Handbook on Quality & Safety

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International Patient Safety Goals (IPSGs)

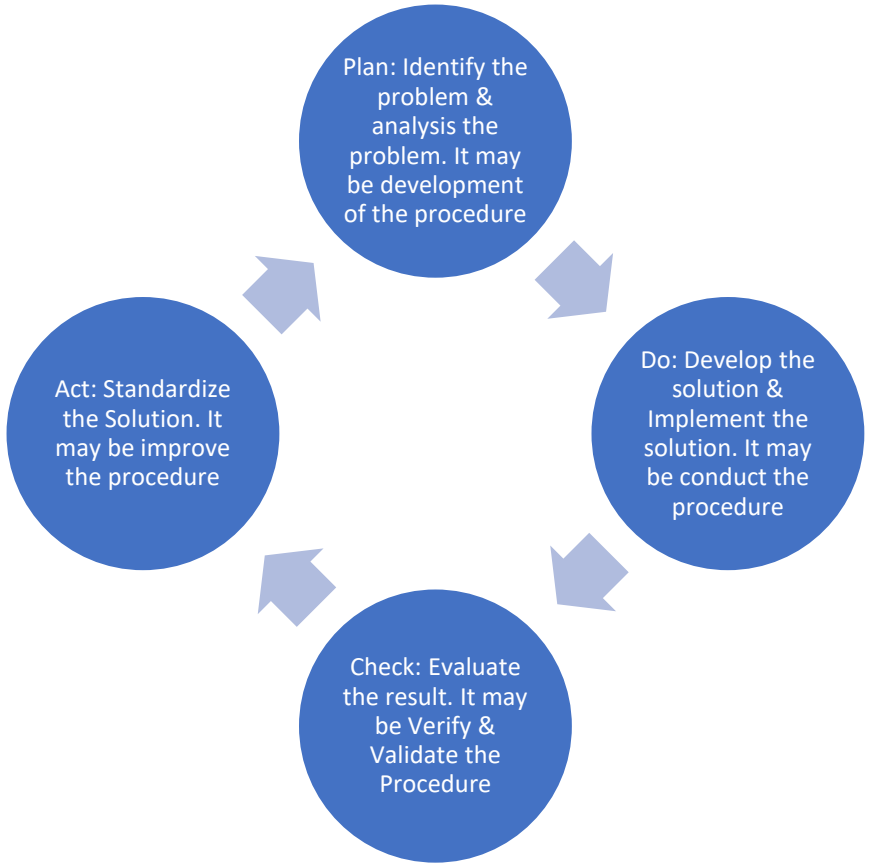
IPSG		
IPSG 1	Identify patients correctly.	1. Use two identifiers: Full Name & UHID for IPD, Full Name & Date of Birth for OPD and Unknown 1/2/3 for unknown patients 2. Use ID bands for IPD patients 3. Verification of patient identity should occur at every point of contact, including before administering medications, blood products, and any diagnostic test or procedures or any change in care level.
IPSG 2	Improve effective communication.	1. Use read back on emergency verbal orders 2. ISBAR Technique for Handoffs 3. Importance of Rapid Notification of critical results of diagnostic tests 4. Fostering a reporting culture

International Patient Safety Goals (IPSGs)

IPSG 3	Improve the safety of medications.	1. High alert medication require special safeguards to reduce the risk of error, such as separate storage, specific labelling, and thorough staff training. Independent double checking for high-alert drugs. 2. Look Alike and Sound Alike (LASA) to be identified, labelled using tall-man lettering for differentiation, incorporating barcode scanning technology, and ensuring clear communication during handoffs. LASA drugs to be stored separately.
IPSG 4	Ensure safe surgery.	1. Surgical Site Verification 2. Universal Time-Out Process that is performed immediately prior to the surgical/ invasive procedure and the sign-out that is conducted after the procedure 3. Pre-operative verification
IPSG 5	Reduce the risk of health care-associated infections.	1. Hand Hygiene 2. Use of PPE 3. Effective Antibiotic Stewardship to minimize the risk of healthcare associated infections

PDCA

- PDCA: also called: PDCA, plan–do–study–act (PDSA) cycle, Deming cycle, Shewhart cycle
- PDCS Procedure:



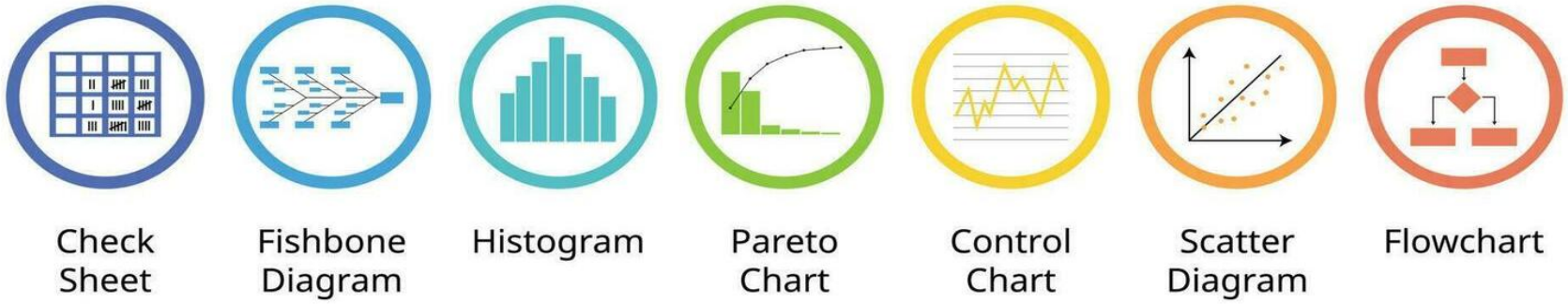
5S TECHNIQUE

Japanese	English	Means
Seiri	Sort	To separate needed tools, parts, and instructions from unneeded materials and to remove the unneeded ones.
Seiton	Set in Order	To neatly arrange and identify parts and tools for ease of use.
Seiso	Shine	To conduct a cleanup campaign.
Seiketsu	Standardize	To conduct seiri, seiton, and seiso daily to maintain a workplace in perfect condition.
Shitsuke	Sustain	To form the habit of always following the first four 5's.

Quality Tools

Quality tools help to understand and improve processes. There are 7 basic tools of quality:

1. Check sheet
2. Cause & Effect diagram/ Fishbone Diagram
3. Histogram
4. Pareto Chart
5. Control Chart
6. Scatter Diagram
7. Flow chart / Process Map



Setting Quality Objectives

1. Specific – Objectives should specify what they want to achieve.
2. Measurable – We should be able to measure whether the objectives are met or not.
3. Achievable - Are the objectives that are set, achievable and attainable?
4. Realistic – Can you realistically achieve the objectives with the resources you have?
5. Time – What is the time frame to achieve the set objectives?

7R’s of Medication Administration

Administration of medicines done after ensuring

1. Right patient,
2. Right drugs,
3. Right route,
4. Right time,
5. Right dose,
6. Right Reason and
7. Right Documentation

OT-MANAGEMENT

- List of Elective Surgeries for the day is prepared and displayed outside. OT-Surgery list is prepared in consonance with availability of the OT hours and patients requirement.
- Surgery list is complete in all respect- Day, date and time of surgeries, Name, Age, Gender of patients, Clear description of the procedure (name of procedure which side,) Name of the surgeon & anaesthetist, Major or minor case.
- Operation list is sent to OT well in advance-By 12:00 hours, a day before the surgery.
- Surgery list is informed to surgeon and ward sister- Verify the surgery register/ email.
- The operation list does not exceed the time allocated to it- this does not refer to the time during an operation of an individual patient.

CLEAN CHAIN, CLEAN BIRTH PRACTICE

Ensures 'six cleans' are followed during delivery:

1. Clean hands,
2. Clean surface,
3. Clean blade,
4. Clean cord tie,
5. Clean towel and
6. Clean cloth to wrap mother

7 Trays to be kept in Labour Room

Delivery tray

- Gloves
- Scissors
- Artery forceps
- Cord clamp
- Sponge holding forceps
- Urinary catheter
- Bowl for antiseptic lotion
- Gauze pieces and cotton swabs
- Speculum
- Perineal pads
- Kidney tray

Episiotomy tray

- Inj. Xylocaine 2%
- 10 ml disposable syringe with needle
- Episiotomy scissors
- Kidney tray
- Artery forceps
- Allis forceps
- Sponge holding forceps
- Toothed forceps
- Needle holder
- Needle (round body and cutting)
- Chromic catgut no.0
- Gauze pieces
- Cotton swabs
- Antiseptic lotion
- Thumb forceps
- Gloves

Baby tray

- Two pre-warmed towels/sheets for wrapping the baby
- Cotton swabs
- Mucus extractor
- Bag and mask
- Sterilized thread for cord/cord clamp
- Nasogastric tube
- Gloves
- Inj. Vitamin K
- Needle and syringe. (Baby should be received in a pre-warmed towel. Do not use metallic tray)

Medicine tray*

- Inj. Oxytocin (to be kept in fridge)
- Cap Ampicillin 500 mg
- Tab Metronidazole 400 mg
- Tab Paracetamol
- Tab Ibuprofen
- Tab B complex
- IV fluids
- Inj. Oxytocin 10 IU
- Tab. Misoprostol 200 micrograms
- Inj. Gentamycin
- Vit K
- Inj. Betamethasone
- Ringer lactate
- Normal Saline
- Inj. Hydralazine
- Nifedipine
- Methyldopa
- Magnifying glass

(*-Nevirapin and other HIV drugs only for ICTC and ART Centres)

Emergency drug tray**

- Inj. Oxytocin (to be kept in fridge)
- Inj. Magsulf 50%
- Inj. Calcium gluconate-10%
- Inj. Dexamethasone
- Inj. Ampicillin, Inj.Gentamicin
- Inj. Metronidazole
- Ceftriaxone (3rd generation cephalosporins) - For L3 facility
- Inj. Lignocaine-2%
- Inj. Adrenaline
- Inj. Hydrocortisone Succinate
- Inj. Diazepam
- Inj. Pheneramine maleate
- Inj. Carboprost
- Inj. Fortwin
- Inj. Phenergan
- Ringer lactate
- Normal saline
- Inj. Hydralazine
- Nifidipine
- Methyldopa
- Inj. Betamethasone
- IV sets with 16-gauge needle (at least 2)
- Controlled suction catheter
- Mouth gag
- IV Cannula
- Vials for blood collection

(–only for L2, L3 facilities)**

MVA/ EVA tray: Gloves, speculum, anterior vaginal wall retractor, posterior vaginal wall retractor, sponge holding forceps, MVA syringe and cannulas, MTP cannulas, small bowl of antiseptic lotion, sanitary pads, pads /cotton swabs, disposable syringe and needle, misoprostol tablet, sterilized gauze/pads, urinary catheter.

