ ፈቅጃለው፡፡ በተጨማሪም ፤ምንአልባት ቀድሞ ከታወቀው(ከተገመተው) ውጪ በቀዶህክምናው ወቀት ሌላ ህመም ቢገኝብኝ ከታቀደው የቀዶህክምና ውጭ ሀኪሞቹ ተገቢ ነው ብለው ያመኑበትን የቀዶ ህክምና አሰቸኳይ ባይሆንም እንኳን እንዲሰሩልኝ ተስማምቻለው ፡፡

በቀዶ ሕክምናው ወቅት ወይም ከቀዶ ህክምናው በኋላ ደም / የደም ተዋፅዎች ልገሳ ቢያስፈልገኝ እንዲለገሰኝ እና ደም/ የደም ተዋፅዎች ከወሰድኩ በኋላ ሊያመጣ የሚችለውን ችግሮች ተነግረዉኝ ለመዉሰድ

ተስማምቻለሁ----------

አልተስማማሁም ----------

ለህክምና ሳይንስ ትምህርት እውቀት ሽግግር እና እድገት ቀዶ ህክምናው በሚካሄድበት ወቅትና ከዚያ በኁላ ተማሪዎች እና አጥኚዎች እንዲኖሩ እፈቅዳለው።። በዚሁ ጊዜ ለሳይንስ ትምህርት የሚጠቅሙ ፎቶግራፎች እና ቪዲዮች ስሜንና ማንነቴን በማይገልፅ መልኩ እንዲነሱና ለትምህርታዊ አገልግሎቶች እንዲውሉ ፈቅጃለው።።

በቀዶ ህክምናው ጊዜ ከአካሌ የሚወገዱ የሰውነት ክፍሎች ተገቢው ምርመራ እንዲደረገላቸው፤ አንደአስፈላጊነቱም በተገቢው መንገድ(በሆስፒታሉ አሰራር መሰረት) እንዲጣሉ ተስማምቻለው።።

የተነገረኝ መረጃ ግልጽ ሆኖልኝ ይህንን ቅጽ ለመፈረም ወይም ላለመፈረም ምርጫ እንዳለኝ ተነግሮኝ ተስማምቼ ለመፈረም ወስኛለሁ።።

ታካሚ /ቤተሰብ/ተወካይ ስምና ፊርማ ----------

የህኪሙ ስምና ፊርማ ----------

ከላይ በተገለጸው መሰረት ታካሚው ካልተስማማ ያልተስማማበት ምክንያት ከታች ይገለጽ።።

የታካሚው ስም---------- ፊርማ----------ቀን----------

የሐኪሙ ስም----------ፊርማ----------ቀን----------

የእማኞች ስምና ፊርማ

1. **ስም---------- ፊርማ----------**
2. **ስም---------- ፊርማ----------**
3. **ስም---------- ፊርማ----------**

ማስታዎሻ፡-ተቋማት እንደ አስፈላጊነቱ ይዘቱን ሳይቀንሱ ሊያሻሽሉት ይችላሉ።።

የአንስቴዢያ ስምምነት ቅጽ

የታካሚው ሙሉ ስም……..……..……ፆታ…….እድሜ……

አድራሻ፡ ክ/ከ/ክልል……ወረዳ…….....ቀበሌ…….የቤት/ቁ……ስልክ ቁጥር……

የታካሚው እድሜ ከ18 አመት በታች/እራሱን የሳተ/አይምሮውን የሚያመው ከሆነ ብቻ በሚመለከተው የሚሞላ

ቤተሰብ/ሞግዚት/ተወካይ ሙሉ ስም……

አድራሻ፣ክ/ከ/ክልል……ወረዳ…….....ቀበሌ……የቤት/ቁ……..

የበሽታው(የህመሙ) አይነት……..……

የታቀደወ የቀዶ ህክምና አይነት_____

የታቀደዉ የአንስቴዚያ አይነት

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3.3.4 Pre-operative Conference

The pre-operative conference is an important surgical team forum for pre-operative discussion and communication of surgical patients. It improves efficiency of the surgical team and optimizes patient safety. Studies show if done right, it does not take time and causes no delays in the operation. The World Health Organization (WHO) and other institutions have developed guidelines for pre-operative briefings. However, it can be fully or partly adopted based on the local need.

The following are short-thumb rules for conducting a pre-operative conference:

1. The pre-operative conference should bring the following team members together:
    - The surgeon
    - The anesthetist/anesthesiologist
    - The OR nurse
    - The ward nurse

- Other as necessary

2. The surgeon should be the leader of the pre-operative conference
3. The pre-operative conference time should be a day before the operation
4. The outcome of the pre-operative conference should be communicated based on the available means to all stakeholders and most importantly to the patient
5. Operation list scheduling should take into account the inputs and outcomes of the pre-operative conference
6. The pre-operative conference checklist is used to ensure that all team members possess accurate and explicit information regarding the patient and the procedural plan

Table 6: Preoperative conference checklist

Patient Full Name:	Implant (s) N/A ☐ Yes ☐ If yes, Specifics _____	Remark
Patient MRN	Pertinent Lab Results	
Names & Roles of Team Members 1. _____ 2. _____ 3. _____ 4. _____	Risk of >500 ml Blood Loss ☐ No ☐ Yes, and adequate IV access and fluids planned, and blood availability confirmed If Yes, Screen Type & Cross match	
Procedure or surgical site marked or on wristband	Need for prophylactic antibiotics Yes ☐ N/A ☐	
Laterality/Side: Left/ Right	DVT Prophylaxis: Yes ☐ N/A ☐	
Known Allergy Yes ☐ No ☐ N/A ☐	Anticipated Critical Events: Surgeon_____ Anesthesia_____ Nursing_____	
Anesthesia type Difficult Airway Yes ☐ No ☐ Aspiration Risk? Yes ☐ No ☐ If yes, equipment & assistance available_____ Safety check completed pulse oximetry_____	Post-operative disposition & bed availability	
Instruments and special equipment ☐ N/A ☐ Yes, if yes specify	Other	

3.3.5 Psychological Preparation of the Patient

Good communication and creation of rapport is key to prevent anxiety of patients scheduled for surgery. The cause of anxiety includes, but is not limited to, fear of death, pain, disability and awaking in the middle of surgery. All health providers shall provide clear information to patients during the preoperative visit to ease patients' anxiety:

- Surgeons should inform the patients in detail about the procedure, the surgical complications and ease any anxiety regarding the surgical procedure.
- The anesthesia team should inform the patients about the anesthetic medication type, route of delivery, possible anesthesia related complications and address all anxiety regarding anesthesia administration.
- The nursing team should inform the patients regarding general knowledge of surgery, addressing the social aspects of the perioperative period.

In case of pediatric patients, family members must be around at all times to ease the patient's anxiety. Use of toys and games help alleviate fear.

Administration of preparative drugs/premedication

According to the patient's clinical condition, premedication drugs shall be administered to patients in order to smoothen the perioperative period. Premedication shall preferably be given via oral route.

Premedication is administered for the following purposes:

- Reduction of anxiety and pain: the anesthetist or anesthesiologist can provide anxiolytic premedication whenever non-pharmacologic method are deemed ineffective
- Promotion of amnesia
- Reduction of secretions
- Reduction of volume and pH of gastric contents (to avoid Mendelson's syndrome)
- Reduction of postoperative nausea and vomiting (PONV)
- Enhancing the hypnotic effects of general anesthesia
- Reduction of vagal reflexes to intubation
- Specific indications – such as prevention of infective endocarditis with antibiotics

Table 7: Common premedication drugs and administration

Drugs	Route	Dose (mg/kg)
Benzodiazepines		
○ Diazepam	Oral	0.1 – 0.5
○ Midazolam	Oral	0.25 -1
	IM	0.1 – 0.2
	IV	0.01 – 0.1
Phencyclidine		
○ Ketamine	Oral	3-6
	IM	3-6
Opioids		
○ Morphine	Oral	0.2 – 0.5
○ Meperidine	Oral	1 – 2
Antacids		
○ Sodium citrate	Oral	30 ml
○ Ranitidine	IV	50 mg
○ Cimetidine	IV	200 mg
○ Omeprazole	Oral	20 mg
Prokinetic		
○ Metoclopramide	IV	10 mg

3.3.6 Fasting Recommendations

All patients shall fast before any procedure performed under general anesthesia, regional anesthesia or sedation. Patients should be well informed about the reason why fasting is needed by the anesthesia provider, as well as the duration of the fasting/NPO time. It should be noted that caregivers must also be addressed as they may secretly feed the patient, especially pediatric patients, without understanding the grave consequence of such actions.

Table 8: Fasting guide

Liquid and Food intake	Minimum fasting hours
Clear liquids (water, clear tea, black coffee, soft drinks, fruit juice without pulp)	2 hours
Breast milk	4 hours
Non-human milk (including infant formula)	6 hours
Light meal	6 hours
Regular or heavy meal	8 hours

3.3.7 Operating Theatre Scheduling

Once the preschedule screening and preoperative conference is conducted and the readiness checklist is complete, the surgical team shall schedule the patient. The schedule shall be disseminated to the OR, respective patient ward and blood bank before the institution's agreed upon deadline for OR schedule submission.

OT scheduling involves an arrangement of several operating rooms to the available surgeons in a specified period. There are multiple variables that go into consideration, including surgeon's availability, the patient's condition, availability of the operating room and the presence of the right medical devices/ surgical instruments. If done right, it contributes to improving the operational efficiency of the hospital and ensures timely care to patients with minimal waiting time.

There are different types of scheduling in the context of operation theaters that are followed in different hospitals. Each institution can select any of the scheduling methods based on their character and situation:

Open scheduling**:** Open scheduling allows surgical cases to be assigned to an operating room available at the convenience of the surgeons. This method can be used in facilities with small number of ORs with low flow (for example, primary hospitals, health centers with OR block).

Block scheduling: Block scheduling allows the assignment of specific surgeons or groups of surgeons to a set of time blocks, normally for some weeks or months, into which they can

arrange their surgical cases. This method can be use in facilities where there are adequate number of OR's and operating staff for the hospital's case flow (for example, referral hospitals, teaching hospitals).

Modified block scheduling: Here the allotted block time can be modified if the operating theatre planning does not keep up with the demands of the surgeons. This method can be use in facilities where there are adequate number of OR's and operating staffs for the hospital's case flow (for example referral hospitals, teaching hospitals).

OR Scheduling Phases

OR scheduling consists of three major phases. The three major phases in OR scheduling are described as follows:

Strategic Phase: The main objective of the strategic phase is to provide a "case mix plan" which is an important tool in strategic and tactical hospital planning by allocating OR blocks to surgery groups. The strategic phase typically has a time horizon of one year.

Tactical Phase: The main objective of the tactical phase is to provide a master surgical schedule (MSS). The MSS determines the number, type and opening hours of operating rooms for each surgery group. In the MSS, surgery types are clustered to surgery groups based on similar characteristics of specialties and requirement of resources in ORs, ICUs and PACUs. The time horizon of the tactical phase is usually one to three months.

Operational Phase**:** After development of the MSS, the assignment of cases to operating rooms and start/end time of each case is determined on a daily basis. This phase specifically deals with the daily scheduling of patients for next day surgery based on the preset MSS.

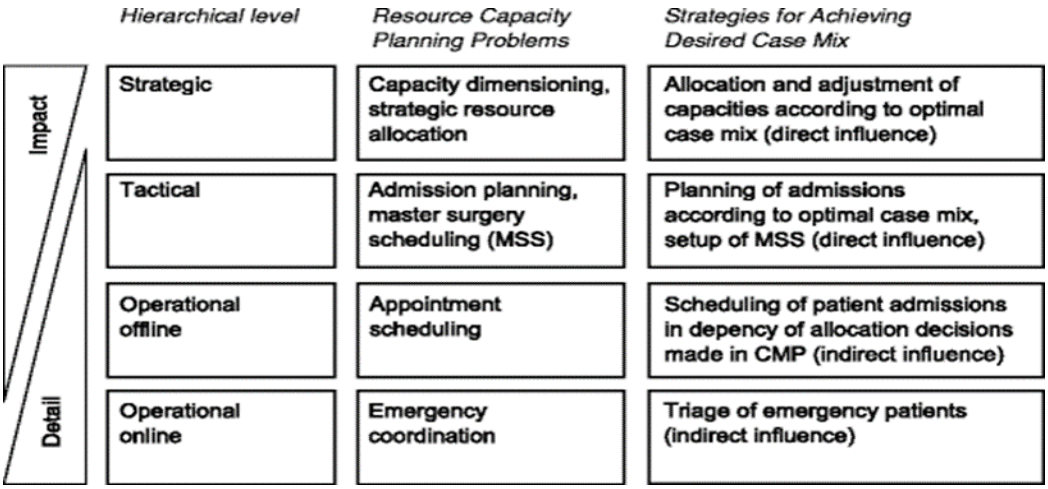


Figure 3: OR scheduling phases

Table 9: Operating schedule template

Department---------- OR Table: ----------Day of Surgery ----------

No	Patient Name	Age	Sex	MRN	Ward	Covid test	Blood Group	Diagnosis	Procedure	Type of anaesthesia	Surgeon	Assistant Surgeon	Anesthesiologist /Anesthetist	Scrub Nurse	Circulating Nurse	Chronological Order of conducted surgery	Remark

3.3.8 Preoperative Nursing Care

Once the patient has been scheduled for surgery, the ward nurse shall identify the patient and procedure, confirm if procedure site is marked (if applicable), attach ID band on the patient, review patient chart, confirm if surgical and anesthesia evaluation is done and assure informed consent is taken.

The ward nurse shall ascertain all the necessary laboratory investigations and imaging are ready and sent to the OR with the patient on the day of surgery.

The ward nurse shall educate the patient on pre-operative preparations including personal hygiene: preoperative showering and removal of hair at surgical site.

The ward nurse shall use the following checklist when preparing a patient for OR.

Review of medical record

Patient Name_____ MRN _____

Age _____Sex _____Weight____ Height_____ Blood group_____ Allergy _____

Date and time vital sign is taken _____

BP_____PR_____RR_____T_____SPO_2_____RBS_____

Chart review

Anesthesia, nursing and surgical assessment in the chart (Y/N) _____

Patient has signed both anesthesia and surgical consent (Y/N) _____

Blood type and cross match (if applicable) (Y/N) _____

If yes, how many units? _____

List of medications patient used in the past clearly indicated in the chart (Y/N) _____

Preoperative order is clearly written in the chart (Y/N) _____

Day of surgery

Identification of patient verbally (Y/N) _____

Procedure and procedure site indicated in the chart (Y/N) _____

Procedure site is marked (if applicable) (Y/N) _____

Crosschecked ID band on the patient (Y/N) _____

Last vital sign taken (Date and time) _____

BP_____PR_____RR_____T_____SPO_2_____RBS_____

Patient kept NPO (Y/N) _____ If yes, at what time? _____

Patient showered(Y/N) _____

Pre-op medications given(Y/N) _____

Patient voided urine(Y/N) _____

Imaging sent to OR with patient (Y/N) _____

Lab tests sent to OR with patient (Y/N) _____

Time to OR _____ Transported by _____

Full name and signature of ward nurse _____

3.3.9 Patient Transfer and Handover

On the morning of surgery, a ward nurse and porter shall bring the first surgical patient on the schedule to the OR waiting area/gate at the facilities agreed upon time, after ensuring the patient has completed all preoperative requirements. The ward nurse shall handover the patient to the operating room team using the preoperative handover checklist provided below. Consecutive patients on the schedule shall be accompanied by the ward nurse and porter to the OR gate once notified by the OR team (surgical team).

At the OR gate the anesthesia and OR nursing team shall:

- Accept the patient and confirm the patient's identity
- Confirm the patient's NPO status
- Check if all pre-operative orders are executed accordingly, including the administration of medications
- Check if new clinical events have developed since the last evaluation

The patient shall be made to change cloth in the way that keeps the patient's dignity at the designated area at the OR gate.

The patient shall be transferred to the operating room table by the runner nurse once the anesthesia and OR nursing team members confirm readiness.

Preoperative Handover Checklist

Patient Identification

Name _____

MRN _____

Ward: Bed number_____

Age _____

Sex _____

Planned surgical procedure

_____

Site marked (Y/N)

_____

Allergy (Y/N)

_____

Preoperative surgical order and execution status

_____

Preoperative anesthesia order and execution status

_____

NPO status /Last meal or liquid

_____

Blood product prepared (Y/N)

_____

Blood consent signed (Y/N)

_____

Surgical and Anesthesia Consent signed (Y/N)

_____

COVID status

_____

Medication given and omitted (including antibiotics and DVT prophylaxis)

Medication given	Time given	Given by
1		
2		
3		
4		

Pre-operative vitals

BP _____ HR _____ RR _____ SPO_2 _____Temperature _____

Special concern _____

Any new development (ask the patient) _____

Ward nurse name and signature _____

Anesthesia provider name and signature _____

Table 10: Pneumonic for patient transfer- I PASS THE BATON

Initial	Stands for...
I	Introduction—Introduce yourself and your role/job (include patient)
P	Patient—Name identifiers, age, sex, location
A	Assessment—Present chief complaint, vital signs, symptoms, diagnosis
S	Situation—Current status/circumstances, including recent changes and response to treatment
S	Safety concerns—Critical lab results*, socioeconomic factors, allergies
THE	
B	Background—Comorbidities, previous episodes, medications, family history
A	Actions—What actions were taken or are required? Provide brief rationale
T	Timing—Prioritization of actions
O	Ownership—Who is the responsible caregiver and professional for the patient?
N	Next—What will happen next? Anticipated changes? Is there a contingency plan?

Adapted from (AHRQ: Agency for Healthcare Research and Quality)

**Critical lab results: indicates laboratory results specific to the patient and the procedure to be performed.*

3.3.10 Operating Room Readiness Checklist

The runner OR nurse must use the following checklist before bringing the patient to the operating room and before preparing the specific case equipment cart.

