PCS-ORNAP-PSIS

THE PHILIPPINE OPERATING ROOM GUIDELINES AND RECOMMENDATIONS

COVID-19 EDITION

2020

OPERATING ROOM GUIDELINES & RECOMMENDATIONS IN THE PHILIPPINES

COVID EDITION

2020

Cover Design by **Lu Darnel S. Pusung**

VISION

A globally-recognized organization of surgical specialists dedicated to ensuring the highest standard of care.

MISSION

1. Provide opportunities for training, continuing surgical education and research.
2. Implement value-innovative strategies geared towards membership development and benefits.
3. Establish and maintain strategic local and international alliances.
4. Ascertain the availability and adequacy of surgical manpower throughout the country.

CORE VALUES

VALUING EXCELLENCE IN SURGICAL CARE

KEY RESULT AREAS

1. Surgical Education/Training/Research
2. Membership Development
3. Strategic Alliances
4. Patient Care
5. Governance/Administration
6. Corporate Social Responsibility

periOPERATIVE REGISTERED NURSES
ASSOCIATION OF THE PHILIPPINES, (ORNAP) INC.

LIFE PURPOSE

To promote the highest professional standard of Peri-operative Nursing

VISION STATEMENT

We envision ourselves as an organization of competent and dynamic peri-operative nurses committed to innovation and provision of optimum peri-operative services locally and internationally.

MISSION STATEMENT

We commit to:

1. Develop/cultivate the highest professional standard in peri-operative nursing through education and research activities.
2. Collaborate with health care partners and other associations for development and training.
3. Sustain a harmonious professional relationship among members.
4. Enhance value centered decision making strategies.

Philippine Surgical Infection Society

The Philippine Surgical Infection Society is a fledgling organization of surgeons and surgical nurses whose primary advocacy is infection prevention and control in surgery. Established in 2018, the Society has embarked on numerous educational activities in order to spread awareness of the global threat of increasing antimicrobial resistance, and disseminate guidelines in the prevention of surgical site infections. This advocacy was put on the spotlight in 2020 when the COVID pandemic erupted in the country – this time, it was not only surgical site infections that had to be dealt with, but more so, the risk of the surgical team contracting the coronaviral infection. With improved dissemination and widespread implementation of infectious guidelines and protocols, and surveillance of compliance and infectious outcomes in surgeries, the PSIS aims to ensure that surgery is as safe as it can be, and infections in surgery be prevented.

Message

On the occasion of the publication of this latest update to the PCS-ORNAP Manual, I congratulate the periOperative Registered Nurses Association of the Philippines (ORNAP), our partners through the years in all the Operating Rooms across the country, and the Surgical Infection Committee of the PCS for once again producing another manual of recommendations for the safe delivery of surgical and nursing care within the OR complex especially during this time of the pandemic when the need for clear guidelines and directions are needed. This will be an essential reference for the creation of sound institutional policies as regards operating theaters.

So on behalf of the Board of Regents of the Philippine College of Surgeons, I send my heartfelt felicitations to both the ORNAP and the Committee on Surgical Infections for once again providing valuable material for our healthcare workers. Continue to provide the necessary information based on clear scientific evidence to all surgeons and OR nurses and we wish you all continued blessings and success.

Warm regards!

JOSE ANTONIO M. SALUD, MD, FPCS
President
Philippine College of Surgeons

Message

The periOperative Registered Nurses Association of the Philippines, (ORNAP), Inc. together with Philippine College of Surgeons (PCS) and Philippine Surgical Infection Society (PSIS) successfully revised this manual, which aims to update and fit the recommended practices in the current situation. The manual is packed with knowledge and evidence-based practices. This masterpiece allows every practitioner to learn, relearn and unlearn things. The contents of the manual communicate answers to the queries, find solutions to the problems, bridge the gap among healthcare practitioners and enable to align and realign the obsolete practices to evidence - based one. It is my hope that through this manual, every perioperative practitioner becomes a catalyst of change and influences every team member to deliver safe and quality care. To quote from former US President Barack Obama "Change will not come if we wait for some other person or some other time. We are the ones we've been waiting for. We are the change that we seek". This is the moment, and the right time to introduce and embrace change, whatever our role in perioperative setting. Change must start in us and must be competently applied through broad knowledge (caput) and psychomotor skills (manus) and exhibits professional attitude (cor) in the practice of perioperative nursing, indeed excellent perioperative care is achieved.

GABRIEL F. NAIG, RN, MAN
President
periOperative Registered Nurses Association
of the Philippines, (ORNAP) Inc.

Foreword

The year 2020 is year like no other. It started with a bang , with a volcanic eruption, which was soon followed by a long, ongoing, period of community quarantine due to the COVID -19 pandemic, and a slew of natural calamities that has wrought havoc in the lives of Filipinos. Yet, resilient as we are, we find the silver lining even in the darkest of hours. The COVID 19 pandemic has thrust the spotlight on infection prevention and control. Many of the health protocols that are in place to prevent COVID transmission are also consistent with surgical site infection guidelines. All of a sudden, EVERYONE, not just healthcare workers, is made aware of protocols to prevent transmission of disease. This year has been most opportune in promoting advocacy in infection prevention and control; hence, the creation of this Operating Room Manual COVID -19 edition, which contains updated recommendations and guidelines developed to respond to the challenges of the pandemic. We do realize that the evidence is still evolving, and some of the recommendations may need updating as more data emerge.

We salute all the brave healthcare workers who have worked tirelessly during this pandemic in spite of so many unknowns, placing their own lives, and that of their loved ones, in jeopardy. This is also dedicated to our dear fallen colleagues who succumbed to COVID 19. Let us pray that we shall all be kept safe, as we adhere to these protocols, until the end of this pandemic.

Let us all be up to the BETTER NORMAL.

ESTHER A. SAGUIL, MD, PhD, FPCS
Chair, Committee on Surgical Infections
President, Philippine Surgical Infection Society

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I. Physical Setup Recommendations

A. Traffic Pattern in the Operating Room Complex

Traffic control patterns define movements in and out of the operating complex and the movements within the operating room. Clearly defined and enforced **traffic control** practices protect personnel, patients, supplies, and equipment from potential sources of cross-contamination, safeguard the privacy of patients, and provide security.

Areas of the Operating Room Complex

The operating room complex should be divided into three designated areas that are defined by the physical activities performed in each area. These are the unrestricted area, semi restricted area and restricted area.

Designated Area	Function/Description	Proper Attire
Unrestricted	A central control point that is established to monitor the entrance of patients, personnel, and materials. Traffic is not limited.	Street clothes are permitted.
Semi restricted	Peripheral support areas of the surgical suite. It has storage areas for clean and sterile supplies, work areas for storage and processing of instruments, scrub sink areas, and corridors leading to the restricted areas of the surgical suite. Traffic in this area is limited to authorized personnel and patients.	Surgical attire Cover all head and facial hair.
Restricted area	Operating rooms, procedure rooms, and the clean core area.	Surgical attire Hair coverings are required. Masks are required where open sterile supplies or scrubbed persons are located.

Movement of personnel from unrestricted areas to either semi restricted or restricted areas should be through a transition zone. A transition zone is an area where one can enter in street clothing and exit into the semi restricted or restricted zone in surgical attire. Locker rooms serve as transition zones between the outside and inside of a surgical suite and may serve as a security point to monitor people admitted to the suite.

An **administrative center** is established to keep track of the number and identity of personnel within the suite at any time. The control point may be in the semi-restricted or unrestricted area. It is adjacent to the clothes-changing areas to aid in monitoring entrance and egress of personnel. To minimize interruptions during surgery, this point may be used for collecting messages and transmitting information between the surgical team and outside areas.

Persons entering the semi restricted or restricted areas of the surgical suite for a brief time for a specific purpose (e.g., parents, phlebotomist) should cover all head and facial hair and may don either freshly laundered surgical attire or a single-use coverall suit such as observer's gown, designed to totally cover outside apparel.

Movement of Patients

- Patients entering the surgical suite should wear clean gowns, be covered with clean linens, and have their hair covered to minimize particulate shedding during surgical procedures.
- Under usual conditions, patients are not required to wear masks while in the surgical suite unless they are under airborne precautions (e.g., a patient with active pulmonary tuberculosis or other airborne respiratory disease). However, in view of the Covid 19 pandemic, all are required to wear masks, except for children under 2 years of age, or those who are otherwise unable to tolerate its use.
- Personal undergarments may be worn when they will not interfere with the surgical site.
  Consideration should be given for management of potential incontinence. Many health care organizations now allow certain patients to wear clean personal clothing, including socks and underwear, into the surgical suite to promote the patient's comfort and sense of dignity.
- The patient is transported to the surgical suite on a cart or bed that has been cleaned prior to transport.
- Movement of patients to through and from the surgical suite should be along the most direct route that prevents cross contamination. Whenever possible, the traffic patterns for the transport of awake patients avoids areas where noxious sights, sounds, or smells may increase their anxiety.
- Transfer of the patient to a clean ''inside" cart upon entry to the semi- restricted area of the suite is optional, depending on patient conditions and suite design. There are insufficient data to support transferring patients from outside to inside carts. This practice does not appear to be a significant infection control measure and may pose safety hazards for surgical patients.

Movement of Personnel

- Movement of personnel should be kept to a minimum while procedures are in progress.
- Doors to the operating or procedure rooms should be closed except during movement of patients, personnel, supplies, and equipment.
- Traffic in and out of the operating room should be minimized through pre-planning. Air turbulence from such activities will be minimized, especially during the procedures or when sterile supplies are opened. Air is a potential source of microorganisms that can contaminate surgical wounds. Because microbial shedding increases with activity, greater amounts of airborne contamination can be expected with increased movement of surgical team members.
- Talking and the number of people present should be minimized during procedures. An increase in airborne microorganisms can occur with an increased number of people present. Movement, talking, and uncovered skin areas can contribute to airborne contamination.
- Adherence to the traffic control plan should be strictly implemented. However, emergency situations such as life-threatening conditions, fire and safety hazards may necessitate modification in traffic control practices.

Movement of Supplies and Equipment

The movement of clean and sterile supplies and equipment should be separated from contaminated one by space, time, and traffic patterns.

- Cleanliness and sterility of supplies prepared for surgical procedures outside the operating room complex (e.g., in central processing) should be maintained during transport to the surgical suite. Protecting items from contamination, physical damage, and loss during transportation ensures safety for patient use.
- Supplies and equipment should be removed from external shipping containers and boxes in the unrestricted area before transfer into the restricted area. External shipping containers and boxes may collect dust, debris, and insects during shipment and may carry contaminants into the surgical suite.
- When there is a clean core area, the movement of supplies should be from the clean core through the operating or procedure room to the peripheral corridor.
- Soiled supplies, instruments, and equipment should not re-enter the clean core area. They should be contained in closed or covered carts or containers for transport to a designated decontamination area.

- The decontamination area and soiled linen and trash collection areas should be separated from personnel and patient traffic areas to decrease the risk of infection.
- If instruments and other supplies are partially or totally reprocessed within the suite, the traffic pattern for these items is in one direction, from decontamination area to processing, and storage. Work areas for each task should be clearly defined to eliminate cross-over or mixing of contaminated and clean supplies.
- Sterile supplies are stored on separate shelves from clean non-sterile supplies to prevent inadvertent use of a non-sterile item.
- Storage conditions are maintained to minimize dust, moisture and insect contamination.
- Supplies are carefully arranged so that whenever possible the stock allotment of an item is kept in one location.
- The storage of supplies inside the operating rooms is kept to a mini- mum since these are a source of dust and dirt accumulation. Items that are likely to be used in several rooms at one time should be stored in a central area.
- Supplies and equipment are stored as close to the point of use as possible to facilitate retrieval and aid in maintaining traffic patterns.
- Equipment from outside the surgical suite, such as x-ray machines, compressed gas cylinders and new furniture are damp dusted with an appropriate agent in the unrestricted area before being brought into the restricted zones.

Policies and Procedures for Traffic Patterns

There should be a hard copy of policies and procedures for operating room traffic pattern in every operating complex at all time. These should be reviewed periodically and revised as necessary, preferably every other years or as needed. Policies and procedures aid in establishing authority, responsibility, and accountability and serve as operational guidelines.

Information on traffic patterns and methods of handling supplies and equipment should be included in the orientation and continuing education of personnel to assist in the development of knowledge, skills, and attitudes that affect surgical patient outcomes.

Reference:
AORN Perioperative Standards and Recommended Practices 2014 Edition

B. Recommended Practices for Operating Room Sanitation

Ensuring that the Operating Room remains properly sanitized is essential in its operation. This is to prevent surgical site infection as well as cross-infection between individuals inside. No other time has made this relevant than the 2020 COVID-19 pandemic. In this revised edition, we will be tackling strategies to efficiently clean an operating room for use as well as take a second look at technologies that appear to have been resurrected because of the pandemic such as Ultraviolet-C (UV-C) light and air purifiers with high efficiency particulate air (HEPA) filters.

Operating Room Sanitation

It is imperative to emphasize that OR sanitation is closely related to surgical site infection prevention. As such, the following are recommendations in cleaning and sanitizing the OR:

- People responsible for environmental cleaning should be educated in OR decorum, hospital protocols, biohazard precautions and health sanitation standards. They should always wear proper personal protective equipment whenever they clean the OR.
- Checklists should be created to facilitate consistent and thorough cleaning of the OR. Documentation records should be kept to maintain standards as well as to aid in future investigation and research.
- Cleaning schedules should be created and followed. It is recommended to have cleaning protocols: before the first case of the day, before and after each procedure, at the end of the last case of the day and a weekly comprehensive cleaning .
- It is recommended to have cleaning equipment and supplies dedicated to the OR. It is also recommended to use clean, fresh cleaning materials and cleaning solutions (floor mops, cloth wipes, sponges etc.) for each cleaning session.
- There is no specific recommendation on the kind of cleaning agent (detergents and disinfectants) to be used as there are many options available. However, it is recommended that these agents be environmentally nontoxic, be used properly, safely and thoroughly to maintain a high standard of sanitation inside the OR.

- It is recommended that there be a schedule (weekly, bi-weekly, or monthly) for proper disassembly and thorough cleaning of different patient care equipment such as but not limited to: OR light sources, suction machines, anesthesia machines, electro-surgery units, endoscopic or laparoscopic towers, patient warmers, etc. It is important not to miss disinfecting easily forgotten objects such as trolley caster wheels, baseboards, backsides of equipment, etc.
- It is recommended that high touch (light switches, door knobs, etc.) and low touch (walls, shelf lining, etc.) components of the OR are identified and disinfected as indicated by institution protocols. It is also recommended that cleaning start from the room periphery going towards the center which is always the patient bed/ OR table. The entire OR must be visibly clean before each case.
- It is recommended that unnecessary equipment and supplies be kept out of the OR especially when it is occupied for a procedure.
- It is recommended that each institution have protocols for sanitizing and possibly sterilizing equipment, appliances and supplies brought in from outside the OR complex.
- Biologic waste should be handled and disposed according to hospital standards and Philippine regulations. Equipment, surfaces and appliances contaminated by biologic material should be immediately disinfected and be visibly clean before starting another procedure.
- It is recommended that items intended for single use be not reprocessed for use on another patient; instead these should be disposed according to hospital standards and Philippine regulations.
- Sharps should be handled cautiously and be collected in a non-permeable container for proper disposal. The sharps container should be regularly replaced to prevent overflowing or puncture of the container. It is recommended that a needle stick injury protocol should be in place.
- Drapes, linen, surgical gowns, table covers and similar items should not be handled roughly so as to possibly generate aerosolized biologic infectious material. These should gently placed in proper receptacles for reprocessing or disposal.

- It is important to remember that people, whether members of the healthcare team or the patient are all potential vectors for infectious agents and originators of grime inside the OR. Proper OR decorum, compliance to OR traffic and protocols should be observed to keep the OR optimally sanitized during the procedure.

- There should be set protocols for cleaning the OR after a highly infectious patient has occupied it. It is recommended that the OR be more meticulously disinfected after such a procedure, using approved disinfecting agents .

- Spraying disinfectant into the air should be avoided while the room is occupied; this may lead to aerosolization of infectious particles. Commercially available room misting devices may be used after the room is cleaned and unoccupied.

- Cleaning materials and equipment as well as utility areas/sinks where these are washed and stored should be cleaned and sanitized regularly.

Ultraviolet-C light

Ultraviolet-C light has the shortest wavelength (100-280nm) among the three classes of ultraviolet light. It also has the strongest germicidal capability among the three and has been safely used in laboratory and clinical settings for many decades. UV-C light energy creates pyrimidine dimers in microbial DNA or RNA in the case of many virus, effectively killing them. It is considered as an adjunct to mechanical cleaning with the use of environment-friendly effective disinfectants. To use them efficiently in the operating room, the following guidelines are suggested:

- Ultraviolet-C light exposure may lead to skin irritation or eye problems like photokeratitis, so the operator must have appropriate protection such as long sleeved gowns, gloves, and UV blocking eye protection.

- To lessen the possibility of health complications, it is better to purchase a UV-C lamp with a remote controlled switch or plug it into a remote controlled electric socket. Any technology such as timers, movement sensors or autonomous robotics that lessen human exposure are also advantageous. No one should enter the room where the UV light is turned on.

- As with all light sources, objects in front of the UV-C light will cast shadows and any microbe in these shadows are not irradiated. Hence, it is recommended to reposition the UV-C lamp inside the room several times to maximize exposure.
- It is recommended that UV-C lamps be used as the last step in sanitizing the operating room after cleaning and wiping down with disinfectant. A disorderly room will cast many shadows and biologic residue may shield microbes from the full effect of UV-C.
- It is recommended that UV-C dosimeters be used to gauge the energy output efficacy of the UV-C lamp and allow for efficient time management. Deactivation levels of SARS-COV2 is around 25mj/cm^2, Staphylococcus aureus at 50mj/cm^2, Clostridium sp. at 100mj/cm^2 and powerful UV-C lamps can achieve this in just one to two minutes.
- Many UV-C lamps also produce ozone (O^3) which although is an effective germicidal agent, is also a pulmonary irritant. It is therefore recommended to ventilate the room for several minutes after UV-C exposure before using.
- In the near future, when it is readily available, far UV-C light (222nm wavelength) may be safely used while people are inside the OR.
- It is essential to keep the UV-C lamp bulbs clean to maximize output and efficiency.

Air Filtration and Treatment

The Department of Health, in several of its memos emphasize adequate air ventilation[ii] in light of the COVID19 pandemic but has not specified how it is to be quantified for the operating room. The United States Centers for Disease Control has long recommended that there should be at least 15 air changes per hour[iii] (ACH) to decrease infection in healthcare settings and has recommended that air treatment with HEPA filters be standard in the operating room.[iv]

A HEPA filter theoretically filters out 99.97% of particulates equal to larger than 0.3µm; an Ultra-Low Particulate Air (ULPA) filter sieves out 99.99% of particulates equal to or larger than 0.1µm. The latter filter is newer and more expensive but there are currently no studies

validating that it is significantly better than HEPA in preventing surgical site infections or cross-infection among room occupants.

One argument against the futility of an air filtration system is that the SARS-COV2 is approximately 0.04μm to 0.014μm in diameter, and in theory can pass through a HEPA or even ULPA filter. Several counter arguments for this are: the SARS-COV2 virus will most likely be expressed via droplets which are larger than 0.3μm; that sub-micron particles such as aerosol particles or a naked virus often follow Brownian motion dynamics and hence are likely to be captured even by a HEPA filter; many other microbes which cause surgical site infection and potentially infectious to other room occupants are big enough to be effectively captured by HEPA filters.

Operating rooms should ideally have a positive pressure airflow wherein clean air is generated inside and pushes out of the room. The COVID19 pandemic has brought to light the importance of a negative pressure operating room wherein room air is sucked out through a filter and is either reprocessed or disposed to the outside environment, greatly reducing the chance of cross-infection between a potentially infected patient and surrounding people.

Air sanitation is as much as an engineering problem as a medical one, and should involve the appropriate personnel in addressing these issues. The following are recommendations to manage air circulation inside the operating room:

- Whenever possible, it is recommended that the operating room be connected to the centralized air conditioning system and be fitted with HEPA filters or higher upon entry of air into the OR.
- Ideally, there should be 12-15 ACH inside the OR.
- If the OR does not have a centralized air treatment and relies on conventional window type or split type air cooling appliances, one or several portable air purifier units with HEPA filter or higher may be used. Preferably, said units be able to treat 300-800 ft^3/min or air to achieve a minimum of 12 ACH for the entire room.
- The use of portable air purifiers with an additional UV-C light are not recommended. These lamps are generally too weak to cause

germicidal effects in a high flow situation. Even when large UV-C lamps are installed inside the air ducts, their effect on infection prevention remains questionable such that the US CDC currently does not recommend it for this purpose.

- Laminar air flow systems in the operating room may be beneficial especially in procedures involving implants.[v] However laminar air flow is theoretically very difficult to achieve inside an OR because of all the movement inside causes turbulence hence negating laminar flow.
- It is important that the OR doors remain closed and personnel movement in and out of the theater are limited. This is to preserve ideal air circulation patterns and prevent cross-contamination.
- It is recommended that for highly infectious patients with droplet or airborne transmission precautions, procedures be done inside a negative pressure OR with an ideal pressure differential of -2.5 Pa. In the absence of a negative pressure OR, the room air may be ventilated to the outside environment after being passed through a HEPA filter.[vi]
- It is recommended that there be a regular schedule (monthly or semi-annually) for preventive maintenance as well as disassembly and thorough cleaning of air handling units, air conditioning units, ventilators and portable air-purifiers.

Cleaning, Disinfection

- For unused instrument packs placed inside the COVID OR: if soiled, consider as used and follow steps for post-operative cleaning; if unsoiled, expose to UV-C light per side, at ten (10) minutes each or send back for resterilization.
- Room Cleaning and Disinfection
    - Room shall be cleaned by the janitorial services postoperatively, wearing proper PPE and using appropriate cleaning and disinfection supplies.
    - After the room is mechanically-cleaned, UVC light disinfection may be used as an adjunct for sterilization. Staff is prohibited to enter the room while this is ongoing and during aeration.

- Turnaround Time
  - Turnaround time shall be monitored. Due to meticulous disinfection. this is expected to be in the range of one to two hours depending on individual circumstances.

References:

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C. Guidelines on Disinfection and Sterilization

Details on endoscope and laparoscope cleaning:

- Need for a negative pressure room for established COVID-19 PCR positive patients, those with lung CT scan findings of interstitial pneumonia with a probability of COVID-19 and / or patients high risk of COVID-19 based on PSMID interim guidelines

- Standard or enhanced PPE is imperative for every member of the surgical team taking care of the COVID-19 positive and suspect patient. These include Goggles, Face Shield, PAPR, Hazmat suits, double gloves, shoe covers. Proper Donning must be maintained, with a Donning Quality officer.

- Immediately after each use and to prevent residual proteins from drying on instruments, instruments should be fully immersed in appropriate neutral-pH cleaning and disinfecting solution recommended for reprocessing of laparoscopic surgical instruments.

- Closely follow the cleaning and disinfectant manufacturer instructions for chemical concentration and ime recommendations. Plain water washing is not considered adequate.

- It is recommended that fresh solutions be used every day. Higher concentration and prolonged immersion time may cause corrosion or other damage to the instruments. Always avoid overnight or weekend holding or soaking.

- Instrument jaws and ratchets must be in open position to avoid damage during the sterilization heating and cooling process. Always follow the autoclave manufacturer instructions and recommendations. For autoclaving, place the instruments in a suitable container or sterilization tray. Cutting edges and tips of instruments should always be protected with a soft cloth.

- After autoclaving allow all components cool down to room temperature. Sudden changes in temperature may cause damage to the instruments.

- Place the pre-cleaned instrument in a transparent aseptic package. It is recommended to cover tips and cutting edges of instruments to avoid perforation of the packaging. Follow the instruction manual of the manufacturer of the gas sterilization equipment and observe domestic health care regulations. Allow sufficient time for ventilation to remove toxic residues.

- To protect everyone from unnecessary exposure, biohazardous waste must never be disposed of together with regular waste. Separate color coded bags should be used specifically for this purpose.

- Do not overfill biohazard waste containers; do not try to compact waste inside the container

- Sharps (needles, syringes, scalpel, blades, Pasteur pipettes, and broken glass) contaminated with biohazardous material are to be collected in puncture-proof biohazardous waste containers. Needles should not be bent, sheared, recapped, removed from the syringe or placed in regular garbage.

- Biohazardous waste that has been autoclaved can be disposed of as regular garbage. Place the autoclave bag inside a regular garbage bag and seal the bag.

- Make sure all waste containers are sealed properly to avoid contamination outside the working area once the containers are being picked-up.

Recommended Guidelines for Disinfection and Sterilization:

- It is strongly recommended that reprocessing should be performed in a centralized area that complies with the physical and human resource requirements for reprocessing.

  Decisions related to reprocessing medical equipment/devices should be made by a multi-disciplinary Infection Control Committee that includes the individuals responsible for purchasing the equipment/device, reprocessing the equipment/device, maintaining the equipment/device, infection prevention and control, occupational health and safety, and the end-user of the equipment/device.

  When formulating written policies and procedures, the following steps in reprocessing must be included:
  a. Collection at point-of-use, containment and transport
  b. Disassembly (if required)
  c. Inspection
  d. Cleaning
  e. Disinfection/sterilization (including establishment of the level of reprocessing required for items, based on Spaulding's Classification and manufacturer's instructions
  f. Rinsing (following disinfection)
  g. Reassembly and functional testing
  h. Clean transportation
  i. Storage

It is essential that an overall inventory of all reprocessing practices within the healthcare setting is done, including documentation as to where, how and by all equipment/devices are being reprocessed and whether current standards are being met, as set out in this document. All processes must continue to be audited on a regular basis (e.g., annually), with clear and known consequences resulting to non-compliance.