PPIUCD tray*–** PPIUCD Insertion Forceps, Cu IUCD 380A/ Cu IUCD 375 in a sterile package.

(* – only for L3 facilities with PPIUCD trained provider)**

Danger signs for Mother & Baby

Danger Signs for Mother

- Excessive Bleeding
- Severe abdominal pain
- Difficulty in breathing
- Severe headache or blurring of vision
- Urge to push
- Can't empty bladder every 2 hours
- Fever or chills
- Foul smelling vaginal discharge

Danger signs for baby

- Fast/difficulty in breathing
- Fever
- Unusually cold
- Stops feeding well
- Less activity than normal
- Whole body becomes yellow

Counselling advice

- Support to cope up with labour pains
- No bath/oil for baby
- No Pre-Lacteal feed
- Initiate breastfeeding in half-an-hour
- Clothe and wrap the baby

High Risk Pregnancy such as:

- ❑ Grand multipara
- ❑ Previous 3rd stage abnormalities / problems
- ❑ All major Medical Disorders
- ❑ Multiple Pregnancy
- ❑ All mal-presentations
- ❑ BOH
- ❑ CPD
- ❑ APH
- ❑ Previous LSCS
- ❑ PIH/ Eclampsia, Gestational Diabetes
- ❑ Recurrent premature labour
- ❑ Rh negative women with Rh positive husband
- ❑ Gynaecological abnormality
- ❑ Elderly primi
- ❑ History of Infertility
- ❑ Gross obesity
- ❑ Oligo/Polyhydramnios
- ❑ Extremes of age regardless of parity, < 18 yrs / > 35 yrs. Both are in need of attention, medical or social, due to various problems.

Respectful Maternal Care

- ❑ Ensure privacy of the woman in labour
- ❑ Avoid Performing harmful practices
- ❑ Provide complete information about the care provided to the patient
- ❑ Take informed consent
- ❑ Allow choice of position for birth
- ❑ Avoid Verbal abuse (insult, intimidation, threats, coercion)
- ❑ Avoid discrimination based on ethnicity, race, or economic status, including denial of admission due to illegal immigration status
- ❑ Keep Pregnant Women (PW) and baby together 24 hours a day. Avoid unnecessary separation of PW and new-born after the birth
- ❑ Prevention of institutional violence against women and babies, including disrespectful. Avoid Physical abuse (slapping/hitting)
- ❑ Depriving the woman of services in the facility due to lack of payment demanded for it
- ❑ Provide choice of companion
- ❑ Provide continuous support during delivery and avoid abandonment of care (i.e. leaving the woman alone or unattended)
- ❑ Ensure confidentiality of the patient
- ❑ Allow drink and food during labor
- ❑ Provide liberty of movement during labor(e.g., walking, moving around
- ❑ Avoidance of the overuse of drugs and technology (such as oxytocin augmentation, episiotomy, cesarean section, incubation, sonograms)
- ❑ Skin- to-skin contact of the newborn with the PW immediately after the birth for at least the first hour
- ❑ Promoting breastfeeding on demand
- ❑ Evidence based care that enhances & optimizes the normal processes of pregnancy, birth, and postpartum

Respectful Maternal Care

Following are the seven 'Universal Rights of Childbearing Women', which need to be considered and practiced during care provision:

Category of Disrespect and Abuse	Corresponding Right
Physical abuse	Freedom from harm and ill treatment
Non-consented care	Right to information, informed consent and refusal, and respect for choices and preferences, including companionship during maternity care
Non-confidential care	Confidentiality and privacy
Non-dignified care (including verbal abuse)	Communication with dignity and respect
Discrimination based on specific attributes	Equality, freedom from discrimination, equitable care
Abandonment or denial of care	Right to timely healthcare and to the highest attainable level of health
Detention in facilities	Liberty, autonomy, self-determination, and freedom from coercion

Source: Respectful Maternity Care: The Universal Rights of Childbearing Women, The White Ribbon Alliance.

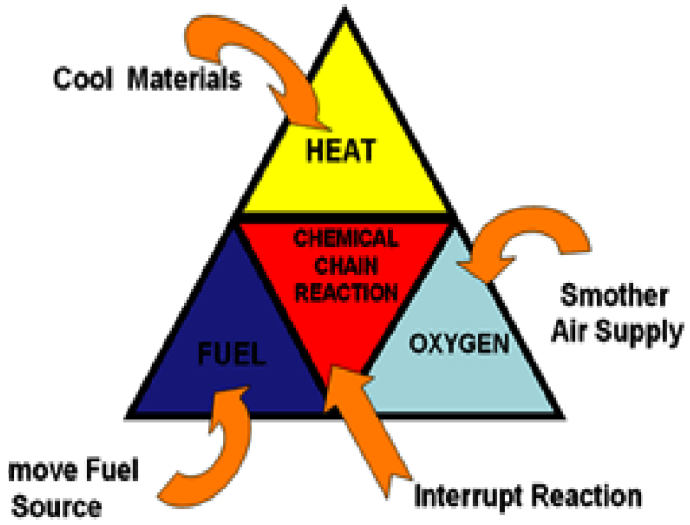
Don'ts/ Harmful Activities at labour Room

1. No routine enema
2. No routine shaving
3. No routine induction/ augmentation of labour
4. No place for routine suctioning of the baby
5. No pulling of the baby
6. No routine episiotomy
7. No fundal pressure
8. No immediate cord cutting
9. No immediate bathing of the new-born
10. No routine resuscitation on warmer

Hospital Codes

HOSPITAL CODES				
Code	Description	Primary Response	Secondary Response	Follow Up
Code Red	Fire	R-Rescue patients A-Activate Code Red, inform Fire Safety Officer/Security Officer/ Electrical Engineer/MS/DMS C- Contain the fire E-Extinguish or evacuate the area	Attempt to extinguish the fire P-Pull the pin A-Aim the nozzle at base of fire S-Squeeze the handle S- Sweep from side to side Fire not controlled-Call Fire Brigade & Evacuate	Return to normal duty after deactivation of code as per direction. Document as appropriate
Code Blue	Cardio Pulmonary Arrest	Activate Code Blue. Notify response team: Emergency Doctor/Emergency Nursing Officer/ECG Technician/ Consultant or SR Cardiology/ Consultant or SR Anesthesiology & Critical Care/DNS/DMS. Get a crash Cart	Keep the person calm. Check pulse and breathing. Initiate CPR if necessary by qualified staff	Return to normal duties as directed upon code blue all clear.
Code Pink	A newborn/ infant/child is missing or is known to have been abducted/kidnapped	Activate Code Pink. Inform the child's name and looks and mention location carry out accountability check. Inform Security Officer/DMS/NS/MS	Monitor & seal all exits for anyone attempting to leave the hospital premises	Return to normal duties once code is called off. Document appropriately
Code Orange	External disaster like (Accident with mass casualty, Natural Calamity, Epidemics, Bomb blasts/terrorist activities)	Activate Code Orange: Report to Security Officer/NS/DMS/ Disaster response team	Coordination with command nucleus and continue care of existing patients	Return to normal duties when code is deactivated. Document as appropriate
Code Purple	Security Alert	Activate Code Purple. Inform Security Officer/DMS/MS/NS/Police	Respond immediately/ investigate/ rescue	Return to normal duties when code is deactivated. Document as appropriate
HAZMAT	Hazardous spill which is likely to cause unknown effects, injury, illness or harm to the environment	Call helpline number for HAZMAT. Secure the area, use PPE and go eye wash area. Don't allow people to step in the area	Assist those who have been contaminated. Take them to emergency for evaluation and management.	Return to normal duties as directed. Prevent future spillage. Document appropriately.