Table 11: Operation room readiness checklist

Cleanliness and Dust				
1	Inspect floor for cleanliness and dust	YES ☐ NO ☐	Clean and damp dust if required	**Remark**
2	Inspect lights for cleanliness and dust	YES ☐ NO ☐	Clean and damp dust if required	
3	Inspect furniture for cleanliness and dust	YES ☐ NO ☐	Clean and damp dust if required	
4	Check the temperature and humidity of the room	YES ☐ NO ☐		
	Check the appropriate equipment and supplies are available and functional			
	Equipment & Supplies Lists	**Available**	**Functional**	
1	Arm Strap X2	YES ☐ NO ☐	YES ☐ NO ☐	
2	Arm Board X2	YES ☐ NO ☐	YES ☐ NO ☐	
3	Back table	YES ☐ NO ☐	YES ☐ NO ☐	
4	Bed	YES ☐ NO ☐	YES ☐ NO ☐	
5	Bed locked	YES ☐ NO ☐	YES ☐ NO ☐	
6	Bed made up with draw sheet is plugged in and working	YES ☐ NO ☐	YES ☐ NO ☐	
7	Count board is erased	YES ☐ NO ☐	YES ☐ NO ☐	

8	Count sheet	YES ☐	NO ☐	YES ☐	NO ☐	
9	Electrocautery unit with foot pedal(s)	YES ☐	NO ☐	YES ☐	NO ☐	
10	Foot stools	YES ☐	NO ☐	YES ☐	NO ☐	
11	IV stand X2	YES ☐	NO ☐	YES ☐	NO ☐	
12	Kick bucket and sponge counter	YES ☐	NO ☐	YES ☐	NO ☐	
13	Linen receptacle	YES ☐	NO ☐	YES ☐	NO ☐	
14	Mayo stand	YES ☐	NO ☐	YES ☐	NO ☐	
15	Patient warming machine	YES ☐	NO ☐	YES ☐	NO ☐	
16	Positioning materials	YES ☐	NO ☐	YES ☐	NO ☐	
17	Prep table	YES ☐	NO ☐	YES ☐	NO ☐	
18	Ring stand (2) single and (1) double	YES ☐	NO ☐	YES ☐	NO ☐	
19	Safety strap	YES ☐	NO ☐	YES ☐	NO ☐	
20	Sitting stools	YES ☐	NO ☐	YES ☐	NO ☐	
21	Separate suction available for anesthesia	YES ☐	NO ☐	YES ☐	NO ☐	

22	Suction plugged in and suction working	YES ☐	NO ☐	YES ☐	NO ☐
23	Surgical lights	YES ☐	NO ☐	YES ☐	NO ☐
24	Time-out paperwork/ Surgical safety checklist	YES ☐	NO ☐	YES ☐	NO ☐
25	Trash receptacles (that is, clean and biohazardous)	YES ☐	NO ☐	YES ☐	NO ☐
	Insert any other basic equipment per the facility _____	**Name and Signature…..... Date..../..../..../**			

4. Intraoperative Care

Intraoperative care begins when the patient is transferred and handed over to the operating room team according to the facility's operating theatre protocol and ends when the patient is handed over to the anesthesia care unit or transferred to the ICU.

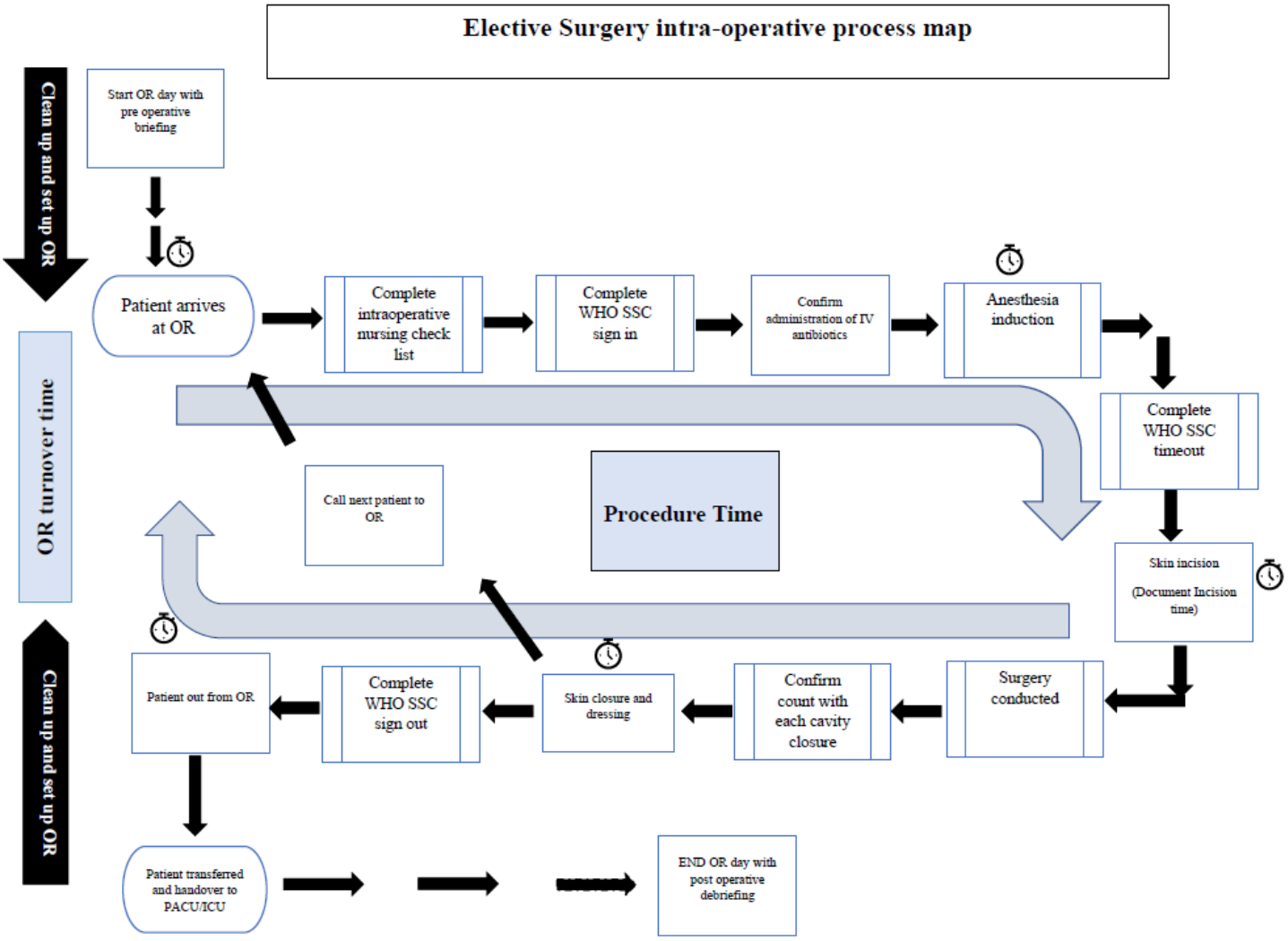


Figure 4: Elective surgery intraoperative process map

Emergency surgery and cesarean section intraoperative process maps have been annexed (**Annex 3**).

4.1 Intraoperative Patient Reception and Briefing

4.1.1 Handover

Formal standardized hand over/hand off protocols, and clear verbal and written communication should be used during the transfer of a patient from one health professional/team to another to ensure continuity of care.

Once the patient has been handed over at the OR gate to the OR team, the runner nurse should transfer the patient to the OR table, accompanied by the anesthesia team.

4.1.2 Transferring patient to OR table

- Patients shall be wheeled in or transferred using a stretcher (or wheelchair when indicated), accompanied by OR nursing and anesthesia team at all times.
    - Be sure to take note of patient's drainage tubes and lines upon transfer.
    - Make sure the patients' body is well covered and their dignity is maintained at all times.
    - For pediatric patients, the minor should be accompanied by the family member/care giver to the OR table to reduce anxiety. The family member/care giver shall leave the OR room once the patient is sedated.
- Make sure the OR table legs are locked before attempting to transfer patients to avoid falls.
- Ensure the table is fully covered with a plastic sheet to avoid skin burn.
- Lower the table to the height of the stretcher and transfer the patient on to the OR table (provide a foot stool if transferred via wheelchair).
    - Use an adequate number of team members upon transferring the patient to the OR table to avoid injury to the patients.
    - It is not uncommon to see head trauma from hanging OR light; push them away from the table up until the patient is transferred and laying comfortably on the table.

4.1.3 Briefings

A surgeon-led preoperative briefing or "huddle" is a 1-5 minute session conducted on the day of surgery in the OT, before the patient enters the OT. All members of the surgical team must be present. As a team, the schedule of the day for a specific table is discussed in depth, allowing

timely communication of any new developments and/or schedule rearrangements to be made. Standardized preoperative briefings include participation of the entire OR team (surgeon, anesthesiologist/anesthetist, circulating nurse, and scrub technician) and have the following elements**:**

- Introducing team members and their roles
- Rechecking patient identity (using dual identifiers) and consent, the surgical procedure to be performed, the site, and side of surgery
- Identifying the patient's medical status, recent laboratory and/or radiology results, and the management plan for medical comorbidities such as diabetes
- Ensuring the teams understanding of critical steps for the procedure, as well as devised contingency plans.
- Discussing antibiotic administration (if appropriate), including antibiotic selection, initial dosing and timing, and plans for re-dosing (if appropriate)
- Discussing venous thrombosis prophylaxis
- Evaluating fire risk and discussing mitigation strategies
- Verifying blood product availability (if appropriate)
- Determining ideal monitoring strategies and availability of equipment
- Verifying availability and proper functioning of all necessary surgical equipment and instruments, and identifying any implant concerns
- Discussing appropriate patient positioning, padding, and skin preparation
- Planning postoperative disposition (for example, PACU or ICU)
- Inviting all team members to ask questions and to speak up regarding any concerns throughout the procedure

A preoperative briefing template, which can be adapted per facility and specialty unit, is annexed

(**Annex 6**).

4.1.4 WHO Safe Surgery Checklist

To ensure safe surgical care and patient safety, all hospitals should implement the Surgical Safety Checklist (SSC). The surgical team should make an effort to reduce avoidable adverse events due to poor communication, poor team work and organizational culture by using the SSC checklist recommended by the WHO, and work toward improving safety.

The WHO SSC is a standard version that serves as a template. Modification of the original SSC is possible by adding components that are pertinent to the facility, without removing the essential 19 items.

WHO's Surgical Safety Checklist Structure

The SSC has three phases. In each phase, the members of the surgical team have assigned specific responsibilities:

Sign in: Before induction of anesthesia, members of the team (at least the nurse and an anesthesia professional) verbally confirm that:

- The patient verifies his or her identity, the surgical site and procedure, and that consent is signed
- The surgical site is marked or site marking is not applicable
- The pulse-oximeter is on the patient and functioning (if not, do not proceed with the procedure)
- All members of the team are aware of whether the patient has a known allergy
- The patient's airway and risk of aspiration have been evaluated and appropriate equipment and assistance are available (if not, do not proceed with the procedure)
- If there is a risk of blood loss of more than 500 ml (or more than 7 ml/kg of blood weight in children), appropriate access and fluids are available (if not, do not proceed with the procedure)

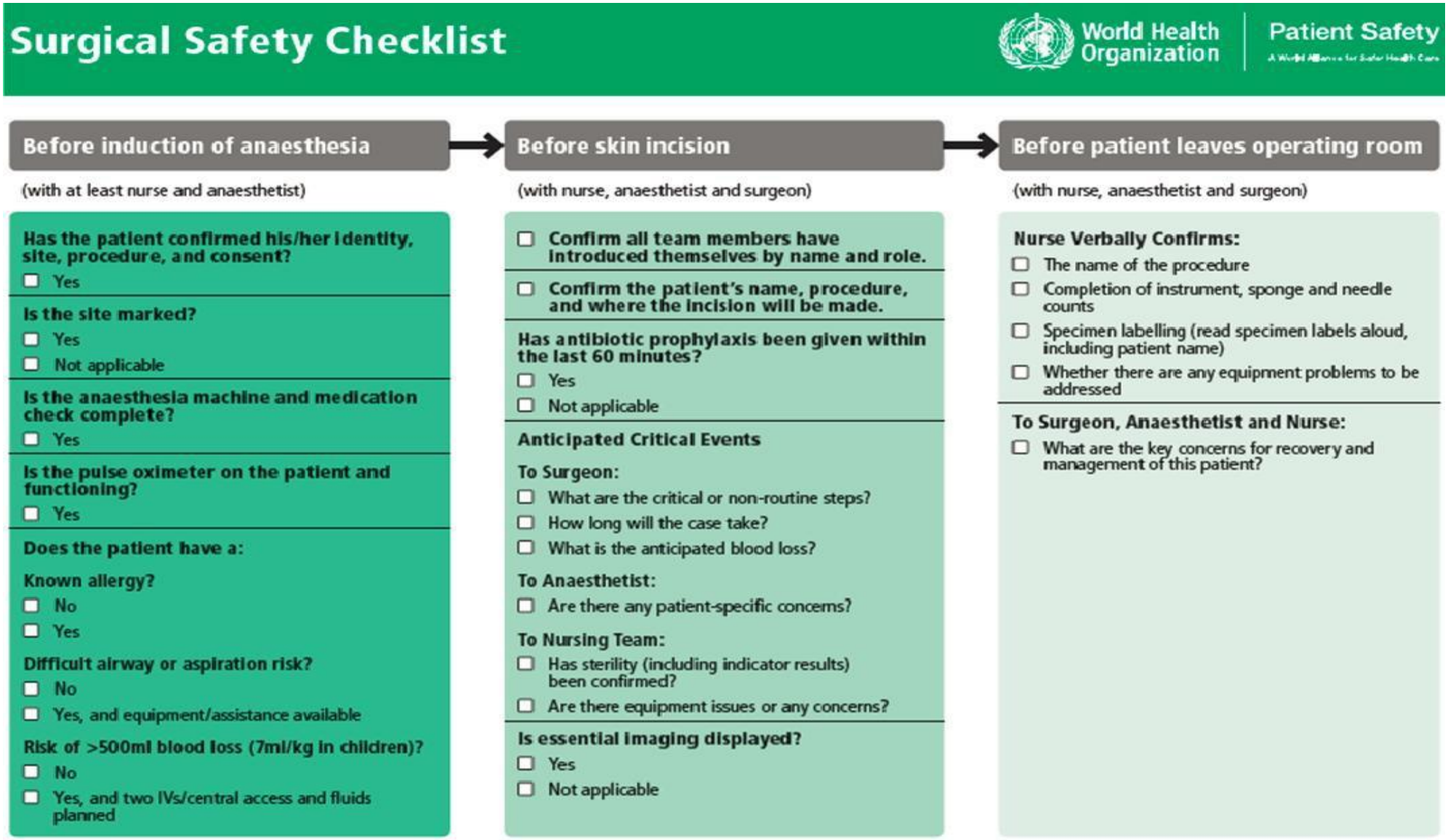
Time out: Before skin incision, the entire team (nurses, surgeon, anesthesia professionals and any professional participating in the care of the patient) verbally:

- Confirms that all team members have been introduced by name and role
- Reviews the anticipated critical events
- Surgeon reviews surgical critical concerns, operative duration, and anticipated blood loss
- Anesthesia staff review anesthesia concerns specific to the patient
- Nursing staff review confirmation of sterility, equipment availability, and other concerns
- Confirms that prophylactic antibiotics have been administered $\leq$ 60 min before incision is made or that antibiotics are not indicated
- Confirms that all essential imaging results for the correct patient are displayed in the operating room or not applicable

Sign out: Before the patient leaves the operating room, and while the entire team is present in the OR, verbally confirm that:

- The checklist coordinator/runner nurse names the procedure as recorded
- The needle, sponge, instrument counts are complete
- Specimen is correctly labeled if applicable
- Any equipment problems to be addressed are discussed
- Key concerns for recovery and management of the patient are discussed

Figure 5: World Health Organization's Surgical Safety Checklist



Surgical Safety Checklist

World Health Organization | Patient Safety

Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?
- ☐ Yes

Is the site marked?
- ☐ Yes
- ☐ Not applicable

Is the anaesthesia machine and medication check complete?
- ☐ Yes

Is the pulse oximeter on the patient and functioning?
- ☐ Yes

Does the patient have a:

Known allergy?
- ☐ No
- ☐ Yes

Difficult airway or aspiration risk?
- ☐ No
- ☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?
- ☐ No
- ☐ Yes, and two IVs/central access and fluids planned

Before skin incision

(with nurse, anaesthetist and surgeon)

- ☐ **Confirm all team members have introduced themselves by name and role.**
- ☐ **Confirm the patient's name, procedure, and where the incision will be made.**

Has antibiotic prophylaxis been given within the last 60 minutes?
- ☐ Yes
- ☐ Not applicable

Anticipated Critical Events

To Surgeon:
- ☐ What are the critical or non-routine steps?
- ☐ How long will the case take?
- ☐ What is the anticipated blood loss?

To Anaesthetist:
- ☐ Are there any patient-specific concerns?

To Nursing Team:
- ☐ Has sterility (including indicator results) been confirmed?
- ☐ Are there equipment issues or any concerns?

Is essential imaging displayed?
- ☐ Yes
- ☐ Not applicable

Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:
- ☐ The name of the procedure
- ☐ Completion of instrument, sponge and needle counts
- ☐ Specimen labelling (read specimen labels aloud, including patient name)
- ☐ Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- ☐ What are the key concerns for recovery and management of this patient?

4.2 Intraoperative Nursing Care

Nursing activities in the intraoperative period are centered on patient safety, facilitation of the procedure and prevention of infection to achieve a satisfactory response to anesthesia and surgery. The following checklist should be filled by the nursing team during the intraoperative period.

Table 12: Intraoperative nursing care checklist

	Circulating Nurse/ Non sterile activities	**Initials/Signature**
	Environment	
	Assists with the preparation of the room	
	Ensures that needed items are available and sterile (as required)	
	Checks mechanical and electrical equipment and environmental factors	
	Ensures patient safety in transferring and positioning	
	Positions the patient (collaboration in patient positioning) to ensure correct alignment, exposure of surgical site, and prevention of injury	
	Coordinates all activities in the room with team members and other health related personnel and departments	
	Procedure	
	Plans and coordinates the intra-operative nursing care	
	Checks the chart and relates pertinent data	
	Reviews anatomy, physiology and surgical procedures	
	Practices aseptic technique in all required activities	
	Monitors practice of aseptic technique in self and others	
	Ensures that needed items are available and sterile (as needed)	
	Identifies and admits the patient to OR	

	Assesses the patient's physical and emotional status	
	Assists with transferring the patient to the operating room bed	
	Ensures patients safety in transferring and positioning	
	Participates in insertion and application of monitoring devices	
	Assists with the induction of anesthesia	
	Monitors the draping procedure	
	Measures blood and fluid loss	
	Monitors urine output	
	Counts sponges, needles and instruments (three times)	
	Moves nonsterile items out of the operating room	
	Accompanies the patient to the anesthesia recovery area	
	Reports and recordings	
	Documents intra-operative care	
	Records, labels and sends tissue specimens and cultures to proper locations	
	Records the counted items (sponges, needles and instruments) correctly on registration book, white board or computer	
	Reports relevant information to the care of the patient to the recovery area nurses	
	Records amount of drug used during local anesthesia	

	Scrub Nurse/ Sterile Activity	
	Procedure	**Initial/Signature**
	Reviews anatomy, physiology and the surgical procedure	
	Assists with the preparation of the operating room	

	Scrubs, gowns, gloves self and other members of the surgical team	
	Assists with draping procedures	
	Ensures the integrity of sterile field	
	Ensures the correct counts of sponges, needles and instruments	
	Monitors practices of aseptic techniques in self and others	
	Reports amount of local anesthesia and other solutions used by surgeon	
	Instrument	
	Prepares the instrument table and organizes sterile equipment for functional uses	
	Passes instruments and is attentive to the surgeon and assistants, anticipating their needs	
	Proper cleaning packaging instrument after use (especially fragile instruments)	
	Records incidents (for example, lost instruments, lost gauze, packs)	
	Patient care	
	Positions the patient for proper body and site alignment	
	Keeps tracks of irrigation fluid and drainage tubes on table and during transfer	
	Applies proper dressing of wound site	
	Assists in the transfer and handover of the patient to the ICU/PACU	

A sample of an intraoperative count sheet is annexed (**Annex 10**).

4.3 Intraoperative Anesthesia Care

4.3.1 Preparing the anesthesia station

The anesthesia provider shall make sure of the availability and functionality of equipment, supplies and medications before bringing the patient to the OR. The WFSA-WHO minimum anesthesia standard guideline for LMIC shall be followed.