Factors Affecting the Efficacy of the Reprocessing Procedure

Policies and procedures for disinfection and sterilization must include statements and information relating to factors that might affect the

effectiveness of reprocessing. These procedures must be readily accessible to staff doing the reprocessing. Many factors affect the efficacy of reprocessing, particularly when chemical reprocessing is used. These factors include:

a. Cleanliness of the surface of the equipment/device:
   i. many chemical disinfectants/sterilants are inactivated by organic material; cleaning must always precede decontamination;
   ii. a higher bioburden makes it harder to disinfect or sterilize the equipment/device.

b. Characteristics of equipment/device:
   i. long, narrow lumens and channels are difficult to clean;
   ii. materials such as rubber and plastic may require special treatment;
   iii. rough or porous surfaces may trap microorganisms (eg., ridges, ribbing, grooves, and articulations);
   iv. hinges, cracks, coils, valves, joints, clamps, crevices on the equipment /device may impede successful disinfection/sterilization.

c. Type and concentration of the product:
   i. Products used for disinfection and/or sterilization must be mixed according to the manufacturer's recommendations in order to achieve the correct dilution; if the concentration of the disinfectant is too low, the efficacy will be decreased; if the concentration is too high, the risk of damage to the instrument or toxic effects on the user increases.
   ii. Dry equipment/devices after cleaning, before immersing in disinfectant, to prevent dilution of the disinfectant.
   iii. Discard solutions on or before expiry date; diluted products are inherently unstable once mixed and the manufacturer's directions as to duration of use must be followed.
   iv. Use chemical test strips for all high-level liquid disinfectants to assess their efficacy; during reuse, the concentration of active ingredients may decrease as dilution of the product occurs and organic impurities accumulate.
   v. Use the appropriate disinfectant/sporicide for the task; infection prevention and control must approve disinfectants and their application.

vi. Some microorganisms are more resistant to disinfectants/ sporicides, and this information must be considered when choosing the product/process.

d. Duration and temperature of exposure to the product:
   i. Use Spaulding's Classification for the level of disinfection/ sterilization required for the intended use of the equipment/device.
   ii. Use manufacturer's recommendations for temperature and for exposure time required to achieve the desired level of disinfection/ sterilization; do not exceed the manufacturer's maximum exposure time, as some chemicals may cause damage to the medical equipment/device if used for extended period of time.
   iii. All surfaces of the article must be in direct contact with the disinfectant/sterilizing agent.
   iv. Contact may be compromised by the complexity of the article and the ability of the disinfectant to penetrate lumens.

e. Physical and chemical properties of the reprocessing environment:
   i. Water hardness can affect some disinfectants.
   ii. Excessive humidity may compromise sterile wrappings.
   iii. The pH of the solution may be an important consideration, as extremes of acidity or alkalinity can limit growth of microorganisms or alter the activity of disinfectants and sterilizing agents.

REPROCESSING ENDOSCOPY EQUIPMENT/DEVICES

For the purposes of this document, endoscopes will be considered to be of two types:

Due to the complexity of their design, flexible fiberoptic and video endoscopes ('semi-critical endoscopes') require special cleaning and handling.

Critical Endoscopes:

These are endoscopes used in the examination of critical spaces, such as joints and sterile cavities. Many of these endoscopes are rigid with no lumen. Examples of critical endoscopes are arthroscopes and laparoscopes.

Critical endoscopes shall be sterilized prior to use.

Semi-critical Endoscope: Fiber-optic or video endoscopes used in the examination of the hollow viscera. These endoscopes generally invade

only semi-critical spaces, although some of their components might enter tissues or other critical spaces. Examples of semi-critical endoscopes are laryngoscopes, nasopharyngeal endoscopes, trans-esophageal probes, colonoscopes, gastroscopes, duodenoscopes, sigmoidoscopes and enteroscopes.

Semi-critical endoscopes require a minimum of high-level disinfection prior to use. flexible bronchoscopes and cystoscopes are entering a sterile cavity, it is highly recommended that these be sterilized; however, if they are not compatible with sterilization, high-level disinfection is the minimum requirement.

A. Education and Training

Individuals responsible for reprocessing endoscopes require training and must meet the health care setting's written endoscope processing competency requirements, which include ongoing education and training.

a. Staff assigned to reprocess endoscopes must receive device-specific reprocessing instructions to ensure proper cleaning and high-level disinfection or sterilization.
b. Competency testing of personnel reprocessing endoscopes shall be performed at least annually.
c. Temporary personnel shall not be allowed to reprocess endoscopes until competency has been established.

B. Physical Space

The areas used to reprocess endoscopes must include:

a. adequate space for the storage and holding of clean and soiled materials that is separate from other activities and controlled to prohibit public contact
b. dedicated processing room(s) for cleaning and decontaminating instruments that are physically separated from clean areas, client/patient/resident care areas and procedure rooms
c. within processing/decontamination rooms, utility sink(s) appropriate to the volume of work and method of decontamination
d. dedicated hand hygiene sink(s)
e. eye-washing facilities
f. sufficient cleanable counter space to handle the volume of work

g. space and utility connections for automatic endoscope reprocessor(s) (AER), if used
h. ventilation system that will remove toxic vapors generated by, or emitted from, cleaning or disinfecting agents
i. the vapor concentration of the chemical disinfectant used shall not exceed allowable limits (e.g., 0.05 ppm for glutaraldehyde);
j. air-exchange equipment (e.g., ventilation system, exhaust hoods) should be used to minimize the exposure of all persons to potentially toxic vapors;
k. in-use disinfectant solutions must be maintained in closed, covered, labeled containers at all times
l. air quality should be monitored on a schedule basis to ensure control of vapors
m. clean equipment room(s), including storage, should protect the clean equipment from contamination.

C. Cleaning Procedures

Each health care setting in which endoscopic procedures are performed shall have written detailed procedures for the cleaning and handling of endoscopes. Endoscopic cleaning shall take place immediately following completion of the clinical procedure, as soil residue in endoscope lumens dries rapidly, becoming very difficult to remove.

Immediately following completion of the endoscopy procedure:

a. Flush and wipe the endoscope at point-of-use.
b. Use a freshly prepared enzymatic cleaning solution.
c. Place the endoscope and accessories in a covered, leak proof container and transport to the designated decontamination area.

The following steps must be included in the cleaning procedure:

a. Follow the manufacturer's recommendations for cleaning and cleaning products.
b. Perform leak testing after each use, prior to cleaning:
    i. verify the patency and integrity of the endoscope sheath through leak testing, performed prior to, and during, immersion of the endoscope
    ii. perform the leak test according to the manufacturer's instructions

iii. an endoscope that fails the dry leak test should not undergo the immersion leak test

c. Soak and manually clean all immersible endoscope components with water and a recommended cleaning agent prior to automated or further manual disinfection or sterilization.
d. Disconnect and disassemble endoscope components (e.g., air/water and suction valves) as far as possible and completely immerse the endoscope and components in enzymatic cleaner.
e. Flush and brush all channels and lumens of the endoscope while submerged to remove debris and minimize aerosols.
f. Ensure that brushes used for cleaning lumens are of an appropriate size, inspected before and after use, and discarded or cleaned, high-level disinfected and dried following use.
g. Consider irrigation adaptors or manifolds that may be recommended by the manufacturer to facilitate cleaning.
h. Thoroughly rinse endoscope and all components with clean filtered water prior to disinfection/sterilization and remove excess rinse water.
i. Identify damaged endoscopes and immediately remove from service.
j. Discard enzymatic cleaner after each use.
k. Discard disposable cleaning items or thoroughly clean and high-level disinfect/sterilize non-disposable items between uses.

D. Endoscope Disinfection and Sterilization

Procedures for disinfection and sterilization of endoscopes must ensure that a minimum of high-level disinfection is used for all endoscopes and their accessories, excluding biopsy forceps and brushes (which require sterilization). The following steps must be included in the disinfection/ sterilization procedure:

a. Choose a disinfectant that is compatible with the endoscope.
b. Monitor the efficacy of the disinfectant before each use with test strips available from the product manufacturer.
c. Maintain a written log of monitoring test results.
d. Do not use disinfectants past their expiry date.
e. Carefully follow the manufacturer's directions regarding the ambient temperature and duration of contact for the disinfectant (e.g. 2% glutaraldehyde for 20 minutes at 20˚C).

f. Completely immerse the endoscope and endoscope components in the high-level disinfectant/sterilant and ensure all channels with bacteria-free or sterile water.

E. Drying and Storage of Endoscopes

Steps in the final drying of semi-critical endoscopes include:

1. Initial flushing of all channels with medical or filtered air
2. Flushing channels with 70% isoprophyl alcohol to aid in the drying process
3. Second flushing of the channels with medical or filtered air

Storage procedures must include the following:

a. Remove caps, valves and other detachable components during storage and reassemble just before use; store close to the endoscope in a manner that minimizes contamination.
b. Store semi-critical endoscopes by hanging vertically in a well-ventilated area in a manner that minimizes contamination or damage.
c. Store endoscopes that have been sterilized in their sterilization containers.
d. Do not allow endoscopes to coil, touch the floor or bottom of the cabinet while handing, or be stored in their cases.
e. Ensure that endoscope storage cabinets are constructed of non-porous material that can be cleaned.
f. Clean and disinfect endoscope storage cabinets at least weekly.

Colonoscopes have a maximum shelf life of 7 days, if stored dry. There are no recommendations regarding shelf life of other endoscopes.

F. Accessories

Endoscopic accessories (e.g. biopsy forceps and brushes) that break the mucosal barrier must be sterilized after each use:

a. Because of the difficulty cleaning biopsy forceps/brushes, it is strongly recommended that disposable items to be used.
b. If reusable biopsy forceps/brushes are used, they must be meticulously cleaned prior to sterilization.

G. Automated Endoscope Reprocessor (AER)

To achieve consistency in endoscope reprocessing, it is recommended that automated endoscope reprocessor (AER) be used. The following must be included in the procedure:

a. Follow the manufacturer's instructions for use of the AER.
b. Ensure that the endoscope and endoscope components to be reprocessed are compatible with the AER used.
c. Ensure that channel connectors and caps for both the AER and the endoscope are compatible.
d. Place brushes and instruments used to clean the endoscope in the AER for disinfection.
e. Do not open or stop the AER once started; if an AER cycle is interrupted, high-level disinfection cannot be assured.
f. Implement and document preventive maintenance program for the AER

Reference:

The ASEAN Guidelines for Disinfection and Sterilization of Instruments in Healthcare Facilities
Lin, Ling Moi,et al.

D. Radiation Safety in the Operating Room

Guidelines for Reducing Peri-Operative Exposure to Radiological Substances

- The exposure of patients and OR personnel to radiation must be kept minimized. The number of personnel present in the operating theater must also be limited when there is a contemplated procedure that will expose them to radiation.

- Signs or warnings should be posted outside the OR suite if a radiological procedure is being performed.

- The radiologist must audibly inform the surgical team regarding the use of radioactive equipment and substances.
  The radiologist / technician must warn the surgical team before commencing the use of radioactive machines and/or substances.

- Protective Measures

  a. Shields – wear leaded aprons and thyroid shields, install lead linings in the OR suite walls. Mobile barriers may also be brought

in for those who must stay in the operating theater. Shielding devices must be carefully handled and regularly examined.

Shielding depends on the type of radiation emitted. Alpha particles can be shielded with even just paper, or our outer layer of dead skin cells. Beta particles can be effectively shielded with a few inches of plastic, or a layer of clothing. Gamma rays can be shielded effectively by adding few inches of lead or a dense substance between the person and the source of radiation.

b. Distance – the farther from the radiation source, the better. -each personnel who necessarily has to stay inside the operating theater during the procedure must make every effort to stay as far away as possible from the source of radiation.

c. Time – the shorter the time a person is exposed to radiation, the better.

d. Handling – use of radioactive equipment and substances should only be done by an authorized user.

- Measures taken to protect the patients and personnel from direct and indirect radiation exposure during the procedure must be documented.
- After the procedure, radiological substances are appropriately labeled before discarded in the Radioactive Wastes Receptacle. After the procedure, radiological substances must be appropriately labeled before discarding them into the radioactive waste receptacle.
- In the context of the COVID pandemic, it would be ideal to have equipment dedicated exclusively for COVID patients. If not possible, rigorous disinfection of the equipment using mechanical disinfection should be carried out after each use. The radiology personnel should be in level 4 PPE at all times while performing the procedure. Coverage of the machine with disposable plastic will help in minimizing contamination of the machine, for the benefit of subsequent users.

Reference:

CDC (https://www.cdc.gov/nceh/radiation/alara.html)

AORN Perioperative Standards and Recommended Practices 2014 Edition

E. Recommended Practices On The Care of Electrosurgical Units (ESU)

The operating room would not be complete without equipment that utilizes electricity. The following constitute recommended practices in the use of electrosurgical units (ESU) in various settings such as operating rooms, doctor's clinics, ambulatory surgical centers. Emphasis on cautery machines and laparoscopic equipment is made since these are the frequently encountered ESUs in the OR.

I. Safety features should be of utmost consideration whenever personnel decide to bring in new or refurbished ESU.

Historically, the most common injury is that of a contact pad burn. This has been minimized with improved dispersive electrode design and use of return electrode contact quality monitoring.

The ESU and accessories should be selected to include technology that minimizes potential for capacitive coupling and insulation injuries. These injuries are more serious than skin burns and have become more common with increased minimally invasive procedures. Unintentional activation of ESUs has caused more than half of alternate site injuries. It is recommended that alarms and activation tones should not be removed to alert the user against the risk of unintentional activation and resultant burns.

ESUs should make use of compatible accessories. Injuries have resulted when a ESU bipolar accessory was used with monopolar connectors. Appropriate matching of these accessories minimize the risk. Health care facilities should attempt to standardize electrosurgical equipment within a facility since standardization has been shown to minimize errors, especially among health care personnel.

II. The ESU, being high-risk equipment, should be used in a manner that minimizes potential for injury.

Injuries include patient and user injuries, electromagnetic interference with other devices, and internal electronic devices. Adverse events may be reduced by adhering to principles of electrosurgical safety.

The ESU should be mounted on a stable counter, stand, or table for its exclusive use. Liquids should never be placed on top of the ESU, since accidental wetting may cause activation, failure, or other hazard. Foot pedal accessories should ideally be wrapped in an impervious material, such as plastic, case liquids spill on the floor. The safety and warning alarms should always be tested as these alert the operator to possible electrode failure so that the team is alerted when the electrode is activated.

Settings should be based on the operator's preference consistent with the intended application and the manufacturer's written instructions for patient size, active electrode type, and return electrode placement.The ESU's power output capability is dependent on multiple variables related to the patient, generator, accessories, and the procedure. The circulating nurse should always verify power settings before activation of the ESU. The lowest power setting needed to achieve the desired tissue effect should be used. If a continual increase in setting is requested , the personnel should check the ESU and its accessories for adequate placement of dispersive electrodes and cord connections. Common causes of ineffective coagulation or cutting include high impedance at the dispersive electrode, poor contact between the electrode and the patient, or the use of electrolytic irrigation or distension solution. The electrode tip should also be inspected for damage.

OR personnel should be aware of safety hazards associated with implanted electronic devices such as pacemakers, defibrillators, and infusion pumps, and the appropriate patient care interventions to protect these patients from injury.

After use the nurse should turn off the ESU, dispose of single use items, and clean all reusable items according to manufacturer instructions.

III. Electrical cords and plugs should be handled in a manner that diminishes potential for damage or injury.

The cords should be flexible and adequate in length to reach the electrical outlet without tension or the use of an extension cord. The cord should be free form knots, bends, and kinks, to

prevent damage to its insulation. The plug, and not the cord, should be held when removing from the socket. It should always be kept dry as fluids may cause a short circuit.. Cord failures can result in fires; hence, the outer insulation of the cord should be periodically checked. The ESU should be pulled out when damage to the cord is noted.

IV. Active electrodes should be used in a manner that minimizes potential for injury. Sparks may cause fires in the presence of gases.

Incomplete circuitry, unintentional activation, and incompatibility of the patient electrode to the ESU may result in patient and personnel injuries. Damaged electrodes and ESUs should never be used. When not in use the electrode should be placed in its holster. For battery operated electrodes, the pen should be capped when not in use.

The active electrode (cautery pen) should be cleaned when there is visible eschar away from the patient's incision . Appropriate cleaning include wiping a moistened gauze or using an abrasive pad. The scalpel should never be used to clean the electrode as this puts the personnel at risk for injury.

When using monopolar electrode in a fluid-filled cavity, an electronically inert, near isotonic solution should be used unless manufacturer instructions indicate otherwise. Electrolyte solutions may conduct and disperse electrical current away from the intended site.

ESUs are a potential ignition source and cause of fires in the operating room. Activation of the electrode should not be done in the presence of flammable agents, unless these have evaporated already. At risk are trapped gases or vapors under drapes. Caution should be used in activating electrodes in head and neck surgery, in the presence of anesthetic gases. Sponges used near the active electrode should be moistened to avoid accidental ignition. Electrosurgery should not be used in the presence of gastrointestinal gases, since these contain hydrogen and methane, which are highly flammable, or in

oxygen-enriched environments. Personnel should be ready to extinguish fires should they occur.

V. Dispersive electrodes should be used and handled in a manner that minimizes injury.

Skin injuries at the site of the dispersive electrode (cautery pad) are the most common ESU associated injuries. The use of adhesive pads rather than stainless pads has already decreased the incidence of such injuries. The skin should always be assessed prior to placement. Dispersive electrodes should be compatible with the ESU and should be discarded if intended for single use. Tape should not be used in improving contact between patient and the electrode. Poor contact may also be caused by moisture or lotions or excessive hair. Appropriate sized dispersive electrodes which are not expired should be used (neonatal, pediatric, adult). The electrode should ideally be placed on clean dry skin over a well-perfused body mass on the surgical side and as close as possible to surgical site. They should not be used on bony prominences or areas distal to a tourniquet, or over implanted medical devices.

The dispersive electrode should be placed only after final positioning of the patient to ensure that it will not be moved or detached, and the nurse should check its contact in case the patient is repositioned. The dispersive electrode should be kept dry and away from warming devices. Contact between the patient and metal surfaces (OR bed, stirrups etc) should be avoided as this could offer an alternative return path and resultant burns. Metal jewelry should be removed from the patient prior to activation of an ESU.

VI. Special care should be taken in case of minimally invasive or laparoscopic equipment. Unique patient risks include direct coupling of current, insulation failure, and capacitance coupling.

Insufflation should use non combustible gas such as carbon dioxide. Conductive trocar systems should be used to provide a means for the current to pass between the cannula and abdominal wall. Insulation should be checked prior to use and

any breaks in the insulating coat of the instruments should prompt removal. The lowest power setting should be used and the activation should only be done when in close proximity to the tissue.

VII. Potential hazards from surgical smoke should be identified and safe practices established.

Surgical smoke (plume) is generated from the use of ESUs. Electrosurgical plume contains toxic gases such as formaldehyde, benzene, and hydrogen cyanide, bio- aerosols, dead and living cell materials, blood fragments, and viruses. These contaminants have at some point been reported to have unpleasant odor, eye irritation, and even carcinogenic or mutagenic potential. It is recommended that smoke evacuation systems (suctions)be employed to prevent acute and chronic problems associated with inhalation of surgical plume. In view of the COVID pandemic, it is prudent to perform smoke evacuation as concerns of viral particles suspended in the surgical plume remain unresolved.

The suction wand should be placed close (< 2 inches) to the source to maximize particulate and odor capture, and to enhance visibility at the surgical site.

Personnel should wear high filtration masks during procedures that generate significant surgical smoke.

VIII. It is necessary that personnel should receive initial education and competency validation on procedures requiring electrosurgical usage, and receive additional training when new equipment, supplies, instruments , or procedures, are introduced.

Personnel should be knowledgeable on the principles of electrosurgery, risks to patients and personnel, measures to minimize the risks,and corrective measures to be taken in case of fire or injuries.

IX. Policies and procedures for electrosurgery should be in place and readily available in the practice setting. Periodic evaluation and revision should be done as necessary,

Patient or personnel injuries and other adverse events should be documented and reported to the administration and regulatory agencies concerned.

Policies should include:

- Safety features of ESUs
- Equipment maintenance programs
- Required supplemental safety monitors
- Equipment checks before use
- Reporting and impounding malfunctioning equipment
- Perioperative patient assessments
- Precautions during use
- ESU sanitation
- Documentation

A written fire prevention and response policy should be developed and communicated to all the personnel.

X. A quality assurance/performance improvement process should be in place that measures patient, process, and system indicators.

Each ESU should be assigned a unique number/identifier. There should be a preventive maintenance program in place. The health care organization should keep abreast on evolving technologies that may impact on patient care and safety in the area of surgical hemostasis.

Reference:
AORN Perioperative Standards and Recommended Practices 2014 Edition

II. Endoscopy and Laparoscopy During The Covid 19 Pandemic

PALES Statement on Laparoscopic Surgery during the COVID-19 Pandemic

In the context of COVID-19, community transmission poses a threat against safety of everyone especially doctors in the frontline. Current data support droplet transmission and spread of coronavirus during aerosol generating procedures. However, in laparoscopy, generation of artificial pneumoeperitoneum and surgical smoke produced by the use of energy devices become risks for aerosol exposure particularly when there are leaks in trocar sites and during evacuation of pneumoperitoneum. Therefore, for patients who are COVID-19 positive, suspect or asymptomatic, the most important aspect to consider at this point in time is for each surgeon to wear standard surgical personal protective equipment (PPE) which includes a face shield / goggles, N95 mask/ PAPR if available, double gloves, water proof surgical gown & booties and mitigate all aspects of risks from exposure while taking care of patients especially during surgery.

We have gathered available resources and reviewed various recommendations pertaining to and involving the use of artificial pneumoeritoneum in laparoscopy during COVID-19 and the effects of microparticles generated from surgical smoke.

Phase 1 (Preparedness & Screening)

- Delay all elective procedures
- Intentional postponement of non-emergent, urgent procedures
- When in doubt, treat all cases as COVID-19 positive unless proven otherwise
- Create COVID-19 ORs and workspace separate from Non-COVID-19 OR
- Designate COVID-19 surgical team & Non- COVID-19 teams with no crossing of rooms & staff
- Organize Work flow for efficiency and safety of both patients and health care workers
- Make sure necessary equipments / instruments to mitigate aerosol transmission are available such as filters and vacuum suction systems.

- Simulate Work flow in laparoscopy with the goal of eliminating risk for the whole surgical team while providing care for the patient

Phase 2 (Surgical Workflow Recommendations)

Pre-operative

- Create a team to assess and triage cases for surgery
- Screen every patient comprehensively, including a CT chest even in asymptomatic for ALL cases especially in non-emergent, urgent cases such as cancer
- Discuss the risk on possibilities of COVID-19 infection with the patient

Intra-operative

- Need for a negative pressure room for established COVID-19 PCR positive patients, those with lung CT scan findings of interstitial pneumonia with a probability of COVID-19 and / or patients high risk of COVID-19 based on PSMID interim guidelines
- Standard or enhanced PPE is imperative for every member of the surgical team taking care of the COVID-19 positive and suspect patient. These include Goggles, Face Shield, PAPR, Hazmat suits, double gloves, shoe covers. Proper Donning must be maintained, with a Donning Quality officer.
- Special attention to maintain integrity of PPE at all times
- During the procedure, prevention and elimination of aerosol transmission is most crucial. The following recommended principles apply:
    - Limit laparoscopic procedure to the most proficient surgeon
    - DO NOT reuse trocars (integrity of trocar is necessary to avoid air leak)
    - Make appropriately sized incision for trocar sites to avoid gas leak
    - Keep pneumoperitoneum intraabdominal pressure as low as possible without compromising the surgical field. (8-10mm Hg, not to exceed 12mmHg)
    - Minimize trendelenburg position
    - Set electrosurgical power settings to a minimum.
    - Keep instruments blood free.
    - Minimize changing of instruments

- Use suction liberally to reduce surgical smoke.
- DO NOT open trocar valves to evacuate surgical smoke or gas during the procedure
- Consider using an outside filter device attached to a closed vacuum suction unit which may be attached to one of the trocars' valve - (via commercially available smoke evacuators whether active or passive or alternative solutions by a make shift closed filter vacuum system - please refer to the appendix)
- Establish strict protocols to maintain pneumoperitoneum avoiding gas leaks that may aerosolise the virus including small port site incisions,
- Completely evacuate pneumoperitoneum through a filter device into a vacuum suction unit (if no commercial smoke evacuator system is available) prior to specimen extraction and trocar removal before closure or during conversion.

Post Operative

- Follow strictly doffing procedures with the Doffing Quality officer and check for breaks
- Post operative room and equipment decontamination and disinfection management should follow and comply with standards from accredited societies and DOH.
- Devices used for COVID-19 positive or suspects should be segregated, labeled and undergo separate disinfection
- Clinical waste materials should be properly labelled and disposed.

As understanding of the SARS-CoV-2 virus improved over time, diagnosis and treatment processes are also streamlined with better guidance and implementation of protocols. The following FAQS are answered below.

1) Is laparoscopy contraindicated in COVID-19 patients?

Laparoscopy is NOT contraindicated in this pandemic, whether COVID-19 positive or not.[2] The first few months of this pandemic created a lot of fear of the unknown. Thus, the concept of limiting laparoscopic approach especially for COVID-19 related surgical procedures was based on past evidences found on HIV, HBV, and HPV transmission from surgical plumes[3,4,5]. More recent data failed to show transmission of COVID-19 in surgical plumes. However, best

practices on safe smoke evacuation using commercial or innovative alternative techniques to prevent possible aerosolization of viral particles from surgical smoke must be implemented[6,7].