FIRE SAFETY


Cool Materials
HEAT
CHEMICAL CHAIN REACTION
FUEL
OXYGEN
Smother Air Supply
move Fuel Source
Interrupt Reaction


IN CASE OF FIRE REMEMBER RACE
R 'Rescue' ANY PERSONS IN IMMEDIATE DANGER
A 'Alarm' ALERT OTHERS BY ACTIVATING ALARM
C 'Contain' THE EMERGENCY BY CLOSING DOORS
E 'Evacuate' EXTINGUISH THE FIRE IF TRAINED AND SAFE TO DO SO


HOW TO USE A FIRE EXTINGUISHER
P
PULL THE PIN
A
AIM AT BASE OF FIRE
S
SQUEEZE THE LEVER
R
L
S
SWEEP FROM SIDE TO SIDE


Using The Correct Fire Extinguisher
Water
For use on
Wood, Paper, Textiles etc
Do not use on
Flammable liquid
Live electrical equipment
Dry Powder
For use on
Wood, Paper, Textiles etc
Flammable liquids
Gaseous fires
Live electrical equipment
Foam
For use on
Wood, Paper, Textiles etc
Flammable liquids
Do not use on
Live electrical equipment
CO2
For use on
Flammable liquids
Live electrical equipment
Do not use on
Wood, paper and textiles
Flammable metal fires
Do not use in a confined space
Wet Chemical
For use on
Cooking oil fires
Wood, Paper, Textiles etc.
Discharge entire contents on to fire from at least 1 metre distance

CLASSIFICATION OF FIRE

Class of fire

Contributing fuel/combustion materials

Class A:

- Fires that involve ordinary combustible materials such as wood, cloth, paper, rubber, and many plastics.

Class B:

- Fires that involve flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases

Class C:

- Fires that involve energized electrical equipment, such as power tools, wiring, fuse boxes, appliances, TVs, computers, and electrical motors.

Class D:

- Fires that involve combustible metals such as magnesium, potassium, titanium, zirconium, lithium, and sodium.

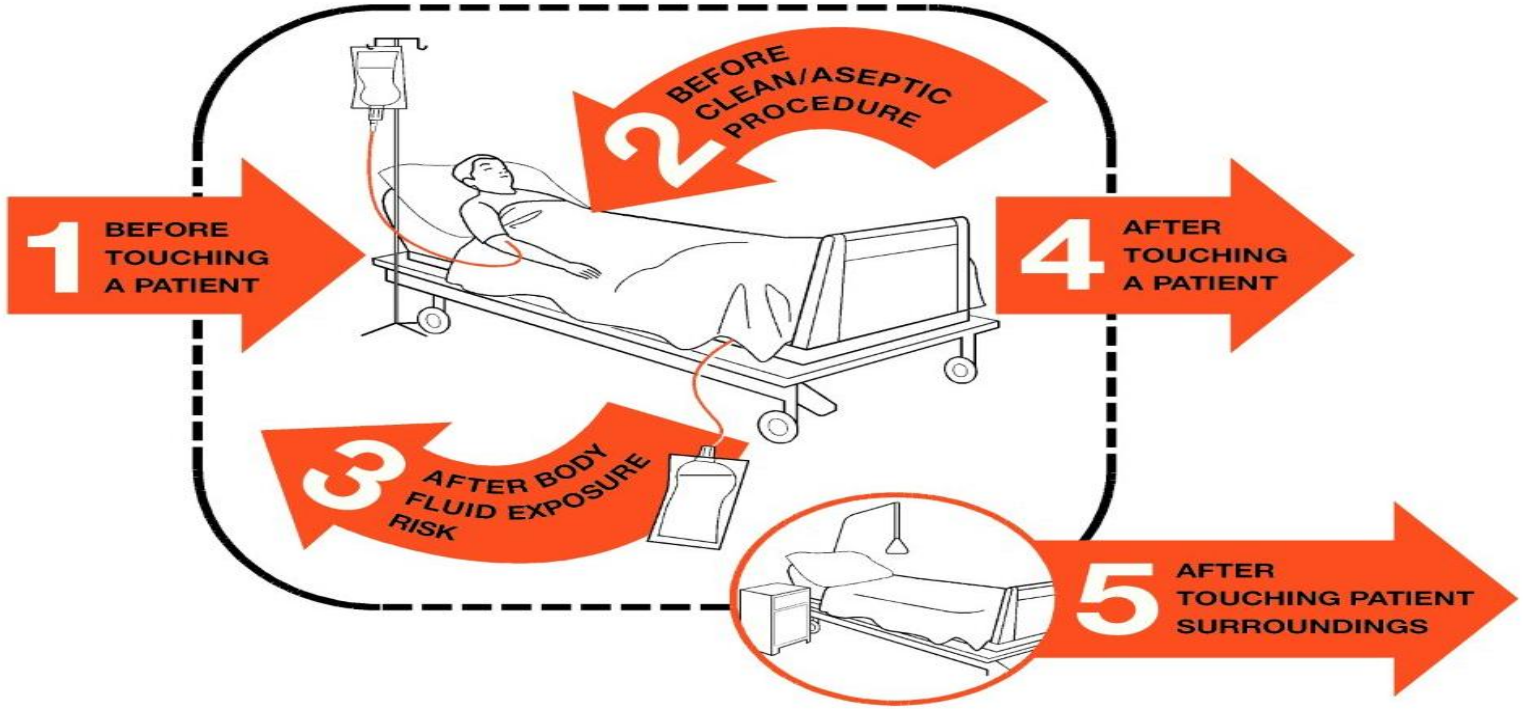
Class K:

- Fires that involve combustible cooking oils and fats used in commercial cooking equipment.

Standard Precautions for All Patient Care

- Perform Hand Hygiene
- Use Personal Protective Equipment (PPE) whenever there is an expectation of possible exposure to an infectious material
- Follow respiratory hygiene/ cough etiquette principles
- Ensure appropriate patient placement
- Properly handle, clean and disinfect patient care equipment and instruments/ devices. Clean & disinfectant the environment appropriately
- Handle textiles and laundry carefully
- Follow safe injection practices
- Waste Disposal

5 Moments for Hand Hygiene

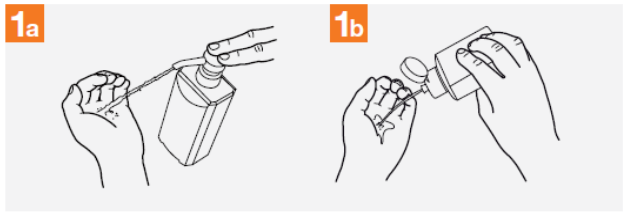


1	BEFORE TOUCHING A PATIENT	WHEN?	Clean your hands before touching a patient when approaching him/her.
		WHY?	To protect the patient against harmful germs carried on your hands.
2	BEFORE CLEAN/ ASEPTIC PROCEDURE	WHEN?	Clean your hands immediately before performing a clean/aseptic procedure.
		WHY?	To protect the patient against harmful germs, including the patient's own, from entering his/her body.
3	AFTER BODY FLUID EXPOSURE RISK	WHEN?	Clean your hands immediately after an exposure risk to body fluids (and after glove removal).
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
4	AFTER TOUCHING A PATIENT	WHEN?	Clean your hands after touching a patient and her/his immediate surroundings, when leaving the patient's side.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
5	AFTER TOUCHING PATIENT SURROUNDINGS	WHEN?	Clean your hands after touching any object or furniture in the patient's immediate surroundings, when leaving – even if the patient has not been touched.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.

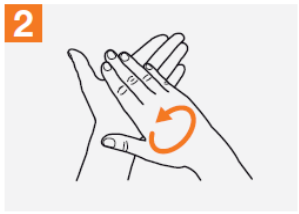
How to Handrub?

RUB HANDS FOR HAND HYGIENE! WASH HANDS WHEN VISIBLY SOILED

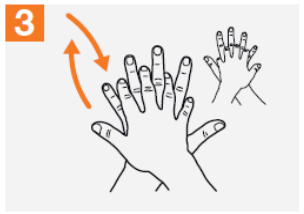
Duration of the entire procedure: 20-30 seconds



Apply a palmful of the product in a cupped hand, covering all surfaces;



Rub hands palm to palm;

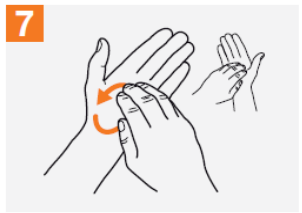


Right palm over left dorsum with interlaced fingers and vice versa;

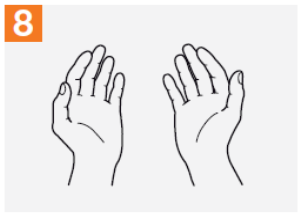
Palm to palm with fingers interlaced;

Backs of fingers to opposing palms with fingers interlocked;

Rotational rubbing of left thumb clasped in right palm and vice versa;



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



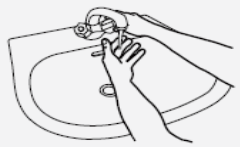
Once dry, your hands are safe.