The provision of safe anesthesia depends on careful preparation, which includes:

1. Any machine or apparatus that supplies gases, vapors, local anesthesia or intravenous anesthetic agents to induce or maintain anesthesia

2. Any equipment necessary for securing the airway
3. Any monitoring devices necessary for maintaining continuous evaluation of the patient
4. Medications
5. The patient himself or herself correctly identified, consensual and evaluated preoperatively

One can use the mnemonic “SOAP ME’ in preparing the anesthesia station before the patient enters the operating room.

Table 13: How to prepare the anesthesia station using the SOAP ME pneumonic

S- Suction	Check availability of the suction machine and make sure that it is functional
O- Oxygen	-Check for availability of oxygen and ensure the amount available is enough to last the intended operation period -Make sure alternative oxygen sources are readily available as a backup for oxygen failure -Make sure oxygen delivery devices are readily available (nasal prong, face mask, bag mask valve, pediatric breathing system)
A–Airway equipment	Check availability of appropriate size of the following: • Laryngoscope – two different size blades • ETT – 3 (expected size and one size below and above), check cuff • Oral airway/Nasal airway • LMA • Stylet • Anesthesia Mask • Ambu bag • McGill forceps Ensure difficult airway equipment is readily available (video laryngoscope, combitube, bougies, intubating laryngeal mask airway, fiber-optic bronchoscope, articulating laryngoscope, cricothyroidotomy set)
P- Positioning	Avail towels , pads or ramp to be applied under pressure areas and to maintain optimal intubation position
M – Machine, Monitors and Medications	Check the anesthesia machine is functional Check continuous monitoring device is functional Check anesthesia and resuscitation drugs are drawn up and labeled
E–Emergency equipment and supplies	Check availability of functional defibrillator, percutaneous tracheotomy set and emergency cognitive aids

Anesthesia Machine

In preparing for anesthesia, the anesthetic machine should be checked by the anesthesia provider:

- Before each administration of anesthesia
- Before the start of each operating day
- After any repair or maintenance of the anesthetic machine
- When introducing a new anesthetic machine

A checklist for the anesthetic machine should be available at each operating room.

Every anesthetic machine should meet the following minimum standard requirements:

- Oxygen and medical air flow-meters
- Color-coding system compatible with international standards
- Visual labeling of gauges and meters
- Anti-hypoxic device
- Oxygen-flush button and an oxygen failure system (visual/audible)
- A back-bar that can fit two vaporizers
- A separate built-in oxygen flow-meter
- A breathing system that can also accommodate pediatric patients
- A scavenging system

The anesthetist should be aware of the checklist and follow them exactly. There should always be an alternative oxygen supply. An alternative method of ventilating the patient must always be available (that is, a self-inflating resuscitation bag). All failure alarms functionality should be checked before proceeding. There should be an oxygen analyzer present on the anesthetic machine. No anesthesia should commence until every machine defect, if found, is fixed.

Anesthesia providers shall make sure a cognitive aid and algorithm for the management of very common and rare emergencies, such as hypoxemia, cardiac dysrhythmia, malignant hyperthermia, anaphylaxis or others are readily available inside the operating theater before starting the procedure.

Once the patient is on the OR table, make sure that IV line(s) are patent or open a new one. Apply monitors and check the initial vital signs. Continuously communicate all procedures and interventions applied to the patient; this will help alleviate their anxiety.

In all cases, pre-oxygenate patients before induction of anesthesia. This can be done by administering 5-10 L/min of oxygen via a tight fitting anesthesia mask for 3-5 minutes. In case of emergency procedures, 4-5 deep breaths will suffice.

Before induction of anesthesia, one can use the WHO anesthesia checklist to re-confirm everything is ready.

4.3.2 Patient Positioning and Anesthesia

Proper positioning requires the cooperation of anesthesiologists, surgeons, and nurses to ensure patient well-being and safety while providing surgical exposure. During anesthesia care, whenever possible, patients should be placed in a position that they would tolerate when awake. All jewelry and hair ornaments must be removed. Padded surfaces, lumbar support, and natural joint positioning are optimal. The head should remain in the midline position without substantial extension or flexion whenever possible. At no time should pressure on the eyes occur. Because surgeons wish to have optimal exposure, and positions may be maintained for long periods, prevention of complications often requires compromise and judgment. The duration of more extreme positions, if such are necessary, should be limited as much as possible. Tilting of the operating room table during surgery should be anticipated before draping, and the patient should be secured accordingly. Use of safety straps and prevention of a fall are fundamental.

Airway Management

Airway management during anesthesia management of surgical patients is a crucial component of anesthesia service in the operation theater. It needs to be practiced in accordance with updated national and international airway management guidelines. This will be accompanied by a well-prepared basic and advanced airway management cart/trolley. Maintenance of oxygenation must take priority over all other issues. Pre-oxygenation should be performed before induction of anesthesia. Mask ventilation should be used between attempts at tracheal intubation. Trauma must be prevented at all times. The first attempt at tracheal intubation should be performed under optimal conditions, including patient position, pre-oxygenation, and equipment preparation. The

number of attempts with blind techniques should ideally be zero and certainly not more than four.

The anesthesia provider should have a sequence of backup plans in place before starting the primary technique. They should have the skills and the equipment needed to execute these plans. When unanticipated difficulty occurs in non-lifesaving surgery, the safest plan is to terminate attempts at tracheal intubation, awaken the patient, and postpone surgery. The anesthesia provider should seek the best help available ("call for help") as soon as difficulty with tracheal intubation is experienced.

Regional Anesthesia

Different regional anesthesia techniques need to be selected on an individual basis, taking in to consideration the patient's preference as well.

The conduct of regional anesthesia should be performed with prior preparation for general anesthesia, and according to the institutionally agreed upon protocol. The protocol need to address the utilization of different regional anesthesia techniques for different purposes including intraoperative anesthesia management, pain control and postoperative pain management modalities.

Single-use regional anesthesia should be practiced with prepared spinal and epidural sets respectively.

Peripheral Nerve Block

Peripheral nerve blocks, including trunk, upper and lower extremity blocks, must be practiced with full prior pre-anesthetic evaluation of patients, and clear documentation of consent after explanation is given to patients on advantage and shortcomings of this procedure. All peripheral blocks should be guided by the institutional protocol. A plan for failed or deteriorating peripheral nerve blocks, like general anesthesia or monitored anesthesia care, should be prepared according to national and international recommendations. These blocks can be performed using the landmark based, peripheral nerve stimulator guided or ultrasound-guided approach.

4.3.3 Induction of Anesthesia

Make sure you have a trained assistant before administering your anesthetic medication. Perform the WHO SSC sign in before induction of anesthesia in the presence of all surgical team members. Inform the patient that you are anesthetizing him/her and the feelings he/she may develop such as dizziness, sleepiness, passing out, or burning sensation at the IV administration site. You need to inform what is expected from the patient when awakening from anesthesia such as following instruction like 'protrude your tongue', or 'open your eyes'. Induction technique and choice of induction agent will be based on the patient's clinical condition. In case of emergency procedures where the patient has a full stomach or bowel obstruction, use rapid sequence induction to reduce risk of aspiration. In case of general anesthesia, secure the airway and maintain oxygenation and ventilation. The specific airway device to be used and ventilation strategy depends on the patient's clinical condition and should be individualized. One needs to confirm the airway device is appropriately placed and patient is well-ventilated and getting adequate oxygen.

4.3.4 Maintenance of Anesthesia

Anesthesia shall be maintained by further continuous administration of inhalation or intravenous agents. This shall depend on the individual patients' condition and availability of resources. After making sure that the anesthesia state is well maintained, surgery can be started. Perform the WHO SSC time out just before skin incision.

The anesthesia providers are expected to perform the following tasks while the operation is in progress:

1. Monitor patient vital signs: Patient's blood pressure, heart rate and rhythm, oxygen saturation, temperature and expired carbon dioxide level should be monitored. This shall be documented on the intra-operative anesthesia recording sheet at **10 minute** intervals (a template of an anesthesia recording sheet has been annexed- **Annex 7**).

Table 14: Anesthesia parameters to be monitored intraoperatively

Parameter to be monitored	**Recommended minimum interval of monitoring**
Blood Pressure (BP)	Every **5 minutes** or continuously using invasive arterial line in selected high risk patients
Heart rate and rhythm (HR)	Continuously using ECG
Oxygen saturation (SPO_2)	Continuously using pulse-oximeter
Temperature	Continuously using patient monitor temperature probe or every **30 minute** using a digital thermometer
End tidal CO_2 ($ETCO_2$) – expired carbon dioxide level	Continuously using capnometer

2. Monitoring depth of anesthesia: The anesthesia provider should clinically follow the patient to assess whether the level of anesthesia meets the surgical stress or not and accordingly increase or lower the amount of anesthesia administered.

3. Monitor the surgical field and blood loss: The anesthesia provider shall inspect the surgical field to follow the course of surgery, follow critical steps and tailor anesthesia accordingly. The anesthesia provider should also estimate blood loss by measuring blood inside the suction tube, counting number of blood soaked gauze and taking into consideration blood pouring over the drapes, surgeons' hand, operation table and the floor.

4. Administer fluid: The anesthesia provider shall administer intraoperative fluid according to the patient's individualized fluid requirement. The fluid administration should take in to consideration deficit, maintenance requirement and ongoing losses. Extra caution should be taken when administering fluid to patients who are prone to develop fluid over load such as patients with cardiac and renal failure.

5. Monitor input output strictly: In case of longer surgeries or when significant fluid shift is expected, urinary catheters need to be inserted to monitor urine output. Urine output shall be checked and documented by the anesthesia provider every **one hour** in catheterized patients.

6. Prevent patient fall, injury and bedsore: Apply physical restraints, cushion pads and towels under pressure areas (occiput, shoulders, sacrum, elbows, and heels) and take extra care when transferring the patient to avoid injury.

7. Monitoring tubes: Monitor oxygen, anesthesia machine, patient monitor, breathing circuits, tubes, IV lines and other ancillary equipment to assure proper functioning and safe delivery of anesthesia.

8. Continuous patient monitoring and communication: The anesthesia provider shall be present in the room throughout the administration of any kind of anesthesia be it general, regional or monitored anesthesia care. The anesthesia provider should be vigilant and always stand by to provide life support measures such as cardiopulmonary resuscitation. It is prudent to have professional and continuous communication with the surgeons and other professionals as needed throughout the surgical procedure.

9. Cautionary measures: The anesthesia provider shall maintain standards to protect patients and staff from all hazards including cross-infection, and the safe disposal of sharps.

10. Thorough documentation: The anesthesia provider shall record all the intra operative events throughout the procedure.

4.3.5 Recovery Phase

The anesthesia provider shall prepare for the recovery phase as the surgery is approaching the end, as per the recovery plan set during the preoperative evaluation.

The recovery preparation may include:

- Reducing the anesthesia administered.
    - Avoid totally discontinuing anesthesia before completion of surgery. This is one of the commonly encountered mistakes made by the anesthesia provider.
- Preparing extubation equipment: functional suction machine, suction tip, anesthesia mask, syringe, equipment for re-intubation, oxygen delivery devices
- Drawing and labeling reversal medication
- Informing the PACU/ICU to prepare to receive the patient

When the operation ends, perform the WHO SSC sign out. Extubate the patient when the patient becomes conscious and is able to protect his/her airway and breathe adequately, unless deep extubation is required due to patient related factors.

The patient shall be transferred to the PACU/ICU after confirming that the effect of anesthesia is proficiently reversed and the patient is in stable condition to be transferred. The anesthesia provider shall remain by the patient's side until the patient is transferred out of OR and handed over to the PACU team. In case of aggressive or delirious patients, physical restraint and/or sedative agents shall be used. The transfer and handover should follow institutional or national protocols.

4.3.6 Documentation and Recording of Intraoperative Anesthesia Management

The primary purpose of anesthesia documentation is to capture accurate and comprehensive information to communicate a patient's anesthetic experience. The following intraoperative anesthesia related activities should be documented on a preformed anesthesia recording sheet [The anesthesia recording template is annexed (**Annex 7**)]:

- Patient identification and major preoperative findings such as ASA classification, anticipated difficult airway, presence of allergy
- Induction technique
- Laryngoscopy grading for intubated patients
- Airway equipment used
- Medication used including dose and route
- IV access (number and size of cannula)
- Monitoring tool utilized
- Intraoperative vital signs, blood loss and urine output
- Total fluid administered, type and amount of blood product given
- Anesthesia and surgery start/end times
- Any adverse anesthetic event or complication
- Providers name and signature

4.4 Intraoperative Surgical Care

Since every surgical procedure entails a set of operative risks, the operating team should be ready to prevent avoidable risks and respond to complications accordingly. The operating team should carry out the following activities during the intraoperative period:

- Check and ensure the right patient receives the right operation before each operation by using all the appropriate checklists (for example, the WHO surgical checklist)
- Ensure thermoregulation and patient dignity are maintained (that is, patient centered care-patient's should be seen as human beings and not as 'a case')
- Ensure that the procedural technique used is the one with minimal blood loss and/or prepare blood for major blood loss procedures
- Ensure the appropriate incision type is used and blunt suturing mechanism is applied
- Ensure the right anesthesia type is used for the specific procedure
- Ensure a sterile operation theater environment is maintained:
    - Human traffic control must be implemented during the procedure
    - Ensure appropriate hand washing technique is followed: washing with soap and water followed by use of antiseptic
    - Conduct appropriate skin preparation by allowing the applied antiseptic agent to air dry
    - Use dry and sterile drapes (avoid wet drape usage)
- Use measures to minimize injuries from sharp edged materials during surgery such as:
    - ✓ Use small Mayo forceps (not fingers) when applying or removing surgical blades from the blade holder or when loading the needle holder. (Alternatively, use disposable scalpels with a permanent blade that cannot be removed)
    - ✓ Always use tissue forceps, not fingers, to hold tissue when using a scalpel or suturing.
    - ✓ Use the hands-free technique to pass or transfer sharps (scalpel, needles and sharp-tipped scissors) by establishing a safe or neutral zone in the operative field
    - ✓ Always remove sharpened materials from the field immediately after use
    - ✓ Make sure that containers for sharp material are replaced when they are only three-quarters full and place containers as close to where sharp materials are being used (that is, within arm's reach)

4.5 Intraoperative Safety

To ensure safety of the OR environment, every operating room must have proper lighting, good ventilation, proper equipment for procedures, equipment to monitor patients as needed for the procedure and drugs as well as other consumables required for routine and emergency use.

The staff, novice and old, must follow the national safety guide and hazardous waste management policy. Various important components of the protocols include, but are not limited to, the following:

- Applying the concept of aseptic technique (for example, respect the OR's defined restricted area)
- Demonstrating the national infection prevention and control (IPC) bundle protocol (for example, appropriate surgical attire)
- Preventing and responding to various hazards in the surgical setting, as well as identifying the role of each operating room member when facing safety threats
    - Hazards such as electric burns, fire, blood splashes and falls.
- Customizing hazardous waste management policies
- Minimizing action-based, decision-based, technical and communication-based human errors to increase patient safety

4.5.1 Adverse Anesthetic Events

An adverse anesthetic event refers to an actual injury to the patient that is associated with administration of anesthesia. It includes unexpected or undesirable response(s) to administered anesthesia medication or intervention.

Documentation of these events on the anesthesia record sheet and OR registry by the managing anesthesia team is necessary, as it shall be reported to the surgical data management unit. It is also desirable if the surgical team documents the event on the OR note as a remark.

The following tool will be filled by the anesthesia team upon discharge of the patient from the OR and at the ward at the 72-hour mark/before discharge from the hospital.

Step 1: Was there one or more adverse event(s) associated with this anesthesia encounter?

- No, this form is now complete
- Yes, fill out reminder of form below

Step 2: Please describe the adverse event(s). Check all that apply.

Airway	**Respiratory**	**Cardiovascular**	**Neurology**
o Difficult intubation oDifficult ventilation oAirway obstruction oLaryngospasm oAirway trauma oEsophageal or Endo-bronchial intubation	oAspiration oSustained hypoxemia oPremature extubation oPneumothorax oBronchospasm oHypoventilation oALI/ARDS oNegative pressure pulmonary edema oRespiratory failure	oHypotension requiring vasopressor support oArrhythmia oPulmonary embolism oMyocardial infarction o Heart failure oPulmonary edema oHypertensive emergency/ crisis	oIntraoperative awareness oSeizure oPeripheral nerve compression/injury oParesis or paralysis oStroke oHigh / total spinal oLocal anesthetic toxicity oBlindness oDelayed awakening
Renal oAcute kidney injury/ failure oFluid overload oPulmonary edema	**Gastrointestinal** oHepatitis / hepatic injury oHepatic failure oPersistent PONV, Hiccup oStress ulcer/ upper GI bleeding	**Neuromuscular/MSK** oFracture oSoft tissue injury oResidual Neuro-muscular block oCorneal abrasion	**Drug error** oWrong drug oWrong dose oSyringe swap oAmpoule swap oAllergic drug reaction
Miscellaneous oDeath oCardiac arrest oMalignant hyperthermia oPsychosis/ delirium oPTSD oUnplanned ICU admission	**Others (please specify)**		

Step 3: Please note the interventions performed to treat the adverse event event(s).

_____

_____

_____

Step 4: Please note the outcome of the adverse event (s). Check all that apply.

Minimal risk outcome

- o No adverse outcome

Moderate risk outcome

- Unplanned ICU admission or escalation of care

Sentinel outcome

- Death
- Permanent neurologic deficit
- Organ failure

Other, specify below

_____

Step 5: Assign a *severity* rating to the adverse event(s) associated with this anesthesia encounter
If there are any options checked in sentinel outcome, then this is ***severe adverse event***
If the most serious option checked above is moderate risk, then this is a ***moderate adverse event***
If the most serious option checked above is minimal risk, then this is ***minor adverse event***

_____

The tool should remain attached in the patients chart and a copy of the tool shall be kept with the OR anesthesia coordinator or over all OR coordinator/manager.

4.6 Managing Operating Room Efficiency

Operating theater efficiency is defined as treating the right patient, and providing the right care within the clinically recommended timeframe, with the optimal use of the resources required to deliver safe quality care at or below an efficient price for the service.

In order to assure the efficiency of the facilities OR table:

- **The OR tables should have their own identifying code**: every hospital tables should have their own identifying code. This therefore would help to measure table efficiency and other efficiency related measures
- **Critical times:** the incision time, wheels in time, wheels out time, and surgical end time should be recorded; these are critical times where unnecessary resources are wasted. In order to monitor and follow the status of resources, the hospital OR team should record every 'critical time' per OR table
- **Surgical cancellation:** any cancelled case and the reason for cancellation must be recorded. Cancellation register is annexed (**Annex 14**)
- **Surgical procedure SOP and checklist:** each institution must have an SOP for all surgical procedures and should be followed when surgeries are performed

- **Anesthesia procedure SOP and checklist:** each institution must have an SOP for all anesthesia procedures and should be followed when surgeries are performed
- **Intraoperative nursing SOP and checklist:** each institution must have a nursing SOP for all surgical procedures and should be followed when surgeries are preformed
- **Standard operating procedure and checklist for surgical supplies**: hospitals must prepare an SOP and checklist for supplies for each surgical procedure

A sample of an operation theatre/room efficiency assessment tool is annexed (**Annex 11**).