2) Can usual laparoscopic procedures for non COVID-19 patients be resumed this time?

Yes. it is safe to resume laparoscopic procedures for non COVID-19 patients provided proper precautionary measures are in place, such as triaging, best practice approach in airway management and anesthesia, use of appropriate PPE, smoke evacuation processes and pneumoperitoneum management, all of which were discussed in detail in the previous PALES position statement dated 2 April 2020. Without existing robust evidence, the benefit of laparoscopy outweighs the risk at this time.

3) Are smoke evacuators imperative in laparoscopy? Is there evidence showing the presence of SARS-COV 2 in pneumoperitoneum or the gases emitted from laparoscopy?

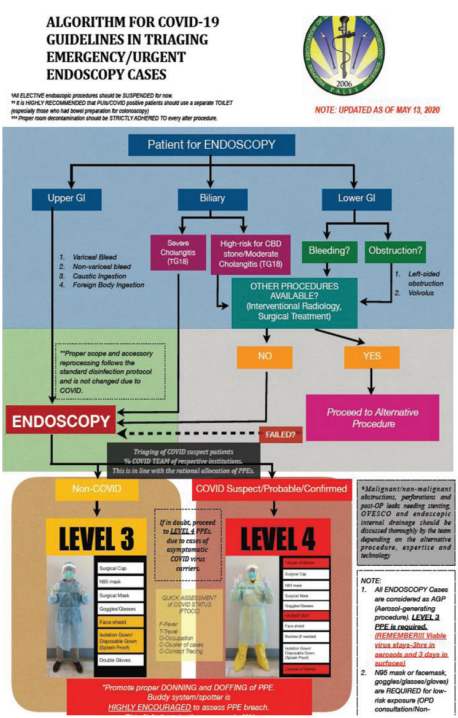
Although no direct evidence points towards definite aerosolization of viral particles in surgical smoke, most centers, surgical societies and publications recommend the use of smoke evacuators due to its POTENTIAL transmission of virus via aerosolization during endoscopic and laparoscopic procedures. Use of HEPA and ULPA filters is likewise recommended as an effective means of protection from the potential release of virus during both endoscopic and laparoscopic procedures. HEPA filters are capable of removing particles greater than or equal to 0.3 microns in diameter resulting to a minimum filtration efficiency of 99.7% at the minimum, while ULPA filters are capable of capturing particles 0.05 microns and above resulting to a filtration efficiency of at least 99.999%. Naturally, implementing and observance of proper precautionary measures of hierarchy of controls[15] are necessary to ensure adequate prevention and control of viral transmission at all times.

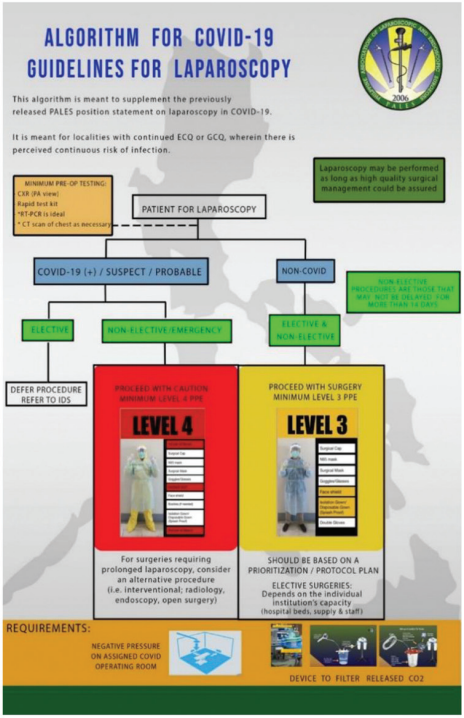
4) Is level 4 PPE necessary in all laparoscopic surgeries?

Level 4 PPE is necessary for all COVID-19 positive patients or those who are still undergoing investigation but requiring emergent and

necessary endoscopic or laparoscopic procedures. If patient is COVID-19 negative, level 4 PPE may not be absolutely necessary and is left to the discretion of the institutional policy or individual surgeon and anesthesiologist's preference, keeping in mind that PCR testing still carries a 40% false negative rate in those who are asymptomatic[16]. There is currently no universal agreement regarding this matter, especially with the limited availability of PPE, standard precautions should be practiced under these circumstances. The Philippine College of Surgeons has issued a guideline on the proper use of PPE[17].

These recommendations are best summarized in the following infographics.





Reference:
PALES Position Statement on Laparoscopic Surgery in COVID-19 Pandemic ver 1.0 2 April 2020

III. Disaster Management in the Operating Room

Disasters can be natural or man made, and when they occur, there are serious consequences. Disasters often come without warning and leave behind destruction and human suffering. As perioperative practitioners, we are devoted to making sure the patient in need of a surgical procedure is cared for safely no matter the circumstances.

The first step is to put together a multidisciplinary team representing all the key stakeholders. Personnel from the emergency room, anesthesia department, materials management, security, and central sterile processing all need to come to the table to put together the best plan possible. Items that the team should consider include communication methods, equipment and supplies needed, patient throughput, suspension of elective procedures, facility security, facility evacuation plans, health care worker emotional safety, education, and procedures for handling different types of disasters.

After a plan is in place, personnel should participate in simulation training. It is important to make the simulations as realistic as possible. Practice helps make perfect, and it is better to be prepared for something that may never happen than to assume it will not happen and be caught unprepared.

Mass Casualty

At the 2018 AORN Surgical Conference & Expo in New Orleans, Louisiana, Meg Femino, senior director of emergency management, and Jeffrey Keane, BSN, RN, CNOR, perioperative educator for the main OR at Beth Israel Deaconess Medical Center, Boston, Massachusetts, presented mass casualty simulations on the exhibit floor. They shared five strategies for a mass casualty situation that their facility put together after the Boston Marathon bombing of 2013:

1. *Understand that triage in a mass casualty response is dynamic and could change the moment one decision is made.*
2. *Trust in your team and make decisions together, respecting everyone's role and expertise to make the best decisions for patients.*
3. *Be prepared to collaborate with colleagues across hospital departments because the walls come down in an emergency response. This is a*

good thing because resources (including staff with needed training) can move to help wherever needed.

4. *Think creatively for your patients. This could mean moving low acuity patients to an Urgent Care station set up in your ambulatory center, or leveraging the critical care knowledge of recovery nurses to set up an [intensive care unit] in the PACU.*
5. *Understand how an emergency response command center works in order to ask for resources and escalate a concern to recruit support.*[3]

If we are can follow these rules, we should be able to save more lives.

One concept that we do not often think about in our hospitals is reverse triage. This is about determining which patients are the most stable and ready for discharge. Getting patients home and out of the hospital to make room for casualties is necessary. Whether some patients can be transferred to other hospitals also is a possibility to consider.

For the OR, it is important to inform patients scheduled for elective procedures if their procedures have been canceled and to empty the PACU to make room for staging victims who might be admitted. Reverse triage can affect how quickly a hospital or health system's surge capacity is filled. Inform the hospital command center how many surgical teams and rooms are available and how many monitored bays are open in the PACU. Being able to respond quickly to prepare for what is coming will be very helpful in the long run.

Post Disaster Recovery

After the incident is over, it is important to debrief and reflect on the performance of the surgical services team in collaboration with the rest of the hospital. The multidisciplinary team should conduct a review of the events that took place, record any roadblocks or missteps, and evaluate what might have worked better. Whatever can be fixed or implemented should be done quickly so that if another disaster occurs, your team will not experience the same problems. This might be as simple as buying more handheld two-way radios to use for communication when phone lines are down. It is important for everyone to think about the smallest details and circumstances so the necessary resources will be available should this ever happen again.[4]

Emotional care of the caregivers post disaster should be a top priority. Your staff members may have been traumatized by what they saw and experienced during the disaster. In the moment, everyone powers through, trying just to do their jobs so that lives are saved. Afterward, when all the smoke has cleared, is when people start to reflect on what happened, and this can cause anxiety and emotional stress. Employees also might be dealing with the effects of the disaster in their home, communities, or extended families. Employers should bring in counselors for staff members and ensure they get professional help to work through the trauma they have experienced while giving care or living in a community where disaster has struck.

Conclusion

Disasters are one of the most unpleasant parts of life. As perioperative practitioners, we have a duty to serve our patients, no matter the circumstances, in the most professional manner possible. Being prepared requires a series of steps and actions. Reeducation of your teams and simulations of different types of events will help you prepare everyone for the unlikely event, and learning from experience is key to success in the future.

Tips on how to make your OR Team disaster ready

1. Secure commitment and support of all staff
2. Form OR safety promotion and disaster preparedness committee
3. Develop manual of policies and procedures
4. Conduct emergency exercises regularly

Stephanie S. Davis, MSHA, RN, CNOR, CSSM, AORN President and the vice president of Surgical Services for HCA Healthcare. Issue Online:29 August 2018
https://aornjournal.onlinelibrary.wiley.com/doi/10.1002/aorn.12360

IV. Infection Control Guidelines

A. Surgical Hand Antisepsis

Purpose

The purpose of the surgical hand antisepsis is to remove or destroy transient microorganisms and inhibit the growth of resident microorganism (Tanner et al 2008).

Characteristics of an acceptable surgical hand preparation agent

1. Agents used for surgical hand antisepsis should reduce microorganisms on intact skin significantly. They are expected to have a broad range of activity, non-irritating, and have a wide margin of safety.
2. The agent should have both antibacterial and anti-fungal activity. Activity against virus and spore-producing bacteria are not part of international test procedures.

Alcohol based formulations as preoperative surgical hand preparation

1. Surgical hand antisepsis with alcohol-based hand rubs are suitable for the prevention of surgical site infections. These agents have a rapid onset of action, with less side effects, and low risk of recontamination when rinsed with water.
2. Numerous studies have demonstrated that alcohol-based formulations containing 60-95% alcohol alone or 50-95% alcohol combined with small amounts of quaternary ammonium compounds like hexachlorophene or chlorhexidine gluconate, reduce bacterial counts on the skin immediately post – scrub more effectively than do other agents.

Products

Any surgical antiseptic should have four main properties (CDC 2002):

1. **Antimicrobial activity** – this should include destruction of a broad spectrum of pathogenic organisms.
2. **Persistent activity** – the microbial agent should be long lasting for longer cases.
3. **Safety** – the agent should be safe for the skin and eyes of the person using it, as well as being non-irritating and sensitizing. The

environment also needs to be considered as the agent may have long term harmful effects.

4. **Acceptance** – this is a more subtle characteristic which may include color, smell and feel and is required for antiseptic uptake by the surgical team. Acceptance should not be underestimated.

Three types of antiseptic solutions are available (Tanner et al 2008):

1. **Aqueous scrubs** – usually contain chlorhexidine gluconate or povidone iodine. Using aqueous solutions requires a surgical scrub.

2. **Alcohol rubs** – three main types of alcohol: ethanol, isopropanol and n-propanol. This involves rubbing the alcohol solution into the hands systematically following removal of visible soiling or a preliminary hand wash.

3. **Alcohol rubs containing additional active ingredients** – these include chlorhexidine gluconate, iodophors, biguanides and phenolic compounds such as hexachlorophene and triclosan.

Source: World Health Organization Patient Safety; Hand Hygiene

Surgical hand preparation technique with an alcohol-based handrub formulation

The handrubbing technique for surgical hand preparation must be performed on perfectly clean, dry hands.
On arrival in the operating theatre and after having donned theatre clothing (cap/hat/bonnet and mask), hands must be washed with soap and water.
After the operation when removing gloves, hands must be rubbed with an alcohol-based formulation or washed with soap and water if any residual talc or biological fluids are present (e.g. the glove is punctured).

Surgical procedures may be carried out one after the other without the need for handwashing, provided that the handrubbing technique for surgical hand preparation is followed (Images 1 to 17).

1

Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your left hand, using the elbow of your other arm to operate the dispenser

2

Dip the fingertips of your right hand in the handrub to decontaminate under the nails (5 seconds)

3

Images 3–7: Smear the handrub on the right forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)

4

See legend for Image 3

5

See legend for Image 3

6

See legend for Image 3

7

See legend for Image 3

8

Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your right hand, using the elbow of your other arm to operate the dispenser

9

Dip the fingertips of your left hand in the handrub to decontaminate under the nails (5 seconds)

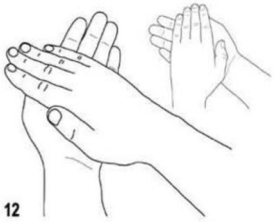
Surgical hand preparation technique with an alcohol-based handrub formulation (Cont.)

10

Smear the handrub on the left forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)

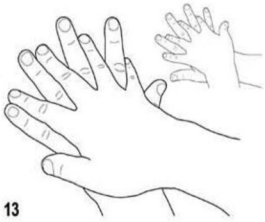
11

Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your left hand, using the elbow of your other arm to operate the distributor. Rub both hands at the same time up to the wrists, and ensure that all the steps re-presented in Images 12-17 are followed (20-30 seconds)



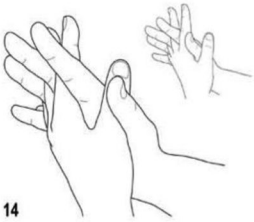
12

Cover the whole surface of the hands up to the wrist with alcohol-based han-drub, rubbing palm against palm with a rotating movement



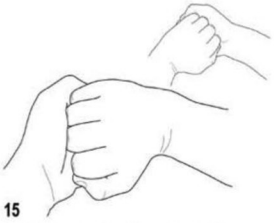
13

Rub the back of the left hand, including the wrist, moving the right palm back and forth, and vice-versa



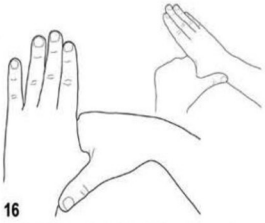
14

Rub palm against palm back and forth with fingers interlinked



15

Rub the back of the fingers by holding them in the palm of the other hand with a sideways back and forth movement



16

Rub the thumb of the left hand by rota-ting it in the clasped palm of the right hand and vice versa

17

When the hands are dry, sterile surgical clothing and gloves can be donned

Repeat the above-illustrated sequence (average duration, 60 sec) according to the number of times corresponding to the total duration recommended by the manufacturer for surgical hand preparation with an alcohol-based handrub.

B. Preoperative Surgical Skin Preparation

Introduction

This recommended policy is presented to reinforce standard practices related to the skin preparation to support healthcare facility protocols.

The patient who will undergo surgical invasive procedure that has to make through the skin or soft tissue, breaking the barrier of the skin that leads to most cases of surgical site infections (SSIs) which are caused by the entry of the patient's own microbial flora into the surgical wound. Skin preparation lessens the presence of transient microbes and hinders the growth of microbes during the procedure.

FDA Approved Preoperative Agents:

The healthcare facility must use FDA approved perioperative agents to be used for skin prep.

1. The three (3) widely used preoperative skin preparation agents are chlorhexidine gluconate, povidone-iodine, and isopropyl alcohol, but the WHO-recommended skin preparation agents are products with a combination of alcohol with iodophors or chlorhexidine containing products. All these products are irritating and must ensure that the soap or shampoo is thoroughly rinsed.

2. Alcohol has broad-spectrum antimicrobial properties, 60% to 90% alcohol is the most effective.

3. A surgeon may include alcohol wipe as an acceptable practice if alcohol-based skin preparation agents are not available and can be used as a part of the overall skin prep regimen ; however, this should not be used as a single agent. Alcohol must not be used on mucous membranes.

4. In evaluating and choosing the antiseptic agents must follow the standard protocol of the institution.

5. The surgical team and the infection control officer must be involved in the process of testing and evaluating the agents.

6. The manufacturer's instruction must be followed strictly to confirm its efficacy, storage, and warning of antiseptic agents.

7. **The World Health Organization and US Centers for Disease Control recommend the use of alcohol-based antiseptic solutions for surgical skin preparation**. Alcohol, however, is NOT recommended when the surgical site involves mucus membranes. The following FDA standards should be considered when evaluating antiseptic agents:
   - Substantially reduce transient microorganisms.
   - Possess a broad spectrum of antimicrobial properties.
   - Fast-acting
   - Have persistent and cumulative activity
   - Non-irritating to the skin

8. Containers must be single-use and should never be refilled, as contamination of the solution may occur during refilling.

9. Proper storage of the solutions must be ensured.

10. Warnings for hazardous substances must be posted. Alcohol containing-products are flammable so fire warning hazards must be posted in all areas in the operating room.

11. All members of the surgical team must be aware of the Material Safety Data Sheets (MSDS) of every product that is being used or stored in the operating room and must be accessible to all personnel.

The following statements constitute recommendations regarding preoperative surgical skin preparation:

1. Preoperative showering

Patients who are to undergo surgery are required to shower or bathe with an antiseptic agent 6-12 hours before the scheduled operative time.

- Preoperative shower or bath using antiseptic agents reduces the skin microbial colony count. Chlorhexidine has been most effective in reducing bacterial colony count, followed by triclocarban medicated soap, and trailed by povidone iodine.
- No study has definitely shown that pre-operative shower or bath using antiseptic agents led to decreased incidence of surgical site infection (SSI).

2. Preoperative hair removal

a. Preoperative hair removal should be avoided unless the hair at or around the incision site will interfere with the operation.
   - Increased SSI risk associated with shaving has been attributed to microscopic cuts in the skin that later serve as foci for bacterial multiplication.
   - The use of depilatory creams has been associated with a lower SSI risk as compared to shaving. However, these chemicals may trigger skin reactions and allergies in some individuals.

b. If hair removal is necessary, an electric or battery-powered clipper with disposable or reusable head which can be disinfected between patients should be used.

c. Hair removal should be done immediately before skin preparation.
   - Clipping hair immediately before an operation is associated with a lower risk of SSI than shaving or clipping the night before an operation . Shaving immediately before the operation compared to shaving within 24 hours preoperatively also correlates with decreased SSI rates.
   - Hair removal should take place away from the sterile field, preferably in an area outside of the room where the procedure will be performed, to avoid contaminating the surgical site and sterile field.

3. Recommended antiseptics for preoperative skin preparation

1. Iodophors (e.g. povidone-iodine)
2. Alcohol-containing products (e.g. n-propanol)
3. Biguanides (e.g. chlorhexidine gluconate)

   - There is insufficient evidence to support or refute the use of one antiseptic over another with regards effectivity and SSI risk.
   - Antiseptic agents used on the skin of patients with known hypersensitivity reactions may cause adverse outcomes (eg, blisters, rashes).
   - Avoid the use of chlorhexidine gluconate and/or alcohol or alcohol-based products on mucous membranes.

4. Recommended practices for skin preparation

1. Thoroughly wash and clean at and around the incision site to remove gross contaminants like dirt, soil, or any other debris.
2. Don sterile surgical gloves after surgical hand preparation.
3. Apply the antiseptic solution beginning in the area of the proposed incision and moving outwards towards the periphery using concentric circular motion. The prepared area should be large enough, in the event that there is a need to extend the incision, create a new incision or place drain sites. The application of the skin preparation may need to be modified, depending on the condition of the skin (e.g., burns) or location of the incision site (e.g. face).
4. Prepare areas of high microbial counts (e.g. umbilicus, pubis, open wounds) last.
5. In cases where there is a stoma present, isolate the area and cover it with an antiseptic soaked sponge. Prepare the stoma site last.
6. Allow sufficient contact time of antiseptic agents , usually until it dries, before applying sterile drapes to achieve maximum effectiveness of the agent.
7. Allow sufficient time for complete evaporation of any flammable antiseptic agent (e.g. alcohol, alcohol-based preparations).
8. Do not allow antiseptic agent to pool beneath patients, pneumatic tourniquet cuffs, electrodes, or electrosurgical unit dispersive pads to reduce the risk of chemical burns , or hypothermia in the case of pediatric patients.
9. The use of an iodophor-impregnated plastic incise drape is optional. A prospective randomized controlled clinical trial showed no difference was found between wound infection rates for patients on whom the iodophor drape was used and those patients on whom the drape was not used.

Preoperative Skin Preparation In Specific Conditions

Performing Preoperative Skin Preparation

1. The skin prep can be done by the surgeon, assistant surgeon, or circulator.
2. The patient was prepared the night before the procedure. Ensure that preoperative procedures were completely done as ordered by the doctors prior to proceeding to anesthesia induction.
3. Skin preparation is started after induction of anesthesia and positioning on the operating table
4. Perform surgical hand washing with alcohol-based hand rub.
5. Skin preparation is the mechanical cleaning of the operative site and the extensive area around the site before sterile draping.
6. Disposable sterile skin prep is opened aseptically on the prep table with complete materials.
7. Confirm the preferred aseptic solution that the doctor needs or follow the standard protocol of the institution.
8. Expose the skin area to be cleaned. Assess the skin condition and note for any significant remarks.
9. Don surgical gloves using the open method. Follow the standard procedure on surgical gloving.
10. Follow the manufacturer's instructions depending on what kind of antiseptic solution.
11. Place a sterile towel above and below the site to isolate the area and to prevent accumulate under the patient or other equipment attached to the patient, and avoid unwanted events such as burn. The towel should be removed after the procedure.
12. Observe the important skin prep principle- always start from clean to the dirty area. The solution and towels should not be allowed to contaminate the prepped area.

13. The ***contaminated area*** generally should be prepped last.
    - In areas with a high count of microbes such as perineal area, axilla, and groin, the sponge is used once and then discarded except for the umbilicus which is prepped first using a cotton-tipped applicator. This is to avoid splashing of debris onto the prepped site.
    - Stomas, skin ulcers and open wounds are prepped last and it should be isolated with sterile gauze or plastic.
    - Traumatic open wounds require extensive irrigation that must be flushed first with a moisture-proof pad place on the operative site. Skin prep will start after complete irrigation. The open wound should be covered while prepping the skin.

14. For ***skin grafting, abdominal-perineal and abdominal-vaginal skin prep*** require two separate skin preps and tables using double gloving to be removed after one set.
    - Separate skin prep set for donor and recipient sites. The donor site is prepped first with a colorless solution for proper visualization of the skin. The recipient is often the open and contaminated site and should not be prepped by alcohol-containing or iodine-containing solutions.
    - The perineal or vaginal prep should be performed first and must be covered after to prep the abdominal area using the other prep set and a new set of gloves.

15. For the eye and facial preps, these require the use of an alternative prep solution or diluted regular solution to avoid injury. Use hospital approved agents that are not irritating to the eyes. Warm sterile water should be used as a rinse.

16. When available, use a prep stick sponge using the no-touch technique. Wet the sponge with an antiseptic solution.

17. Scrub the skin, starting at the site of the incision with a circular motion widening the circle to the outer portion.

18. Apply pressure and friction to remove dirt and microorganism.

19. Never bring a soiled sponge back toward the center. Discard the sponge into the kick bucket after it has reached the outer area.

20. Repeat the scrub with a new sponge for a minimum of 3 cycles.
21. Blot dry the prepared area using a sterile towel and do not scrub the towel back and forth. Remove the towel carefully from one side to the other to avoid contaminating the clean skin.
22. Apply preoperative approved antiseptic following the institution's policy.
23. Properly remove the gloves and perform handwashing.

Document:

Properly document the procedure:

- Preoperative instruction
- Removal and handling of jewelry or denture
- Hair removal or Shave prep
- Prep parameters
- Time of prep
- Method and antiseptic agent used
- Name of the person who performed the shave prep
- Condition of the skin before and after the skin prep

Reference:
AST Standard of Practice for Skin Prep of the Surgical Patient. Retrieved from https://www.ast.org/uploadedFiles/Main_Site/Content/About_Us/Standard_Skin_Prep.pdf

C. Use of Personal Protective Equipment

Personal protective equipment includes:

- gloves
- protective eye wear (goggles) or face shields
- mask
- apron
- gown
- close shoes / shoe covers
- cap/hair cover

The use of personal protective equipment provides a physical barrier between the micro-organisms and the wearer. It offers protection by helping to prevent micro-organisms from contaminating hands, eyes, clothing, hair and shoes and transmitting to other patients and staff. Personal protective equipment should be worn by individuals who may have contact with blood, body fluids, excretions and secretions of patients.

Principles for the use of personal protective equipment

- Personal protective equipment should be used properly at all times when contact with blood and body fluids of patients may occur.
- Adequate training for their proper use should always be provided.
- Type of personal protective equipment should be chosen according to the risk of exposure.
- Handling of contaminated personal protective equipment should be done with caution.

Proper Doffing Of Personal Protective Equipment (PPE) In The Operating Room

Donning and Doffing Procedure

Personal Protective Equipment (PPE) is the next measure in preventing transmission of infectious diseases next to Engineering Controls. Ensure proper wearing and removing of PPE. It is recommended to focus on REMOVAL or DOFFING of PPE as this causes higher chance of contamination more than wearing of PPE.

Donning

1. Identify and gather the proper PPE to don. Ensure choice of gown size is correct (based on training).
2. Perform hand hygiene using hand sanitizer.
3. Put on isolation gown. Tie all of the ties on the gown. Assistance may be needed by other healthcare personnel.
4. Put on NIOSH-approved N95 filtering facepiece respirator or higher (use a facemask if a respirator is not available). If the respirator has a nosepiece, it should be fitted to the nose with both hands, not bent or tented. Do not pinch the nosepiece with one hand. Respirator/facemask should be extended under chin. Both your mouth and nose should be protected. Do not wear respirator/facemask under your chin or store in scrubs pocket between patients.*
   - Respirator: Respirator straps should be placed on crown of head (top strap) and base of neck (bottom strap). Perform a user seal check each time you put on the respirator.
   - Facemask: Mask ties should be secured on crown of head (top tie) and base of neck (bottom tie). If mask has loops, hook them appropriately around your ears.
5. Put on face shield or goggles. When wearing an N95 respirator or half facepiece elastomeric respirator, select the proper eye protection to ensure that the respirator does not interfere with the correct positioning of the eye protection, and the eye protection does not affect the fit or seal of the respirator. Face shields provide full face coverage. Goggles also provide excellent protection for eyes, but fogging is common.
6. Put on gloves. Gloves should cover the cuff (wrist) of gown.
7. Healthcare personnel may now enter patient room.