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

Duration of the entire procedure: 40-60 seconds

0

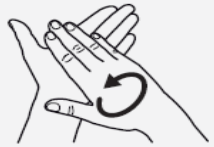


Wet hands with water;

1

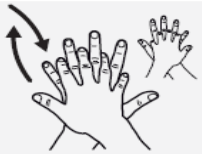
Apply enough soap to cover all hand surfaces;

2



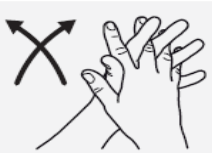
Rub hands palm to palm;

3



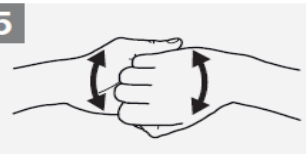
Right palm over left dorsum with interlaced fingers and vice versa;

4



Palm to palm with fingers interlaced;

5

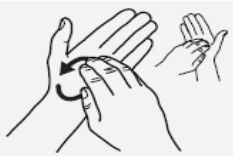


Backs of fingers to opposing palms with fingers interlocked;

6

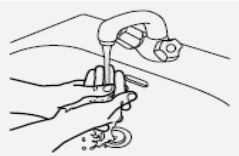
Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8

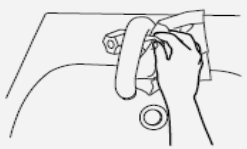


Rinse hands with water;

9

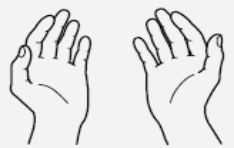
Dry hands thoroughly with a single use towel;

10



Use towel to turn off faucet;

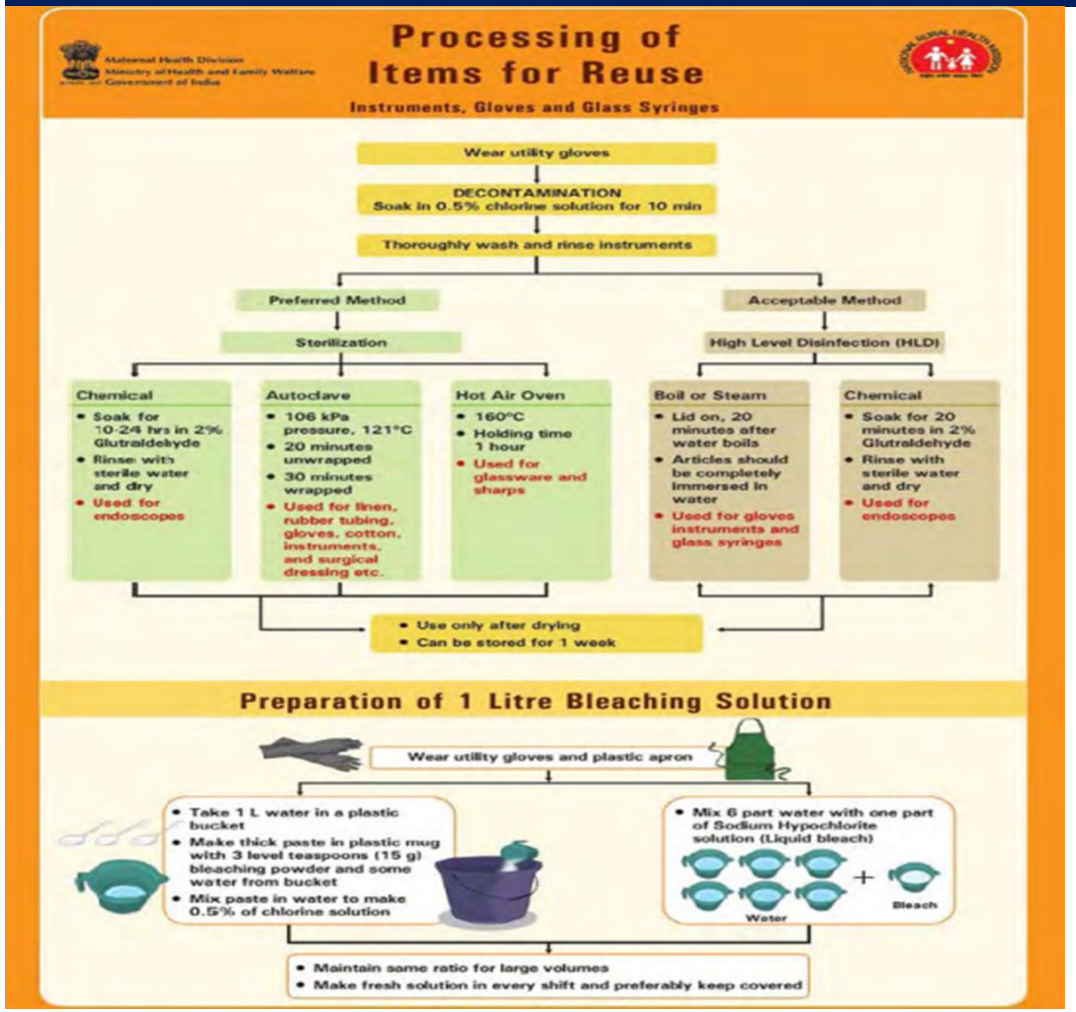
11



Your hands are now safe.

Segregation of Biomedical Waste

Processing of Items for Reuse



Steps of processing instruments and other items

Decontamination

(Soak in 0.5 % chlorine solution 10 minutes)

Cleaning with brush, detergent and water

Preferred Method — **Sterilization**

- **Autoclave** 15lbs/In2 pressure 121ºC, (250ºF) 20 min/30 min
- **Chemical** soak in Glutaraldehyde (2%) for 10-24 hrs, Rinse with sterile water

Acceptable Method — **HLD**

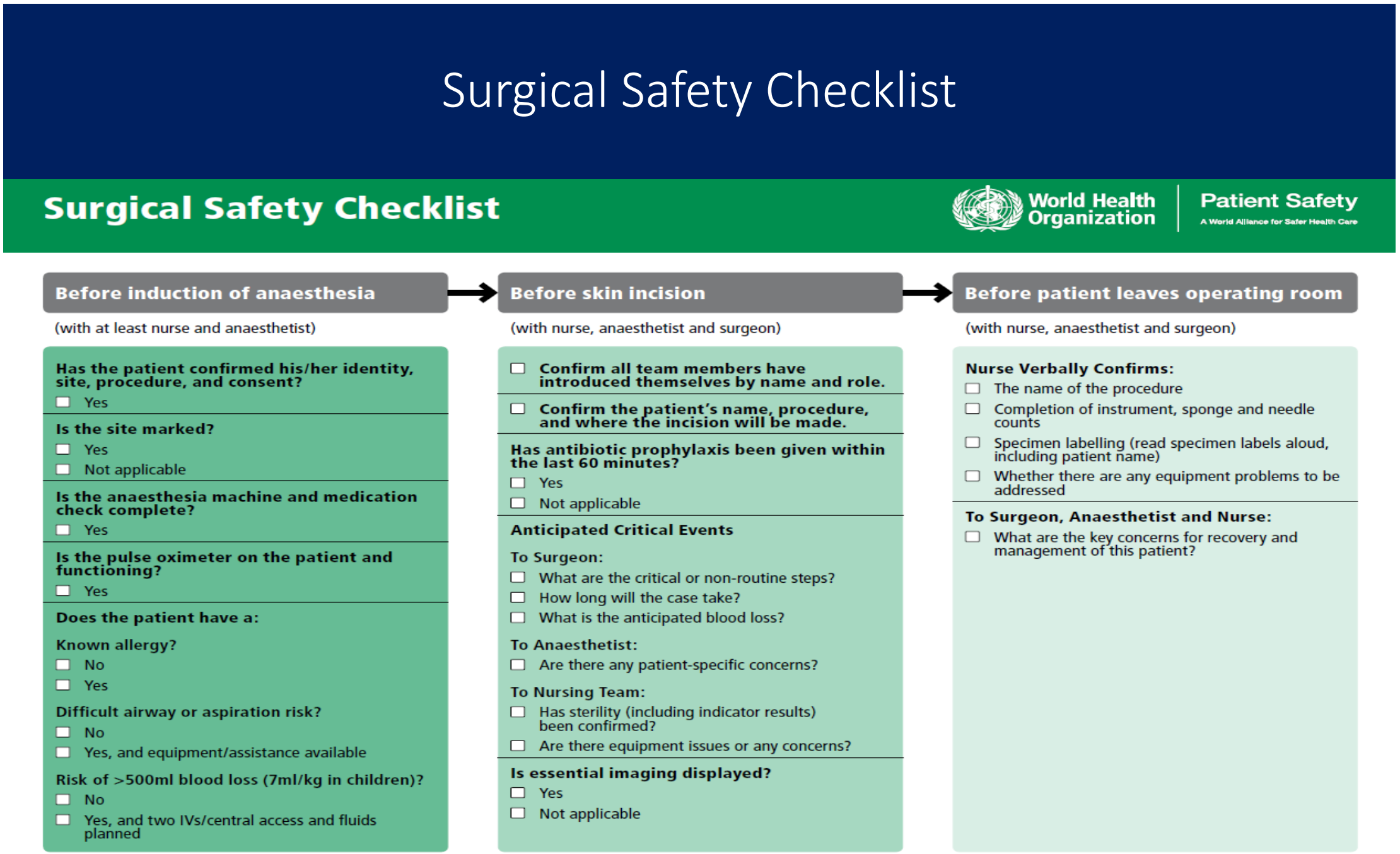
- **Boiling** Lid on 20 minutes
- **Chemical** Soak in Glutaraldehyde (2%) for 20 min. Rinse with boiled for 20 min

Cool, dry and Store

Preparation of Chlorine Solution

Concentration of commercially available hypochlorite solution	Required Chlorine concentration	To Prepare 1000 ml	
		Solution in ml	Add water in ml
5 %	2 %	400	600
	1 %	200	800
	0.5 %	100	900
10 %	0.5 %	50	950
	1 %	100	900
	2 %	200	800

Surgical Safety Checklist



Radiation Safety Checklist

- Wear the TLD badge at work
- Know the recent TLD values
- Do not fold lead apron; look for PM tag
- Thyroid and Gonad Shields to be used
- Periodic Fluoroscopy- Lead apron & other devices
- Quality (radiation) controls for all equipment
- Annual Health Check for all radiation workers
- Appropriate Signages in Radiation Area
- Obtain Obstetrics history for all women prior to radiation exposure
- Inform overexposure and injuries if any immediately to Radiation Safety Officer/ HOD