4.7 Intraoperative Documentation and Reporting

Operating room records that should be attached to the patient chart include complete: operation note, order sheet, anesthesia record sheet, WHO surgical safety checklist, decision note and intra operative nursing checklist.

All procedures performed must be documented in the surgeon OR book registry, anesthesia OR book registry and nursing registry.

- ✓ **Operation Note-** After each procedure, the surgeon/assistant must complete the operation note for the patient and should include: patient identity (name, age, sex, card number), time, indication, procedure type, surgeon name, assistant name, scrub nurse name, runner name, anesthetist/ anesthesiologist name, type of anesthesia provided, intra operative finding, intra operative complications and post-operative diagnosis. A sample of an operation note is annexed (**Annex 8**).
- ✓ **Order Sheet-** After each procedure, the surgeon should record the finding-based order sheet, which includes: patient name, age, sex, date and time, diagnosis, NPO time, postoperative antibiotics, postoperative analgesics, wound care, patient positioning, tube management and physician signature.
- ✓ **OR Registry Book**- All surgical procedures, upon completion, must be recorded on the provided OR registry book- in paper form or digitally. The OR registry book should include: name, age and sex of the patient, type of procedure/ surgery, indication, name of surgeon/ assistant surgeon/scrubs/runner, name of anesthetists/anesthesiologists, type of anesthesia, outcomes and remarks. A sample of an OR registry is annexed (**Annex 9**).

5. Postoperative Care

5.1 Postoperative Process Map

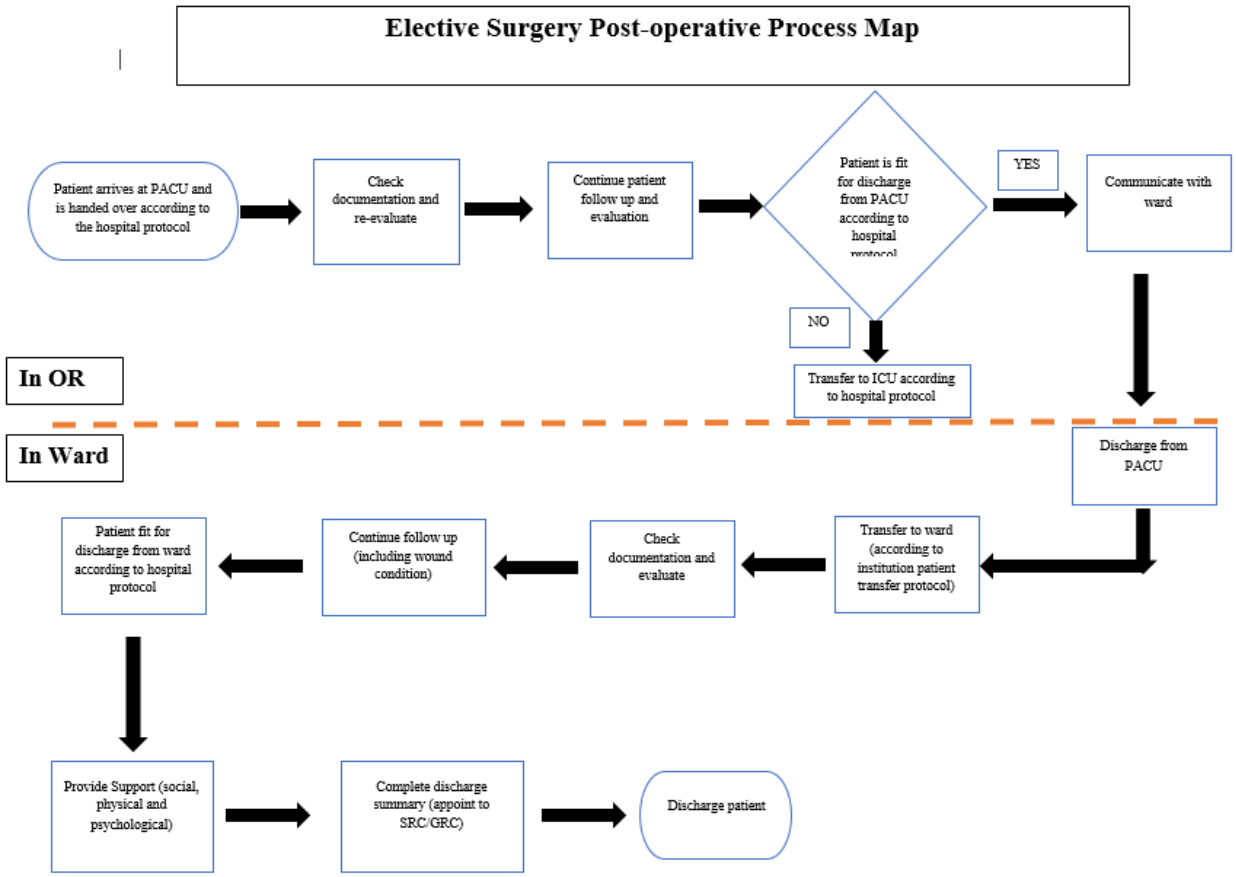


Figure 6: Elective surgery postoperative process map

Postoperative process maps for emergency general surgeries and cesarean sections are annexed (**Annex 3**).

5.2 Postoperative Transport and Transfer to PACU/ICU

Postoperative transport and transfer of patients requires involvement of all surgical team members in-line with the national surgical safety guideline. The patient is moved carefully off the operation table using a roller plate. A minimum of four persons are required to safely transfer the patient on to the shifting trolley or the recovery bed. The wheels of the trolley or recovery bed should be locked while moving the patient. The team should give careful attention to the patient's indwelling catheters, tubes and lines.

All team members will then wheel out the patient from the theater to the recovery room for close observation. The patient should remain in the PACU/ICU for immediate postoperative care until

the discharge criteria, according to the institutions protocol, is fulfilled. Once the patient is stabilized, the patient's relatives should be informed regarding the status of the patient by the operating team.

5.3 Handover for Postoperative Care

Effective handover plays a key role in ensuring the continuity, quality and safety of patient care. Hence, standardization of the handover process can improve patient care and the staff should comply with the local standardized processes for patient handover. Handovers should be in both verbal and written form.

Handover Procedure:

a. Hand over from OR to PACU/ICU

A dedicated nurse should be present in the PACU/ICU to receive the patient. Upon arrival to the PACU, monitoring of patient's vital signs, level of consciousness and airway patency should be initiated.

Patient handover from runner nurse to the PACU/ICU practitioner should include patient's name, allergy status, details of operation performed, details of any items left in situ (for example packs, drains, catheter), skin closure technique, type of dressing used, any local anesthetic given during or after the operation, and any specimen taken during the procedure.

The anesthetist provider should inform the PACU/ICU practitioner about the type of anesthesia administered, specific intraoperative anesthesia events and/or complications, as well as details of the parenteral drugs infused.

The surgeon/assistant should inform the PACU/ICU practitioner regarding the nature of the surgery performed, postoperative orders and surgical complications to watch for.

b. Handover from PACU/ICU to Ward

The PACU team handovers the patient to the ward team based on the postoperative handover checklist.

Based on the institution's set criteria, the patient's readiness for discharge must be met before discharge. The parameters used for discharging a patient from the PACU/ICU are the following:

1. Uncompromised cardiopulmonary status
2. Stable vital signs
3. Pulse oximetry readings of adequate oxygen saturation
4. Adequate urine output – at least 30 ml/ hour
5. No signs of fluid volume imbalance
6. Orientation to time, person and place
7. Tolerable or minimized pain
8. Absence or controlled nausea and vomiting

c. Handover from OR/PACU to ICU/HDU (High Dependency Unit)

The PACU nurse following the same hand over protocol can transfer patients not on any ventilator support to ICU/HDU. Patients on ventilator support should be escorted to the ICU/HDU directly by the operating team, bypassing the PACU.

Table 15: Postoperative handover checklist

Patient	
Patient identification	
Duration of surgery	
Allergies	
Surgical procedure and reason for surgery	
Type of anesthesia (GA, regional, sedation)	
Surgical or anesthetic complications	
Past medical history	
Preoperative cognitive function	
Preoperative activity level (METs)	
Limb restriction	
Preoperative vitals	
Procedure	
Primary post-operative concern	
Positioning of patient	
Intubation conditions (grade of view, airway, quality of bag mask ventilation)	
Lines/catheters (IVs, a-lines, CVCs, foley catheters, chest tubes, surgical drains, ventriculoperitoneal-VP- shunt)	
Fluid Management (Fluids given, blood loss, urine output, transfusions)	
Medications	
Analgesia plan - during case, postoperative orders	
Antiemetic administered	
Antibiotic medications administered	
Other intraoperative medications (steroids, antihypertensive)	

5.4 Postoperative Surgical Care

The physicians should clearly prescribe and document different immediate, early and late postoperative follow-up related care. This includes orders related to NPO time, ambulation, venous-thromboembolism prevention strategies, pain management modalities, antibiotic administration, postoperative care of tubes and catheters, fluid management, frequency of follow-up, continuation of care, discharge plan and any other concern specific to the patient's condition.

Feeding

The decision to start feeding in the postoperative period will depend on individualized patient factors.

Antibiotic Administration

The administration of intravenous antibiotics should be practiced based on the national rational drug use formulary.

Venous Thrombo-embolism Prevention Strategies

Postoperative ambulation should be initiated as soon as possible. Patients should ambulate 8-12 hours following the surgery unless indicated otherwise.

For patients who are at high risk for development of DVT, preventive strategies include intraoperative stockings, sequential pressure cuff use, and medications.

5.5 Postoperative Nursing Care

Airway

- Keep airway in place until the patient is fully awake and tries to eject it. Return of pharyngeal reflex, noted when the patient regains consciousness, may cause the patient to gag and vomit if the airway is not removed.
- Suck out secretions as needed.

Breathing

Use the pneumonic BREATH:

- B – Bilateral lung auscultation frequently

- R – Rest and place the patient in a lateral position with the neck extended, and the arms supported with a pillow, if not contraindicated
- E – Encourage the patient to take deep breaths
- A – Assess and periodically evaluate the patient's orientation to person, place and time
- T – Turn the patient every 1 to 2 hours to facilitate breathing and ventilation
- H – Humidified oxygen administration

Circulation

- Obtain patient's vital signs as ordered and report any abnormalities
- Monitor input and output closely
- Recognize early symptoms of shock or hemorrhage such as cold extremities, decreased urine output, slow capillary refill, dropping blood pressure and narrowing pulse pressure and tachycardia

Thermoregulation

- Monitor temperature to detect hypothermia or hyperthermia; report temperature abnormalities to the physician
- Monitor the patient for post-anesthesia shivering
- Provide a therapeutic environment with proper temperature and humidity using warm blankets, warm IV fluids, and/or room heaters.

Fluid Volume

- Assess and evaluate patient's skin turgor
- Recognize signs of fluid imbalances:
    - Hypovolemia: decreased blood pressure, decreased urine output, increased pulse rate, increased respiration rate, and decreased central venous pressure (CVP).
    - Hypervolemia: increased blood pressure and CVP, chest findings

Safety of Patients

- Avoid nerve damage and muscle strain by properly supporting and padding pressure areas
- Frequent dressing/surgical site examination for possible tightening, bleeding or discharge
- Raise the side rails of the bed to prevent the patient from falling
- Protect the extremity where IV fluids are inserted to prevent possible needle dislodgement

- ❖ Make sure that bed wheels are locked
- ❖ Provide symptomatic therapy, including antiemetic medications for nausea and vomiting
- ❖ Administer phenothiazine medications as prescribed for severe, persistent hiccups
- ❖ Assist patient to return to normal dietary intake (liquids first, then soft foods)

Patient Comfort

- ❖ Observe and assess behavioral and physiologic manifestations of pain
- ❖ Administer medications for pain and document its efficacy
- ❖ Assist the patient to a comfortable position

Drainage

- ❖ Maintain patency and monitor drainage of tubes

Wound Care

- ❖ Perform hand washing before and after contact with the patient
- ❖ Regularly inspect dressings and reinforce them if necessary
- ❖ Proper wound care as needed
- ❖ Record the amount and type of wound drainage
- ❖ Re-position the patient every 2 hours. Pad pressure areas

Assessing and Managing Voluntary Voiding in Non-Catheterized Patients

- ❖ Assess for bladder distention and encourage patients to void upon arrival and frequently thereafter (patient should void within 8 hours of surgery)
- ❖ Initiate methods to encourage the patient to void (for example, letting water run, applying heat to perineum)
- ❖ Warm the bedpan to reduce discomfort and automatic tightening of muscles and urethral sphincter
- ❖ Obtain order for catheterization before the end of the 8-hour time limit and if the patient has an urge to void but cannot, or if the bladder is distended
    - o Continue intermittent catheterization every 4 to 6 hours until patient can void spontaneously

Encouraging Activity

- ❖ Encourage surgical patients to ambulate as soon as possible, unless contraindicated

- ❖ Advice patients regarding the importance of early mobility to prevent complications
- ❖ Anticipate and avoid orthostatic hypotension:
    - o When the patient gets out of bed, remain at patient's side. Sit the patient on the edge of bed for a few minutes initially and advance to ambulation as tolerated
    - o Assess patient's feelings of dizziness and his or her blood pressure (in supine, sitting and standing positions)
    - o Assist patient to change position gradually. If patient becomes dizzy, return to supine position and delay getting out of bed for several hours
- ❖ Initiate and encourage patient to perform bed exercises

Gerontology Considerations
Elderly patients continue to be at increased risk for postoperative complications.

- ❖ Avoid restraint in geriatric patients, if possible, because it can worsen confusion. Family or staff members may sit with the patient instead.
- ❖ Assist the older postoperative patient in early and progressive ambulation to prevent the development of problems such as pneumonia, altered bowel function, DVT, weakness, and functional decline
- ❖ Avoid prolonged sitting positions that promote venous stasis in the lower extremities
- ❖ Provide assistance to keep patient from bumping into objects and falling
- ❖ Encourage voiding to prevent urinary incontinence

5.6 Surgical Site Infection (SSI)

Surgical site infection is defined as an infection that occurs within 30 days after the operation and involves the skin and subcutaneous tissue (superficial), and/or fascia/ muscle (deep), and/or organs or spaces other than the incision that was opened.

Use the following WHO surgical site infection surveillance postoperative data collection form to classify, diagnose and report surgical site infections. The form should be attached to each patient's chart.

Surgical site infection surveillance post-operative data collection form

ID	Patient name	Age/ Date of birth ...../...../.....	InPatient number	Address (town/village)
	Telephone number 1	Whose telephone number		Checked? ☐
	Telephone number 2	Whose telephone number		Checked? ☐

World Health Organization

*All follow-up in the 30-day post-operative period should be recorded in **Box 2**. Each patient interaction should be recorded in the "Event" column from the day of surgery onwards, including: surgical procedure, wound dressing removed/changed, (each) inpatient (IP) review, discharge, outpatient (OP) review, telephone call, readmission, return to the operating theatre, surveillance discontinued (reason). At least three reviews are recommended in the 30-day follow-up period. For each "Event", please record the date, tick the "Antibx" column if antibiotics are prescribed/being taken, complete health workers' initials, and record any surgical site infection (SSI) symptoms or other important notes in the last column (see footnote 1).*

BOX 2 - Admission date to hospital for primary operation: ...../...../..... **Hospital discharge date:** ...../...../.....

Day	Date	Event	Antibx	SSI symptoms and other notes[1]	Health worker initials
1		Surgical procedure			
2-3					
4-5					
6-7					
8-10					
11-14					
15-17					
18-21					
22-25					
26-29					
Day 30				End of SSI surveillance (standard)	

1. *At each patient interaction, first check the patient's identification. Then assess or ask about the **SSI symptoms:***
- *Drainage of fluid from wound: pus versus clear (serous) / bloody / other • Pain / tenderness beyond normal for operation*
- *Localized swelling or wound breakdown • Redness/heat of skin • Generally unwell, especially fever >38°C*

If any SSI symptoms are noted in Box 2, proceed to Box 3 to determine the SSI case definition and consult with the operating surgeon.

BOX 3

Surgical Site Infection? ☐ Yes ☐ No (Determine with case definition tick boxes below)
Patient re-admitted for Surgical Site Infection? ☐ Yes ☐ No (note reason) .....
Date of re-admission for Surgical Site Infection: ...../...../..... Discharge date: ...../...../.....

☐ **Superficial SSI** (skin/subcutaneous) e.g. cellulitis	☐ **Deep SSI** (fascia/muscle) e.g. deep abscess	☐ **Organ/space SSI**** Deeper than fascia/muscle e.g. endometritis (organ), peritonitis (space)
☐ Purulent drainage (pus) from superficial incision	☐ Purulent drainage (pus) from deep incision	☐ Purulent drainage (pus) from sterile organ or space (from an inserted drain)
OR	**OR**	**OR**
☐ Organism identified (if culture done)*	☐ Deep incision dehiscence or deliberately opened by surgeon	☐ Organ or space infection/abscess found on imaging/examination
OR	**AND**	**OR**
☐ Superficial incision deliberately re-opened	☐ Organism identified (if culture done)*	☐ Organism identified from fluid/tissue from organ/ space*
AND	**AND**	
☐ Infection symptoms[1]	☐ Infection symptoms[1]	
OR	**OR**	
☐ Surgeon/attending physician diagnosis	☐ Deep infection/abscess found on imaging/examination	

Other surgical complications
☐ Non-infectious **local** wound complications including bleeding and abnormal skin reactions
☐ Patient death: Date ...../...../..... Cause of death (as far as known) .....

Microbiology culture results*	Specimen taken Date...../...../..... type.....	Organism(s) identifed	Antibiotic resistance/sensitivities

*Note: most surgical wounds that have broken down rapidly become colonized with bacteria. Bacterial growth from a wound is only significant when a sample to identify organisms by microbiological culture is collected aseptically under sterile conditions with symptoms of infection also present.

Date form completed ...../...../..... Database entry [Y / N] Signature.....

Figure 7: WHO SSI surveillance form

A template of an SSI registry/logbook for tracking and determining SSI rate in the wards or postoperative departments is annexed (**Annex 13**).

5.7 Discharge

The practice of discharging surgical patients from the hospital is dependent on many factors such as the hospital norms, type and duration of surgery, coexisting medical illness and need of postoperative care.

- Include the patient and family as full partners in the discharge planning process. Identify which family or friends will provide care at home and include them in the conversation:
  - Describe what life at home will be like
  - Review medication administration
  - Highlight warning signs and problems
  - Explain test results
  - Make follow-up appointments
- At the time of the discharge, provide patients with the brief summary of the procedure
- Advise the patient to avoid strenuous physical activities such as exercise and lifting of heavy weights, for minimum period of 4–6 weeks following surgery
- Appoint the patient for a follow-up checkup within a week
- Upon discharge, the patient should be advised on warning signs and problems
- Prior to discharging patients from hospital, a discharge summary should be completed. Ideally, one copy is kept in the patient's files and another copy is given to the patient.