Doffing

More than one doffing method may be acceptable. Training and practice using your healthcare facility's procedure is critical.

1. Remove gloves. Ensure glove removal does not cause additional contamination of hands. Gloves can be removed using more than one technique (e.g., glove-in-glove or bird beak).

2. Remove gown. Untie all ties (or unsnap all buttons). Some gown ties can be broken rather than untied. Do so in gentle manner, avoiding a forceful movement. Reach up to the shoulders and carefully pull gown down and away from the body. Rolling the gown down is an acceptable approach. Dispose in trash receptacle.
3. Healthcare personnel may now exit patient room.
4. Perform hand hygiene.
5. Remove face shield or goggles. Carefully remove face shield or goggles by grabbing the strap and pulling upwards and away from head. Do not touch the front of face shield or goggles.
6. Remove and discard respirator (or facemask if used instead of respirator). Do not touch the front of the respirator or facemask.
    - Respirator: Remove the bottom strap by touching only the strap and bring it carefully over the head. Grasp the top strap and bring it carefully over the head, and then pull the respirator away from the face without touching the front of the respirator.
    - Facemask: Carefully untie (or unhook from the ears) and pull away from face without touching the front.
7. Perform hand hygiene after removing the respirator/facemask and before putting it on again if your workplace is practicing reuse.

Facilities implementing reuse or extended use of PPE will need to adjust their donning and doffing procedures to accommodate those practices. The Safety Officer should ensure that the Doffing Process is carried out meticulously to prevent contamination.

For institutions which require coveralls in Covid surgeries, the following process is applicable.

PHASE 1 (Sterile Team)
Inside the OR Suite

1. Remove short booties. Perform hand hygiene
2. Remove sterile gown (Level 3). Perform hand hygiene
3. Remove outer layer of gloves (surgical) using glove to glove and skin to skin technique. Perform hand hygiene
4. Remove face shield (lean forward and dispose). Perform hand hygiene

5. Remove bouffant cap (up and away from the face). Perform hand hygiene
6. Remove tie-on surgical mask. Perform hand hygiene.

PHASE 1 (Unsterile Team)
Inside the OR Suite

1. Remove short booties. Perform hand hygiene
2. Remove sterile gown (Level 3). Perform hand hygiene
3. Remove outer layer of gloves (clean). Perform hand hygiene
4. Remove face shield (lean forward and dispose). Perform hand hygiene
5. Remove bouffant cap (up and away from the face). Perform hand hygiene
6. Remove tie-on surgical mask. Perform hand hygiene.

STEP 1

Remove Cover-all suit

- Release zipper/tie
- Remove the hood of the suit (Bunny suit) touching only the outside portion
- Pull one arm at a time touching only the inside part of the suit
- Fold the exposed part of the gown inwards
- Dispose cover-all suit inside bind
- Perform hand hygiene

STEP 2

Remove Long Shoe Covers

- Remove long shoe covers one at a time touching only the unexposed side.
- Dispose shoe covers
- Perform hand hygiene

STEP 3

Remove Gloves (Inner Layer)

- Grasp the outside of one glove at the wrist
- Peel away from your body
- Hold the removed glove in the gloved hand

- Put the finger inside the glove. Turn inside out while pulling away from the body.
- Dispose gloves.
- Perform hand hygiene.

STEP 4

Remove Eye Goggles

- Touching only the strap or tip, remove eye goggles while avoiding the exposed part.
- Perform hand hygiene.

STEP 5

Remove N95 Mask

- Without touching the respirator, remove lower strap of N95 mask
- Followed by the upper strap while slightly leaning forward with chin down gently pull the straps away from your body.
- Place N95 mask in a bin reprocessing or dispose if necessary
- Perform hand hygiene

STEP 6

Decontaminate

- Take a shower
- Wear new set of scrub suit or outer wear

Reference:
St. Luke's Medical Center; Makati Medical Center; University of Toronto Hospital

COVID-19 Safety Officer

Safety officers are assigned personnel in each department or unit that must commit to fulfilling new safety tasks related to reducing the risk of COVID-19 transmission. They must ensure fellow staff in their own units are compliant to all provisions of the new normal standards set by the institution.

The following minimum health and safety standards shall be implemented in all workplaces in respective institutions:

1. Increasing physical and mental resilience
   a. Emphasize to health care workers the everyday actions to stay healthy
   b. Provide free vitamins and medicines
   c. Refer health care workers needing counseling or presenting mental health concerns

2. Reducing transmission of COVID-19

   All healthcare workers shall:

   a. Mandatory wearing of prescribed surgical masks, acceptable face shields in all premises and appropriate Personal Protective Equipment (PPE) at the patient care units.
   b. Accomplish a daily online or manual health declaration questionnaire and submit or show proof to the guard.
   c. Mandatory temperature checks in all employee entry points and recorded in the Health Declaration Form
   d. Spray alcohol or sanitizers on hands
   e. Physical distancing measures shall be strictly implemented. At least 1.5 to 2 meters distance between individuals must always be observed. The number of people inside an enclosed space such as rooms, elevators, etc. shall be limited in observance of physical distancing of one meter.
   f. All are discouraged to engage in conversation, as well as prolonged face to face interaction with colleagues and patients. Eating in common areas is discouraged. Employees shall be encouraged to eat in their individual workplace area unless it is a restricted no-food/eating zone. "Take Out" and "Delivery" options shall be encouraged.
   g. Online systems, including the use of videoconferencing, are encouraged for meetings and teleconsulting.
   h. Rigorous and intensified cleaning, disinfection of all spaces.

Reference:
St. Luke's Medical Center guidelines for New Normal Workforce and Management; Department of Trade and Industry and Department of Labor and Employment issue Interim Guidelines on Prevention and Control of Covid-19 in the Workplace

D. Operating Room Attire

Standards Pertaining To Wearing The Proper Attire In The Operating Theater

Importance of traffic control inside the Operating Room Theater:

Planning and controlling the movement of people assists in the containment or limitation of contamination. **The use of proper surgical scrub attire and name identification restricts the movement of personnel within the surgical suite**.

Proper OR attire includes:

1. Clean scrub suit (with shirt tucked into pants)
2. Hair and beard cover
3. Protective foot wear with covered toes
4. Masks (fully cover the mouth and nose)
5. Sterile gowns and gloves when doing surgery

Recommendations regarding the proper OR attire:

1. Wear newly laundered scrub suits, head covering or cap, shoes and masks.
2. Change attire if it becomes wet or soiled.
3. Change attire if it gets punctured, contaminated or when strike through occurs.
4. Gowns must be free of holes, punctures and tears.
5. Flame-resistant gowns must be worn during laser surgery.
6. Remove any jewelry when doing hand antisepsis.

Measures to ensure Infection Control:

1. When contact with blood or body fluid is anticipated, wear double gloves, protective apron, cover gown and protective eye wear.
2. When retrieving cultures and specimens and delivering them, gloves must be worn.
3. When breaking down and disposing instruments, utensils, trash, linens, and sharps, gowns and gloves must be worn.
4. Clean stethoscope and sphygmomanometer and other frequently-used equipment daily.

5. Bags and other personal items should be left outside the restricted or semi restricted areas, or placed in clean plastic bags allotted for the purpose.

Other considerations in the attire selection process:

1. Attire should be comfortable, durable, and impermeable to most microorganisms.
2. Surgical team members must be involved in the selection process.
3. Choice of gown is based on the procedure and anticipated level of exposure to blood and body fluids.
4. Manufacturers must provide data as basis for evaluating efficacy.

E. Updated Recommendations for the Rational and Effective Use of Personal Protective Equipment (PPE): Guidelines For Extended Use, Re-Use and Acceptable Reprocessing Methods

The COVID-19 pandemic is exerting tremendous pressure on all healthcare systems worldwide. Strategies must be employed to care for patients the best we can while protecting health care workers (HCWs) from contracting the disease themselves. DOH has confirmed that community transmission of COVID-19 has been sustained since March, thus it is prudent to consider all patients as a suspect for COVID-19.[1] Ensuring the availability and appropriate use of personal protective equipment (PPE) is necessary for the safety of healthcare workers, especially during this time. The mandate to protect the health care workers from COVID-19 has resulted in an alarming increase in demand for PPE worldwide, especially in healthcare facilities, leading to a shortage in some areas.

A report from the Philippines[2] calculated that at least 12 PPE per patient per day is required whenever a suspected COVID-19 patient seen at the emergency room, who will undergo multiple diagnostic tests, will be admitted and monitored in 8-hour work shifts. Hence, at least 168 PPE sets from admission to discharge will be utilized in 14 days, which is the usual duration of hospital stay of COVID-19 patients. If the patient will require a surgical procedure, an additional of at least 10 PPE sets

will be needed, excluding subsequent needs for the postoperative care of the patient. Using these figures, the total cost of PPE for one admitted suspected COVID-19 patient can easily be estimated adding up to a cost that becomes overwhelming.

Most institutions and regulatory bodies suggest adapting levels of protection worn by HCWs to the risk of contracting the disease based on patient COVID-19 status, the level of the interaction (procedure, time of contact, distance etc.) and transmission dynamics of the virus (contact, droplet or aerosol).[3] This will avoid the unnecessary over-consumption of precious PPEs on relatively low-risk patient encounters and conserving them for the high-risk settings.

Though it is ideal to dispose of used PPE quickly, we need to anticipate the compelling requirements and the possible disparity in supply and demand for the days to come, as we continue to combat this unpredictable pandemic. Because of this problem, apart from setting rules on the rational use of PPE, its extended use or limited re-use may be necessary to conserve the supply of PPE without compromising the safety of the healthcare workers. Reprocessing methods have been recommended for PPE made of durable materials that lead to sterilization without sacrificing its safe use and integrity. These so-called Crisis Capacity Strategies.[4] for the extended use or limited re-use of PPE and reprocessing methods have been recommended as acceptable alternatives to the ideal standard of disposing used PPE.

The Philippine College of Surgeons (PCS) summarized the proper indications for the rational and appropriate use, extended use and reuse of the PPE, which are needed depending on the risk of exposure of the healthcare worker. We have also included recommendations on how to extend or limit its use, as well as some acceptable reprocessing methods for reuse. It has to be emphasized however that these alternative strategies are only recommended in crisis situations where supplies are critically low.

After 8 months into the COVID pandemic, the Philippine College of Surgeons feel the need to upgrade the initial guideline formulated when the pandemic started. The basis of this revision is the learning that the most important mode of transmission is still by infectious droplets therefore for most situations, the surgical mask should suffice. When

there are aerosol generating procedures, the possibility of airborne transmission is likely and N95 or equivalent masks should be used. Transmission by contact with fomites and contaminated surfaces is still considered possible but least in the amount of risk.[4]

I. Definition Of Terms

Personal Protective Equipment (PPE) – includes any gear to protect against infection (gloves, face masks, N95 mask/respirators, goggles, face shield, gowns, scrub suits, coveralls, shoes, booties/shoe covers).[3]

- Level 1 PPE – surgical mask, alcohol hand wash/spray
- Level 2 PPE – surgical mask, goggles or face shield
- Level 2.5 PPE -KN95 mask or equivalent , face shield or googles, isolation/washable line gown(4)
- Level 3 PPE - NIOSH- certified N95 mask, goggles or face shield, gloves, surgical cap, scrub suits, gowns and shoe covers
- Level 4 PPE – NIOSH- certified N95 mask or equivalent (or PAPR), goggles or face shield, double gloves, surgical cap, scrub suits, coveralls, dedicated shoes, shoe covers, (Please refer to Appendices 3 , 4 and 5)

Powered Air Purifying Respirator (PAPR) - protects the user by filtering out contaminants in the air and uses a battery-operated blower to provide the user with clean air through a tight-fitting respirator, a loose-fitting hood, or a helmet[6]

COVID area – a space or place in the hospital (e.g. private room or emergency room) where probable or confirmed COVID-19 patients stay for significant period of time (>6 hours) or where potentially aerosol generating procedures are performed

Aerosol-generating procedures (AGP) - any medical and patient care procedure that results in the production of airborne particles (aerosols)[7]

List of Aerosol-generating procedures but not limited to;[7]

- Intubation, extubation and related procedures; for example, manual ventilation and open suctioning
- Tracheotomy/tracheostomy procedures
- Cardiopulmonary resuscitation

- Bronchoscopy
- Dental procedures – high speed drilling
- Surgical procedures in which high-speed devices are used (include energy devices)- high speed cutters and drills, powered instrumentation, suction microdebrider
- Non-invasive ventilation (NIV) e.g. bi-level positive airway pressure ventilation (BiPAP)
- Continuous positive airway pressure ventilation (CPAP)
- High frequency oscillatory ventilation (HFOV)
- High-flow nasal oxygen (HFNO)
- Induction of sputum
- Gastrointestinal endoscopy (unless carried out through a closed-circuit ventilation system)
- Evacuation of pneumoperitoneum during laparoscopic procedures

Extended use – The use of PPE without removing for up to 6 hours, when caring for a cohort of COVID-19 patients[3,5]

Reprocessing / Reuse – Process to decontaminate using disinfection or sterilization methods.[3,5]

Decontamination - refers to a process of decreasing antimicrobial presence in an area or on a surface.

Disinfection - refers to the elimination of virtually all pathogenic organisms on inanimate objects and surfaces thereby reducing the level of microbial contamination to an acceptably safe level.

Sterilization - a process of destruction of all forms of living microorganisms from a surface or substance.

II. Rational Use of Personal Protectitive Equipment (PPE)

The use of Personal Protective Equipment (PPE) must be strengthened by appropriate institutional administrative and engineering controls to be deemed effective. These include the creation of infection control policies (including training of personnel on proper PPE use), increased testing capabilities, appropriate infrastructure, provision of adequate manpower and triaging systems to effectively reduce the spread of infection. Environmental controls like physical distancing, good ventilation/airflow design, properly instituted workflow and proper disinfection processes all

help curb infection rates. Without them, the use of PPE alone will not be as effective. The setting, patients and risk for exposure determine the type of PPE to be used. Strict adherence to proper hand hygiene must be ensured at all points of care and in all areas.

Practical Strategies to Conserve PPE:[2,3]

1. Minimize the need of patients to go to health care facilities for consultation and evaluation, by using telemedicine and telephone hotlines
2. Use physical barriers in areas of the health care facilities where patients will first present such as, triage, screening areas and registration desks to reduce exposure.
3. Zoning of COVID and non-COVID areas into color coded zones based on risk levels of transmission
   Green zone for low risk, Orange zone for moderate risk, and Red zone for high risk
4. Improve operational efficiency via monitoring, audits, and use of safety officers
5. Earning commitment of healthcare workers to use PPEs judiciously
6. Extended use, reprocess followed by reuse and use of alternative items compared with recommended standards
7. Consider the use of elastomeric masks with appropriate filters and reusable body suits.[4]
8. Improve COVID-19 Testing workflow to swiftly re-classify patients and transfer to appropriate risk zones to decrease unnecessary use of PPEs for Non-COVID patients

III. Specific Areas And Recommended Use Of Personal Protective Equipment (PPE)[4,5]

Starting October 1, 2020 Level 1 is not sufficient at this time of the pandemic and will not be used until further advised[4]

Setting in Health Care facility	Activity	Risk level	Type of PPE
EMERGENCY ROOM COMPLEX			
Triage area	Preliminary screening for prioritization of care according to severity	Low	Maintain physical distance of at least 1 meter • Ideally, build glass/plastic screens to create a barrier between health care workers and patients • Level 2 PPE • Perform hand hygiene When physical distance is not feasible and yet no patient contact, • Level 2 PPE • Perform hand hygiene
Emergency room setting Patient room/ward	Providing direct care to COVID-19 patients, in the **absence** of AGP	Moderate	• Level 3 PPE • Perform hand hygiene
Emergency room setting Patient room/ward	Providing direct care to COVID-19 patients in settings where **AGP** are frequently in place	High	• Level 4 PPE • Perform hand hygiene
OUTPATIENT DEPARTMENT			
Triage area	Preliminary screening not involving direct contact	Low	Maintain physical distance of at least 1 meter. • Ideally, build a glass/plastic screen to create a barrier between health care workers and patients • Level 2 PPE • Perform hand hygiene

			When physical distance is not feasible and yet no patient contact, • Level 2 PPE • Perform hand hygiene
Consultation room	Physical examination of patients **without** symptoms suggestive of COVID-19	Low to Moderate	• PPE according to standard precautions and risk assessment. • Level 2 PPE • Perform hand hygiene
Consultation room	Physical examination of patients **without** symptoms suggestive of COVID-19 but aerosol-generating procedures can occur	Moderate	• Level 2.5 PPE • Perform Hand Hygiene
Consultation room	Physical examination of patient **with** symptoms suggestive of COVID-19	Moderate	• Level 3 PPE • Perform hand hygiene
SINGLE OR WARD ROOMS			
Single or Ward Rooms	Patient **without** symptoms suggestive of COVID-19	Low to Moderate	• PPE according to standard precautions and risk assessment • Level 2 PPE • Perform hand hygiene
Single or Ward Rooms	Patient **without** symptoms suggestive of COVID-19 but aerosol generating procedures can occur	Moderate	• Level 2.5 PPE • Perform hand hygiene
Single or Ward Rooms	Patient is probable or confirmed COVID-19	High	• Level 3 PPE • Perform hand hygiene

OPERATING ROOM			
Operating Room procedures Local/ Regional anesthesia (No AGP)	Surgery on COVID-19 positive or probable patients	High	• Level 3 PPE • Sterile gown and gloves over PPE • Perform hand hygiene
Operating Room procedures 1. With AGP 2. Patients under general anesthesia	Surgery on COVID-19 positive, probable or suspect patients	High	• Level 4 PPE • Sterile gown and sterile gloves over coveralls, use of PAPR if available • Perform hand hygiene

IV. Appropriate Use Of Personal Protective Equipment (Ppe) In Relation To Risk Level Of Transmission In Hospital Areas (ZONING)

(Developed by Berba RP, HICU, UP-PGH)

Low risk level of transmission (Green Zone) — Level 2 Personal Protective Equipment

Moderate risk level of transmission (Orange Zone) — Level 2.5, 3 or 4 Personal Protective Equipment

High risk level of transmission (Red/Hot Zone) — Level 3 or 4 Personal Protective Equipment

V. Appropriate Use Of Level 3 Vs. Level 4 Personal Protective Equipment In Moderate Risk Or High-Risk Zones (Developed by Berba RP, HICU UP-PGH)

1. **If a Healthcare Worker (HCW) is in a moderate (Orange Zone) or high risk (Red/Hot Zone) zone in COVID-19 Areas he/she wears Level 3 PPE in the following instances:**

   a. Required to stay for <4 hours
   b. Brief interaction with patients such as: History taking, Physical examination, X-rays, blood draws, daily rounds
   c. Perform nasopharyngeal swabs/oropharyngeal swabs
   d. Assigned as safety officer at the doffing area

2. **If a HCW is in a moderate (Orange Zone) or high risk (Red/Hot Zone) zone in COVID-19 Areas he/she wears Level 4 PPE in the following instances:**

   a. Required to stay for >4 hours
   b. Perform close contact procedure with patient (Carrying patient, changing bed linen while patient on bed, changing diaper, suctioning, performing oral or ET care, inserting NGT and similar procedures) – use additional apron/raincoat material
   c. Perform procedures such as intubation
   d. Perform CPR, use additional apron/raincoat material
   e. Perform surgical procedures under GA in the Operating Room theaters or endoscopy suites
   f. At the Emergency room where you will evaluate, triage, stabilize a COVID-19 suspect patient
   g. **When in doubt if Level 3 or 4 PPE, opt for level 4**

VI. Appropriate Use Of Level 2.5 Personal Protective Equipment In Moderate Risk Zones (adapted from HICU UP-PGH)[4]

Level 2.5 PPE is a Filipino adaptation to address the scarcity of N95 Respirators and the availability of KN95 Respirators. It also takes into consideration the clothing normally worn by Filipino doctors and surgeons in the clinics and upon patient visits.

Use of KN95 masks or equivalent should undergo strict hospital assessment for quality and filtration efficiency, as there is a surplus of counterfeit masks. Only approved KN95 masks should be used by all healthcare workers.

It is advised to only use masks from manufacturers included in Philippine FDA circular[8] CDC, or other certifying body.[9]

VII. Description Of Each Personal Protective Equipment (PPE)

1. Surgical Mask

Specifications:
Disposable, non-woven, pleated, hypoallergenic, high filtration capacity, with adaptable nose bar, very low resistance to breathing

Recommended use for HCW who are:

- Not directly handling COVID-19 patients
- No risk of splashing or spraying of bodily fluids

Extended use of surgical mask without removing for up to 6h[3,5], when caring for a cohort of COVID-19 patients is feasible but increases the risk of contamination. The use of a face shield over a surgical mask (covering the chin and sides of the face) may extend the use of the face mask

Reprocessing of surgical masks is NOT RECOMMENDED.

Cloth masks are NOT considered as an alternative to surgical masks for health care workers.[10]

2. **Eye Protection (Goggles/ Face Shields)**[11]

Specifications:

- Anti-fog with side shield is preferred
- Made of polycarbonate material
- Lightweight with adjustable head-strap
- Must cover the side of the face and below the chin.

Recommended use for HCW who are:

- involved or performing AGP
- directly caring for probable or confirmed COVID-19 patients
- performing procedures with risk of splashing or spraying of blood and other bodily fluids

Extended use or limited re-use of goggles/face shields are accepted.

Situations where goggles/face shields should be discarded:

- goggles or face shields are damaged
- item can no longer fasten securely to the HCW
- visibility is obscured upon use of the item

Reprocessing of goggles/face shields are accepted.

Method of Reprocessing goggles/face shields:

a. The most common method of reprocessing is by washing with soap/detergent and water first, followed by disinfection[12], then rinsing with water and lastly by airdrying.

Disinfection Alternatives:[12]

1) soak with 0.1% sodium hypochlorite for 5 minutes
2) wipe with 70% ethanol with a minimum contact time of 5 minutes.
3) soak with 3% hydrogen peroxide for 30 minutes

b. Another method to reprocess goggles is to clean it then decontaminate the goggles, then expose to ultraviolet radiation in a UV sterilizing cabinet for 15 minutes. This method is supported by a study by Ziegenfuss where decontamination of eye protection equipment was found effective, using ultraviolet radiation (UV): at 253.7 nm wavelength.[13]

The reuse/reprocessing of goggles/face shields without appropriate decontamination sterilization is strongly discouraged because it is one of the principal sources of transmission to health care workers.

3. Respirators (N95, N99, N100)

Specifications:
At least 95% filtration efficiency, fluid resistance, with nose clip, 2-strap design with welded strap attachment, with nose foam.

Fit testing is a critical component to a respiratory protection program whenever workers use tight-fitting respirators. Use a test agent, either qualitatively detected by the wearer's sense of taste, smell, or involuntary cough (irritant smoke) or quantitatively measured by an instrument, to verify the respirator's fit.[14]

Based on evidence the following respirators (shown below) can be expected to function very similarly to one another, based on the performance requirements stated in the standards and confirmed during conformity testing. NIOSH certification is recommended[15] however in the absence of NIOSH certification the following may be used during shortage of respirators.[15,16]

Product Classifications	Jurisdiction	Performance Standard
P2, P3	Australia/New Zealand	AS/NZS 1716:2012
PFF2, PFF3	Brazil	ABNT/NBR 13698:2011
KN95, KP95, KN100, KP100	China	GB2626-2006 GB2626-2019 GB19083-2010
FFP2, FFP3	Europe	EN 149-2001
DS/DL2, DS/DL3	Japan	JMHLW-2000
Korea 1st class	Korea	KMOEL-2017-64
N95, P95, R95 N99, P99, R99 N100, P100, R100	Mexico	NOM-116-2009

(CDC, NPPTL Respirator Assessments to Support the COVID-19 Response Updated July 16, 2020)[15,17]

Elastomeric Respirators are equipped with replaceable filter cartridges or flexible, disc or pancake-style filters provide at least equivalent protection to N95 respirators.[18]

It is imperative that every healthcare facility perform their own evaluation and performance tests of the respirators that they issue for their healthcare workers. Certain manufacturers have been reported to issue masks that do not meet the performance standards as labeled and will pose a significant risk to the healthcare workers and people around them.[19]

Recommended use for HCW:

- involved in or performing aerosolizing procedures (endoscopy, intubation, etc.)
- directly caring for COVID-19 suspect or confirmed patients
- performing procedures with risk of splashing or spraying of blood and other bodily fluids
- can be used for up to 8 hours[20-21]

Extended use is safe and accepted provided that the respirator must maintain its fit and function.[21]

Conditions that will prevent extended use of N95 masks[3,5, 20-21]

- soiled with blood or bodily fluids
- discarded following use in aerosol generating procedures
- following close contact with, or exit from, care area of COVID-19 suspect or confirmed patients
- damaged (tie or ear loops are torn or broken)
- hard to breathe through

Extended use is favored over reuse.[3-5, 20-21]

Reuse after extended use is not accepted.