Please Ensure

- All medications, which are recalled needs to be returned to pharmacy immediately
- Emergency Medicines are available and stored properly
- Don’t write any unapproved abbreviation
- Don’t stop any medication without sign, date and time by doctor
- Don’t overwrite in medication chart
- Don’t cut any writing without signing and cut with a single line only
- Medication orders are to be legible in specified page of drug chart, dated, timed and signed. Nurse’s signature & time is must on administration.
- Verbal orders are not acceptable except in life saving situations. Follow read back policy and signature by treating doctor within 24 hours.
- All medication errors to be reported
- All incidents to be reported (Near Miss, Adverse Event and Sentinel)
- Label all open in use vials and pre-filled syringes with date and time of opening
- Temperature monitoring to be done for fridge: daily morning and evening and documented
- All patient files to be returned to MRD within 48 hours of discharge/ death
- Vulnerable patients to be identified in the hospital
- All patients must be with ID band

Self-Assessment toolkit for In-Patient Areas

Name of Patient Care Area: **Assessor Name:**

S. No.	Parameters	Methods OB=Observation, SI=Staff interview, RR=Record review, PI=Patient Interview	0=Non-compliance 1=Partial compliance 2=Full compliance NA=Not Applicable
1	Do the patient care areas having functional critical equipment like monitors, suction equipment, oxygen cylinders/ central oxygen supply, defibrillator.?	OB/SI	
2	Do the patient care area is having records of preventive maintenance, breakdown register, work instruction and calibration of medical devices?	RR/SI	
3	Does the hospital have measure to prevent child/neonate abduction and abuse?	SI	
4	Is there monitoring of infection control practices?	RR/SI	
5	Is there a record of usage, administration and disposal of narcotic drug?	RR/SI	
6	Are there expired drugs in any patient care area?	RR/SI	
7	Is privacy maintained during examination/ procedure?	OB	
8	Are patients protected from physical abuse and neglect?	OB/SI	
9	Is patient's information confidential?	OB/SI	
10	Is patients consent taken at admission and before carrying out procedure?	RR/SI	
11	Is patient aware of how to voice a complaint?	PI	
12	Does hospital inform patients about expected cost of treatment?	PI	
13	Does the patient care area maintain cleanliness and general hygiene of areas/ surfaces, furniture, fixtures and items?	RR/OB	
14	Are admission or discharge to home or transfer to another organization is documented?	RR/SI	
15	Are there duty rosters of staff posted in the patient care area?	RR	
16	Is staff aware of disciplinary procedure?	SI	
17	Is staff able to demonstrate and take actions to report and eliminate/ minimize risks?	SI	
18	Does staff know how to use fire extinguisher?	SI	
19	Does staff know the procedure of cleaning non-infected areas?	SI	
20	Does staff know the procedure of cleaning infected areas?	SI	
21	Does staff know the procedure of cleaning blood spill?	SI	
22	Is the waste collected, segregated, transported and disposes as per Biomedical Waste regulation?	OB/SI	
23	Does the staff know the procedure of cleaning or washing the blood-stained linen?	SI	
24	Are equipment cleaning, disinfection and sterilization practices adhered?	OB/SI	
25	Do the sterilized drums and trays have date of expiry?	OB	
26	Are indicators used to monitor effectiveness of sterilization process?	OB	
27	What is parameter for patient identification?	SI	
28	Does the continuous process of quality improvement and patient safety programme practise like maintenance of KPI, Incident reporting, medication error, ADR etc.?	SI/RR	
29	Is the list of maintenance staff available in the area?	OB	
30	Are occupational hazards taken care of-like needle stick injury, aggressive and violent patients?	SI	
31	Are all the medical gas cylinders stored in racks or in chains?	OB	
32	Are smoke/ fire detectors installed in patient care areas are functional?	OB	
33	Is fire-fighting equipment kept up-to-date?	OB	
34	Does the area have safe exit plan for fire and non-fire emergency?	OB	
35	Are aprons and PPEs used by staff whenever required?	OB	
36	Are there standardised colour coding of cylinders and medical gas pipelines?	OB	
37	Whether LASA drugs are identified and stored separately?	OB	
38	Whether High Risk drugs identified and stored separately?	OB	
39	Does staff have knowledge on policy of high risk drugs?	SI	
40	Does the area has identified the vulnerable patients and has taken preventive measures?	OB/SI	
42	Does staff has knowledge on standard precaution?	SI	
43	Does staff has knowledge about 7Rs?	SI	
44	All documents are signed with name, date and time in patient file?	RR	
45	Handover communication is complete?	RR	
45	Initial assessment is done within half an hour and complete?	RR	
46	All progress notes are signed with name, date and time in patient record	RR	
47	Biomedical bins are available and segregation poster is displayed?	OB	
48	Three bucket system is available?	OB	
49	Posters of hand hygiene and its moments available?	OB	
50	Nurses call bell system is functional	OB	
51	Records of fridge temperature for last three months	RR	

High Alert Drugs

Maximum Doses of High Alert Drugs

Definition of the High Alert Drugs: They are drugs that bear a risk of causing significant patient harm when they are used in error. 11 categories of high-alert medications:

1. Neuromuscular Blocking Agents
2. Concentrated Electrolytes Injection
3. Magnesium Sulfate Injection
4. Moderate Sedation in Adults and Children, Minimal Sedation in Children
5. Insulin, Subcutaneous and Intravenous
6. Lipid-Based Medications and Conventional Counterparts
7. Methotrexate for Non-Oncologic Use
8. Chemotherapy, Oral and Parenteral
9. Anticoagulants
10. Neuraxial Opioids and/or Local Anaesthetics
11. Opioids

S. No.	Drug Name	Dose and route	Maximum Dosage	Precautions	Remarks
1.	Oxytocin	IV: Infuse 20 IU in 1 litre IV fluid at 60 drops per minute. IM 10 IU. Continuing Dose: IV: Infuse 20 units in 1 L IV fluids at 40 drops per minute	Not more than 3 litres of IV fluids containing Oxytocin. (60 IU)	Do not give as an IV bolus.	For management of the PPH
2.	ANTICONVULSIVE DRUGS: 1. Magnesium sulfate	**Loading dose** • Give 4 g of 20% magnesium sulfate solution IV over five minutes. • Follow promptly with 10 g of 50% magnesium sulfate solution: give 5 g in each buttock as a deep IM injection with 1 mL of 2% lignocaine in the same syringe. Ensure aseptic technique when giving magnesium sulfate deep IM injection. Warn the woman that a feeling of warmth will be felt when magnesium sulfate is given. • If convulsions recur after 15 minutes, give 2 g of 50% magnesium sulfate solution IV over five minutes.	**Maintenance dose** • Give 5 g of 50% magnesium sulfate solution with 1 mL of 2% lignocaine in the same syringe by deep IM injection into alternate buttocks every four hours. Continue treatment for 24 hours after delivery or the last convulsion, whichever occurs last. • If 50% solution is not available, give 1 g of 20% magnesium sulfate solution IV every hour by continuous infusion.		Magnesium sulfate is the drug of choice for preventing and treating convulsions in severe pre-eclampsia and eclampsia. WITHHOLD OR DELAY DRUG IF: • Respiratory rate falls below 16 per minute. • Patellar reflexes are absent. • Urinary output falls below 30 mL per hour over preceding four hours.
	2. Diazepam	Intravenous administration Loading dose • Diazepam 10 mg IV slowly over two minutes. • If convulsions recur, repeat loading dose	Maintenance dose • Diazepam 40 mg in 500 mL IV fluids (normal saline or Ringer's lactate) titrated to keep the woman sedated but rousable. • Maternal respiratory depression may occur when dose exceeds 30 mg in one hour: - Assist ventilation (mask and bag, anaesthesia apparatus, intubation), if necessary. - Do not give more than 100 mg in 24 hours.		Use diazepam only if magnesium sulfate is not available.
	3. Phenytoin	If the woman is known to be epileptic but cannot recall details of her medication, give her phenytoin 100 mg by mouth three times per day. Follow-up with her regularly	Give phenytoin 100 mg IV slowly over two minutes or by mouth every eight hours beginning at least 12 hours after the loading dose.		Only normal saline can be used to infuse phenytoin. All other IV fluids will cause crystallization of phenytoin. Avoid drugs in early pregnancy which are associated with congenital malformations (e.g. valproic acid).

High Alert Drugs

		and adjust the dose of medication according to her response.			
3.	Calcium Gluconate	In case of respiratory arrest: - Assist ventilation (mask and bag, anaesthesia apparatus, intubation). - Give calcium gluconate 1 g (10 mL of 10% solution) IV slowly until calcium gluconate begins to antagonize the effects of magnesium sulfate and respiration begins.			Antidote of Magnesium Sulphate Toxicity
4.	Local Anaesthesia Lignocaine	20 mL 15 mL normal saline +5 mL Lignocain	4 mg/kg of body weight 240 mg for 60 kg adult		Avoid using concentrations of lignocaine stronger than 0.5%. The anaesthetic effect should last for at least two hours. Doses can be repeated if needed after two hours (
5.	Adrenaline	Adult 0.5 ml adrenaline 1:1000 solution (0.1 mL in 10 mL normal saline or Ringer's lactate) IV slowly;	IV: 0.5 to 1 mg (5 to 10 mL) IV once; during resuscitation effort, 0.5 mg (5 mL) should be given IV every 5 minutes		MANAGING ANAPHYLACTIC SHOCK FROM MISMATCHED BLOOD TRANSFUSION. Do not administer repeated injections of epinephrine at the same site, as the resulting vasoconstriction may cause tissue necrosis.
6.	Atropine Sulfate	Give atropine sulfate 0.6 mg IM 30 minutes prior to surgery. 0.4 to 1 mg, IV, every 1 to 2 hours as needed	Up to a maximum of 2 mg, may be required		To overcome severe bradycardia and syncope due to a hyperactive carotid sinus reflex
7.	Soda bI Carbonate	**Adult Dose for Asystole** 1 mEq/kg slow IV initially, may repeat with 0.5 mEq/kg 10 minutes			HCO3 (mEq) required = 0.5 x weight (kg) x [24 - serum HCO3 (mEq/L)].

		later one time, or as indicated by the patient's acid-base status.			If acid-base status is not available, dosages should be calculated as follows: 2 to 5 mEq/kg IV infusion over 4 to 8 hours; subsequent doses should be based on patient's acid-base status.