Thumb rules for discharge summary

1. Provide patient name, chart number, date of admission and admitting diagnosis. Avoid lengthy descriptions.
2. Write the summary of patient's initial presentation.
3. List test results and findings, state surgical procedures performed, including dates and findings.
4. Write a brief summary of the hospital care. Include treatments pertinent to the diagnosis, along with information regarding any complications.
5. Describe the condition of the patient at the time of discharge.
6. State the disposition. The disposition refers to where the patient is going upon discharge.
7. State recommendations for the patient's continued care. Include detailed instructions regarding diet, wound care when applicable, symptoms requiring medical attention, and

outpatient appointments.

8. List discharge medications. Include dosage and instructions regarding frequency and time of day the medication should be taken.
9. Write the date of the discharge and provide the name of the person who prepared the report.

A sample of an ideal discharge form is annexed (**Annex 12**).

5.8 Follow up Care

After discharge, patients should be appointed to the outpatient department. During their visit, the care provider should:

- Ask the condition of the patient and check for presence of complications
- Examine the patient: document findings regarding the surgical site
- Assess the adherence of the patient to the given medications
- Update investigations, if indicated
- Give follow up appointment, as needed
- Address the concern of the patient and the family
- Advice on warning signs and complications

6. Perioperative Critical Incident Reporting

6.1 What is an incident?

An incident is an event that gives rise to or has the potential to produce unexpected or unwanted effects, which could be detrimental to the safety of service users, other persons, staff or the organization.

6.2 Risk Evaluation

The three main categories of incident reporting are harmful incidents (serious incidents), a major incident and a near miss.

Evaluation of risk is a key component of incident reporting. All incidents should be assessed to determine the type of action to be taken to reduce or eliminate any risk.

All staff members have a responsibility to identify and (within their level of authority) respond to the risk to promote its effective mitigation.

When an incident occurs the staff member who reports it should take action to manage any immediate safety concerns, and/or escalating the incident to their line manager (or relevant other individual as determined by the nature of the incident) immediately.

The OR manager and quality assurance manager are responsible for checking that all necessary steps have been taken to manage the incident and its aftermath, and to ensure the risk grading is accurate.

Table 16: Risk Assessment

Risk Assessment	**Serious Incident**	**Major Incident**
Unnatural death (procedure related)	X	
Procedure related events		
Surgery on the wrong body part	X	
Surgery on the wrong patient	X	
Wrong surgical procedure performed on patient	X	
Unplanned return to operating room on this admission	X	
Transfer from general care unit to a higher level (for example, HDU or ICU)		X
Length of stay greater than 10 days		X
Unplanned re-presentation to department within 48 hours for the same condition		X
Return to emergency department or outpatients department for complication related to the last hospital admission		X
Disability associated with labor related event or procedure		X
Incorrect blood administered (Blood to wrong patient)	X	
Hospital incurred patient incident, such as fall	X	
Development of pressure sores		X
Infant discharged to wrong person or missing infant	X	
Health care provider/Patient with needle stick injury		X
Equipment and supplies related incidents		X
Lack of Electricity/ backup generator		X
OR table/ Anesthesia machine malfunction		X
Lack of drape/water		X
Lack of oxygen		X

6.3 Incident Investigation

All incidents must be investigated and the responsibility for undertaking the initial investigation rests with the investigation manager.

The incident investigation should be completed by the appointed investigator (usually the service manager).

Incident Reporting Format and Procedures

1. For major and serious incidents, the health care provider should notify the facility OR manager/ SaLTS focal person within one hour of occurrence by completing the incident reporting format.
2. Facility manager should be notified immediately for major incidents affecting OR functionalities such as light, water, instruments and supplies for immediate action.
3. The SaLTS focal should investigate the incident using the checklist and debrief the reporting facility provider.
4. The SaLTS focal, with the OR manager, shall compile the investigation result report within 12 hours for the facility management team.
5. The management team should discuss about the specific incident and design a plan of action.
    - The plan of action should be have a short term and long-term plan developed, with responsible bodies assigned
6. The chief executive director should discuss and arrange a reporting format with the communication board for public announcements, when there are serious incidents creating rumors in the facility.

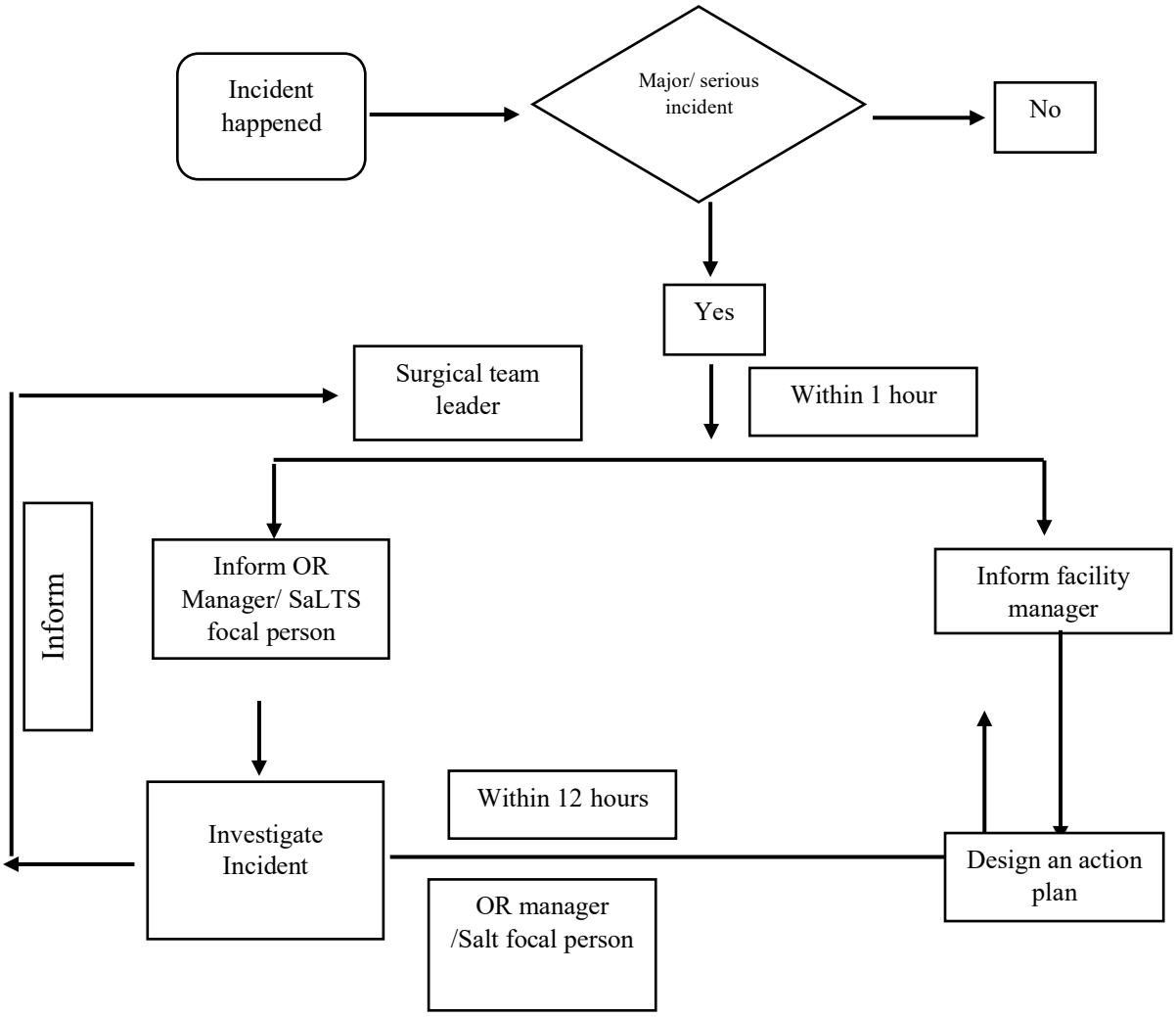


Figure 8: Incident reporting flow chart

Table 17: Incident investigation report format

<table>
<tr><td colspan="6">A. Identification of incident</td></tr>
<tr><td colspan="2">1.Full name</td><td>2.Incident registration serial number</td><td>3.Gender</td><td>4.Age</td><td>5.Injured person
o Patient
o Staff</td></tr>
<tr><td>6.Region</td><td>7.Wereda or Kefle ketema</td><td>8.Kebelle</td><td>9.House number</td><td colspan="2">10.Mobile or Line Phone number</td></tr>
<tr><td colspan="4">B. Place of incident</td><td colspan="2" rowspan="3">C. Nature of incident
o Staff exposure (needle stick injury)
o Anesthesia related adverse incident
o Problems with OR instruments
o Wrong patient
o Wrong Procedure
o Wrong Medication
o Retain Instruments
o Count discrepancy
o Adverse and transfusion reaction
o No apparent injury
o Other(specify)</td></tr>
<tr><td colspan="2" rowspan="2">OR (Operation Room)</td><td colspan="2">WARD</td></tr>
<tr><td>Male Ward</td><td>Female Ward</td></tr>
<tr><td>PACU</td><td>ICU</td><td colspan="3">Others (specify)</td></tr>
</table>

<table>
<tr><td colspan="4">D. Type of incident</td></tr>
<tr><td colspan="2">1. Anesthesia related adverse events</td><td>2. Blood transfusion</td><td>3. Wrong Surgical Intervention</td></tr>
<tr><td colspan="2">o Airway- difficult intubation/laryngeal intubation
o Drug unavailability consideration after one administration
o Regional administration without checking availability of GA
o Power source issue
o Oxygen supply issue
o Human factor issue
o Knowledge-based (errors due to a lack of knowledge or experience with a particular process or situation)
o Rule-based (misinterpretation or misuse of relevant data or applying the wrong rule); and
o Skill based (attention and memory failures, including omitted tasks)</td><td>o Type
o Wrong patient
o Monitoring
o Wrong rate
o Others (specify)</td><td>o Wrong patient
o Wrong Procedure
o Wrong body part
o Others</td></tr>
<tr><td rowspan="2">4. Staff / Patient Exposure
Type of drug
o Sharp instrument injury
o Blood / body fluid Spillage
o Other</td><td colspan="3">Type of an incident</td></tr>
<tr><td>o Wrong patient
o Wrong prescription
o Wrong dose
o Wrong frequency
o Wrong time</td><td>Un Natural Death
o On OR Table
o Anesthesia related death
o Others</td><td>Failure or delay in diagnosis of co-morbid illness
o Poor communication
o Negligence
o Dishonesty
o Documentation error
o Others</td></tr>
</table>

	Other types of incident o OR instrument and supply shortage/ mal function o Hospital fall o Laboratory workup o Self-inflicted o Needle puncture	o Intubation failures o Struck by equipment o Struck by patient o Contaminated food Others(specify)_____	
Environmental hazard	Level of incident o the patient experienced the event, but the event did not cause harm; o low potential of residual disability; o high potential of residual disability; o event resulted in death o unknown		
Seen by a physician? o Yes o No			
If yes, mention physician name and position			

If yes date and time of evaluation				
Give brief factual description of incident				
Physical findings, diagnosis at time of incident and treatment provided				
Present diagnosis				
Reported by	Title	Signature	Date	Phone number
Supervised by	Title	Signature	Date	Phone number

Clinical/Incident Notification Form

This form is to be accompanied by the Clinical Risk Assessment Tool

Ward: **Department:**

Date of Incident: **Time of Incident:**

Name of Incident:

Type of Incident (Serious/Major/Near miss):

Admitting Diagnosis:

Brief Description of Incident/Clinical Event:

_____

_____

_____

_____

_____

Notified By: **Date:**

7. Monitoring and Evaluation

The objectives of monitoring and evaluation are to improve the quality of services, optimum use of resources and management, and to make timely decisions to resolve problems and/or constraints of implementation. The sources of information for timely monitoring are routine service and administrative records compiled through the Health Management Information System (HMIS) and/or facilities Key Performance Indicators (KPIs). Monitoring happens regularly throughout the lifetime of a plan. It includes the collection and review of information available from HMIS/KPIs sources, supervisory visits, review meetings and annual reports. Some of the core indicators listed below are used for monitoring the implementation of Health Sector Development Program (HSDP IV) and they are relevant at facility, regional and federal levels. Every facility should track and monitor the following surgical KPIs on a monthly basis. The data obtained should be analyzed and used for decision making accordingly.

R. No.	KPI	Operational definition	Numerator	Denominator	Formula	Data Source
1.	Elective Surgery Patients Treated Within Clinically Recommended Time	Elective surgery patients treated are those who were registered on a surgical waiting list as a category 1, 2 or 3, with a surgical specialty, and were removed because they received their surgery as an elective patient.	The number of patients who received elective surgery who were treated within 30 days (≤ 30 days) if a category 1, within 90 days (≤ 90 days) if a category 2, or within 365 days (≤ 365 days) if a category 3.	The number of patients who received elective surgery for each respective category	$\frac{\begin{array}{c}The\ number\ of\ patients\ who\ received\ elective\ surgery\ who\ were \\ treated\ within\ 30\ days\ (\leq\ 30\ days) \\ if\ a\ category\ 1, within\ 90\ days\ (\leq\ 90\ days) if\ a\ category\ 2, \\ or\ within\ 365\ days\ (\leq\ 365\ days)\ if\ a\ category\ 3\end{array}}{\begin{array}{c}The\ number\ of\ patients\ who\ received\ elective\ surgery \\ for\ each\ respective\ category\end{array}}$	Institution's waiting list management data base; OT log/registration book
2.	Utilization Rate	Operating theater utilization measures the percentage of OT time used against that, which was budgeted.	Total number of active days	Total number of working days	$\frac{total\ number\ of\ active\ days}{total\ number\ of\ working\ days}$	Efficiency tool

3.	First Case Starting on Incision Time	First case on-time start is measured by the difference between the planned session start time and first case in OR time			planned session start time- first case in OR time	OT Schedule, intraoperative nursing check list, efficiency tool
4.	Number of clients in the waiting list for elective surgical service	The difference between the number of patients added to the elective surgery waiting list and the number of patients removed (either treated or removed)	Number of patients added to waiting list	Number of patients treated from the waiting list ***or*** number of patients removed from the waiting list	$\frac{Number\ of\ patients\ added\ to\ waiting\ list}{Number\ of\ patients\ treated\ from\ the\ waiting\ list\ or\ number\ of\ patients\ removed\ from\ the\ waiting\ list}$	Institution waiting list management database
5.	Changeover Time (Turn Over Time)	Measure of the difference between patient wheels in (next on the order) and patient wheels out (already in OT) in minute			patient wheels in (next on the order) in minutes- patient wheels out (already in OT) in minutes	Intraoperative nursing check list, sign out time, efficiency tool
6.	Day of Surgery (DOS) Cancellation Rate	The percentage of all elective patients cancelled on the day of surgery for both hospital and patient-initiated reasons	Total number of cancelled cases	Total number of scheduled cases	$\frac{Total\ number\ of\ cancelled\ cases}{Total\ number\ of\ scheduled\ cases}$	Operation theatre schedule management database, annexed efficiency tool
7.	Average Elective Pre-Procedural Anesthesia Care Time	The average time from which an anesthetic agent is administered **or** anesthetist/anesthesiologist enters the room ('In anesthetic') to the initiation of cleaning of the surgical site ('Procedure start') for the first case of an elective morning or all day session.	Sum ('In Anesthetic' to 'Procedure Start') for first cases of an elective morning or for all-day sessions Number of first cases in elective sessions		$\frac{Sum\ (`In\ Anesthetic'\ to\ `Procedure\ Start')for\ first\ cases\ of\ an\ elective\ morning\ or\ all-day\ session}{Number\ of\ first\ cases\ in\ elective\ sessions}$	Anesthesia record Sheet

8.	Delayed Hospital Discharge	Average time (in hours) taken between when an elective patient is ready for discharge to when they are actually discharged.	[Discharge time (in Hour) – Ready for Discharge time for each patient (in Hour)] Number of Discharges		$\frac{[Discharge\ time\ (in\ Hour) - Ready\ for\ Discharge\ time\ for\ each\ patient\ (in\ Hour)]}{Number\ of\ Discharges}$	Round progress note/ round note, ward DHIS_2 register
9.	Emergency Cases in Elective Session	Percentage of planned elective session time occupied by emergency case	Sum of emergency case minutes performed within an elective session	Sum of planned elective session minutes	$\frac{sum\ of\ emergency\ case\ minutes\ performed\ within\ an\ elective\ session}{sum\ of\ planned\ elective\ session\ minutes}$	Operation theater schedule management data base
10.	Elective surgery cancellation rate	The proportion of elective surgical procedures cancelled compared with elective surgical procedures scheduled	Sum total number of elective surgical procedures cancelled	Sum total number of elective surgical procedures scheduled	$\frac{Sum\ total\ number\ of\ elective\ surgical\ procedures\ cancelled}{Sum\ total\ number\ of\ elective\ surgical\ procedures\ scheduled}$x100	Cancellation book, efficiency tool
11.	Number of surgeries per table	The total number of surgeries operated per major operating room table	Sum total number of surgical procedures conducted	Total number of OT tables x total number of days in the reporting month	$\frac{sum\ total\ number\ of\ surgical\ procedures\ conducted}{total\ number\ of\ OT\ tables\ x\ total\ number\ of\ days\ in\ the\ reporting\ month}$	OR registry book
12.	Number of surgeries per surgeon per day	Number of surgeries that are performed by a surgeon	Sum total number of surgical procedure conducted	Total number of surgeons x total number of days in the reporting month	$\frac{sum\ total\ number\ of\ surgical\ procedures\ conducted}{total\ number\ of\ surgeons\ x\ total\ number\ of\ days\ in\ the\ reporting\ month}$	OR registry book
13.	Bed Occupancy Rate (BOR)	This is the average percentage of occupied beds during the reporting period	Sum total length of stay in days during reporting period	Average no of operational beds during reporting period x number of days in reporting period	$\frac{Sum\ total\ length\ of\ stay\ in\ days\ during\ reporting\ period}{Average\ No.of\ operational\ beds\ during\ reporting\ period\ x\ No.of\ days\ in\ reporting\ periods}$ x 100	Surgical ward register

14.	Average Length of Stay	The average number of days from admission to discharge, death or transfer out	Sum total length of stay for patients who were discharge d	No of patients discharged alive (including transfer out)+no of deaths among admitted inpatients	$\frac{Sum\ total\ length\ of\ stay\ for\ patient\ who\ were\ discharged\ (including\ deaths\ and\ transfer\ out)}{No.of\ patients\ discharged\ alive(including\ transfer\ out)+No.of\ deaths\ among\ admited\ inpatients}$	Inpatient register
15.	Inpatient Mortality	The number of deaths per 100 discharged inpatients	No of deaths among admitted patients	No of deaths among admitted patients+no of patients discharged alive (including transfer out)	$\frac{No.of\ deaths\ among\ admitted\ inpatients}{No.of\ deaths\ among\ admitted\ patients+No.of\ patients\ discharged\ alive\ (including\ transfer\ out)}$x100	Inpatient register
16.	Delay for Elective Surgical Admission	The average number of days between the dates each patient was added to the waiting list to their date of admission for surgery	Sum total of no of days between date added to surgical waiting list to date of admission for surgery	No of patients who were admitted for elective surgery during the reporting period	$\frac{Sum\ total\ of\ No.days\ between\ date\ added\ to\ surgical\ waiting\ list\ based\ on\ the\ category\ to\ date\ of\ admission\ for\ surgery}{No\ of\ patients\ who\ were\ admitted\ for\ elective\ srgery\ during\ the\ reporting\ period}$	Operation theater schedule management data base
17.	Surgical Site Infection	The proportion of all major surgeries with an infection occurring at the site of the surgical wound prior to discharge.	No of patients with new surgical site infections arising during the reporting period	No of major surgeries performed during the reporting period on public patients + no of major surgeries performed during the reporting period on private wing patients	$\frac{No.of\ patients\ with\ new\ surgical\ site\ infection\ arising\ during\ the\ reporting\ period}{No.of\ major\ surgeries(both\ elective\ and\ non-elective)performed\ during\ the\ reporting\ periods\ on\ public\ patients+\ No.of\ major\ surgeries(both\ elective\ and\ non-elective)performed\ during\ the\ reporting\ period\ on\ private\ wing\ patients}$x1	SSI registration book