Reuse is permitted provided the following steps are observed to reduce contact transmission[3,5, 20-21]

- Can rotate 5-7 pcs of N95 respirators for each HCW
- Use one N95 in a particular day, take off and store
- Store by hanging used respirators in designated storage area or use a breathable container such as a paper bag in between uses
- Avoid respirators touching each other in storage to minimize potential cross contamination
  - o this amount of time in between use, exceeds the 72-hour expected survival time for SARS-CoV-2
- Minimize cross contamination by labeling one respirator per HCW.
- Use of face shield over an N95 respirator

Limited re-use for not more than 5 times per device to ensure adequate safety margin.[20,21]

Contact transmission caused by touching a contaminated mask is identified as a primary hazard for use and reuse of respirators.[11-12]

Reprocessing Methods: There are three decontaminating methods for ensuring effectiveness and integrity of respirator after reprocessing.[21,22,23]

- Vapor of hydrogen peroxide (VHP) – STERRAD gas plasma sterilizer for 55 mins.
- UV radiation lamp – UV sterilizing cabinet for 15 minutes
- Moist heat incubation – hot air (oven) 70ºC for 30 minutes

VHP and UV technique allow reuse up to three times; moist heat allows reuse for up to two times.

Decontamination methods not recommended by current evidences[20-25]

- Ethylene oxide
- Ionizing radiation
- Microwave
- High temperature above 75ºC, such as autoclave or steam

Expired N95 can still be used, as long as there are no signs of damage (discoloration, residue shedding, loss of elasticity of earloops). However, it is advised to get in touch with the manufacturer prior to use.

Damage to the shape of respirators due to reprocessing may affect fit and protection properties.

Elastomeric Respirators are safer and more sustainable.[3] They can be repeatedly used, cleaned, disinfected, stored, and re-used.[18]

4. Powered Air-Purifying Respirators (PAPR)

Principle:

- Battery powered blower that forces air through filter cartridges or canisters and into the breathing zone of the wearer, an airflow is created inside, either a tight-fitting facepiece or loose-fitting hood or helmet, providing a higher assigned protection factor (APF)
- Uses high-efficiency particulate air (HEPA) filter which implies that they have a greater level of respiratory protection than N95 masks.

Components:

- Headgear or Hood, face shield, head harness, nose cup assembly, spectacles, visor covers, inhalation and exhalation valves, port adapter, cartridge filter, PAPR system, belt, air hose, battery chargers, etc.

Some Useful information about loose fitting PAPR[26]

- Better than tight-fitting non-powered approved air-purifying respirators[6]
- A fit test is not required
- Can be worn with a limited amount of facial hair.
- May offer significant splash protection for the face and eyes.

- Patients can see the face of the HCW, providing better interpersonal communication.
- Can be cleaned, disinfected, re-used, and shared.
- Less taxing from a physiological/breathing resistance perspective than other respirators.

Limitations of PAPR[6,26]

- May interfere with the user's visual field because of the limited downward vertical field of view.
- Ability to hear may be reduced because of the blower noise, and noise induced by the movement of a loose head covering.
- Ability to use a stethoscope may be limited.
- Batteries have to be recharged or replaced.
- Requires a significant amount of storage space in between shifts.
- Highly recommended for health facilities to have a program on
  - o Maintenance, cleaning and proper disinfection
  - o Battery supply and maintenance
  - o Formal training on donning and doffing, because removal of the hood is more complicated

Role of PARPs in contingency and capacity settings

Access to PARPs may be even more limited due to cost and need for routine maintenance[26]

Only NIOSH-certified/NPPTL-certified PAPRs are recommended, as build quality, filtration efficiency, extended use, and other factors have been carefully tested before NIOSH approval is granted. CDC has a current list of approved PAPRs from the National Personal Protective Technology Laboratory (NPPTL). Locally distributed brands such as 3M, Honeywell, Draeger, and Clean Space Halo are NIOSH HEPA filter Approved.[15,19]

During this pandemic, healthcare facilities and individual healthcare workers may opt to use Non-NIOSH, Non-FDA certified PAPRs on their own discretion provided that manufacturers show authentic proof of third party testing for filtration efficiency and safety, and/or authentic proof of approval from other international standards. Locally distributed PAPR Brands should undergo local testing and verification and before they can be recommended, especially for use in treating COVID-19 patients.

It is noted by the CDC that: "PAPR HE filters used in industry are generally re-used until they are soiled, damaged, or reduce PAPR air flow below specified levels.[12,13] Caution should be used when using the filter for a live virus, and a practical replacement cycle should be implemented until more is known."

Modifications of NIOSH-approved respirators, such as using an external filtering device connected to a disposable or elastomeric N95 or greater mask is not recommended as they lose their NIOSH approval status once modified. Popular consumer devices that function as Personal Filtered Air Device, especially for use in treating COVID-19 patients, are recommended only if they have NIOSH/FDA/local government approval for use in the healthcare setting.[15,19]

5. Gowns

Specifications:

- PPE gown - also commonly known as Surgical gown, sometimes called isolation gowns
- Material Non-woven polypropylene (disposable single use), or non-woven cloth, polyester or polyester-cotton (washable, reusable)
- Long sleeved, tie back, covers down to mid-calf, light weight, durable, breathable, water and blood resistant

Appropriate use of gowns

- Gowns are worn over scrub suits.
- In conventional capacity situation use, surgical or isolation gowns (polypropylene-made).
- In contingency capacity strategies, shift gown use towards use of cloth gowns.
- Upon entry to a room or area of a suspect or confirmed COVID patient, use clean isolation gown.
- In actual and close contact patient encounter with COVID suspect or confirmed case, use two layers of gowns as much as possible. One may opt to combine the use of polypropylene made gowns with cotton made gowns.
- If a combination of cotton made gown and polypropylene made gown is needed, use the polypropylene made gown as inner layer, followed by the cotton gown as the outer layer. Quickly

dispose of the cotton gown once it is stained or soiled and replace immediately if necessary.
- In the Operating Room, don an unsterile gown as first layer protection at the donning area and then proceed inside the operating cubicle for another layer of sterile gowning process.

Removal/disposal of gowns, if it is:
- Wet, soiled or damaged
- Exposed to chemicals, infectious substances or bodily fluids
- Used in providing care outside designated cohort of COVID-19 patients

Extended use is acceptable in HCW providing care for a cohort of COVID-19 patients[27]

Reuse/Reprocessing of gowns made of cloth is accepted.[27]

Cloth gowns are to be laundered after each use.[27]

Reprocessing:[27,28]
- Cotton gowns:
  - Washing machine – wash and disinfect with warm water (60-90ºC) and laundry detergent
  - Manual washing – soak and stir with hot water and soap followed by soaking in 0.05% chlorine for 30 minutes then rinse with water and dry fully.

- Disposable gowns
  - The CDC cites easy breakage of disposable gown ties and fasteners, making them less amenable to washing and reuse than reusable gowns.

When gowns are in short supply, the following are the alternatives but be aware of their limitations:[27,28]
- Disposable lab coats are less durable than gowns
- Disposable impermeable plastic aprons cannot protect arms and back of torso
- Reusable patient gowns or lab coats but design or thickness may not be comparable

- Combination of pieces of clothing such as the following may be considered for activities that may involve body fluids and when there are no gowns available:
  - Long sleeved aprons in combination with long sleeved patient gowns or laboratory coats
  - Open back gowns with long sleeved patient gowns or laboratory coats
  - Sleeve covers in combination with aprons and long-sleeved patient gowns or laboratory coats

6. Coverall (Hazmat Suit)

Specifications:[29]

- Made of high-density polyethylene (HDPE) formed into non-woven fabric; other materials are polypropylene fiber with polyethylene coating, breathable, light weight, water-based liquids and aerosol repellant, low linting, tunneled elastic bands for the wrists, ankles and face, and thumb loops
- Ideal color is white or light blue, ideally single use, biohazard protective coverall clothing

Recommended only for HCW who are:

- Involved or performing aerosol-generating procedures (endoscopy, intubation, etc.)
- Directly caring for COVID suspect or confirmed cases
- Performing procedures with risk of splashing or spraying of blood and other bodily fluids

Coveralls provide 360-degree protection including back and lower legs, sometimes the head and feet as well

Reuse or reprocessing of coveralls is acceptable in times of severe shortage.[29] Ideally, coveralls are for single use. However, if supply becomes an issue, recycle those, which can be adequately cleaned, disinfected and sterilized.[30,32]

Reprocessing:

The most common method of reprocessing is to initially, wash with soap/ detergent and water followed disinfection.[12] then by rinsing with water and finally by air & sun drying

Disinfection Alternatives:[12]

1) soak with 0.1% sodium hypochlorite 5 minutes
2) soak with 3% hydrogen peroxide for 30 minutes

Alternatives to commercially available coveralls:

Non-woven polypropylene –

- same material used to make reusable shopping bags
- made from thermoplastic polymer
- recyclable and reusable
- coveralls can be washed if they are used in low-risk areas.

Infectious disease experts do not recommend this type of non-woven polypropylene coveralls as these are not meant for health care workers who come into direct contact with infected patients.[31]

Advise on locally manufactured coveralls[32]

- Current recommendations on specifications on medical grade coveralls is still undergoing quality and safety assessment by DOH and DTI.
- Local manufacturers are mandated by the FDA to:
  - secure a License to Operate (LTO) as medical device manufacturer
  - be guided by local (Philippine National Standard) and applicable international standards (ISO or IEC), in the absence of Philippine National Standard.
  - comply with technical requirements for the registration of medical devices
  - undergo safety testing by appropriate accredited laboratories.

Donated PPEs must also be subjected to the scrutiny and approval of individual hospital infection control committees and caution must be applied for use in Level 4 areas without the aforementioned precautions.

7. Surgical Cap

Specifications:

Disposable, non-woven surgical bouffant cap, shower type

8. Shoe Cover

Specifications:

- Disposable, non-woven
- Fabric does not tear/break easily
- Non-skid, does not slip on wet floor

No recommendation can be made for the use of shoe covers versus no shoe covers for health care personnel caring for patients with suspected or known COVID-19 as part of appropriate PPE. No studies conducted at this time.

9. Gloves

Specification:

- Hypoallergenic, nitrile, powder free, latex free (some are too thin), standard thickness, beaded cuff, smooth with micro textured finish, safe grip easy downing and comfort, excellent hand fitting.
- Superb tensile strength.
- With left and right hand marking on gloves

Recommendations:

- Should be worn when providing direct care for a COVID-19 patient and then removed, followed by hand hygiene in between patients
- Should be worn when in close contact with a patient during physical examination then immediately removed followed by hand hygiene in between patients
- Do not use the same pair of gloves for multiple patients
- Double gloving is not recommended except in surgical procedures carrying a high risk of glove perforation.
- Extended use of gloves (using the same gloves for a cohort of COVID-19 cases) must not be done.
- Changing gloves between dirty and clean tasks in the delivery of care to a patient and when moving from a patient to another, accompanied by hand hygiene, is absolutely necessary.

Use of double gloves or single gloves

- No recommendation as no comparative studies were conducted.
- Using a single pair of gloves puts one at a theoretical risk that the organism may transfer from contaminated PPE to the hands

after removal of the contaminated gloves or clothing, which may contribute to infection.[33]

KEYPOINTS:

1. Most personal protective equipment (PPEs) are designed for single use, but in situations where supply is limited, extended use and reuse after reprocessing may be considered. The following PPEs may be reprocessed then reused: N95 mask, goggles, face shields, scrubs, coveralls, covered shoes and cotton gowns.
2. Reprocessing should follow the principles of cleaning and decontamination before disinfection and sterilization. Reprocessing should be performed by a trained staff in the sterile services department of a health care facility or at a bigger scale under controlled and standardized conditions.[5]
3. Disinfection and reuse of disposable PPE may be possible, but always be aware that the processes used may compromise the integrity of the product and impact its effectiveness.
4. It must be understood that reprocessing of disposable PPE is an evolving subject where research and development is currently ongoing. More evidence may become available in the future.
5. It cannot also be overemphasized that these alternative strategies are only recommended in crisis situations where there is a critical shortage of supplies.

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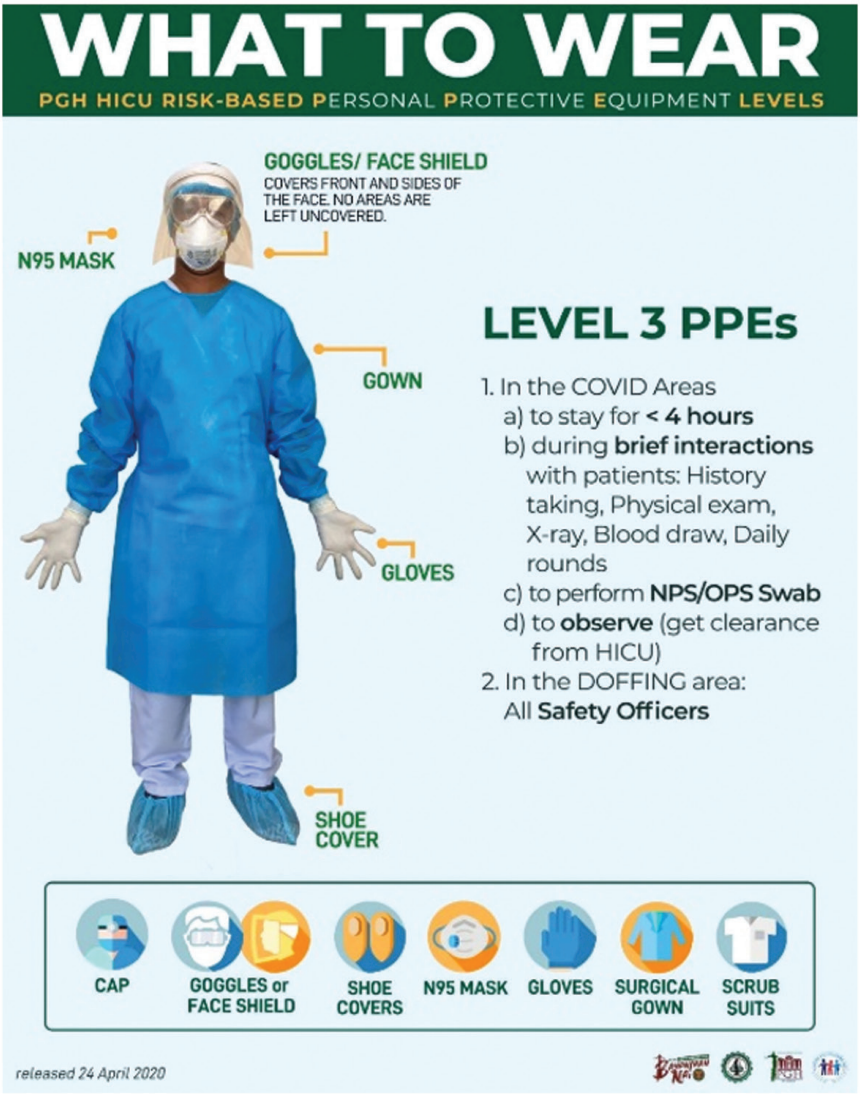
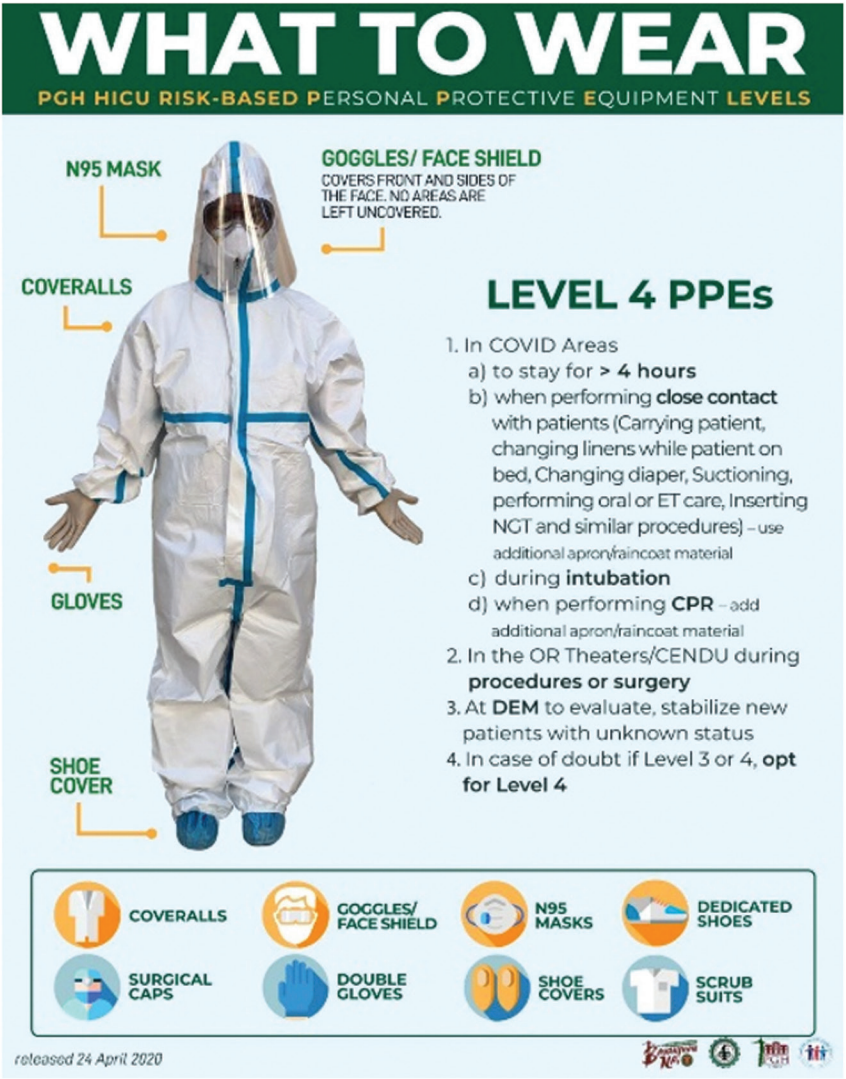
Appendices

Appendix 1
Level 3 PPE
(With permission from Philippine General Hospital – Information, Education Communication)



Appendix 2. Level 4 PPE
(With permission from Philippine General Hospital – Information, Education Communication)



F. Health Care Waste Management

Health care waste is a potential reservoir of pathogenic microorganisms and requires appropriate, safe and reliable handling to ensure that there are no adverse consequences to health and the environment. The main risk associated with infection is sharps that are contaminated with blood. There should be persons in the organization who are identified and responsible for waste collection, handling, storage and disposal. Waste management should be conducted in coordination with the infection control team.

Hospital waste is a potential reservoir of pathogenic microorganisms and requires appropriate, safe and reliable handling. The main risk associated with infection is sharps contaminated with blood. There should be persons in the organization who is responsible for waste collection, handling, storage and disposal. Waste management should be conducted in coordination with the infection control team.

Steps in the management of hospital waste include:

a. Training and Awareness
b. Generation
c. Segregation/Separation
d. Collection
e. Transportation
f. Storage
g. Treatment
h. Final disposal

Principles of Waste Management:

a. Develop a waste management plan that is based on an assessment of the current situation and which minimizes the amount of waste generated.
   Develop a waste management plan that is based on an assessment of the current situation and that is focused in minimizing the amount of waste being generated.

b. Segregate clinical (infectious) waste from non-clinical waste in dedicated containers that are watertight and properly labeled.
   Segregate clinical (infectious) waste from non-clinical waste in

dedicated color-coded containers that are water tight and properly labelled. The recommended color-coding scheme is shown below:

Color of container/bag	Type of waste
Black	Non-infectious dry waste
Green	Non-infectious wet waste (kitchen, dietary etc.)
Yellow	Infectious and Pathological waste
Yellow with black band	Chemical waste including those with heavy metals
Orange	Radioactive waste
Red	Sharps and pressurized containers

c. Blood and body fluids found in suction tubing, blood bags, and other reservoir are placed in leak-proof bags then placed in biohazard containers.

d. Items that are contaminated with blood or body fluids in a liquid state when compressed (soaked surgical sponges, soaked gowns, soaked linens, etc.) are placed in the biohazard containers in the operating room.

e. Sharps are placed in the puncture resistant containers made of plastic or metal and have a lid that can be closed. They should be marked with the appropriate label or logo, e.g. a biohazard symbol for clinical (infectious) waste.
Sharps are placed in the puncture-resistant rigid containers, usually made of high-density plastic or metal, which are fitted with covers. These should be marked with the appropriate label or logo (e.g. biohazard symbol for clinical infectious waste).

f. Needles must be disposed without being manipulated (removed from syringe, recapped or bent).

g. Disposable gloves, masks, disposable gowns and gauze must be sufficiently contained in leak-proof bags for transport and disposal.
Disposables (e.g. PPEs, gowns, gloves, masks, respirators, face shields, head caps, shoe covers, etc.) and gauze, must be sufficiently contained in leak-proof bags for transport and disposal.

h. Store waste in specified areas with restricted access.

i. Store chemical waste in separate secure containers. Never mix chemical wastes.

j. Mark the storage areas with a biohazard symbol.

k. Ensure that the carts or trolleys used for the transport of segregated waste collection are not used for any other purpose. These should be regularly cleaned.

l. Identify a storage area for waste prior to treatment or being taken to final disposal area.

Treatment of hazardous and clinical/infectious waste

Each health care facility should identify a method for the treatment of clinical/infectious waste. This may involve transportating infectious waste to a centralized waste treatment facility or on-site treatment of waste. The waste treatment method should be duly approved by the regulatory agencies such as the Department of Health and Department of Environment and Natural Resources, as well as the local government agencies.

All items for disposal from a COVID operation are **considered highly infectious** and should be placed in double yellow bin bags, with each bag sufficiently sealed using a cable tie. Personnel handling the waste must use at least a **Level 3 PPE** with double gloves. Utility workers are responsible for transporting the OR waste to the Waste Disposal or Garbage Room after each case, and at the end of the duty shift.

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COVID Operations

The COVID OR is for patients who meet any the following criteria:
a. Positive COVID PCR swab result
b. Indeterminate COVID status due to unavailability of COVID swab
c. Negative COVID PCR swab but with active respiratory symptoms

Before the procedure

1. Team huddle is started to identify roles, complete the preoperative safety checklist, prepare all necessary supplies and equipment to be used for the procedure, review COVID protocols in place, and make sure entry of people in the COVID OR is minimized
2. All members don level 3 or level 4 PPE and proceed to COVID OR
3. Upon receiving the patient, standard ASA monitors are attached prior to induction

During Induction of Anesthesia

Regional anesthesia: Usual neuraxial induction with or without sedation
General anesthesia:

- All non-anesthesia personnel or those who are not essential for induction of anesthesia should be outside the room
- Large plastic sheets or aerosol box may or may not be placed over the patient, depending on the level of competency and comfort of the anesthesiologist
- Make sure all filters are attached at the Y-piece and expiratory limb
- Preoxygenation using tight-fitting mask with 100%, then proceed with administration of medications for rapid sequence induction
- Video laryngoscopy is performed and correct placement of ET tube is confirmed using capnography without auscultation
- Protective mechanical ventilation strategy is used: 6 ml/kg of predicted body weight, plateau pressure $\leq$ 30 cmH_20
- **For difficult airway scenarios, consider the use of supraglottic airway devices or referral to ORL service for surgical airway

During Maintenance of Anesthesia

- Disinfect hands and change gloves when necessary
- Other essential OR personnel can enter the COVID OR for the procedure

During Emergence and Extubation

- Administer anti-emetics and insert closed-suction system
- Essential personnel for extubation should enter the COVID OR and non-essential personnel should leave the OR prior to extubation
- Don new gloves on top of existing gloves and confirm that patient meets extubation criteria
  - o <0.4 FiO_2
  - o Paralysis has been reversed
  - o Adequate minute ventilation
  - o Hemodynamically stable
  - o Intact gag and airway reflexes
- May consider placing plastic drapes or aerosol box over the patient's head depending on the anesthesiologist's competency and confidence with aerosol barriers
- Loosen tube tapes and suction ET tube and oral cavity
- Place a nasal cannula over the patient's nares prior to extubation
- Extubation is performed and anesthesia facemask is placed over the patient with good seal to confirm adequate ventilation
- Turn off all gas flows and quickly replace the anesthesia face mask with a surgical face mask over the nasal cannula and remove plastic drapes or box if placed over the patient
- All providers will sanitize and change gloves over baseline PPE and doff in appropriate areas
- *****Non-essential personnel should not enter the room until sufficient time has passed to allow for removal of infectious aerosols (defined as number of air exchange per hour)***

Air change per hour	Time (mins) required to removal 99% efficiency	Time (mins) required to removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

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Source: Philippine General Hospital Department of Anesthesia October 2020, reprinted with permission.

Post ECQ Elective Surgeries

Introduction

The COVID-19 pandemic has cost the lives of many Filipinos. It continues to spread throughout the country and it is apparent that there are significant differences in incidence and prevalence in each locality. This pandemic has changed the way we practice anesthesia and posed numerous anesthetic challenges. For the past few weeks, interim guidelines were issued because of our limited knowledge and experience on the virus.

The deferment of elective surgeries during the community quarantine and lockdown in different areas of the country will eventually cause the surge of procedures in the hospital once lifted. Patients demand for surgical and procedural care may be immense. While many are eager to resume regular hospital services, resuming elective procedures will depend on whether the hospital can attend to patients as quickly as possible, conduct necessary tests, without compromising patient safety or staff safety and well-being.

The anesthesia guidelines presented here is in response to the need to resume elective surgeries. It heightens precautionary measures and tailors anesthetic practices to patients who are suspect, probable or confirmed for COVID- 19 infection.

Time To Resume Elective Surgery

The hospital will evaluate the following prior to resumption of elective procedures.