ALL INDIA INSTITUTE OF MEDICAL SCIENCES (AIIMS), GUWAHATI
Look Alike & Sound Alike Drug Lists

S. No.	Look Alike 1	Look Alike 2	Sound Alike 1	Sound Alike 2
1.	Inj Diazepam	Inj Avil	Inj. Dopamine	Inj. Dobutamine
2.	Inj Ephedrine	Inj Nor-adrenaline	Inj. Adrenaline	Inj. Nor-adrenaline
3.	Inj. Potassium Chloride	Inj. Calcium Gluconate	Inj. Ceftriaxone	Inj. Cefotaxime
4.	Inj. Atropine	Inj. Magnesium Sulfate	Inj. Dexamethasone	Inj. Dexmedetomidine
5.	Inj. Adenosine	Inj. Magnesium Sulfate	Inj. Ciprofloxacin	Inj. Levofloxacin
6.	Inj. Atropine	Inj. Adenosine	Inj. Metronidazole	Inj. Mannitol
7.	Inj. Ceftriaxone	Inj. Cefotaxime	Inj. Lignocaine	Inj. Lignocaine+ Adrenaline
8.	Inj. Metronidazole	Inj. Mannitol	Inj. Vecuronium	Inj. Rocuronium
9.	Inj. Methyl Prednisolone	Inj. Hydrocortisone	Inj. NS 0.9%, 500 ml	Inj. NS 0.45%, 500 ml
10.	Inj. Lignocaine	Inj. Lignocaine+ Adrenaline	Tab Metoprolol	Tab Misoprostol
11.	Inj. NS 0.9%, 500 ml	Inj. NS 0.45%, 500 ml	POVIDONE GARGLE	POVIDONE SOLUTION
12.	Inj. Tramadol	Inj. Eptoin	Diazepam	Diltiazam
13.	Inj. Dexamethasone	Inj. Amikacin	Dextrose 25%	Dextrose 5%
14.	Inj. Avil	Inj. Nor-adrenaline	Inj. Ceftriaxone-S	Inj. Ceftriaxone
15.	Inj. Lignocaine 2%	Inj. Lignocaine + Adrenaline		

ALL INDIA INSTITUTE OF MEDICAL SCIENCES (AIIMS), GUWAHATI
HIGH-ALERT MEDICATION LIST

Anti-coagulants & thrombolytics
- Unfractionated Heparin
- Enoxaparin / Dalteparin
- Warfarin
- Apixaban, Rivaroxaban, Dabigatran
- Alteplase, Tenecteplase, Streptokinase

Insulins (All Types)
- Regular insulin
- Rapid-acting
- NPH insulin
- Long-acting
- Premixed insulin
- IV insulin infusion

Vasopressors & Inotropes
- Epinephrine
- Norepinephrine
- Dopamine
- Dobutamine
- Phenylephrine
- Vasopressin
- Digoxin, milrinone

Anti-Arrhythmic Drugs
- Amiodarone
- Lidocaine
- Adenosine
- Procainamide
- Magnesium sulfate

Sedatives, Anesthetics & Opioids
- Propofol
- Midazolam
- Diazepam
- Lorazepam
- Dexmedetomidine
- Ketamine
- Hydromorphone
- Methadone

Neuromuscular Blocking Agents *(Restricted Areas Only)*
- Succinylcholine
- Rocuronium
- Vecuronium
- Atracurium
- Cisatracurium

Concentrated Electrolytes
- Potassium chloride injection
- Potassium phosphate
- Hypertonic saline
- Calcium chloride
- Magnesium sulfate injection

Cytotoxic / Chemotherapy Drugs
- Methotrexate
- Cyclophosphamide
- Cisplatin
- Vincristine
- Vinblastine
- Doxorubicin

Uterotonic: Oxytocin

Other Drugs: Promethazine, Tranexamic Acid, Sodium Chloride 3%, Glimepiride, Glipizide, Tolbutamide

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TENTATIVE EMERGENCY DRUG LIST

1 Cardiac Arrest / ACLS
- Epinephrine
- Amiodarone
- Atropine
- Adenosine
- Lidocaine
- Magnesium sulfate
- Calcium gluconate / chloride
- Sodium bicarbonate
- Isoprenaline

2 Acute Coronary Syndrome
- Aspirin
- Nitroglycerin
- Morphine
- Heparin
- Clopidogrel / Ticagrelor
- Atorvastatin
- Esmolol

3 Shock & Hypotension
- Norepinephrine
- Epinephrine
- Dopamine
- Dobutamine
- Vasopressin

4 Respiratory Emergency / Anaphylaxis
- Adrenaline (IM)
- Salbutamol
- Ipratropium
- Hydrocortisone
- Methylprednisolone
- Magnesium sulfate

5 Neurological Emergencies
- Lorazepam
- Diazepam
- Midazolam
- Phenytoin
- Levetiracetam
- Mannitol
- Hypertonic saline

6 Metabolic Emergencies
- Dextrose 25%
- Regular insulin
- Calcium gluconate
- Sodium bicarbonate
- 3% NaCl

7 Emergency Antidotes
- Naloxone
- Atropine

8 Induction Agent (For OT. Emergency & ICU areas)

Inj. Etomidate
Inj. Propofol
Inj. Ketamine

9 Thrombolytics

Inj Tenecteplase
Inj Streptokinase

10 Hypertensive Emergency

Inj Labetalol
Inj Nitroglycerine
Inj Hydralazine

Code Red AIIMS Guwahati

Inform Nursing Officer At the counter

Activate Nearest Fire Alarm Break Glass/Manual Call Point

Call (First):
Nurse Activates informs – Code Red Location
Security/Fire Control Room: 8088
MS Office: 8533, 8479
Electrical enquiry: 7258, 8284
AC (Air-Conditioning): 8283
Manifold Room: 8186

Call: (If required)
Call Fire Brigade-101, 0361-2737680, HOTLINE-1077, Police Control Kamrup: 0361-2684402, Disaster Management: 1077/ 1070, DDMA Kamrup: 96784-71071

In case the fire could be handled safely

Practice RACE

Fire Panel Operator makes appropriate announcement

Fire Fighting Team reaches Uses hydrant and hose reels, other equipment to control fire

Electrical AC Manifold Staff Secure Hospital site

Fire Controlled

Code Red De-Activated

Call Fire Brigade

Fire Not Controlled

Evacuate

Follow instructions of Fire Warden (in charge of safe evacuation **1- Evacuation Team of Security Guards moves patients horizontally then vertically** **2- Medical Team-1 of doctors and nurses ensures continuity of care**	**3- Housekeeping and sanitation staff help all teams** **4- Assembly area- Security Team does head count** **5- Search & Rescue Teams save any left behind staff** **6- Medical Team 2 awaits patients at assembly area -shift to referral facility/casualty as per command**

ROOM TEMPERATURE & HUMIDITY MONITORING SHEET

(MONTH: _____) **Department/Unit: _____**

Date	Morning Temp (°C) &Humidity in%	Time	Evening Temp (°C)& Humidity in %	Time	Remarks	Signature
01						
02						
03						
04						
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CLASSIFICATION OF LINEN

Dirty Linen

- Dirty linen is used linen, but not visibly soiled with blood or blood tinged body secretions

Soiled/infected Linen

- All linen which is contaminated with excreta, blood or body fluids or contaminated linen from a patient who is known or clinically suspected, to be infected with diseases like salmonella, Hepatitis A, B or C, open pulmonary tuberculosis, HIV etc

LINEN COLLECTION AND SEGREGATION

- All the patient linen including bed sheets, patient gowns needs to be changed daily
- All the linen of critical areas like OT and ICU etc. need to be changed daily
- The staff linen needs to be changed on weekly basis
- It is strongly recommended to change all the linen used in the hospital when visibly dirty or are soiled
- While collecting linen, care should be taken to ensure all sharps or patient equipment is removed
- Staff should wear appropriate PPE like heavy duty gloves, apron and mask during linen handling. Any skin lesions on hands should be covered
- Hand hygiene should be practiced after linen handling
- Linen needs to be collected in bags and trolleys and should not be placed on the floor or any other surfaces
- All the linen generated from patient care areas should be segregated into dirty and infected linen. Linen generated from different areas of the hospital needs to be collected in different colour coded trolleys

LINEN COLLECTION AND SEGREGATION

- Dirty linen needs to be collected in a **green coloured** trolley and soiled/ infected linen in **yellow coloured** trolley. The laundry management protocol of the hospital needs to include segregation guidelines for all the staff of the hospital
- To minimise aerosolisation of any organisms contaminating linen, linen should not be rinsed, shaken or sorted in the clinical area. The personnel should keep his/her hands away from face while handling linen
- The collected linen needs to be stored at a designated place i.e. in dirty utility of the area of generation.
- The attendant/Nursing Officer in-charge of the area needs to update the daily transaction register every time linen is collected from the area. The transaction register should include the details of the number of different types of linen items collected from the particular area. A separate register has to be maintained in different areas for the same.