18.	Pressure Ulcer Incidence	Proportion of inpatients who develop a pressure ulcer during their hospital/department stay	No of inpatients who developed a new pressure ulcer during the reporting period	No. of patients discharge alive(including transfer out)+No deaths among inpatient admission	$\frac{No\ of\ inpatients\ who\ developed\ a\ new\ pressure\ ulcer\ during\ the\ reporting\ periods}{No\ of\ patients\ discharged\ alive(including\ transfer\ out)+No\ of\ deaths\ among\ admitted\ inpatients}$x100	Inpatient register
19.	Pre-operative Stay (PrOS)	The no. of days a patient waits until getting operated	∑(Day of Operation-day of admission)	No. of operated patients	$\frac{\sum(days\ of\ operation - days\ of\ admission)}{No.of\ operated\ patients}$	Waiting list and scheduling
20.	Post-operative Stay (PoOS)	No. of days a patient stayed after getting operated	∑(day of discharge-day of operation	Total no. of operated patients discharged	$\frac{\sum(day\ of\ discharge - day\ of\ operation}{Total\ no.of\ operated\ patients\ discharged}$	Patient chart
21.	Percentage of cases not Operated (CnO)	Percentage of admitted patients not operated	No of admitted patients-no of operated patients	Total no of admitted patients	$\frac{(No\ of\ admitted\ patients - No\ of\ operated\ patients)}{Total\ No\ of\ admitted\ patients}$x100	Cancelation book
22.	Unplanned Return to the Theatre (URT)	Percentage of operated patients re-operated	Total no of reoperations	Total no of operations	$\frac{Total\ No\ of\ reoperations}{Total\ No\ of\ operations}$x100	Re-admission register
23.	Average Time Interval between Surgeries (TIS)	The time elapsed between two consecutive operations	∑Time elapsed between two consecutive surgeries in minutes	No of operations – No of operation days	$\frac{\sum Time\ elapsed\ between\ two\ consecutive\ surgeries\ in\ minutes}{No.of\ operations - No.of\ operation\ days}$	OR Register
24.	Percentage of Surgical Safety Checklist use (SSC-use)	The proportion of safe surgery checklist utilization per each operations	Number of SSC completed	Number of major operations	$\frac{Number\ of\ SSC\ completed}{Number\ of\ Major\ operations}$x100	Patient chart

25.	Emergency Surgical Referrals as a Proportion of all surgical referrals made (ESRP)	The proportions of emergency surgical referrals made among emergency and non-emergency surgical referrals	Number of emergency surgical referrals made	Numbers of emergency surgical referrals made + Numbers of non-emergency surgical referrals	$\frac{Numbers\ of\ emergency\ surgical\ referrals\ made}{(Numbers\ of\ emergency\ surgical\ referrals\ made + Numbers\ of\ non-emergency\ surgical\ referrals)} x100$	Liaison and referral
26.	Percentage of 1st operations started on the agreed time	The proportion of Operations 1st Operation time started to total operation days	Number of operations first operation time started	Total number of operation days	$\frac{Number\ of\ operations\ 1st\ operation\ time\ started}{Total\ number\ of\ operation\ days}$x100	OR Register

8. Annexes

Annex 1: Summary of team leadership roles and responsibilities

Health facility structure	Roles and responsibilities
Hospital/health center chief executive officer/clinical director/senior management team (SMT)	Establish a facility surgical and anesthesia services directorate/office Assign SaLTS office director, OR manager, and necessary team members Supervise overall SaLTS activities Conduct baseline and ongoing assessment Engage senior professionals in leadership Allocate and mobilize resources Evaluate implementation progress Assess and reward champion provider Ensure availability of necessary supplies Ensure the availability and utilization of the WHO safe surgery essential checklist
Facility surgical service directorate/office	Lead, mobilize, and motivate the facility SaLTS multidisciplinary team Develop SaLTS-specific action plan for the facility Prepare agenda's for weekly/every two week SALTs multidisciplinary team meeting Prepare monthly clinical audit forum to discuss with anesthesia, surgery and nursing staffs Ensure that the surgical team works together and feels valued Review and report collected data monthly Participate on the SMT representing the surgical team
SaLTS multidisciplinary team	Support implementation of the facility SaLTS plan Conduct ongoing assessment to advise the SMT and provide feedback to service units Provide training to clinical and nonclinical surgical staff Plan and supervise the activity of the respective units Discuss with team how to improve the quality of surgical activities

	Organize hospital-wide advocacy and communications Engage in all surgical team meetings Document all activities and submit reports
Full-time Anesthesia service manager	Member of SALTs multidisciplinary team Supervise anesthesia team lead in each surgical centers Supervise and monitor daily activities of anesthesia team leads in the hospital Plan, organize and report weekly and monthly anesthesia service report Lead anesthesia clinical audit team
Full-time nursing manager	Member of SALTs multidisciplinary team Supervise nursing team lead in each surgical centers Undergo daily supervision of the nursing service delivery with nursing team leads Plan, organize and report weekly and monthly nursing service report of the hospital Lead nursing clinical audit team of the hospital
Anesthesia team lead	Oversee day-to-day OR activity related to anesthesia workforce Conduct daily supervision of key anesthesia function and service
Nursing team lead	Oversee day-to-day OR activity related to nursing workforce Conduct daily supervision of key Nursing function and service Undergo daily supervision of the Central supply staff and activities

Annex 2: Role and responsibility of team leads: OR nurses, surgeon, anesthetists/anesthesiologists and OR managers

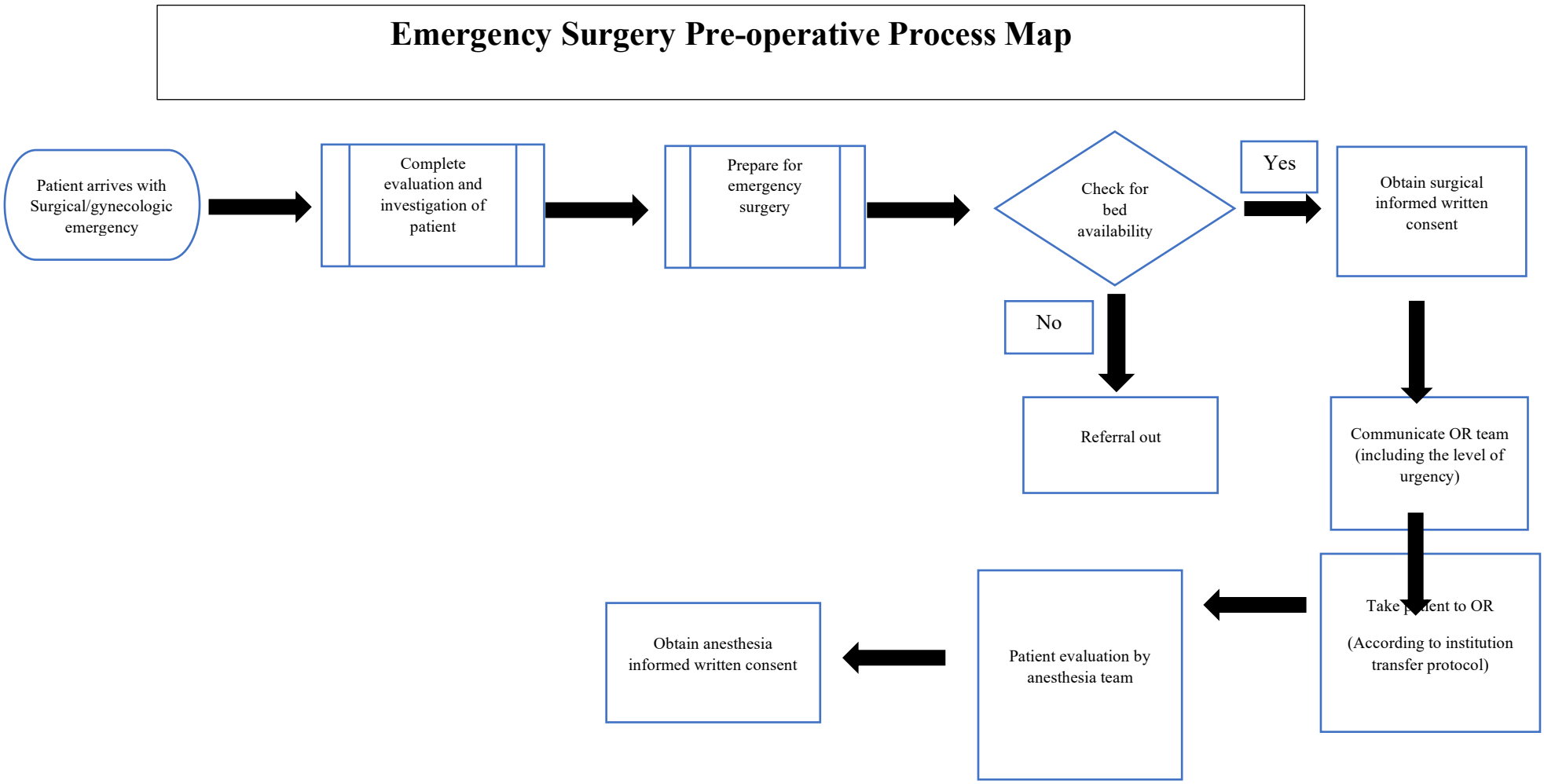
An overview of the key nursing and medical leadership roles involved in the management of an efficient OT is described in the tables below; roles for heads of departments and roles of the floor (OT) coordinator.

Leadership Roles for the Heads in the Operating Theater		
Nurse	**Surgeon**	**Anesthetist/Anesthesiologist**
• Overall management of budget and resources within the perioperative service • Ensure appropriate nursing workforce availability for the perioperative environment • Review and monitor surgical services in collaboration with relevant stakeholders to achieve performance benchmarks • Review and analyze service activity and resource allocations to assist capacity planning for future service provision • Coordinate the capital equipment list and collaborate in the prioritization and negotiation for equipment • Provide mentorship and support to the professional development of the nursing staff within perioperative services • Actively celebrate successes and encourage high performers • Address root causes of poor performance • Promote quality activities and coordinate quality improvement projects within the department • Foster collaborative teamwork to drive continuous improvement	• Take an active governance role in theatre management to ensure that the surgical care provided is patient centered • Ensure appropriate surgical workforce availability for the perioperative environment • Review and monitor services in collaboration with relevant stakeholders to achieve performance benchmarks • Advocate and liaise with hospital administration to ensure services are adequately staffed and equipped to provide a safe, efficient and effective working environment • Ensure that processes and protocols are in place that reflect best practice in the operating theatre environment • Ensure that a professional and respectful work environment is maintained • Provide feedback to all surgical departments regarding perioperative issues of importance	• Take an active governance role in theatre management to ensure the anesthetic care provided is patient centered • Ensure appropriate anesthetic workforce availability for the perioperative environment (including pre-admission, theatre, and postoperative care) • Review and monitor services in collaboration with relevant stakeholders to achieve performance benchmarks • Advocate and liaise with hospital administration to ensure services are provided in a safe, efficient and effective working environment • Provide advice and direction regarding issues relating to anesthesia and sedation governance • Provide feedback to the department of anesthetics regarding perioperative issues of importance • Actively celebrate successes and encourage high performers

	• Actively celebrate successes and encourage high performers • Address root causes of poor performance • Ensure audit processes are in place to monitor and assess key quality and safety practices	• Address root causes of poor performance • Ensure audit processes are in place to monitor and assess key quality and safety practices

Role of the OR Manager	
Full-time OR manager	Oversee day-to-day OR activity Conduct daily supervision of key function units and provide information to the surgical service director Supervise teamwork and collaboration effectiveness between surgical workforce Develop annual and quarterly plan Organize Clinical audit forum from Surgical, Anesthesia and nursing care delivery Lead SaLTS multidisciplinary team meeting

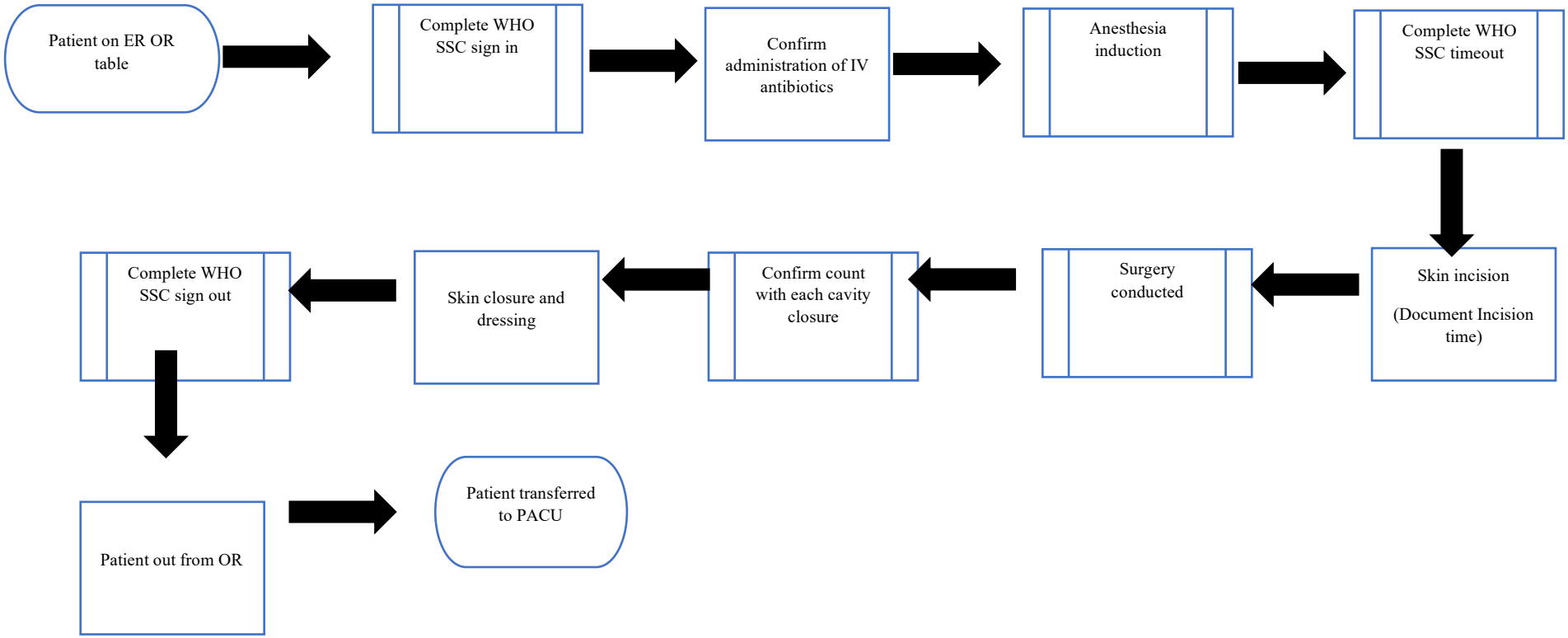
Annex 3: Perioperative Process Maps for Emergency Procedures



Emergency Surgery Pre-operative Process Map

1. A patient that arrives at the emergency department with an indication for emergency surgery should be evaluated and investigated upon arrival after triage.
2. The management of the patient should be initiated, and the patient is prepared for emergency surgery.
3. The surgical team should confirm the presence of bed for admission for the patient:
4. If a bed is available for admission, the surgical team should obtain surgical informed written consent from the patient.
    - If there is no bed for admission available, refer the patient to a center where bed is available after communication.
5. Once surgical consent is obtained, the operating room (OR) staff should be communicated regarding the patient's diagnosis and condition (i.e. the level of urgency).
6. The patient should be transferred and handed over to the OR team according to the hospital protocol.
7. The anesthesia team evaluates the patient before entering the OR.
8. Anesthesia team will then counsel the patient and if the patient agrees, obtain anesthesia informed written consent.

Emergency Surgery Intra-operative Process Map



Emergency Surgery Intra-operative Process Map Narration

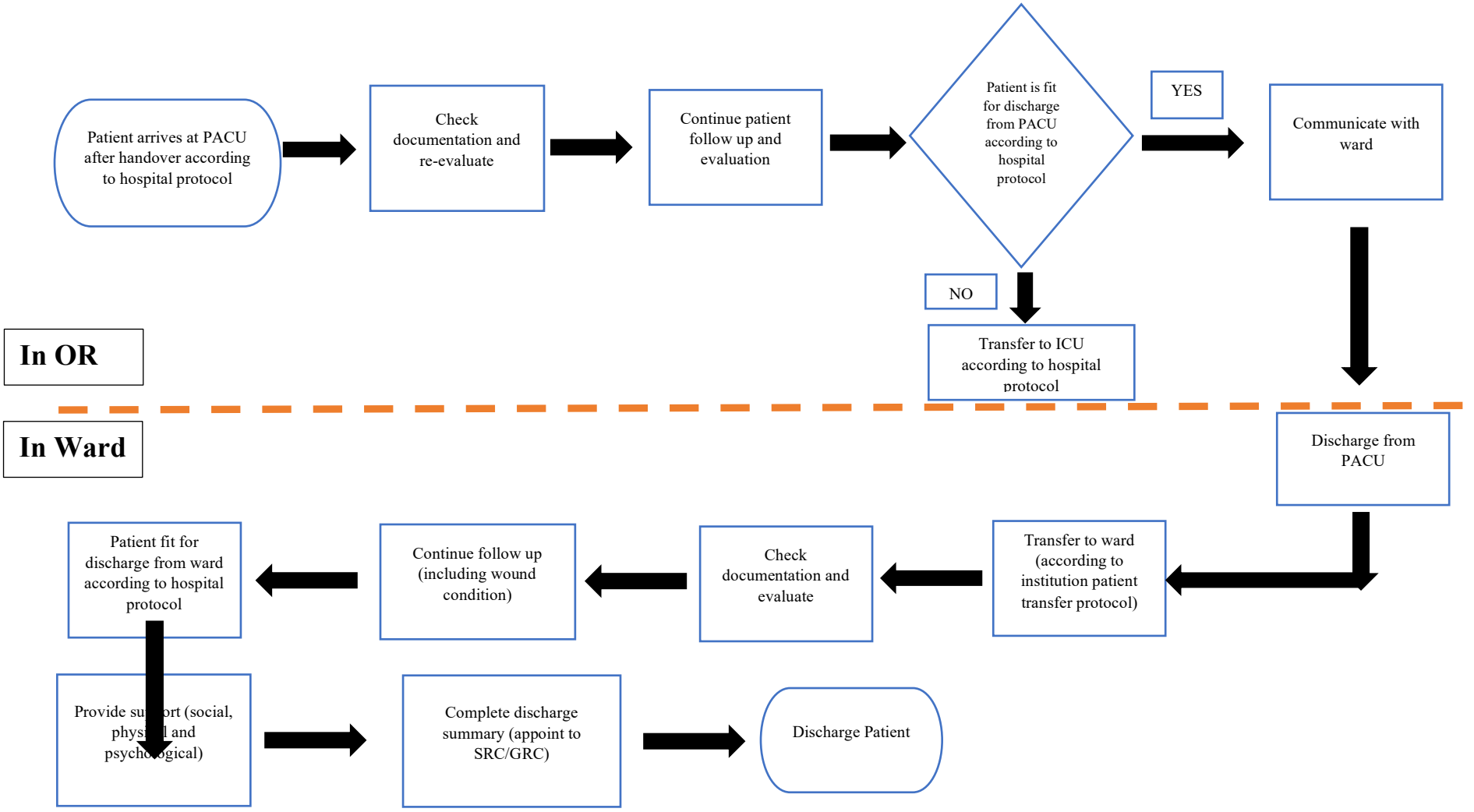
1. After ‘wheels in’ and the patient is transferred on to the emergency room (ER) operating room (OR) table, the designated checklist coordinator will call out for completion of the sign-in section of the World Health Organization (WHO) Surgical Safety Checklist (SSC), ensuring all team members are fully engaged.