1. Resumption of elective procedures will be determined by the hospital and authorized by government health authorities.
2. It should be compliant with community quarantine and other policies of the national or local government authorities
3. This will be considered only if there is a continuous decline in the rate of new COVID 19 cases.
4. The hospital should be able to provide adequate number of PPE's, anesthetics, medications, anesthesia machines, monitors and ventilators.
5. There should be enough PACU, ICU, and non-ICU beds to accommodate post-op cases.

Anesthesiologist Safety

The safety of anesthesiologists is of utmost importance due to close patient contact and the need for airway instrumentation. They are at increased risk of exposure and infection for all diagnostic, therapeutic, and surgical procedures from the COVID-19 cases.

Personal Protective Equipment

1. The hospital should be able to provide adequate PPE, including supplies required for potential second wave of COVID-19 cases.
2. Staff training and proper use of PPE should be instituted.
3. Conservation of PPE as well as extended use or re-use of PPE should be practiced.

Hand Hygiene

1. Hand hygiene before and after all patient contact, contact with potentially infectious material, and before putting on and after removing PPE, including gloves.
2. Use alcohol-based hand rub (60-95% alcohol) or washing hands with soap and water.
3. Hospital should ensure that hand hygiene supplies are readily available to all personnel in every care location.

Scheduling Of Surgical Procedures

Prioritization and scheduling of surgical cases shall be determined by a committee which includes the surgeons, anesthesiologists and the nursing staff.

1. There should be enough primary personnel commensurate with increased volume and hours (e.g., surgery, anesthesia, nursing, housekeeping, engineering, sterile processing, etc.).
2. Adjunct personnel should be available (e.g., pathology, radiology, laboratory).
3. Supplies for the planned procedure should be adequate (e.g., anesthesia drugs and equipment, procedure-related medications etc.)
4. Prioritizing procedures of short duration should be done.
5. Prolonged procedures are discouraged but if necessary, careful planning should be done, to include OR team substitution/changes.

6. COVID-19 suspect, probable or confirmed cases should be scheduled last.
7. Ensure adequate availability of PACU beds and intensive care beds and ventilators for the expected postoperative care.

Pre-Anesthesia Evaluation Clinic

The pre evaluation clinic serves as an area where patients are evaluated before surgery upon which risk assessment and perioperative management decisions can be made.

In addition to the existing guidelines of the pre-anesthesia evaluation clinic, a stringent screening is needed for suspect, probable or confirmed COVID-19 cases because of the high morbidity and mortality of asymptomatic patients who were operated during their incubation period

1. It should implement social distancing policy for the staff, patients, and companions.
2. Only the patient is allowed inside the clinic, unless a companion or guardian is needed.
3. Use of personal protective equipment like surgical mask or N95 and gloves. Other PPE when deemed necessary.
4. A recent history and physical examination within 30 days is necessary for all patients. This will verify that there has been no significant interim change in patient's health status.
5. Some face-to-face components can be scheduled on day of procedure, particularly for healthier patients.
6. Use of telemedicine for the component of preoperative patient evaluation is encouraged especially for suspect, probable or confirmed COVID- 19 cases.
7. Consider testing all patients with RT-PCR prior to their scheduled procedure.
8. Laboratory testing and radiologic procedures should be determined by patient indications and procedure needs. Chest x-ray may be helpful in screening especially in patients with discrepancy between clinical findings and indeterminate RT-PCR or negative in an asymptomatic patient with history of contact with COVID-19. A CT scan maybe requested depending on local resources.

Identify suspected COVID-19 patients

1. Suspected, probable and confirmed cases should be identified prior to anesthetic assessment.
2. A RT-PCR test is considered in all elective cases. If such testing is not available or time does not permit, evidence-based infection prevention techniques should be considered.
3. Defer the planned elective surgery for patients who are COVID-19 positive.
4. If patient is considered high risk, discuss with surgeons on urgency of operation, and delay if possible.
5. Involve infection control team early in suspected cases.

Identify high-risk procedures

1. Identify procedures in the operating room that are at high risk of aerosol-generation which necessitates airborne precaution.
2. Surgical procedures that may cause aerosol- generation include rigid bronchoscopy, tracheostomy and surgery involving high speed drilling.
3. Apart from intubation and extubation, anesthetic procedures that may cause aerosol-generation include NIV, manual ventilation and awake fiber- optic intubation.

Optimize patients confirmed with COVID-19

1. For patients who are confirmed to have COVID-19, the preoperative assessment should focus on optimizing the patient's respiratory condition.
2. Assess airway meticulously and formulate airway plan.
3. Determine severity of respiratory compromise.
4. Take note of oxygen requirements, chest x-ray changes, arterial blood gas.
5. Look for organ failure, particularly signs of shock, liver failure, renal failure.

Intraoperative Management

General Anesthesia

Modifications in the usual practice of anesthesia are important to minimize aerosol generation and optimize respiratory condition of patients with COVID-19

Preparation Phase

1. Negative pressure room should be provided to COVID-19 positive patients if available.
2. Minimize the number of staff in the operating room.
3. Keep the door of the operating room closed all the time.
4. Ensure all staffs in the operating room are wearing appropriate PPE according to departmental protocol.
5. Reiterate infectious risk of the patient and the level of precautions required to all members in the operating room.
6. Communicate clearly with other OR personnel on airway plan as talking and hearing through N95 respirators and face shields could be difficult.
7. Bring only the needed medications inside the operating room. It should be pre-aspirated and properly labeled.
8. Prepare video-laryngoscopes with disposable blades to optimize best first attempt.
9. Insert Heat and Moisture Exchange Filter (HMEF) with 0.1–0.2 µm pore size, between the endotracheal tube and the expiratory limb of the breathing circuit.
10. Consider disposable plastic covers for surfaces of monitors, anesthesia machine and airway equipment, as well as use of aerosol box or tent to reduce droplet and contact contamination.

Oxygenation

1. Avoid high-flow pre-oxygenation. Use minimal gas flow possible i.e. less than 6L per min. and ensure good seal with facemask.
2. For escalating pre-oxygenation, a NIPPV with a tight-fitted mask is recommended.
3. Avoid nasal cannula for apneic oxygenation.

Intubation Phase

1. Only the anesthesiologist and an assistant are allowed inside the operating room during intubation.
2. Intubation by experienced practitioner to reduce attempts and time.
3. Use video laryngoscope for indirect tracheal tube placement.
4. Give fentanyl slowly, in small amount if required to reduce coughing.
5. Perform rapid sequence induction to reduce the need for mask-ventilation

6. Use RSI with the highest recommended dose of an NMBA.
7. Maintain airway patency and ensure onset of paralysis before performing intubation to avoid coughing.
8. Use two-hand grip to optimize seal if mask-ventilation becomes necessary.
9. Ask for assistance with bagging, while utilizing the lowest flow.
10. Give small tidal volumes. Start positive pressure ventilation only after the cuff of the endotracheal tube is inflated.
11. Oral or tracheal suction should be performed with a closed suction system if necessary.
12. Remove outer gloves after intubation if using the double glove technique to reduce operating room contamination.
13. Use pre-cut tape to secure endotracheal tube.
14. Confirm tube position by observing bilateral chest rise and capnography, as auscultation may be difficult due to personal protective equipment.
15. Place all used airway equipment into a double zip-locked plastic bag.
16. After induction of anesthesia, wipe down all equipment and surfaces with disinfection wipes that have anti-viral activity.
17. Remove hand gloves.

Rescue Technique

1. SGA placement for unsuccessful intubation only. Immediately attached to closed ventilator circuit for rescue oxygenation to avoid manual bagging.
2. Use HEPA filters whenever PPV is performed.

Maintenance Phase

1. Minimize tube and circuit disconnection.
2. Place the ventilator on standby whenever a circuit disconnection is required, such as tube repositioning.
3. Restart mechanical ventilation only after the circuit has been reconnected/ closed.
4. Employ lung protective mechanical ventilation strategies by maintaining tidal volumes of 5-6mL/kg
5. Increase respiratory rate to maintain minute ventilation and keep peak airway pressure below 30mmHg.

Pre-extubation Phase

Assessment prior to extubation is critical, as commonly used rescue strategies are complicated by an increased risk of exposure to healthcare workers. Strategies for supporting respiration after extubation, such as non-invasive ventilation and high-flow nasal oxygen, are relatively contraindicated because of their ability to aerosolize SARS-CoV.

1. All non-essential staff should exit the room before extubation. Only the anesthesiologist and an assistant stay in the room.
2. Limit the need for subsequent staff interactions with:
   a) Prophylactic anti-emetics.
   b) Adequate analgesia and consider the use of regional anesthesia.
   c) Perform oropharyngeal suction with vigilance, as this may generate aerosols.
   d) Antitussive drugs, such as remifentanil, lidocaine, and dexmedetomidine, reduce the risk of coughing and minimize agitation on extubation.

Extubation Phase

1. Ensure a smooth emergence and minimize coughing.
2. Consider the use of aerosol box or tent to reduce droplet and contact contamination.
3. There should be no positive airway pressure during extubation. The ventilator should be off with no gas flow.
4. Consider attempting to extubate at end-expiration.
5. The mask over the tube extubation technique is recommended. The mask should have a Heat and Moisture Exchange Filter (HMEF) with 0.1–0.2 µm pore size to avoid direct exposure to droplets or aerosols produced by extubation or associated coughing.
6. Unless used to rescue an airway, supraglottic airway device should be avoided because of the risk of exposure to infective secretions, and manipulation of a Supraglottic airway may trigger coughing or laryngospasm

Post-extubation

1. Place a surgical mask on the patient once the anesthetic face mask is no longer required.

2. Supplemental oxygen can be delivered under a surgical mask via a nasal cannula.
3. Doffing should only occur once the patient has been handed over to another staff member.
4. Airborne precautions of the rooms for a variable period after an aerosol-generating procedure, depending on air changes per hour (ACH).

Regional Anesthesia and Peripheral Nerve Blocks

The use of regional anesthesia is not contraindicated and should be considered whenever surgery is planned for a suspect or confirmed COVID-19 patient or any patient who poses an infection risk.

Regional anesthesia reduces exposure to patients' respiratory secretions and the risk of perioperative viral transmission to healthcare workers and other patients.

Preparation Phase

1. The patient should be reviewed, blocked, and recovered inside the OR where the surgery will be performed to limit contamination to a single location
2. The number of personnel within the OR should be kept to a minimum.
3. Only necessary equipment and drugs required should be brought into the OR to prevent contamination and wasting resources.
4. To prevent contamination of the ultrasound machine but still be able to obtain satisfactory images, the ultrasound machine's screen and controls should be protected with a single-use plastic cover.
5. Use of N95 respirator or PAPR (powered airpurifying respirator) is at the discretion of the anesthesiologist as regional anesthesia is not aerosol-generating procedure. The physical encumbrance of the PAPR affects the performance of the anesthesiologists.

Procedural Phase

1. Sedation should be used with caution in COVID-19 patients as they may have co-existing respiratory compromise from COVID-19 pneumonia.
2. Supplemental oxygen can be delivered under a surgical mask via a nasal cannula using a low flow.

3. Oxygenation and ventilation should be closely monitored if the patient is sedated.
4. Carbon dioxide (CO_2) monitoring should be done with a CO_2 sampling line and a HEPA filter to prevent contamination of the monitor.
5. Thorough testing for block success should be done before proceeding with surgery to minimize the need for conversion to GA.
6. Rapid sequence intubation should be followed if intraoperative conversion to GA is required.
7. Use a pencil-point spinal needle for spinal anesthesia. It may reduce the risk of introducing viral material into the CNS, as there is less tissue coring compared with cutting tip spinal needles.
8. Caution should be exercised when attempting to reduce the duration of the spinal anesthetic by using short acting spinal anesthetics or reducing the dose of the spinal anesthetic agent as conversion to GA is least desirable
9. Rule out thrombocytopenia as there is preliminary evidence to suggest that it might occur in patients with severe COVID-19 disease.
10. The routine asepsis technique should be followed. If available, sterile paper drapes should be used instead of plastic ones because virus particles are viable longer on plastic than paper drapes.
11. Do not allow the CSF to drip freely after lumbar puncture as the virus has been isolated from cerebrospinal fluid (CSF) in patients who suffered from COVID-19 encephalitis.
12. No dose adjustment of spinal anesthesia or adjuvant opioids. A change to the epidural infusion regimen may be needed to reduce the need for additional top-up doses that require frequent patient contact.
13. Be prepared with the strategies to deal with hypotension following neuraxial procedures.
14. A negative pressure room should be provided to COVID-19 positive patients if available.
15. Disposal of consumables used after the procedure should be carefully done to avoid any risk of transmission.

Postoperative Management

1. Avoid transferring confirmed cases to the postanesthetic care unit. Patients will be monitored inside the operating room or in a designated isolation room.

2. A negative pressure room should be provided to COVID-19 positive patients if available.
3. Consider applying a surgical mask to all other awake and stable patients in the post anesthesia care unit. The distance between patient beds should be at least 6 feet.
4. Avoid giving high flow oxygen, NIPPV, or nebulized medications.
5. No watchers inside the post-anesthesia care unit except for pediatric cases.
6. Clean and disinfect high-touch surfaces on the anesthesia machine and anesthesia work area with an approved hospital disinfectant.
7. Allow time for aerosols in the operating room or isolation room to be washed out, the time required depends on the air changes per hour (ACH) of the specific location.

OB Anesthesia Special Considerations

The following are general recommendations for the management of suspect, probable, or confirmed case of COVID-19 patients.

Pre-operative Evaluation

1. All elective procedures should be evaluated in the pre-operative clinic.
2. Follow all the guidelines of the pre-anesthesia evaluation clinic.
3. Patients should be phoned the night before to screen for symptoms consistent with COVID-19 infection.
4. Due to the high prevalence of COVID-19 infection in the population, PCR testing is recommended for all pregnant patients admitted for labor and vaginal delivery.
5. For purposes of clinical management and PPE use, women may, therefore, be categorized as follows 1) COVID-19 negative, 2) suspect/probable, and 3) positive for COVID-19 testing. This information should be made available to all health care providers and updated at all times, as it may change during the course of labor
6. A multidisciplinary team of anesthesiologists, obstetricians, labor and delivery nurses, neonatologists, critical care experts, infectious disease and infection control experts, employee health services, environmental health services, and telemedicine services should create and implement protocols to support the management of

patients with COVID-19 infection in the setting of a Labor and Delivery Unit.

Management

1. Resource allocation within the Labor and Delivery Unit, as well as other units (including Intensive Care Unit), should be proactively addressed.
2. It is imperative to establish a back-up team to care for patients without COVID-19 infection due to the time-intensive tasks of donning/doffing PPE, transporting the patient, providing anesthetic care, and performing surgery in patients with active COVID-19 infection
3. A designated operating room within the Labor and Delivery Unit should be prepared at all times and sanitized after each use.
4. Admit patients in isolation rooms, preferably a negative pressure room, and limit the number of care providers to the strict minimum.
5. Patients and support people should wear a face mask at all times.
6. All healthcare providers should implement droplet and contact precautions with eye protection upon entering the delivery room (gown, gloves, surgical mask, face shield).
7. Donning and doffing take time. Avoid emergency situations by anticipating needs.
    a) Early epidural analgesia may reduce the need for general anesthesia for emergent cesarean delivery.
    b) A COVID-19 diagnosis itself is not considered a contraindication for neuraxial anesthesia.
    c) Encourage proactive communication with obstetricians and nurses. For respiratory distress, intubate early using appropriate PPE.
    d) Avoiding urgent cesarean delivery is essential to reduce the risk for general anesthesia and provider exposure during uncontrolled transfers to the operating room. Therefore, ongoing assessment of both maternal and fetal status is a key to balance risks of prolonged labor versus cesarean delivery
    e) Assign the most experienced anesthesia provider whenever possible for procedures such as neuraxial blocks and intubation.
    f) Minimize the number of personnel in the delivery or operating room.

8. Before entering the operating room, regardless of the type of anesthesia:
   a) The Anesthesiologist and assistant should implement droplet and contact precautions with eye protection. The risk of an aerosol-generating medical procedure should be evaluated for of airborne PPE precautions.
   b) Use donning and doffing checklists and trained observers.
   c) Double glove for all procedures and replace the outer layer of gloves after intubation.
9. If GA is indicated, follow the modified guidelines to minimize aerosol generation and optimize the respiratory condition of patients with COVID-19. If deemed necessary and not avoidable, provision of general anesthesia should follow general recommendations for intubation and extubation in the setting of COVID-19 infected patients
10. Antiemetics should be administered to prevent vomiting in patients undergoing cesarean delivery. Some studies suggest avoiding the use of dexamethasone for PONV prophylaxis due to potential risks in COVID infection.
11. Post-operatively, there is inconclusive evidence to suggest that the use of NSAIDs is harmful in COVID positive patients so NSAIDs may be used if necessary.

References:

1. *Joint Statement: Roadmap for Resuming Elective Surgery after COVID-19 Pandemic American College of Surgeons, American Society of Anesthesiologists, Association of Perioperative Registered Nurses, American Hospital Association from https://www.asahq.org/aboutasa/newsroom/news- releases/2020/04/jointstatement-on-elective- surgery-after-covid-19-pandem*

2. *Joint Position Statement: The Use of Personal Protective Equipment by Anesthesia Professionals during the COVID-19 Pandemic The American Society of Anesthesiologists (ASA), Anesthesia Patient Safety Foundation (APSF), American Academy of Anesthesiologist Assistants (AAAA) and American Association of Nurse Anesthetists (AANA) https://www.apsf.org/newsupdates/the-use-of-personal-protectiveequipment-by-anesthesia-professionalsduring-the-covid-19-pandemic/*

3. *Interim Infection Prevention and Control Recommendations for Patients with Suspect or Confirmed Coronavirus Disease 2019 (COVID19) in Healthcare Settings. Updated March 10, 2020.*

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5. *D'Silva DF, McCulloch TJ, Lim JS, Smith SS, Carayannis D. Extubation of patients with COV-19 from https://www.wfsahq.org/resources/anaesthesia-tutorial-of-the-week*

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7. *Interim Considerations for Obstetric Anesthesia Care related to COVID19 https://soap.org/wpcontent/uploads/2020/04/SOAP_COVID19_Obstetric_Anesthesia_Care_040520.pdf*

8. *Practical considerations for performing Regional anesthesia: lessons learned from the COVID-19 P pandemic Sui an Lie, Sook Wai Wong, Loong Tat Wong, Theodore Gar Ling Wong, Shin Yuet Chong Can J Anaesth. 2020 2020 Mar 24: 1–8. doi: 10.1007/s12630-020-01637-0*

9. PCS guidelines on post-ECQ resumption of elective surgeries and outpatient clinics Philippine College of Surgeons April 2020

Reprinted with permission from the Philippine Society of Anesthesiology
Disclaimer: This guideline is based on our current concept of COVID-19 and we expect future revisions as we continue to understand the disease. Clinical judgment should therefore be exercised. Anesthesiologists should continue to follow updates on Anesthesia from Centers for Disease Control and Prevention (CDC), World Federation ofSocieties of Anesthesiologists (WFSA) and other reputable anesthesia organizations.

VI. Guidelines on Specimen Handling, Sponge, Sharps and Instrument Count

Specimen Handling

1. **Significance of specimen handling inside the operating room:**
   Inadequate or wrong labeling of specimens or lost specimens may hinder patient care and safety.[1,2]
   This can lead to medico-legal claims for errors in surgical pathology

2. **Common mistakes in labeling of specimens:**
   Most mistakes are due to labeling errors.[3] Errors in labeling laboratory specimens occur because of mismatches between the specimen and the requisition forms.[4] Patient identification on specimen and requisition forms is critical in any attempt to prevent laboratory errors. Absence of accurate labeling, omission of details regarding tissue site, the absence of patient's name and mislabeling of surgical pathology specimen can have more severe consequences.

3. **How to minimize labeling errors:**
   - Patients from whom the specimen was obtained should be identified using at least 2 identifiers (e.g. name and date of birth, hospital number, address). Improved identification is crucial in preventing errors in laboratory specimen labeling. Rechecking wrist identification bands can decrease specimen labeling error rates and blood grouping errors.[5-7]
   - The nurse should counter check with the attending surgeon the specimen details like name of patient, source of the specimen and the site or origin of the specimen including its laterality and any orienting marker.
   - The requisition form should be completely filled up and signed by the attending surgeon and duly witnessed by the nurse.

Recommendation:

The surgical team should confirm that all surgical specimens are correctly labeled with the identity of the patient and name, origin, and laterality of the specimen by having one member of the team read the specimen label aloud and another verbally confirming agreement.

Handling Specimens From Suspected or Confirmed Covid Positive Cases:
This document shall serve as a guide in handling tissue specimens for routine processing and fluid specimens for cytologic evaluation from

patients with confirmed or suspected COVID-19 disease, from preparation to releasing of results.

1. Surgical pathology specimen preparation and handling of specimens from patients with confirmed or suspected COVID-19 disease
   1.1. Handling of tissue specimens:
   1.1.1. Before the procedure starts, secure a specimen container and request form. Specimen container should be wide-mouthed, puncture-proof, and leak-proof
   1.1.2. Once the specimen is collected, submerge all tissue specimens immediately in 10% neutral buffered formalin and place in the appropriate-sized container
   1.1.2.1. Specimen to formalin ratio should be 1:10 but if there is no container large enough, at the very least, specimens should be fully submerged and floating in formalin.
   1.1.2.2. Label each specimen container correctly. Indicate that the specimen is from a patient with confirmed or suspected COVID-19 disease
   1.1.3. Fill up request form completely and properly
   1.1.3.1. Document and write down all orienting marks and sutures as necessary
   1.1.3.2. Record time and date of fixation in request form
   1.1.3.3. Indicate in request form that the specimen is from a patient with confirmed or suspected COVID-19 disease
   1.1.3.4. The name of the requesting physician and his/her contact details should be written in the request form
   1.1.3.5. Request forms should be placed in a plastic bag and submitted alongside the cooler provided by the OR

   1.2. Handling of fluids/cytology specimen which are specimens for cell block, cytospin, and smear slides and include but are not limited to pleural fluids, ascitic fluid, aspirates, JP drain fluid, abscess contents etc.
   1.2.1. These specimens must be fixed in 95% ethyl alcohol (aka fixative, ethanol) and placed in appropriate-sized container.
   1.2.1.1. For cell block and cytospin specimens, ratio of fluid to ethanol is 1:1
   1.2.1.2. For smear slides, submerge fully in ethanol

1.2.1.3. Label each specimen container correctly. Indicate that the specimen is from a patient with confirmed or suspected COVID-19 disease

1.2.2. Fill up request form completely and properly.

1.2.2.1. Record time and date of fixation in request form

1.2.2.2. Indicate in request form that the specimen is from a patient with COVID-19

1.2.2.3. The name of the requesting physician and his/her contact details should be written in the request form

1.2.2.4. The request form should be placed in a separate plastic bag and submitted alongside the specimen

2. Endorsement and Safekeeping of Specimen:
   All specimens collected in the operating room shall be submitted to the OR nurse in charge of specimens
   The OR nurse in charge shall be responsible in safekeeping of all specimens from the OR until the specimens are turned over to the surgical pathology. He/She shall keep a logbook where all specimens submitted to her shall be recorded. This logbook will later be counterchecked and signed by the surgical pathology personnel.

   The logbook should contain the following information:
   - Patient name
   - Age/Sex
   - Ward
   - Case number
   - Surgeon
   - Types of specimens collected
   - Number of specimen containers
   - etc.

   All specimens submitted to the OR nurse in charge shall be placed in a large, leak-proof box dedicated for specimens from confirmed or suspected COVID-19 patients.

3. Specimen Receiving And Verification
   3.1. Specimens for Surgical Pathology may be received in 2 ways:
   3.1.1. Specimens from the Operating Room shall be submitted to the Surgical Pathology Division by Operating room personnel.
   3.1.2. Direct specimen submission to surgical pathology

3.2. All specimens from the COVID OR will undergo 48 hours of fixation prior to opening and processing. Surgical Pathology staff checks that the specimen being submitted corresponds with the entries in the OR logbook.
3.3. Surgical Pathology staff checks completeness of request form, specimens, and labels
3.4. The surgical pathology staff may reject specimens that are incomplete, with incompletely filled up request or inadequately prepared specimens.

Reference:
Dr. K Sotalbo, PGH Dept of Laboratories

Handling Bullets Retrieved During Surgery:

- It is important to avoid the use of standard metal instruments like forceps which may scratch the jacket or lead of the bullet producing marks and hamper or prevent analysis of bullet striations and firearm identification. This could be avoided by using rubber shods or insulators to cover the tips of forceps or clamps.
- The retrieved projectile should be examined for macroscopic trace evidence such as fibers and glass. If none is found, the projectile may be rinsed gently to remove excess blood and body fluids.
- Deformed sharp-edged or bullet fragments should be placed in a hard plastic container rather than traditional bullet envelopes to prevent accidental puncture through the envelopes and subsequent loss or injury.
- The bullet container or envelope should be annotated with the date, time, anatomical location of the bullet, the name and hospital number of the patient and the collector's name. It is advised that these objects be surrendered immediately to the authorities.
- In surrendering the evidence to local police authorities, it is also important to provide a receiving document attached to the patient's chart to indicate the investigating officer who received the object.
- The same procedure is followed for other objects recovered on and in the patient's body.

Indications For Sponges, Sharps And Instruments Count:

- Sponges, sharp, instruments and related miscellaneous items (vessel loops, trocar sealing caps etc.) should be counted on ALL procedures.

- Counts are performed to account for all items and to lessen the potential for injury to the patient as a result of a retained foreign body.
- Complete and accurate counting procedures help promote optimal peri-operative patient outcomes and demonstrate the peri-operative practitioner's commitment to patient safety.