TRANSPORTATION OF LINEN

- Linen collected from different areas of the hospital needs to be transported in the covered trolleys to the laundry
- Dirty and soiled/infected linen needs to be transported in separate trolleys
- A dedicated trolley for transportation of linen needs to be used and trolleys used for waste collection or any other purpose should not be used for transportation of linen
- During transportation it is to be ensured that the bags used for collection of linen are properly tied.
- In case of any spillage of the soiled linen during transport, the linen needs to be securely placed in the transportation trolley and cleaning of the surface is undertaken as per the spill management protocol of the hospital.

DISINFECTION AND SLUICING

This step is followed at laundry and not in the patient care areas:

The first step of processing of the soiled/ infected linen is disinfection and sluicing of the linen. All infected linen needs to be soaked in 0.5% bleaching solution for 30 minutes, then thoroughly rinsing.

SPILL MANAGEMENT

(Spill of blood/ body fluids)

1. **Small spills (<10 ml)** should be managed with one step procedure (Using 1% sodium hypochlorite solution). Use (personal protective equipment) PPE appropriate to the task. When sharps are involved use forceps to pick up sharps, and discard these items in a puncture resistant container
2. **Large spills (>10 ml):**

- Confine the contaminated area.
- Appropriate PPE should be worn for cleaning up a large spill. Household heavy duty gloves should be worn during cleaning and disinfecting procedures. If the possibility of splashing exists, the worker should wear a face mask and gown. Overalls gowns or aprons, boot/ protective shoe covers should be worn. Personal protective clothing should be changed if torn or soiled, and always remove before leaving the location of spill.
- The blood spill area must be cleaned of obvious organic material. The organic material should be first removed with disposable towels or paper and be discarded it in a yellow plastic waste bag.
- After removing organic material, the area should be covered with absorbable material such as paper or cloth and 1% sodium hypochlorite solution is poured over the spread and left for 10-15 minutes, then wipe and discard the material in a yellow plastic waste bag.
- After disinfection, thorough cleaning of the floor with soap and water/ any floor cleaner is necessary.
- The treated area should be cleaned and allow it to dry.
- Care must be taken to avoid splashing or generating aerosol during the clean-up.

If chlorine solution is not prepared fresh daily, it can be stored at room temperature for up to 30 days in a capped, opaque plastic bottle with a 50% reduction in chlorine concentration after 30 days of storage (e.g., 1000 ppm chlorine [approximately a 1:50 dilution] at day 0 decreases to 500 ppm chlorine by day 30).

SPILLAGE KIT:

Blood and body fluid spill kit contents:

- Workman's gloves x 2 pairs
- Apron
- Mask
- Shoe over or plastic bag to cover the shoes
- Absorbent material like newspaper or blotting paper
- Waste collection bag

Cleaning equipment – bucket, mop, cloths, and hypochlorite solution can be obtained from housekeeping and must be washed and disinfected appropriately after use

CHEMICAL SPILL MANAGEMENT

SPILL PREVENTION

Chemical spills can be prevented in the workplace by:

- Ensuring appropriate chemical containers are used with seals that are in good condition (i.e. glass containers for corrosive chemicals)
- Ensuring all chemicals are stored appropriately
- Provision of locked cupboards and storage areas
- Provision of drip trays or purpose built chemical storage cupboards/cabinets with inbuilt spill retention
- Storage of chemicals as per their respective Material Safety Data Sheets (MSDSs)
- Ensuring appropriate equipment and procedures are in place for chemical spill management
- For chemical spill management it is to be ensured by the hospital that it maintains and reviews the relevant MSDSs to ensure appropriate risk controls are in place for accidental spill. MSDSs should be no more than five years old from date of issue

CHEMICAL SPILL KIT

Spill kits needs to be provided and be readily accessible in relevant locations at the hospital.

A chemical spill kit should include the following items:

Absorbents:

- Universal Spill Absorbent: 1:1:1 mixture of Flor-Dri (or unscented kitty litter), sodium bicarbonate and sand. This all-purpose absorbent is good for most chemical spills including solvents, bases and acids (with the exception of hydrofluoric acid)
- Absorbent pads and rolls: ‘HazMat’ absorbent pads
- Acid Spill Neutraliser: Sodium bicarbonate, sodium carbonate or calcium carbonate
- Alkali (Base) Neutraliser: Sodium bisulphate, boric acid or oxalic acid
- Solvents/Organic Liquid Absorbent: Inert absorbents such as clay and sand
- PPE
- Hand protection: Chemical resistant safety gloves (i.e. nitrile gloves)
- Eye protection: Safety goggles
- Body protection: Laboratory coat/Corrosive apron

CHEMICAL SPILL KIT

- Foot protection: Enclosed footwear, shoe covers
- Respiratory protection: Dust mask/Respirator (All personnel should be properly fit tested before using a respirator)
- Clean-up material for spills can be obtained from housekeeping; including:
- Brooms, plastic dustpan and square mouth shovel to sweep up the absorbent material
- Paper towels for minor spills
- Plastic tongs/scoops to pick up contaminated absorbent material
- A chemical resistant bin with a close fitting lid to hold the volume of spill and absorbent residues prior to disposal
- Heavy duty plastic bags for wrapping contaminated PPE.

SPILL RESPONSE

Dangerous goods or hazardous substance spills should be cleaned up immediately, taking appropriate precautions for hazards of the material.

STEP 1 - Assess Safety and Stop the Source of the Spill

STEP 2 - Review Safety Precautions and Risk Controls

STEP 3 - Clean up the Spill Using appropriate PPE promptly cover the spill with absorbent material taking care not to spread the spill further.

STEP 4 - Notify the Appropriate Authority

STEP 5 - Restock the Chemical Spill Kit

Note: The chemicals should be treated as per manufacturer’s instructions before disposing off the same into municipal drainage system

MERCURY SPILL MANAGEMENT
Suggested steps for mercury spill clean-up:

- Evacuate area & cordon off the area
- Use personal protective equipment (PPE)
- Remove ring/jewelry (mercury binds with the metal).
- Locate mercury beads: Locate all mercury beads and look for mercury in any surface cracks or in hard-to-reach areas of the floor. Check a wide area beyond the spill. Use the flashlight to locate additional glistening beads of mercury that may be sticking to the surface or in small cracked areas. Cardboard sheets should be used to push the spilled beads of mercury together'.
- Use syringe without a needle/eyedropper and sticky tape: A syringe (without a needle) shall be used to suck the beads of mercury. Collected mercury should be placed slowly and carefully into an unbreakable plastic container/glass bottle with an airtight lid half filled with water. After removing larger beads, use sticky tape to collect smaller hard-to-see beads. Place the sticky tape in a punctured proof plastic bag and secure properly. Commercially available powdered sulfur or zinc stains mercury a darker colour and can make smaller beads easier to see (powder sulfer may be used because (i) it makes the mercury easier to see since there may be a colour change from yellow to brown and (ii) it binds the mercury so that it can be easily removed and suppresses the vaporization of any missing mercury).
- Collection in leak-proof bag or container: Place all the materials used during the clean-up, including gloves, mercury spills collected from the spill area into a leak-proof plastic bag or container with lid and sealed properly and labelled as per these guidelines and such collected waste should be stored in a designated area only.
- Cleaning of the floor surfaces contaminated with mercury and cleaning of room surfaces: Sprinkle sulphur or zinc powder over the area. Either powder will quickly bind any remaining mercury. In case, zinc powder is used, moisten the powder with water after it is sprinkled and use a paper towel to rub it into cracks in the flooring. Use the cardboard and then dampened paper towels to pick up the powder and bound mercury. Place all towels and cardboard in a plastic bag and seal all the bags that were used and store in a designated area.
- All the mercury spill surfaces should be decontaminated with 10 % sodium-thiosulfate solution. Keep a window open to ventilate after the clean-up. After ensuring all the mercury has been removed, resume normal vacuuming and utilise the cleaned area for routine operation
- Labelling: All the bags or containers containing items contaminated with mercury should be marked properly and labelled as per these guidelines
- To inform the higher authority for further disposal through CBWTF

Guidelines for Sterilization & Disinfection

Zone	Activities	PPE Use	Documents Required
Receiving Area (Soiled Zone)	Collection of Used instrument-Transportation to CSSD	Full PPE: Gloves, apron, face mask, goggles, and boots	-Material receiving register -various instruments/ sets pack content checklists
Cleaning Area Decontamination Zone)	Cleaning & Decontamination of instrument (manual or mechanical)	Full PPE: Waterproof apron, Heavy-Duty-Gloves, face mask, goggles/ face shield, and boots	-Decontamination records -Instrument cleaning checklist -SOPs for Cleaning -Cleaning methods chart
Inspection, Assembly, and Packing Area (Clean Zone)	Inspection of clean instruments, assembly, and packing for sterilization	Hairnet, mask, gloves (Sterile), gown (optional depending on risk).	-Assembly checklist -List of items that can be re-used along with number of items it can be re-used -Instrument integrity check records -Packing protocols
Sterilization Zone (Sterile Zone)	Sterilization of packed instruments in autoclave or other sterilization methods	Hairnet, mask, gloves (Sterile), gown	-Sterilization records -Autoclave parameters log -Maintenance records for sterilizers
Storage Area (Sterile Storage Zone)	Storage of sterilized instruments, ensuring sterility until use	Hairnet, mask, gloves (Sterile), gown	-Inventory register -Expiry date tracking log -Sterility check records
Dispatch Area (Dispatch Zone)	Dispatch of sterilized materials to different hospital areas	Hairnet, mask, gloves (Sterile), gown	-Dispatch register -Transport log -Delivery Checklist
Quarantine Area	Holding area for materials awaiting sterility checks or results	Hairnet, mask, gloves (Sterile), gown	-Quarantine record -Sterility testing records