   NB:

   - IV antibiotics administration should be administered only if indicated and if the patient is not already taking antibiotics.
   - A second dose of antibiotics should be considered if the surgery last for more than 2 hours.

2. Anesthesia is then administered, with anesthesia administration time strictly documented.
3. Once patient is positioned and draped, the designated checklist coordinator will call out for the ‘time out’ section of the WHO SSC, ensuring all team members are fully engaged.
4. Once ‘time out’ is completed, the surgeon can make the skin incision with the incision time strictly documented.
5. Once the surgery is completed, marked by the closure of the skin and applying dressing, the ‘sign out’ section of the checklist should be completed with all members of the team fully engaged.
   - It should be noted that count of gauze, pack, peanut, instruments and stitch materials should be conducted with closure of **every** cavity and again, at the end of the procedure (skin closure and dressing application).
6. Once the sign out is completed and the patient is deemed ready for transfer by all team members, the patient will be wheeled out of the OR to the primary care unit or intensive care unit, implementing the hospitals’ transfer and hand-over protocols.

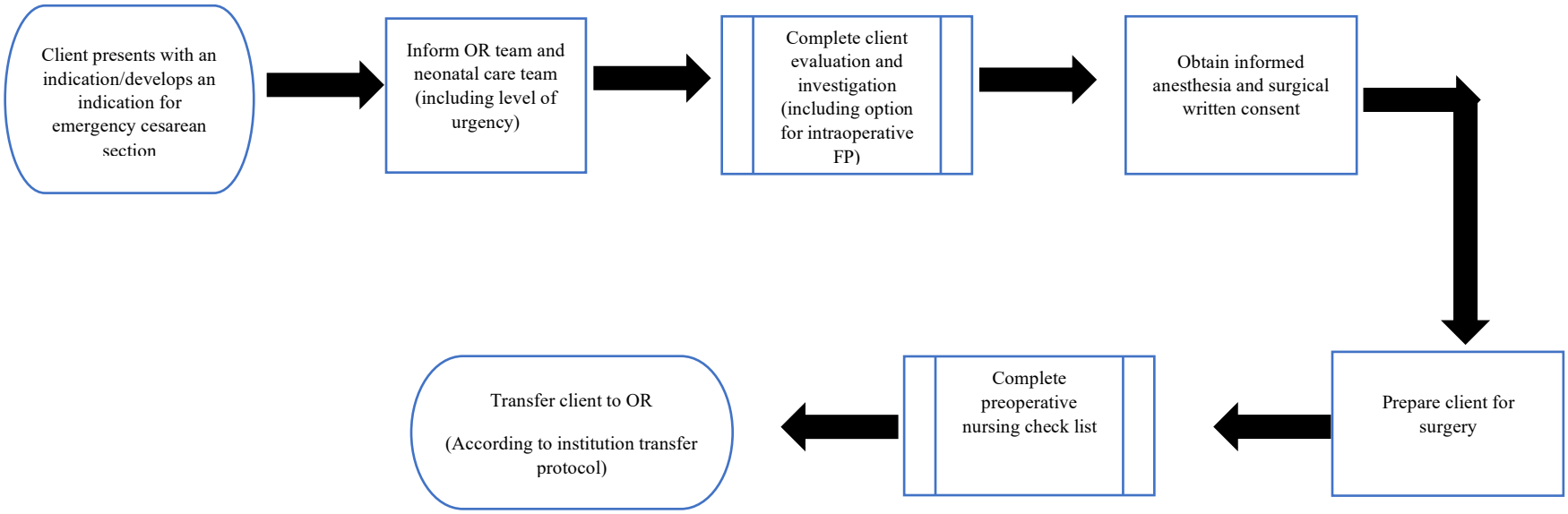
Emergency Surgery Post-operative Process Map



Emergency Surgery Post-operative Process Map Narration

1. The postoperative patient who has arrived to the PACU must be handed over to the PACU team by the operating room team according to the hospital protocol.
2. The receiving team must ensure all necessary documents are attached to the chart, evaluate the patient upon arrival and document all findings accordingly.
3. The patient is to be on strict follow up according to the physician order and/or hospital policy:
    - If the patient is not deemed fit for discharge, patient is to be transferred to the ICU according to the hospitals' transfer policy.
    - If the patient is deemed fit for discharge from the PACU according to the hospital policy, patient is transferred to the ward according to the hospitals' transfer policy **after** communicating with the ward team and ensuring they are prepared to accept the patient.
4. Upon acceptance to the ward, the ward team must confirm all documents are complete and attached to the chart. The patient is to be on strict follow up according to the order sheet.
    - Patient wound assessment should always be documented on the postoperative note on the chart, including the day of discharge
5. Once the patient is deemed fit for discharge according to hospital protocol, the patient should be provided with the necessary support and information by the ward team (physical, psychological and social).
6. Complete the discharge summary, including the specific date, time and clinic the patient is to be appointed to for follow up. Leave one copy in the chart. The patient is now ready for discharge.

Emergency Cesarean Section Pre-operative Process Map

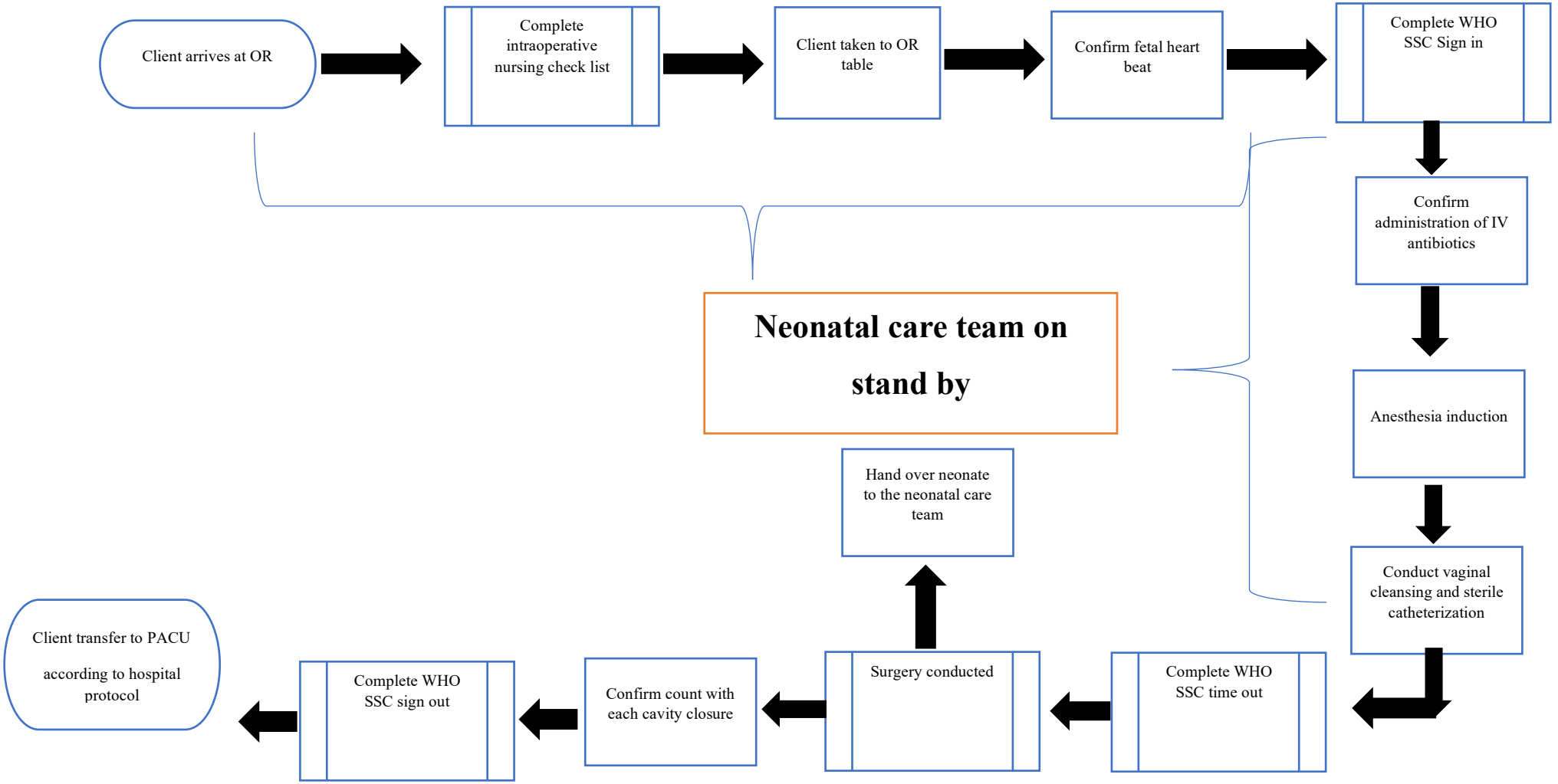


Emergency Cesarean Section Pre-operative Process Map

1. Once a patient is a candidate for emergency cesarean section, the operating room (OR) team should be notified immediately: the anesthesia team, the nursing team, the midwives, the operating surgeon and the pediatric/neonatal team. Level of urgency should be clearly communicated.
2. Client evaluation and investigation should be finalized. The option of intraoperative family planning (FP) should be disclosed to the patient.
3. The anesthesia team as well as the operating team will obtain the anesthesia and surgical informed written consent respectively from the client.
4. Complete the preparation of the patient for surgery.
5. Complete the preoperative nursing checklist.
6. Transfer the client to the OR according to the hospitals' protocol.

7.

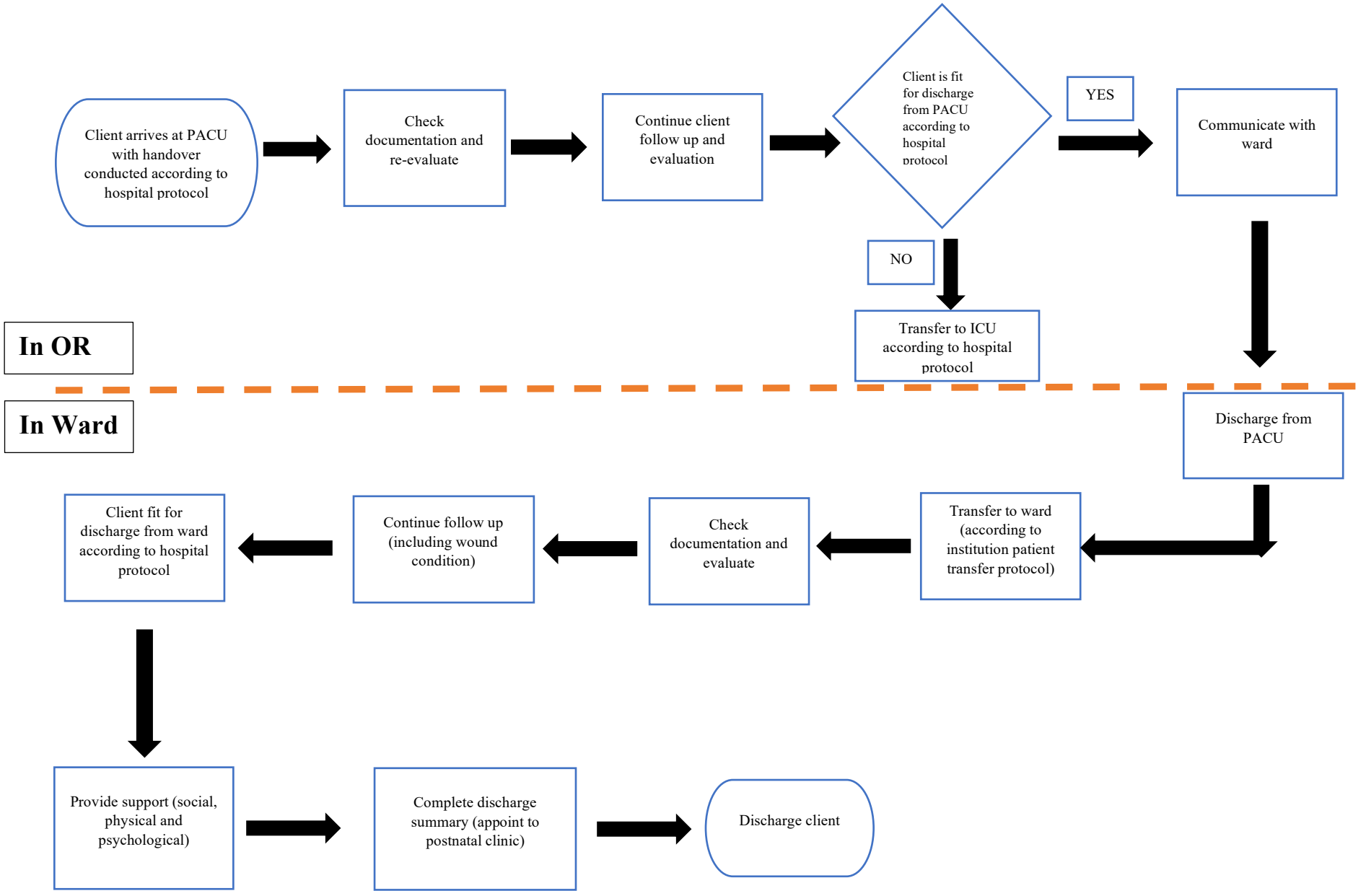
Emergency Cesarean Section Intraoperative Process Map



Emergency Cesarean Section Intraoperative Process Map

1. Once the client arrives at the operating room (OR), the intraoperative nursing checklist should be completed.
2. The client is then transferred to the OR table.
    - The neonatal care team should be in the room preparing for the management of the newborn.
3. Fetal heart beat is confirmed on the table.
4. The designated checklist coordinator will call out for completion of the sign-in section of the World Health Organization (WHO) Surgical Safety Checklist (SSC), ensuring all team members are fully engaged.
5. IV antibiotics administration is confirmed.
    - IV antibiotics administration should be administered only if indicated and if the client is not already taking antibiotics.
6. Anesthesia is then administered, with anesthesia administration time strictly documented.
7. Vaginal cleansing and aseptic urethral catheterization will be conducted for all clients.
8. Once the client is positioned and draped, the designated checklist coordinator will call out for the 'time out' section of the WHO SSC, ensuring all team members are fully engaged.
9. Once 'time out' is completed, the surgeon can make the skin incision with the incision time strictly documented.
10. Once the newborn is delivered, it should be handed over to neonatal care team.
11. Once the surgery is completed, marked by the closure of the skin and applying dressing, the 'sign out' section of the checklist should be completed with all members of the team fully engaged.
12. It should be noted that count of gauze, pack, peanut, instruments and stitch materials should be conducted with closure of every cavity and again, at the end of the procedure (skin closure and dressing application).
13. Once the sign out is completed and the client is deemed ready for transfer by all team members, the client and newborn will be wheeled out of the OR to the primary care unit or intensive care unit, implementing the hospitals' transfer and hand-over protocols.

Emergency Cesarean Section Post-operative Process Map



Emergency Cesarean Section Post-operative Process Map Narration

1. The postoperative client and newborn who have arrived to the PACU must be handed over to the PACU team by the operating room team according to the hospital protocol.
2. The receiving team must ensure all necessary documents are attached to the chart, evaluate the client upon arrival and document all findings accordingly.
3. The client is to be on strict follow up according to the physician order and/or hospital policy:
    - If the client is not deemed fit for discharge, patient is to be transferred to the ICU according to the hospitals' transfer policy.
    - If the client is deemed fit for discharge from the PACU according to the hospital policy, client is transferred to the ward according to the hospitals' transfer policy **after** communicating with the ward team and ensuring they are prepared to accept the client.
4. Upon acceptance to the ward, the ward team must confirm all documents are complete and attached to the chart. The client is to be on strict follow up according to the order sheet.
    - Client wound assessment should always be documented on the postoperative note on the chart, including the day of discharge
5. Once the client is deemed fit for discharge according to the hospital protocol, the client should be provided with the necessary support and information by the ward team (physical, psychological and social).
6. Complete the discharge summary, including the specific date, time and clinic the patient is to be appointed to for follow up. Leave one copy in the chart. The client is now ready for discharge.