Persons Responsible For Accounting of Sponges, Needles and Instruments:

Accurate accounting of sponges, needles and instruments during a surgical procedure is the primary responsibility of the perioperative team. It is the responsibility of all perioperative team members to engage in safe practices for the prevention of retained surgical items. The surgeon(s) and surgical first assistant(s) should maintain awareness of all sponges, instruments, and sharps used in the surgical wound during the course of the procedure. The surgeon does not perform the count but should facilitate the count process by:

1. Using only radioscopic surgical items in the wound
2. Verbalizing placement of surgical items in the wound to the perioperative team for notation
3. Acknowledging awareness of the start of the count process
4. Removing unnecessary sponges, sharp and instruments from the surgical field at the initiation of the count process
5. Performing a methodical wound exploration when closing counts are initiated
6. Accounting for and verbalizing the surgical items in the surgical field
7. Notifying the scrub personnel and circulating nurse about surgical items returned to the surgical field after the count

Counting of sponges, needles and instruments is performed during these times:

- Before the procedure to establish a baseline
- Before closure of a cavity within a cavity
- Before wound closure begins
- At skin closure or at the end of the procedure
- At the time of permanent relief of either the scrub personnel and/or the circulating nurse

Proper way of counting sponges, needles and instruments:

1. Sponges should be separated, counted audibly, and concurrently viewed during the count procedure by two individuals, one of whom should be the circulating nurse.
2. Repeat the count procedure when additional sponges, sharps and instruments are added to the field.
3. Any package containing incorrect number of sponges should be removed from the field, bagged, labeled and isolated from the rest of the sponges in the operating room.
4. Suture needles should be counted and recorded according to the number marked on the outer package and verified by the scrub personnel when the package is opened. Both tips of the needle should be inspected for completeness.
5. Verification of all broken parts should be present and accounted for to prevent unintentional retention of foreign body within the patient.
6. Individual pieces of assembled instruments (suction tips, wing nuts, sheaths, etc.) should be accounted for separately.
7. The counting sequence should be in logical progression (smallest to biggest, proximal to distal) from surgical site to immediate surrounding area, to Mayo stand, to back table, and finally to sponges, sharps and instruments that have been discarded/removed from the field.
8. Instrument counts should be performed in the order of the instruments as listed on the count sheet so as no instrument is inadvertently missed from the count.

Key factors to prevent errors in counting:

- The perioperative personnel should count all prepackaged sterile sponges and suture needles for accuracy. They should be counted according to the number marked on the outer package and verified by the scrub personnel and circulating nurse once the packaged is open.
- All sponges used during the surgical procedure should be x-ray detectable.
- Sponges should be left in their original configurations and should not be cut.
- Sponges used preoperatively must be removed before any procedure starts.

- Opening all suture packages during the initial count is not recommended and will result in needles being exposed during the entire surgical procedure. This will create additional opportunity for lost or retained needles during the procedure.
- Sharps should be handed to the surgeon on an exchange basis. Sharps remaining free on the sterile field may inadvertently be introduced into the incision or dropped onto the floor or may penetrate barriers.
- Instrument sets should be standardized with the minimum types and numbers of instruments needed for the procedure. Specialty instruments, if needed, can be opened and added to the count at the time of the procedure.
- Preprinted count sheets are identical to standardized sets should be used to document counted items.
- Non- radioopaque gauze dressing material should be withheld from the field until wound is closed or until the case is completed.
- When a counted sponge, sharp or instrument is passed or inadvertently dropped off the sterile field, the circulating nurse should retrieve it, show it to the scrub personnel and isolate it from the field to be included in the final count.
- All sponges, sharps and instruments should remain within the operating room and/or sterile field during the procedure. Linen and waste containers should not be removed from the room until counts are completed and resolved.
- Counted sponges should not be used as postoperative packing.
- End-of-procedure clean-ups help avoid potentially incorrect counts on subsequent procedures. Contaminated sponges, needles and instruments should be handled and disposed according to hospital policies.
- Alternative measures should be established to minimize the risk of retained sponges, sharps, instruments and other miscellaneous items during procedures in which accurate accounting is not achieved.

Procedures when discrepancy in counting occurs:

- The surgical team is responsible in carrying out steps to locate missing items.
- Suspend the procedure if patient's condition permits.
- The surgeon should do a manual inspection of the operative site.
- Visual inspection of the area surrounding the surgical field, including kick buckets, linen and trash bins.

- If patients' condition permits, intraoperative x-ray should be taken and read before final closure of the wound, or if the patient's condition is unstable, an x-ray should be taken as soon as possible to rule out any retained foreign body
- Document all measures taken and outcomes to the patient's records.
- The reporting of incident should be followed according to the organization policy.
- Make a review of an incident or near miss for cause, effect and prevention.

Documentation of sponge, sharp and instrument count:

- Documentation of counts in the patient's intra-operative record should be done by the circulating nurse which includes:
  1. Types of counts (ie. Sponges, sharps, instruments, miscellaneous items) and the number of counts
  2. Names and titles of personnel performing the counts
  3. Results of surgical item counts
  4. Notification of the surgeon
  5. Instruments remaining with the patients or sponges intentionally retained as packing
  6. Actions taken if count discrepancies occur
  7. Rationale of counts not performed or completed as dictated by policy*
     (* Extreme patient emergencies may necessitate waiving counts. Documenting the omission and rationale provides a record of the occurrence).

Reference:
AORN Perioperative Standards and Recommended Practices 2014 Edition

VII. Guidelines on Peri-operative Documentation

Perioperative Teamwork and Communication:

Communication failures can occur anytime in the preoperative, intraoperative or postoperative phases of surgical care. Several factors (e.g., high workload; inadequate knowledge, ability or experience; poor human factor interface design; inadequate supervision or instruction; stressful environment; mental fatigue or boredom; and rapid change) can precipitate unfortunate incidents. To avert such adverse events, communication between perioperative team members is essential to improve safety and maximize efficiency in the operating room. Communications should be clear, accurate, timely, respectful, inclusive, open, and trusting.

A constructive team culture can promote interdisciplinary discussions and ensure adequate planning and preparation for each surgical case. Doing pre-procedural briefings enhance transfer of critical information and create an atmosphere of shared learning and responsibility. Utilization of the checklists ensure adherence to safe practices and counteracts omissions that are prone due to information overload, process requiring multiple steps, or departures from routine procedures. This culture of teamwork and communication supports a collaborative approach in decision-making and better patient outcomes.

Peri-Operative Nursing Documentation

Documentation policies and procedures establish authority, responsibility, and accountability, and serve as operational guidelines. Recommended practices below should be viewed as guidelines for documenting within the perioperative setting. It is strongly encouraged that it should be introduced and reviewed during personnel orientations and in their continuing education because these tenets will assist them in honing their knowledge, and in developing their skills and competencies that will definitely have positive influence in perioperative patient care.

Purposes of peri-operative nursing documentation:

1. Demonstrate that pre-operative, intra-operative and post-operative care was given.
   Documentation demonstrates that preoperative, intraoperative and postoperative care was given.

2. Prove to local and national regulating agencies that the staff are following the mandated regulations.
   Documentation proves to local and national regulating agencies that the staff are following the mandated regulations.

3. Documentation facilitates communication among operating room team members, thus promoting the continuity of care.

4. Documentation provides mechanisms for comparing actual versus expected outcomes.

5. Documentation is the key to avoiding allegations of malpractice, and peri-operative substandard or poor nursing care.
   Documentation is the key to avoiding allegations of malpractice, and substandard perioperative nursing care.

Recommended Components of Peri-Operative Documentation:

1. Identification of a process providing peri-operative patient care (i.e., name, title, signature of person responsible for the care).
   Identification of the team member providing perioperative patient care (e.g., name, title, signature of person responsible for the care).

2. Documentation should include information about the status of the patient, nursing diagnosis and interventions, expected patient outcomes, evaluation of the patient's response to peri-operative nursing care. The nursing process provides the governing framework for documenting peri-operative nursing care. When the nursing process is used in the peri-operative setting, it demonstrates the critical thinking skills practiced by the nurse in caring for the surgical patient.
   Documentation should also include the following information: the status of the patient, nursing diagnosis and interventions, expected patient outcomes, evaluation of the patient's response to perioperative nursing care.
   The nursing process provides the governing framework for documenting perioperative nursing care. When used in the perioperative setting, the nursing process demonstrates the critical thinking skills practiced by the nurse in caring for the surgical patient.

3. Description of the patient's overall clinical condition on arrival and upon discharge from peri-operative suite.

4. Peri-operative patient care planning, including baseline physical, emotional, psychosocial, and cultural data.

5. Presence and/or disposition of sensory aids and prosthesis devises (e.g., eyewear, hearing aids, dentures, artificial limbs)
Presence of sensory aids and prosthetic devices (e.g., eyewear, hearing aids, dentures, artificial limbs), and its disposition.

6. Placement of electro surgical units (ESU) grounding pad.

7. Use of temperature-regulating devices, including identification of the unit and documentation of the patient's body temperature before and upon discharge from the operative suite.

8. Placement of electrocardiogram (ECG) electrodes, blood pressure cuff, pulse oximetry, and temperature probes, and other invasive and monitoring devices

9. Patient positioning and/or repositioning devices and supports, including immobilization devices used during the surgical procedure

10. Placement of tourniquet cuffs, including identification of the unit, pressure settings, and inflation and deflation times.

11. Location of the skin preparation, including solution used.

12. Use of lasers, including identification of the unit, name of surgeon and support staff members, type of laser used, surgical procedure, the lens used, length of time laser was used, and the wattage.

13. Use of intra-operative x-rays and fluoroscopy.

14. Patient specimens and cultures taken during the surgical procedure.

15. Location and type of drains, catheters, wound packing, casting material, and dressing used.

16. Placement and location of implants (e.g. medical devices, synthetic and biologic grafts, tissue, bone), including the name of the manufacturer or distributor, lot and serial numbers, type and size of the implant, and expiration dates as appropriate; and the drug

administered. Most devices typically come with a sticker that can be retrieved and placed on the operative record as further proof of implantation.

17. Placement of radioactive implants, including the time, number, location and material type placed in the patient.
18. Anesthesia classification, the mode of anesthesia provided, and the type of anesthesia.
19. Documentation of sponge, sharp, and instrument count outcomes as appropriate.
20. Documentation of the date and time of patient discharge, the patient status upon discharge, the patient disposition and the method of transfer.
21. Any significant or unusual occurrences pertinent to operative patient outcomes.

Forms included in the peri-operative nursing documentation:

1. Operative Report
2. Pre-operative Patient Checklist
3. Nurses' Notes
4. Flow Sheets
5. Care Plan
6. Implant Reports
7. Laser log
8. Pre-Anaesthetic Evaluation

Common Charting Errors:

1. Failing to record pertinent health or drug information
2. Failing to record nursing actions
3. Failing to record that medications have been given
   Failing to record the medications given
4. Recording on the wrong chart
5. Failing to document a discontinued medication
6. Failing to record drug reactions or changes in the patient's condition
7. Transcribing orders improperly or transcribing improper orders.
8. Writing illegible or incomplete records

These recommended practices should be viewed as guidelines for developing policies and procedures for documentation within the peri-operative setting. Documentation policies and procedures establish authority, responsibility and accountability and serve as operational guidelines. These should be regularly included in the orientation and ongoing education of personnel to assist them in obtaining knowledge and developing skills and competencies that will influence peri-operative patient outcomes.

Risk management recommendations:

To ensure a well-documented peri-operative patient record, consider these risk-management guidelines:

1. Document all peri-operative care given. This will be measured by Nursing Law and standards of professional nursing practice. It also is proof that pre, intra, and post operative care were given.
   All perioperative care given should be documented. These are proof that preoperative, intraoperative and postoperative care/interventions were rendered. Negative legal repercussions can often be avoided because of proper documentation.

2. Document conversations with the OR team. Include highlights of the conversation, response, instructions, and orders of the Surgeon and Anesthesiologist.
   Document conversations with the perioperative team, to include highlights of the conversation, response, instructions and orders of the surgeon and anesthesiologist.

3. Document the peri-operative nursing interventions that occurred before and after notifying the doctor. If the chain of command was used, document who was contacted, the time of the call, the message communicated, and the response.
   Document the perioperative nursing interventions that occurred before and after notifying the doctor, if the chain of command was used, identifying who was contacted, the time of the call, the message communicated, and the response.

4. Always complete all forms/documentation tools.

5. Document all sponge, instrument, and needle counts.

6. Document what pre-operative and post-operative instructions the patient was given, his or her understanding of the instructions, and any conversations with the patient/family.
7. Use only your facility's accepted methods for correcting chart errors in the medical record.
8. Do not document opinions of the OR team.
9. Never blame another individual or department in the clinical record.
10. Unauthorized duplication is prohibited.

Reference:
AORN Perioperative Standards and Recommended Practices 2014 Edition

The Operative Record

Record-keeping is an integral component of high quality health care. The operative record should be clear, objective, contemporary, tamper-proof and original. It must be an accurate and complete documentation of the procedure performed, and must be duly signed. These relevant clinical data should allow other members of the multi-disciplinary team treating the patient to reconstruct the clinical events to enable them to plan any further treatment or interventions needed. It should reflect the names of all team members involved, and detailing their time of participation (e.g., start and completion). Intraoperative referrals and/or consultations must likewise be documented. The operative note should include the necessary minimum information, but no limited to the following entries, from the team members:

1. from the surgeon: a) name of the main procedure performed, and any secondary procedures; b) names of any assistant; c) details of the procedure; and d) intraoperative blood loss.
2. from the anaesthesiologist: a) intraoperative vital sign parameters recorded at regular intervals; b) medications and fluids administered intra-operatively; and c) any intraoperative events or periods of patient instability.
3. from the nursing team: a) sponge, needle, sharps and instrument counts; b) names and positions of the personnel performing the counts; c) instruments and sponges specifically left inside the patient;

d) any action taken in the event of a count discrepancy; and e) if no count was performed, the reasons for not conducting a count.

The World Health Organization (WHO) Surgical Safety Checklist

Introduction:

The Safe Surgery Saves Lives program was established by the World Alliance for Patient Safety as part of the World Health Organization's efforts to reduce the number of surgical deaths across the globe. The aim of the program is to harness political commitment and clinical will to address important safety issues, including inadequate anesthetic safety practices, avoidable surgical infection, and poor communication among team members. These have proven to be common, deadly and preventable problems in all countries and settings. To assist operative teams in reducing the number of these events, the Alliance- in consultation with surgeons, anesthesiologists, nurses, patient safety experts, and patients around the world- has identified a set of safety checks that could be performed in any operating room. The aim of the resulting WHO Surgical Safety Checklist (available at www.who.int/patientsafety/challenge/safe.surgery/en/index.html) is to reinforce accepted safety practices and foster better communication and teamwork between clinical disciplines. The checklist is not a regulatory device or a component of official policy; it is intended as a tool for use by clinicians interested in improving the safety of their operations and reducing unnecessary surgical deaths and complications.

How to Run the Checklist (See Figure 1):

In order to implement the checklist during surgery, a single person must be made responsible for checking the boxes on the list. This designated checklist coordinator will often be a circulating nurse, but it can be any clinician participating in the operation. The checklist divides the operation into three phases, each corresponding to a specific time period in the normal flow of a procedure—the period before induction of anesthesia (the Sign In), the period after induction and before surgical incision (the Time Out), and the period during or immediately after wound closure but before removing the patient from the operating room (the Sign Out). In each phase, the checklist coordinator must be permitted to confirm that

UNIVERSAL PROTOCOL CHECKLIST
(WHO Surgical Safety Checklist)

PLACE BARCODE STICKER HERE

PATIENT NAME	BIRTHDATE	SEX	ATTENDING PHYSICIAN	AGE
LAST NAME / FIRST NAME / MIDDLE NAME	MM / DD / YYYY	❒ MALE ❒ FEMALE	NAME OF PROCEDURE	DATE: TIME:

AREAS OF CONFIRMATION

Please specify:	Please specify:	Please specify:	Please specify:

ACTION

CONFIRMED BY

❒ Patient ❒ Relative	❒ Patient ❒ Relative	❒ Patient ❒ Relative	❒ Patient ❒ Relative
❒ Identification Band ❒ Correct Surgical Site ❒ Correct Procedure ❒ Physician's Order ❒ Antibiotic Prophylaxis needed (if applicable) ❒ Informed Consent ❒ Verbal confirmation ❒ Patient refused site marking (please see signed waiver) ❒ Site marked and visual confirmed	❒ Identification Band ❒ Correct Surgical Site ❒ Correct Procedure ❒ Physician's Order ❒ Antibiotic Prophylaxis needed (if applicable) ❒ Informed Consent ❒ Verbal confirmation ❒ Patient refused site marking (please see signed waiver) ❒ Site marked and visual confirmed	❒ Identification Band ❒ Correct Surgical Site ❒ Correct Procedure ❒ Physician's Order ❒ Antibiotic Prophylaxis needed (if applicable) ❒ Informed Consent ❒ Verbal confirmation ❒ Patient refused site marking (please see signed waiver) ❒ Site marked and visual confirmed	❒ Identification Band ❒ Correct Surgical Site ❒ Correct Procedure ❒ Physician's Order ❒ Antibiotic Prophylaxis needed (if applicable) ❒ Informed Consent ❒ Verbal confirmation ❒ Patient refused site marking (please see signed waiver) ❒ Site marked and visual confirmed

ACKNOWLEDGED BY

Signature Over Printed Name NURSE-IN-CHARGE	Signature Over Printed Name RECEIVING ALLIED MEDICAL PROFESSIONAL-IN-CHARGE	Signature Over Printed Name OPERATING ROOM NURSE	Signature Over Printed Name CIRCULATING NURSE

AREAS OF CONFIRMATION

PRIOR TO INDUCTION OF ANESTHESIA/SEDATION SIGN IN	START OF SURGICAL PROCEDURE/INSERTION OF SCOPE OR NEEDLE PUNCTURE TIME OUT	PRIOR TO PATIENT LEAVING THE OPERATING THEATER SIGN OUT
• Patient Confirmed ❒ Identity ❒ Site ❒ Consent ❒ Procedure • With implants? ❒ Yes ❒ No ❒ N/A ❒ Site Marked ❒ N/A ❒ Anesthesia safety check completed • Pulse oximeter on patient and functioning ❒ Yes ❒ No • Does patient have a known allergy? ❒ Yes, please specify: ❒ No • Difficult Airway / Aspiration Risk ❒ Yes, and equipment assistance available ❒ No • Risk of > 500 cc blood loss (7cc in children)? ❒ Yes, and IV access available ❒ No	❒ Confirm all team members have introduced themselves by name and role • Surgeon, Anesthesia professional and nurse verbally confirm ❒ Patient Identity ❒ Site ❒ Position ❒ Procedure • With implants? ❒ Yes ❒ No ❒ N/A ❒ Surgeon Reviews: • What are the critical steps, operative duration, anticipated blood loss? ❒ Anesthesia Team Review • Are there any patient specific concerns? ❒ Nursing Team Reviews: • Has sterility been confirmed? • Are there equipment issues or any concerns? • Antibiotic prophylaxis given within the last 60 mins? ❒ Yes ❒ N/A • Essential imaging displayed? ❒ Yes ❒ N/A ❒ Other checks:	• Nurse verbally confirms with the team: ❒ That instrument sponge and needle counts are correct (or not applicable) ❒ Is the specimen labeled (including patient name)? ❒ Whether there are any equipment problems to be addressed ❒ The name of the procedure recorded ❒ Surgeon, Anesthesia professional and nurse review the particular concerns for recovery and management of this patient? ❒ Was anybody hurt or exposed to blood and body fluids of the patient?

ACKNOWLEDGED BY:

Signature Over Printed Name/Date & Time SURGEON/RADIOLOGIST	Signature Over Printed Name/Date & Time ANESTHESIOLOGIST

Signature Over Printed Name/Date & Time
CIRCULATING NURSE-IN-CHARGE/
ALLIED MEDICAL PROFESSIONAL-IN-CHARGE

Figure 1: WHO Safety Checklist sample

the team has completed its tasks before it proceeds onward. **As operative teams become familiar with the steps of the checklist, they can integrate the checks into their familiar work patterns and verbalize their completion of each step without the explicit intervention of the checklist coordinator**. Each team should seek to incorporate the use of the checklist into its work with maximum efficiency and minimum disruption while aiming to accomplish the steps effectively.

Nearly all the steps will be checked verbally with the appropriate personnel to ensure that the key actions have been performed. Therefore, during the Sign In, the person coordinating the checklist will verbally review with the patient (when possible) that his or her identity has been confirmed, that the procedure and site are correct and that consent for surgery has been given. The coordinator will visually confirm that the operative site has been marked (if appropriate) and will verbally review with the anesthesia professional the patient's risk of blood loss, airway difficulty and allergic reaction and whether a full anesthesia safety check has been completed.

Ideally the surgeon will be present for the Sign In, as the surgeon may have a clearer idea of anticipated blood loss, allergies, or other complicating patient factors. For the Time Out, each team member will introduce him or herself by name and role. If already partway through the operative day together, the team can simply confirm that everyone in the room is known to each other. The team will pause immediately prior to the skin incision to confirm out loud that they are performing the correct operation on the correct patient and site and then verbally review with one another, using the checklist questions for guidance. They will also confirm that prophylactic antibiotics have been administered within the previous 60 minutes and that essential imaging is displayed, as appropriate.

For the Sign Out, the team will review together the operation that was performed, completion of sponge and instrument counts and the labelling of any surgical specimens obtained. It will also review any equipment malfunctions or issues that need to be addressed. Having a single person lead the checklist process is essential for its success. In the complex setting of an operating room, any of the steps may be overlooked during the fast paced preoperative, intra-operative, or postoperative preparations. **For many institutions, this will be a circulating nurse, but any clinician can coordinate the checklist process**.

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Electronic Data In The Operating Room

Electronic health records have been adopted across healthcare organizations. Its full implementation however remains challenging because of the complex nature of the perioperative setting. Electronic recording has successfully provided adequate services for basic functionality areas (e.g., patient/case scheduling, case planning and management, staffing, OR suite management, nursing perioperative documentation, and charge collection for hospital billing), but it still encounters difficulty in keeping pace with the peculiar demands this unique environment. Despite such shortcomings, benefits exist with this innovative technology, although, there are inherent problems as well.

Advantages of Electronic Data:

1. There is improved electronic accessibility to patients' medical records, eliminating the need of physical transporting, sifting and filing of charts.
2. It allows placement of laboratory and imaging orders, prescriptions and other notices electronically.
3. It reduces error of hand-written orders.
4. It allows other physicians within the network to access orders of other health care providers.
5. It improves the preventative health aspect of patients.
6. Healthcare organizations can better keep track of the patient's use of hospital resources (e.g., equipment, medical supplies, diagnostic testing, medication and hospital staff, etc.).
7. It allows the revision and co-signing of notes to happen electronically.
8. Health care providers can communicate through e-messaging with other members in the multidisciplinary team.
9. It facilitates retrieval of medical data for research.

Disadvantages of Electronic Data:

1. Lack of interoperability between information technologies.
2. High cost of setting-up an Electronic Medical Record (EMR) system and its maintenance.

3. Workflow disruptions due to the learning curve result to a decrease in productivity during the early phase of implementation.
4. Delays and errors in documentation may result when health care providers wait to close their notes at the end of the day.
5. It removes the "face-to-face" or "phone-to-phone" conversations between health care providers, thus eliminating the active interactions observed in "give-and-take" conversations and "question-and-answer" scenarios.
6. There is lack of accountability to continually update the patient's record.
7. There is an increased risk of privacy violations in accessing patient's sensitive information.
8. Failures of health care providers to fill in empty data fields in the patient's record.
9. Health care providers tend to do shortcuts and rely on the "copy and paste" function, particularly for routine or follow-up visits.

Electronic records have markedly increased in utilization in the time of the COVID pandemic. This is in light of the need for less paper exchanges, as the virus has been demonstrated to survive on various types of surfaces for several days.

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VIII. Recommended Practices for Sharps Safety

Recommended Practices for Sharps Safety:

Surgical team members should use a neutral zone or hands-free technique for passing sharp instruments, blades, and needles.

Use of a neutral zone should include:

- Identifying the neutral zone in the preoperative briefing
- Using a basin, instrument mat, magnetic pad, or designated area on the Mayo stand as the neutral zone.
- Giving verbal notification when a sharp is in the neutral zone
- Placing one sharp at a time in the neutral zone
- Orienting the sharp for easy retrieval by the surgeon
- Handling of a sharp item by only one team member at a time; and
- Placing sharp items in the neutral zone after use.
- A modified neutral zone (eg., a limited hands-free passing technique) should be used during procedures that require the use of a microscope. The scrub person should place the sharp in the surgeon's hand. The surgeon should return the sharp to the designated neutral zone.
- A no-touch technique should be used when handling sharps. This minimizes manual handling of sharp devices and instruments, reducing the risk of injury to peri-operative team members and the patient.
- Suture needles should not be manipulated with gloved hands. Suture needle injuries occur when loading the needle holder or repositioning the needle. When a suture is being loaded on a needle holder, the suture packet should be used to position the suture needle in the needle holder without touching the needle. A blunt instrument (eg, forceps) should be used to manipulate and guide the suture needle through tissue to avoid finger contact with the suture needle or the tissue being sutured.
- An instrument should be used to pick-up sharp items (eg, scalpel blades, suture needles) that have fallen off the sterile field. Sharp instruments (eg, retractors, towel clips) should be used only when clinically necessary. Sharp devices should be used only when there is no safer alternative available.
- Safe scalpel handling methods should be used when clinically feasible.An instrument should be used for loading or removing a scalpel blade on a knife handle.