Spaulding Class (Level of Processing)

Spaulding Class (Level of Processing)	Definition	Sterilization Process/ Disinfectants	Strength (Contact Time/ Processing Time)	Examples of Instruments/ Devices
Critical (Sterilization)	Instruments entering sterile tissue, the vascular systems, or any part of the body with high infection risk)	-Ethylene Oxide (ETO) -Steam Sterilization (Autoclave) -Hydrogen Peroxide Plasma	ETO (1-4 Hrs) Steam: High Temperature (30 mins)	-Surgical Instruments -Implants -Cardiac Catheters -Prosthetics -Biopsy Instruments
Semi-Critical [High-level disinfection (HLD)]	Instruments contacting mucous membranes or non-intact skin but do not penetrate them.	-Glutaraldehyde (2%) -Hydrogen peroxide (6-7.5%) -Peracetic Acid (0.2%) -OPA (Ortho-phthalaldehydes)	Glutaraldehyde:2% (20 mins) Hydrogen peroxide: 6-7.5% (30 mins)	- Endoscopes - Respiratory therapy devices - Vaginal specula - Laryngoscopes - Tonometers
Non-Critical (Low-level disinfection)	Instruments or surfaces contacting intact skin but not mucous membranes	-Quaternary ammonium compounds (QACs) -Sodium Hypochlorite (1:100 dilution) -Alcohol (70%)	QACs (10 mins) 0.5-1% Sodium Hypochlorite (10 mins) 70% isopropyl alcohol (1-2 mins)	-BP cuffs, Stethoscopes, Bedpans, ECG Electrodes, Oximeters, Bedside tables, Bed rails, Patient furniture, Bed Pans, Urinals, Computers

Steps of instrument reprocessing

The six recommended steps of instrument reprocessing are listed as follows:

- Transportation of instruments/equipment
- Cleaning of instruments and equipment
- Packaging
- Disinfection of the instruments/equipment
- Sterilization
- Storage and issue

Pearls of Wisdom

- Cleaning is the first and most crucial steps in the reprocessing of medical devices
- Avoid drying of the instruments after use
- Safe transport & minimize risks to CSSD personnel
- Cleaning agents should contain multiple enzymes, such as protease, lipase, and amylase, while maintaining a neutral pH
- Appropriate cleaning brushes must be used to avoid damage to the instrument
- PPE FOR STAFF PERFORMING CLEANING: Waterproof gown, hair cover, face visor, closed footwear, and heavy duty gloves

Disinfection

Low Level

- Targets vegetative bacteria, certain fungi, and enveloped viruses
- For non-critical medical equipment/ devices and environmental surface
- 3% H_2O_2, 0.5% accelerated H_2O_2, QUATS, Phenolic Compounds and diluted Sodium Hypochlorite (Bleach) solution

Intermediate

- Active against vegetative bacteria, mycobacteria, fungi, and most viruses. Not effective against spores after prolonged use
- Ethanol, isopropyl alcohol 60-80%

High-level

- Eliminates vegetative bacteria, enveloped and non-enveloped viruses, fungi, and mycobacteria and may also eliminate a small number of bacterial spores
- 2.45% Glutaraldehyde, 6% H_2O_2, 0.2% Peracetic Acid, 7% accelerated H_2O_2, and 0.55% ortho-phthalaldehyde (OPA)

Sterilization

Features	Steam	ETO	Plasma
Principle	Uses saturated steam under pressure to denature proteins and destroy microorganisms, including spores.	Uses ethylene oxide gas to alkylate the DNA and proteins of microorganisms, causing cell death.	Uses vaporized hydrogen peroxide and low-temperature plasma to generate reactive radicals that destroy microorganisms.
Operating Parameters	Temperature: 121-134°C Pressure: 15-30 psi Exposure Time: 15-30 Minutes (depending on load)	Temperature: 37-63°C Humidity: 30-60% Exposure Time: 1-6 hours Aeration: 8-12 hours	Temperature: 45-55°C Exposure Time: 45-75 minutes Low-pressure environment (plasma phase)
Quality Control	Biological Indicators (Bls): Bacillus stearothermophilus spores (weekly) Chemical Indicators (Cls): Class 1, 4, or 5 indicators in every load and pack as applicable. Bowie-Dick Test (daily) for air removal in vacuum-assisted autoclaves.	Biological Indicators (Bls): Bacillus atrophaeus spores (with each cycle) Chemical Indicators (Cls) in each load	Biological Indicators (Bls): Geobacillus stearothermophilus spores (with each cycle) Chemical Indicators (Cls) with each load

Sterilization

Features	Steam	ETO	Plasma
Items Sterilized in Hospital	Surgical instruments Textile wraps Metal trays Heat-stable items	Complex medical devices Plastic\rubber Instruments Heat-sensitive medical equipment Electronics	Endoscopes Cameras Heat-sensitive devices Fiber-optic devices Electrical equipment
Items Not Sterilized in Hospital	Heat-sensitive devices Plastics that deform at high temperatures	Liquids Materials that absorb ETO Devices containing heat-sensitive electronic components	Liquids Large lumen instruments Fabrics and paper

Sterilization

Features	Steam	ETO	Plasma
Advantages	Fast and effective Non-toxic Low cost Can handle large loads	Effective for heat-sensitive devices Penetrates complex devices Does not damage delicate instruments	Safe for heat- and moisture-sensitive instruments Shorter aeration time than ETO Low temperature No toxic residue
Limitations	Cannot be used for heat-sensitive instruments May cause corrosion or damage to delicate instruments	Long aeration time (8-12 hours) Highly toxic gas Requires special handling and safety measures	Limited penetration in lumens Cannot sterilize liquids or fabrics Higher cost than other methods
Costs	Low operational cost Equipment cost: Moderate	High operational cost (gas, safety measures) Equipment cost: High	High operational cost Equipment cost: Very high

Classification & Characteristics of chemical indicators in CSSD

Type of Chemical Indicator	Purpose/ Characteristics	Examples
Type 1: Process Indicator (External Indicator)	Used to differentiate processed from unprocessed items	Autoclave tape, Indicator label, Heat Sensitive ink
Type 2: Indicators for Specific Tests	Air Removal in Pre-vacuum sterilizers	Bowie-Dick Test Pack Helix Test Device
Type 3: Single Parameter Indicator	Reacts to a single sterilization parameter (e.g. temperature)	Temperature Sensitive Indicator strips, Steam Sensitive Indicator dots
Type 4: Multiparameter Indicator	Reacts to two or more critical parameters (e.g., temperature & time)	Multi-parameter indicator strips Chemical integrator cards
Type 5: Integrating Indicators	Reacts to all critical parameters (e.g., temperature, time and sterilant presence).	Steam integrator strips ETO integrator strips
Type 6: Emulating Indicators	Designed for specific sterilization cycles. Monitors all critical parameters to ensure cycle completion	Cycle-specific indicator strips (for steam or low-temperature sterilization)

Biological indicators in CSSD

- Gold Standard for verifying sterilization efficiency
- Geobacillus Stearothermophilus for Steam and Hydrogen peroxide (Plasma) (incubation at 56 Degree C)
- Bacillus Atrophaeus for ETO & Dry Heat (Incubation 35-37 Degree C)
- Types: Spore Strips, Self-contained BIs, Electronic Bis (rapid Bis).
- Recall policy in case of an event of positive Bis
- Bis in Process Challenge Devices for better outcomes
- Quarantine the implant load until BI result is negative

Sterile Storage and Instrumentation

Audit Point	Options	Score
Written policies for sterile storage (including stock rotation and labeling).	Not available (0) / Partially available (5) / Fully available (10)	/10
Sterile storage area temperature and humidity Maintained (18-24°C, RH <70%).	Not controlled (0) / Partially controlled (5) / Fully controlled (10)	/10
Items stored at appropriate height (20-25 cm above floor, 45 cm below ceiling).	Not done (0) / Occasionally done (5) / Always done (10)	/10
Packaging visually inspected for damage and expiry date before use.	Not done (0) / Occasionally done (5) / Always done (10)	/10
First In First Out (FIFO) method used to rotate stock.	Not done (0) / Occasionally done (5) / Always done (10)	/10
Records and registers for sterile storage (e.g., stock rotation logs, expiry tracking).	Not maintained (0) / Partially maintained (5) / Fully maintained (10)	/10
Total Section E		/60

MAINTAINING STERILITY

Proper storage conditions are essential to maintain the integrity of sterilized items. Thus healthcare settings should have procedures for storage and handling of clean and sterile medical equipment/devices that include:

- The end-user should check the integrity of the package before use
- Sterile medical equipment/devices should be used before the expiration date
- Stock should be rotated, so that oldest stock can be used first
- Sterility should be maintained until used
- Sterile packages that lose their integrity should be re-sterilized prior to use
- Equipment/devices should be handled in a manner that prevents recontamination of the item.

MONITORING OF STERILISING PROCESS

Quality control parameters for the sterilization process which also serve as a checklist for the sterilization department includes:

- Load number
- Load content
- Temperature and time exposure record chart
- Chemical indicator testing (with each load)
- Biological Indicator testing (at least weekly) Regular maintenance of sterilization equipment should be performed and documents should be maintained

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