Annex 4: Preoperative Surgical Checklists for Pediatric Patients

Surgical Perioperative Checklist: Pediatric

Patient Name: _____ MRN: _____
Age: _____ Gender: _____
Ward and Bed number: _____

	Present	Absent	Not Applicable
HISTORY			
11. History of upper respiratory tract infections in the last two weeks (*runny nose, cough, fever, difficulty of swallowing*)			
12. History of acute gastroenteritis symptoms (*vomiting, diarrhea*)			
13. History of recent skin rashes			
14. History of vaccination in the last two weeks			
15. History of any current medication (*antibiotics, anticoagulants*)			
16. History of known medical illnesses (*diabetes, bleeding disorders, thyroid disorders, renal disease, cardiac disease*)			
17. History of previous surgery			
18. History of known allergies			
19. Last menstrual period			
PHYSICAL EXAMINATION	**Present**	**Absent**	**Not Applicable**
9. General appearance:			
Signs of respiratory distress:			
If **present**, specify:			
Signs of cardiac failure:			
If **present**, specify:			
10. Vital signs			
Blood pressure			
PR (Regular/Irregular)			
Respiratory rate			
Temperature			

11. Weight of the patient (kg)			
12. MUAC			
13. Anthropometric assessment:			
Wasting:			
Stunting:			
14. Signs of anemia (assess conjunctiva, palm of hand)			
15. Erythematous/swollen tonsils			
16. Runny nose			
17. Abnormality of respiratory system			
If **present**, specify:			
18. Abnormality of cardiovascular system			
If **present**, specify:			
19. Colostomy washout adequate (*determined by nature of colostomy output*)			
20. Presence of skin lesions/rashes			
INVESTIGATIONS	**Done**	**Not Done**	**Not Applicable**
10. CBC within normal range and updated within the **last week**			
11. Blood group and Rh factor			
12. Serum electrolyte within normal range and updated within the last **one** week			
13. RFT within normal range and updated within the last **two** week			
14. LFT within normal range and updated within the last **two** week			
15. Echocardiography			
16. Chest X-ray			
TREATMENT	**Done**	**Not Done**	**Not Applicable**
8. Family/patient counseled about the proposed procedure and written consent acquired			
9. Family/patient counseled about keeping the patient NPO for at least four hours before surgery			
10. Required amount of cross matched whole blood prepared (*calculated by 20ml/kg)*			

11. For Patients on bowel preparation - Clear fluid diets started 24 hours before day of surgery			
- Cleansing enema BID started 48 hours before day of surgery			
12. Vitamin K administration (*only for neonates and patients with jaundice*)			
13. Anesthesiologist/senior anesthetist notified with consultation paper about subcritical/critical patients 24 hours prior to the day of surgery			
14. ICU bed reserved for patients requiring postoperative ICU care			

Diagnosis: _____

Is the patient fit for surgery?	**1. Yes**	**2. No**

If no, specify the reason for cancellation: _____

Physician's Name: _____ Signature: _____ Date (DD/MM/YY): _____

Annex 5: Urgency of Admission (set criteria related to pathology of the disease)

CARDIO-THORACIC PROCEDURES	URGENCY CATEGORISATION
Congenital cardiac defect/s	2
Coronary artery bypass grafting	2
Heart valve replacement	2
Lobectomy / wedge resection / pneumonectomy	1
Pleurodesis	2
GENERAL SURGERY	URGENCY CATEGORISATION
Anal fissure – surgery for	2
Axillary node dissection	1
Breast lump – excision and/or biopsy	1
Cholecystectomy (open/laparoscopic)	3
Cholecystectomy (open/laparoscopic) with biliary pancreatitis	1

Cholecystectomy (open/laparoscopic) with potential common bile duct stone or severe frequent attacks (two within 90 days)	2
Colectomy/anterior resection/large bowel resection	1
Fundoplication for reflux disease	3
Hemorroidectomy	3
Herniorrhaphy – femoral/inguinal/incisional/umbilical	3
Lipoma – excision of	3
Malignant skin lesion – excision of +/- grafting	1
Mastectomy	1
Obstructing hiatus hernia (para-esophageal hernia)	2
Parotidectomy /submandibular gland – excision of	2
Parathyroidectomy	2
Pilonidal sinus surgery	3
Skin lesions (not malignant) – excision of	3

Thyroidectomy/hemi-thyroidectomy	2

GYNAECOLOGY SURGERY	URGENCY CATEGORISATION
Bartholin's abscess drainage	1
Bartholin's cyst – removal of	3
Curettage and evacuation of uterus	1
Colposcopy	2
Cone biopsy	1
Endometrial ablation	3
Female sterilization	3
Hysterectomy (abdominal / vaginal / laparoscopic)	3
Hysteroscopy, dilatation and curettage	2
Laparoscopy for dye studies / endometriosis	3
Large loop excision of the transformation zone cervix (LLETZ)	2
Mirena insertion	3

Myomectomy	3
Salpingo-oophorectomy / oophorectomy / ovarian cystectomy	2

Stress incontinence surgery	3
Vaginal repair - anterior / posterior	3
Warts - diathermy of	3
NEUROSURGERY	URGENCY CATEGORISATION
Carpal tunnel release	3
Cerebral hematoma – evacuation of	1
Cervical discectomy and fusion unless neurological deficit	3
Chiari malformation decompression	3
Common peroneal nerve release	2
Craniotomy for removal of tumor (neurological deficit)	1

Craniotomy for removal of benign tumor (no neurological deficit)	3
Craniotomy for ruptured aneurysm	1
Craniotomy for un-ruptured aneurysm	2
Cranioplasty	3
Discectomy with foot drop	1
Intracranial lesion (for example abscess/arteriovenous malformation) – removal of	1
Laminectomy	3
Muscle biopsy/temporal artery biopsy	1
Nerve decompression of spinal cord	2
Pedicle screw fusion	3
Posterior fossa- decompression for hemorrhage or tumor	1
Untethering of spinal cord	2
Ventricular peritoneal shunt for obstructive hydrocephaly	1

Ventricular peritoneal shunt for normal pressure hydrocephaly	2
OPHTHALMOLOGY SURGERY	URGENCY CATEGORISATION
Blepharoplasty (for reasons other than cosmetic)	3
Cataract extraction (+/- intra-ocular lens insertion)	3
Cataract extraction (+/- intra-ocular lens insertion) with angle closure glaucoma	1
Cataract extraction (+/- intra-ocular lens Insertion) with severe disability	2
Chalazion - excision of	3
Corneal graft	3
Dacrocystorhinostomy	3
Ectropion – correction of	3
Examination of eye under anesthesia	2
Probing of naso-lacrimal duct	3
Pterygium - excision of	3

Ptosis – repair of	3
Squint - repair of	3
Trabeculectomy	2
Trabeculectomy with high intra ocular pressure	1
Vitrectomy (including buckling/cryotherapy)	2
Vitrectomy (including buckling/cryotherapy) with retinal detachment or infection	1

ORTHOPAEDIC SURGERY	URGENCY CATEGORISATION
Anterior cruciate ligament reconstruction	3
Acromioplasty	3
Arthrodesis	3
Arthroplasty – revision of	2
Arthroscopy	3
Arthroscopy shoulder / sub acromial decompression	3
Bunion (hallux valgus) - removal of	3
Dupytrens contracture release	3

Exostosis – excision of	3
Fracture non-union - treatment of	2
Ganglion - excision of	3
Hammer/claw/mallet toe – correction of	3
Meniscectomy	3
Muscle or tendon length – change of	3
Nerve decompression	2
Osteotomy	3
Rotator cuff - repair of	3
Shoulder joint replacement	3
Shoulder reconstruction	3
Tendon release	3
Tenotomy of hip	2
Total hip replacement	3
Total knee replacement	3

OTOLARYNGOLOGY HEAD AND NECK SURGERY	URGENCY CATEGORISATION
Adenoidectomy	3
Ethmoidectomy	3
Functional endoscopic sinus surgery	3
Laryngectomy	1
Mastoidectomy	3
Microlaryngoscopy	2
Myringoplasty/tympanoplasty	3
Myringotomy	3
Nasal cautery	3
Nasal polypectomy	3
Nasendoscopy	2
Panendoscopy	1
Parotidectomy/submandibular gland – excision of	2
Pharyngoplasty	3

Pharynx – excision of	2
Pressure equalizing tubes (grommets) - insertion of	3
Radical neck dissection	1
Rhinoplasty (for reasons other than cosmetic)	3
Septoplasty	3
Stapedectomy	3
Sub-mucosal resection	3
Tonsillectomy (+/- adenoidectomy)	3
Turbinectomy	3
PAEDIATRIC SURGERY	URGENCY CATEGORISATION
Branchial apparatus remnant –removal of	2
Circumcision (for reasons other than cosmetic)	3
Congenital pulmonary lesion – removal of	1
Dermoid cyst - removal of	2
Fundoplication	2

Herniorrhaphy - epigastric/umbilical	3
Hydrocele – repair of	3
Hypospadias - repair of	2
Inguinal herniotomy/herniorrhaphy for age < 6 months	1
Inguinal herniotomy/herniorrhaphy for age > 6 months	2
Lingual or maxillary frenulum surgery	3
Neonatal surgery (e.g. hirschsprungs, anorectal, malrotation, esophageal atresia)	1
Nephrectomy for congenital abnormality	2
Orchidopexy	2
Pectus surgery	3
Pyeloplasty	2
Pyogenic granuloma - removal of	1
Skin lesion- excision of	3

Thyroglosssal remnant –removal of	2

Toenail surgery	3
Ureteric re-implantation	2
PLASTIC AND RECONSTRUCTIVE SURGERY	URGENCY CATEGORISATION
Breast prosthesis - removal of (for reasons other than cosmetic)	2
Breast reconstruction (for reasons other than cosmetic)	3
Breast reduction (for reasons other than cosmetic)	3
Cleft lip and palate – repair of	3
Dupytrens contracture release	3
Lipoma – excision of +/-grafting	3
Lymphangioma – surgery for	3
Malignant skin lesion – excision of +/- grafting	1
Rhinoplasty (for reasons other than cosmetic)	3

Skin lesions, non-malignant – excision of	3
Scar revision (for reasons other than cosmetic)	3
Trigger finger / thumb release	2
UROLOGICAL SURGERY	URGENCY CATEGORISATION
Bladder neck incision	3
Circumcision (for reasons other than cosmetic)	3
Cystectomy	1
Cystoscopy	3
Epididymal cyst - removal of	3
Hydrocele - repair of	3
Hypospadias – repair of	3
Lithotripsy	2
Meatoplasty	3
Nephrectomy	2
Orchidectomy	1

Orchidopexy	3
Prostatectomy (transurethral or open)	2
Prostate biopsy	1
Pyeloplasty	2
Retrograde pyelogram	2
Stone/s urinary tract – removal of	1
Uretero-pelvic junction - correction of	2
Ureters re-implantation	3
Ureteric stent - insertion of	1
Urethra – dilatation of	2
VASCULAR SURGERY	URGENCY CATEGORISATION
Abdominal or thoracic aortic aneurysm by any means	1
Amputation of limb	1
Bifurcated aortic graft	1
Carotid endarterectomy	1

Dialysis access surgery	2
Femoro-popliteal bypass graft	2
Varicose veins treatment by any means (for reasons other than cosmetic)	3

Annex 6: Perioperative Briefing Templates

PREOPERATIVE BRIEFING

NB: ***THE PREOPERATIVE BRIEF IS TO BE CONDUCTED BEFORE THE FIRST CASE ENTERS THE OPERATING ROOM WITH ALL TEAM MEMBERS PRESENT.***

BRIEF LEADER: _____ DATE (DD/MM/YY): _____ THEATRE NUMBER/SPECIALTY: _____

1. TEAM MEMBERS:

1. ARE **ALL** TEAM MEMBERS PRESENT? (Yes/No)	**Nurse:**	**Anesthesia:**	**Surgeon:**
2. INTRODUCTION OF **ALL** TEAM MEMBERS	1. Done	2. Not done	
3. ADDITIONS TO THE TEAM/ANY VISITORS?			

2. DISCUSS EACH CASE:

	LIST ORDER	ALLERGY	BLOOD	ANTIBIOTIC	TUBES TO BE PLACED	PATIENT POSITION	SURGERY DURATION	EQUIPMENT AVAILABILITY	INVESTIGATIONS DISPLAY	CRITICAL CONCERNS
CASE I NAME:										
CASE 2 NAME:										
CASE 3 NAME:										
CASE 4 NAME:										
CASE 5 NAME:										

TEAM LEADER SIGNATURE: _____

POSTOPERATIVE BRIEFING

NB: THE DEBRIEF IS TO BE CONDUCTED AFTER THE LAST CASE OF THE DAY LEAVES THE ROOM WITH ALL TEAM MEMBERS PRESENT

DEBRIEF LEADER: _____DATE (DD/MM/YY): _____

WHAT WENT WELL AND WHY?	DID WE WORK WELL AS A TEAM?	
	DID WE SPEAK UP WHEN REQUIRED?	
	WERE WE WELL PREPARED?	
WHAT DID NOT GO WELL AND WHY?	DID THE PREOPERATIVE BRIEF MISS ANYTHING?	
	WAS THERE ANY CONFUSION?	
	WHERE THERE ANY ERRORS/NEAR MISSES?	
FEEDBACK AND ACTIONS	WHAT DO WE NEED TO CHANGE?	
	WHAT CAN WE DO TO IMPROVE?	
	WHAT DO WE NEED TO DO FOR THE NEXT OPERATION SESSION?	
ACTION PLAN		

TEAM LEADER SIGNATURE: _____

Annex 7: Anesthesia Recording Template

ANESTHESIA RECORDING & MONITORING SHEET

NAME OF THE HOSPITAL_____

Name_____

Hospital/ Card No_ / _____

Address_____

Ward_____

DEPARTMENT OF ANESTHESIA					DAY	MONTH	YEAR 20__
AGE	Weight ____Kg	BP_____mmHg P/R____/m	Hgb ___dl	Hct__ ___%	BSA _____m^2	A / B / AB / O	RH^+ / RH-
HIGH RISK / LOW RISK	GENERAL / SPINAL / EPIDURAL / OTHER				SPONTANEOUS BREATHING		
Cycle/Pediatric Sys._____	NASAL / MASK / ORAL	TUBES No_____			ASSITED VNT. / CONTROLED VENT.	AIR / O_2 / N_2O / ENFLUR.	
MALLAPATI I II III IV	IV / IM / INHALATION INDUCTION	CRASH PREOX,CRICOID PRESSURE			HALOTHAN. / ISOFLURANE	RELAXATION 1.INDUCTION _____ 2.MENTANANCE _____	
ASA ⟺	1	2	3	4	5		

DIAGNOSIS_____

CVS/HEART/_____ RESP/LUNGS/_____ RENAL/KIDNEY_____

SPECIAL _____ ALERGY _____

REMEDICATION Ordered By ONCALL ☐ TIME Given by Time No of tested blood_____ ANESTHESIA MACHINE APPARATUS_____

TIME		0 10 20 30 40 50	10 20 30 40 50	10 20 30 40 50	10 20 30 40 50	Total
Anes/Surg--- Start/End/						
Oxygen (O_2)	Lit/min					
Halothane	Vol %					
Enflurane	Vol %					
Isoflorane	Vol %					
N_2O	Lit/min					
SCCH	Mg iv					
Pancruronium	Mg iv					
Vecuronium	Mg iv	220				
Rocuronium	Mg iv	210				
mivacuronium	Mg iv	200				
	Mg iv	190				
	Mg iv	180				
Ketamine	Mg iv	170				
Thiopental	Mg iv	160				
Propofol	Mg iv	150				
Etomidate	Mg iv	140				
Midazolam	Mg iv	130				
Diazepam	Mg iv	120				
Fentaline	Mg iv	110				
Sulfentaline	Mg iv	100				
Meperedine	Mg iv	90				
Morphine	Mg iv	80				
hydrocortisone	Mg iv	70				
		60				
		50				
$EtCO_2$	mmHg	40				
O_2satu	%	30				
Dieresis	ml	20				
Gastric loss	ml	10				
Blood loss	ml	0				
Atropin/glycop/scopala/	Mg iv					
Neostigmine	Mg iv					
Hemacel	ml iv					
Dextran	ml iv					
Dexin saline	ml iv					
0.9%norman saline	ml iv					
Ringer lactate	ml iv					
5% Dextrose	ml iv					
Blod N[a]	ml iv					

Operation _____ Surgeon_____ Anesthetist _____

KEY

X - Start/End Anesthesia

I – In/Extubation

Θ- Start/End oprattion

V / Λ -Blood pressure

• - pulse rate

MONITORING

-Pulseoxymeter ☐
-Capnography ☐
-Urinary catheter ☐
-ECG monitoring ☐
-Temp monitoring (skin,rec,oesoph,ear) ☐
-CVP ☐
IV canula ☐
NGTube ☐
Pericardial steth

TO WARD ☐
TO RECOVERY ☐
TO ICU ☐

TIME OF SURGERY HRS_____MIN____
TIME OF ANESTHESIA HRS_____MIN____

NB
1ST COPY-WITH CHART
2ND COPY-WITH ANEST RECO

Annex 8: Operation Note Sample

Name, _____ Date_____ Age, ____Sex _____Card number_____

Surgeon_____ Assistant Surgeon _____

Scrub Nurse_____ Runner Nurse_____

Anesthetist/Anesthesiologist: _____

Time: _____ Anesthesia Type_____

Indication, _____ Procedure_____

Intra Operative finding_____ **Post Operative Diagnosis**_____

Annex 9: Operation Registry

S.No	Name	Age	sex	Card number	Procedure	Indication	Anesthesia Type	Surgeon	Anesthesiologist/ Anesthetist	Assistant	Scrub	Runner	Outcome	Remark	

Annex 10: Count Sheet

Name of Patient_____**Date**_____

Operation_____

	Count before incision	Items added/removed	Total	Count before closing		Final count (before closing skin)
				Cavity	Fascia	
Gauze						
Abdominal packs						
Sharp Objects						
Blades						
Needles						
Instruments						
Scalpel handle						
Towel clips						
Dissecting forceps						
Scissors						
Forceps						
Needle holder						
Retractor						
Other						

Annex 11: Operating Theatre Table Efficiency Assessment Tool

Time	Case 1	Case 2	Case 3	Case 4	Case 5
Patient entry to OT (Wheels In)					
Patient Intubation/anesthesia administration time					
Patient incision time					
Patient extubation time					
Patient transferred out of OT (Wheels out)					

Annex 12: Discharge Form

Patient name _____Date of Birth (Age) _____

Address_____Sex_____

Medical record number_____

Admission date_____

Discharge Date_____

Attending physician _____

Operating surgeon: _____

Condition on discharge _____

Final diagnosis (List primary diagnosis first)_____

Procedures (list dates, complications)

_____

History of present illness

_____

_____

Laboratory/ Data (mention the most permanent results that need to be followed)

_____
_____
_____

Hospital Course (By problem list, not by date)

_____
_____

Discharge medications (most important. List medications that are different from those taken at admission)

_____

Discharge instruction (Diet, activity, discharge to home / nursing facility, etc.) _____

Follow up appointment:
Date_____Place_____To be seen by_____

Plan on next appointment (what is to be done on the next appointment)_____

Name_____Signature _____

Annex 13: SSI Recording Register

SURGICAL SITE INFECTION REGISTRATION LOGBOOK

INPATIENT ☐ **OUTPATIENT☐**

MRN	PATIENT NAME	BED No.	AGE	SEX	DATE OF SURGERY	PROCEDURE PERFORMED	DATE SSI WAS DIAGNOSED	POSTOPERATIVE DIAGNOSIS	WOUND CULTURE RESULT

Annex 14: Cancellation and scheduling (operation theater daily activity report) Register

Operation Theater Activity Daily Report

Day_____Date_____

Reporting person_____

S. N	Name	MRN	Department	Diagnosis	Planed procedure	Procedure status Operated / cancelled	Reason for cancellation*	Remark

*Select reason for cancellation from the list

Main Reason	Specific reason					
	Uncontrolled /acute medical illnesses	(6)	Uncontrolled /acute medical illnesses		(7)Lack of important investigation	
	Lack of important investigation		Increase blood pressure		Hematocrit	
			Uncontrolled DM		Electrolyte	
	refusal/request		Uncontrolled asthma		LFT	
	Poor bowel preparation		Coagulopathy		Pulmonary function test	
	Financial shortage		Ischemic heart diseases		ECG	
	Absent		Uncontrolled Thyroid		RFT	
	Not fasting		Acute fever		X-RAY/CT SCAN	
	Taking anticoagulant		URTI			
			Others			
(2) Management related	Shortage of OR material					
	Power breakdown					
	Lack of ICU bed					
	Shortage of water supply					
	Lack of mechanical ventilator					
	Blood not prepared					
	Lack oxygen source					
	Others					
(3) Staff related	Surgeon					
	Anesthetist					
	Nurse					
	Cleaner					
	Porter					
(4)Shortage of time	Previous case prolonged					
	Emergency priority					
	Over scheduling					
(5)Unexpected emergency	Cardiac arrest					
	Aspiration on the table					
	failed intubation/spinal					