- Peri-operative team members should use additional sharp safety practices, including:
  - Maintaining situational awareness of all sharps on the sterile field.
  - Communicating the location of sharps on the sterile field with other members of the perioperative team during the procedure and at times of personnel change.
  - Removing suture needles from the suture before tying (eg, cutting, control release);
  - Retracting tissue with instruments (eg, retractors) rather than hands;
  - Handling (eg, applying, passing, using, removing) saw blades, sharp K-wires, burrs, and other sharp devices with caution; and
  - Covering with a protective cap or cutting the exposed ends of sharp pins or K-wires after they have passed through the patient's skin.
  - Discard chipped or broken glass device or arrange to have them repaired
  - Avoid recapping used needles or other sharps unless using a recapping device
  - Refrain from manually bending or breaking needles
  - Sharp devices must be contained and disposed of safely. Containing sharps in an appropriate puncture -resistant container can reduce sharp injuries.

- Functional selection criteria for a sharps disposal container should include that the container
  - Is durable (resistant to punctures and chemical or liquid leaks)
  - Has a mechanism for closing that minimizes exposure to contents and hand injuries during handling and that is resistant to being opened manually.
  - Is stable
  - Is of size and shape to accommodate the type of sharps that require disposal.

- Perioperative personnel should report sharp injuries immediately. Reporting facilities prophylaxis against blood-borne pathogen exposure. Post -exposure prophylactic medication reduces the risk of infection and facilitates prompt treatment.

Reference:
AORN Perioperative Standards and Recommended Practices 2014 Edition, p 358-364

IX. Patients' Rights

Patients' Rights

There is always the need for continuous quality improvement and patient safety since clinical outcomes are determined by how healthcare organizations possess their structural and procedural integrity.[1] Standards for promoting good patient care outcomes must be in place. Inasmuch as an individual patient is unique, with his/her needs, strengths, values, and beliefs, establishing trust and open communication with patients is one of the priorities in strengthening physician-patient relationships. Each patient's cultural, psychosocial, and spiritual values must be respected. Patient care outcomes can be improved when patients and, as appropriate, their families and/or those who make decisions on their behalf are well informed and involved in care decisions and processes in a way that matches their cultural expectations.[2]

To promote patient rights and patient-centered care, organizations begin by defining those rights and involving patients and their families in making decisions about the patient's care. Patients need to be well informed of their rights and how to act on them. Multidisciplinary team members are taught to understand and to respect patients' beliefs and values and to provide considerate and respectful care that promotes and protects patients' dignity and self-worth.[2]

A. Rights of Patients[3,4]

1. **Right to Good Quality Health Care and Humane Treatment** - Every person has the right to a good quality Health Care without discrimination and within the limits of the resources, manpower and competence available for health and medical care. In the course of such care, his human dignity, convictions, integrity, individual needs and culture shall be respected.
2. **Right to Dignity** - The Patient's dignity, culture and value shall be respected at all times in medical care and teaching. The patient is entitled to relief of his/her suffering according to the current state of knowledge. Likewise, terminally ill patients shall be entitled to humane terminal care to make dying as dignified and comfortable as possible.
3. **Right to be Informed of the Rights and Obligations as a Patient** - Every person has the right to be informed of his rights and obligations as a Patient.

4. **Right to Freedom of Choice** - The Patient is free to choose the services of a physician or health institution of his choice except when he chooses to be confined in an institution where the services are offered for free, either in a state-funded facility or as a service patient in private facilities. The Patient has the right to seek a second opinion and subsequent opinions, if necessary, from another physician or health institution, and to change his physician or health institution.

5. **Right to Informed Consent** - The Patient has a right to self-determination and to make free decisions regarding himself/herself. However, the attending physician shall inform the Patient of the consequences of his/her decisions. *(See also Informed Procedural Consent Section)*
   a. A Patient who is mentally competent and is of legal age or his/her legal representative (if he/she is incapacitated or is at age of minority) has a right to a clear explanation of all proposed or contemplated procedures, whether diagnostic or therapeutic, including the identity and professional circumstances of the person or persons who will perform the said procedure or procedures.
   b. The right to informed consent shall likewise consider the voluntariness in which the Patient or his/her legal representative has given his/her consent.
   c. In the case of a Patient who is legally incompetent or is a minor, the consent of a legal representative is required; Provided, however, that the Patient must be involved in the decision-making process to the fullest extent allowed by his mental capacity. If the legally incompetent Patient can make rational decisions, his/her decisions must be respected, and he/she has the right to forbid disclosure of such information to his/her legal representative.

6. **Right to Refuse Diagnostic and Medical Treatment** - The Patient has the right to refuse diagnostic and medical treatment procedures; Provided that the following conditions are satisfied:
   a. The Patient is of legal age and is mentally competent,
   b. The Patient is informed of the medical consequences of his/her refusal,
   c. The Patient releases those involved in his care from any obligation relative to the consequences of his/her decision, and
   d. The Patient's refusal will not jeopardize public health and safety.

7. **Right to Refuse Participation in Medical Research** - The Patient has the right to be advised of plans to involve him/her in medical research that may affect the care or treatment of his/her condition. Any proposed research shall be performed only upon the written informed consent of the Patient.

8. **Right to Religious Belief and Assistance** - The Patient has the right to receive spiritual and moral comfort, including the help of a priest or minister of his/her chosen religion. He/she also has the right to refuse medical treatment or procedures which may be contrary to his/her religious beliefs.

9. **Right to Privacy and Confidentiality** - The patient has the right to privacy and protection from unwarranted publicity. The right to privacy shall include the patient's right not to be subjected to exposure, private or public, either by photography, publications, video-taping, discussion, or by any other means that would otherwise tend to reveal his/her person and identity; and the circumstances under which he/she was, he/she is, or he/she will be, under medical or surgical care or treatment. *(See Patient Privacy section)*
   Confidential information may be disclosed, among others, in the following cases:
   i. When the patient's medical or physical condition is in controversy in a court litigation and the court, in its discretion, orders the patient to submit to physical or mental examination of a physician,
   ii. When public health or safety so demands,
   iii. When the Patient, or if incapacitated, his/her legal representative, expressly gives the consent,
   iv. When the patient's medical or surgical condition is discussed in a medical or scientific forum for expert discussion for his/her benefit or for the advancement of science and medicine; Provided, however, that the identity of the Patient should not be revealed.

10. **Right to Disclosure of, and Access to, Information** - In the course of the patient's treatment and hospital care, the Patient or his/her legal guardian has the right to be informed of the result of the evaluation of the nature and extent of his/her disease. Any other additional or further contemplated medical treatment on surgical procedure or procedures shall be disclosed and may only be performed with the written consent of the patient.

The Patient has the right to be given, and examine, an itemized bill for hospital and medical services rendered. He/she is entitled to a thorough explanation of such bill (amount).

11. **Right to Correspondence and to Receive Visitors** - The Patient has the right to communicate with his/her relatives and other persons and to receive visitors subject to reasonable limits prescribed by the rules and regulations of the Health Care Institution.

12. **Right to Medical Records** - The Health Care Institution and the physician shall ensure and safeguard the integrity and authenticity of the medical records. The Patient, upon his/her request, is entitled to a medical certificate and clinical abstract.

13. **Right to Health Education** - Every person has the right to health education that will assist in making informed choices about personal health and about available health services. The education shall include information about healthy lifestyles and about methods of prevention and early detection of illnesses

14. **Right to Leave Against Medical Advice** - The Patient has the right to leave a hospital or any other Health Care Institution regardless of his/her physical condition; Provided that:
    a. He/she is informed of the medical consequences of his/her decision,
    b. He/she releases those involved in his/her care from any obligation relative to the consequences of his/her decision, and
    c. His/her decision will not prejudice public health and safety.

15. **Right to Express Grievances** - Every Patient has the right to express valid complaints and grievances about the care and services received and to know the disposition of such complaints.

B. Informed Procedural Consent

The physician-patient relationship is built on trust and open communication. The physician has ethical and legal mandates to disclose all information relevant to the patient's decision making. The physician is bound by the patient's right to self-determination (Principle of Autonomy) and the Doctrine of Informed Consent.

An educated patient also benefits the physician, both in terms of cooperation in the planned intervention and in reducing acrimony in case of complications.[5] The physician who teaches and responds carefully brings the patient into the medical decision-making process, addresses the patient's concerns, and creates reasonable expectations regarding outcomes.[6]

A written, informed consent is required for any patient undergoing any surgical procedure in the operating room. The consent is taken after a comprehensive discussion of the indications, treatment options, planned surgical procedure, possible risks and complications, expected outcome have been thoroughly discussed by the surgeon with the patient. The content of an informed consent should include the following, but not limited to, the patient's full name, planned surgical procedure, surgeon's name, anesthesiologist name, date and time, signature by the patient, patient representative or guardian, signature of the surgeon and signature of the witness.[7]

An integral part of physician's overall obligation to patient is the duty of reasonable disclosure of available choices with respect to proposed therapy and of dangers inherently and potentially involved in each. There are four essential elements a plaintiff must prove in a malpractice action based upon the Doctrine of Informed Consent[8]: 1) the physician had a duty to disclose material risks; 2) he failed to disclose or inadequately disclosed those risks; 3) as a direct and proximate result of the failure to disclose, the patient consented to treatment she otherwise would not have consented to; and 4) plaintiff was injured by the proposed treatment. A 2015 medical negligence case was adjudged in violation of this Doctrine.[9]

Material facts[6] — Material facts are those that are relevant to decision making and usually include:

a. Diagnosis. The methods and alternative means of diagnosis may be relevant, particularly when invasive diagnostic techniques are utilized,
b. Proposed treatment or procedure,
c. Alternative treatment options (surgical or medical) along with their risks and benefits,

d. Risks and benefits of treatment, and
e. The risks of refusing treatment.

In addition, the likelihood of success and possible problems related to recovery are elements that are to be discussed also during the informed consent process.[2]

While the law remains unsettled, it seems prudent to include a warning that coronavirus disease 2019 (COVID-19) positive patients undergoing surgical procedures incur higher risks for respiratory complications and mortality. Thus informed, patients who are planning elective surgeries may decide to postpone them.[6] Prudence further dictates that future emerging and novel infections with detrimental consequences to a surgical patient may need to be disclosed to him/her as part of the physician-patient discussion where shared decision making is warranted. A concern that such emerging and novel diseases may be acquired in the hospital of confinement exists. Patients who will undergo surgery and their surgical team must have full discussion, addressing well this apprehension.

As regards age, for patients less than 18 years, a parent or a legal guardian is eligible to give consent for the patient.

C. Patient Privacy[7] And Privacy Policy

The right to privacy has to be secured and protected. These give patient the right over their health information, set rules and limits on who can look at and receive their health information. The Privacy Rule applies to all forms of individuals' protected health information, whether electronic, written, or oral.

Patient's rights regarding health information further include:

1. Ask to see and get a copy of the patient's health records from hospital, clinic and/or health maintenance organization
2. Have corrections added to one's health information
3. Receive a notice that tells patient how their health information may be used and shared
4. Have the right to consent before their health information can be used or shared for certain purposes, such as for marketing

5. Get a report on when and why one's health information was shared for certain purposes

In order to make sure that the patient health information is protected in a way that does not interfere with one's health care, information can be used and shared:

1. For the patient treatment and care coordination
2. To pay doctors and hospitals for one's health care and to help run their businesses
3. With one's family, relatives, friends, or others, the patient identifies who are involved with health care or health care bills, unless the patient explicitly objects
4. To make sure doctors give good care and nursing homes are clean and safe
5. To protect the public's health, such as by reporting when the flu is in the patient area
6. To make required reports to the police, such as reporting gunshot wound

The patient health information cannot be used or shared without written permission. The Privacy Rule does not require a health care provider or health plan provider to share information with patient's family or friends, unless they are authorized personal representatives.

Recording of surgeries and other patient information and records in the operating room should be authorized by the patient or the patient's legal representative. These recordings should be considered privileged and should not be used for personal communications or reporting without the consent of the patient. Employees shall not use personal devices to photograph patients for any reason. All patients' photographs, videotapes and other images will be stored in a secure manner that will protect patient's privacy.[7]

It is worth mentioning that the patient's Right to Privacy must be stipulated in the Health Care Institution Privacy Policy as exemplified here:

*"**Rights of the Data Subject**. (Name of hospital) upholds all pertinent statutory and regulatory laws pertaining to rights and privacy of data subjects as stated under the Data Privacy Act of 2012 including the Rights of Patients stated under the (proposed) Magna Carta of Patient's Rights and Obligations Act of 2017."*[10]

D. Advance Directive[7]

An advance directive is a written legal document that indicates how the patient would like to be managed in the event that the patient is unable to make any medical decision such as comatose state. It may include certain treatment options that the patient would like or not like to receive in certain conditions. Advance directive may be in the form of a living will, a special power of attorney or a "do not resuscitate" order.

E. Pertinent Laws

There are two relevant laws aimed to protect the rights of patients. These are the law on 'anti-detention' of patients on account of non-payment of medical bills[11] and the law on 'anti- hospital deposit.'[12]

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X. Professional Ethics and Decorum

The operating room in a hospital is a highly critical and complex area which requires the highest standards. A certain code of conduct must be followed at all times to maintain a pedagogical model of excellence. There is indeed a very narrow margin for errors and critical incidents are waiting to happen with any lapses in the standard of care. The core idea of possessing certain etiquettes and mannerisms is therefore quintessential for excellence and safety in patient care and a good outcome.

Operating room decorum and demeanor shall always be enforced on every person allowed to enter the Operating Room premises.

Basic house rules before entering our temple of work - The Operating Room

1. Only authorized personnel with official business (to include security and maintenance personnel assigned in the complex, non-surgical medical personnel co-managing a surgical patient, officially enrolled students of the University with curriculum prescribed OR time, officially registered students /resident rotators from other institutions, official guests/observers) are allowed entry into the OR Complex. As such, no visitors, relatives, press personnel, and other persons without official business shall be allowed into the complex.

2. Parents or guardians of pediatric patients accompanying their children during induction and transfer to the Post Anesthesia Care Unit (PACU) are allowed entry only with the permission of the attending surgeon and anaesthesiologist.

3. Unauthorized persons seeking entry must get official clearance from the hospital administration and consent of attending physician/ surgeon and this has to be presented to the Chief Nurse of the area concerned prior to being allowed entry. OR personnel are discouraged from entertaining their personal guests at the complex. If it is absolutely necessary, such should be done briefly and only at the information areas.

4. All operating room personnel and authorized "guests" are required to be in proper attire upon entering the complex. This includes:
   a. Newly laundered clean OR gown/scrub suit
   b. Surgical cap, ensuring complete coverage of hair
   c. Clean surgical mask, placed over the nose and mouth
   d. Shoe covers / OR slippers or clogs

5. Surgeons, assistants, anesthesiologists, and scrub nurses should be able to perform proper donning and doffing of personal protective equipment, scrubbing, gowning, and gloving as prescribed.

6. Surgeons or his/her representative should inform the OR staff of any patients with infectious/communicable diseases. This allows for pre-operative preparation and post-operative disposal and sterilization processes for equipment and supplies, and also peri-operative patient "quarantine" or isolation procedures.

7. Operating room equipment and instruments officially assigned to a particular department (or with signed memorandum receipt by a particular department) should not be transferred to any other area without the permission of the department concerned through its authorized representative (usually the Chief Resident) and the Head Nurse of the area. Transfers or loan of such equipment and/or instruments should have prior notice/schedule (unless required on an emergent basis) and should be properly logged and covered with a receipt. Immediate return to the area concerned is mandatory after every use.

8. Special instruments (those not included in standard packs) should be requested prior to the start of the surgery/procedure to ensure availability and sterility.

9. Each operative team member should is to treat all other members of the team and the patient with respect at all times. There shall never be any discussion of conflicts within hearing distance of the patient. Ethical standards and codes of conduct provided for by the Philippine Medical Association, the Professional Regulations Commission, the University Code, and the Civil Service Commission shall always be adhered to by everyone.

10. Punctuality is expected among all members of the surgical team to avoid delays and cancellation of cases.

11. Eating within the complex is only allowed at the OR cafeteria/pantry. Smoking, drinking of alcoholic beverages, and peddling are strictly prohibited in the complex.

12. Bags and other personal effects should not be brought into the operating suites. Books and other academic reading/instructional

materials necessary for the procedure/surgery will have designated areas of placement very proximate to the operating theatre for easy access when needed.

13. Noise in any form should be minimized. Shouting is strictly prohibited. If music is to be played, the level of loudness should not interfere with the communication of the operative team.

Respect For Human Dignity:

1. Respect the Patient's Bill of Rights.
2. Refrain from derogatory comments about patient, family and significant others, colleagues, & other associates.
3. Integrate cultural differences of co-workers.
4. Recognize and respect the value of all team members, including students, ancillary and support staff.
5. Provide interpreters when necessary.

Confidentiality/Privacy

1. Keeps doors of OR and procedure rooms closed at all times except during movement of patients, personnel, supplies or equipment.
2. Restrict access to patient care areas to designated authorized personnel only.
3. Maintain respect for deceased, providing protected area for viewing deceased by family/significant others and provide a protected area for viewing by family/significant others.
4. Close patient record and log off whenever leaving the computer unattended to protect patient information.
5. Limit access to patient record and information (e.g. surgery schedule) to appropriate members of health team.
6. Record of disposition of patient's belongings and valuables must follow agency's policies and protocols.
7. Operative records must be completed in an objective & non-judgmental manner.
   Operative records must be completed before the patient leaves the OR in an objective and non-judgemental manner.
8. Release patient information only to individual properly identified and in compliance with established policies mandates or protocols.

Protection of Participants In Research:

1. Confirm informed consent of patient, by physicians or responsible researcher, prior to initiation of study and before use of patient information for research.
2. Follow recommended guidelines and protocols when using investigational devices or when engaging in new procedure.

Questionable Practice:

1. Act as patient advocate by protecting the patient from incompetent, unethical, or illegal practices. Report verbal, psychological, and physical harassment or abuse.

Regulatory Requirements:

1. Maintain licensure and certification of all health team members.
2. Practice within scope of training and competency.

Environment Of Ethical Obligations:

1. Know chain of command.
2. Promotes environment that does not tolerate harassment & abuse.
3. Facilitate work environment conducive to learning.
4. Collaborate with all health team members.
5. Question unfair employee practices.
6. Identify and report unsafe patient practices

Reference:
1.WHO Guidelines for Safe Surgery 2008

Ethics and Surgery

Surgical decision-making can be viewed as a two-part process. First, there is the '*is it possible to treat' or 'how to treat*' aspect, which is a matter of knowledge and technique (i.e. surgical science). This is translated into an evidence-based practice. Secondly, the '*why treat' or 'what should be done*' issues, which are a matter of surgical ethics and should be based on moral philosophy.

When deciding on 'why to treat', ethics provides us with four principles: beneficence, non-maleficence, respect for patient autonomy, and justice. These principles guide the evaluation and interpretation of ethical issues

in patient care. These ethical principles proposed by Beauchamp and Childress are internationally recognized. They are known as principlism or the 'four-principle' approach and are conceived to be part of a common moral ground that enables a practical approach to ethical decision-making. This means that those four principles aspire to be applied universally and constitute the framework of a "common morality".

Table 3: The Practical Approach to PRINCIPLISM IN SURGERY by Beauchamp and Childress

<table>
<tr><td colspan="2">Principle: Respect for autonomy</td></tr>
<tr><td>Definition
Patients should be treated as autonomous agents. This means recognizing the individual's capacity for self-determination, their ability to make independent decisions and authentic choices based on personal values and beliefs.
- Patients with diminished autonomy are entitled to protection.
- Autonomy does not mean that a patient has the right to obtain any treatment he or she wishes or requests if this particular treatment is not medically indicated.
- Autonomy can only be exercised after having obtained full and appropriate information as well as having understood it. The decision has to be taken without any undue coercion or pressure.</td><td>Statements
The patient must be adequately informed about the benefits and risks of the proposed surgical treatment.
The patient has the right to decide whether or not to accept treatment.
A competent patient has the right to refuse a treatment after adequate information, even when this refusal would lead to his or her death.</td></tr>
<tr><td colspan="2">Informed consent
Informed consent plays a highly significant role in the patient-surgeon relationship. For patients waiting to undergo surgery, obtaining informed consent is the surgeon's final step in the information process, and giving informed consent is an important decision that the patient must make freely and independently25. For informed consent in surgery, the legal principle emphasizes that the patient is an independent adult who has the capacity and the competence to authorize that which is going to be done to their body and mind. Therefore, any operation that may infringe upon this principle is not only considered to be illegal and liable to result in lawsuits for unlawful injury caused to the patient, it is also ethically unacceptable26.</td></tr>
<tr><td colspan="2">Principle: Beneficence</td></tr>
<tr><td>Definition
The principle of beneficence imposes an obligation to act for the benefit of the patient.
Surgeons have to follow professional obligations and standards.</td><td>Statements
Surgeons have the obligation to maximize potential benefits for their patients while at the same time minimizing potential harm for them
The patient must not be deceived.</td></tr>
</table>

Surgeons should provide appropriate surgical intervention in response to a medical indication and following the consent of the patient. Each decision must be taken on an individual level.	
Principle: Non-maleficence	
Definition The principle of non-maleficence imposes an obligation not to inflict harm on others. Surgery should minimize possible harm. Surgeons must assess the nature and scope of the risks and benefit	**Statements** If the risks and burdens of a given surgery for a specific patient outweigh the potential benefits, then the surgeon has an obligation not to operate.
Principle: Justice	
Definition The principle of justice refers to equal access to health care for all. Limited resources including the time surgeons and other health personnel and caregivers devote to their patients must be evenly distributed to achieve a true benefit for the patient. Resources should be distributed fairly without any discrimination. With regard to limited resources, there must be proper use of ethically appropriate and transparent criteria.	**Statements** Every patient is entitled to obtain the best surgical care available. Expensive surgeries should always, like any other therapy, be provided solely when indicated. Undertreatment should never be the result of containing the growing costs of healthcare. Patients have the right to have their health valued more highly than the surgeon's own economic interest.

"***Captain of the Ship***"

"People may not remember exactly what you did, or what you said, but they will always remember how you made them feel." Carl W. Buehner

The Operating Room is an intimidating setting for most of the surgical team. The attending surgeon being the "captain of the ship", serves as the leader who guides the team and sets the tone for interactions and emotions in the OR environment. He serves as the role model for all the operating room staff. The team expects exemplary behaviour from the attending surgeon. He must possess effective communication skills, demonstrate respect for all team members and maintains a sense of confidence. It is this leadership that maintains the OR an efficient and safe place for the staff and most of all, the patient.

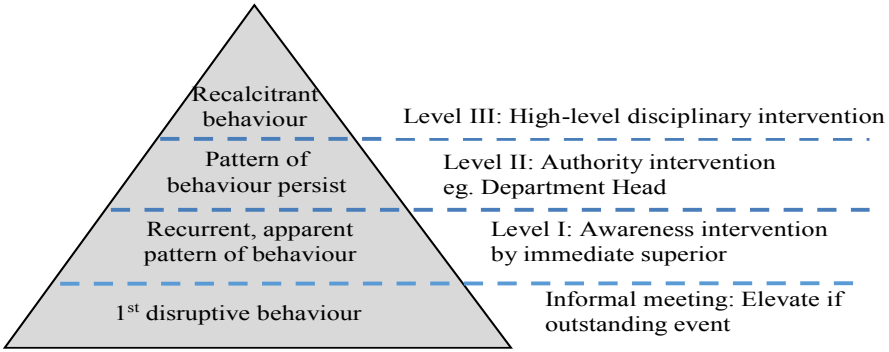
The emotional reactions of the surgeon are the most memorable take away. A disruptive attending surgeon can have an immense impact on the patient and the whole OR team. Disruptive behaviours shift the attention towards the surgeon and away from the patient. These can result in increased procedural errors when members feel threatened. They become less proactive for fear of committing another mistake and its repercussions from the attending surgeon. Team members may also be distracted from other patient care activities when they are preoccupied defusing and pacifying the disruptive experience.

Table 1: Definitions of Disruptive Behaviour among Healthcare Organizations by Villafranca, et al. 2017.

Organization	Definition	Generalized Examples	Excluded Behaviour
Council on Ethical and Judicial Affairs, American Medical Association	Verbal or Physical conduct, that does, or may negatively affect patient care	Foul language	Good faith criticism
		Threatening language	
		Aggressive	
		Hyperactivity	
		Intrusiveness	
		Irritability	
		Argumentative	
Canadian Medical Protective Association		Derogatory comments	Good faith advocacy for patient
		Dismissive comments	Complain to an outside agency
		Insensitive, uncaring callous attitude	Testifying against colleague
		Inappropriate language	Professionally written alerts
		Profanity	
		Bullying	
		Threats	
		Demeaning conduct	

		Condescending conduct	
		Aggressive conduct	
		Angry outburst	
		Boundary issues	
Joint Commission on Accreditation of Hospital Associations (JCAHO)	Conduct that intimidates others to the extent that quality and safety are compromised	Verbal outburst	None provided
		Physical threat	
		Refusing to perform assigned tasks	
		Reluctance to answer questions	
		Quietly exhibiting uncooperative attitude	
		Condescending language	

These behaviors should not be taken lightly given their negative consequences. Other than those mention above; it dissuades trainees from a career in surgery, disrupts the learning environment, results in loss of respect for the surgeon and loss of motivation to assist the surgeon. It is important for remediation to occur with a follow-through on disciplinary action if change does not occur.



90 % of professionals have no disruptive behaviour >>>> regular performance evaluation

Figure: Staged Remediation and Intervention Structure Hickson GB et al, 2007

The appropriate behaviour for a surgeon can follow the guidelines established for civility for the greater population. Examples of these behaviours are respect, self-awareness and kind speech. When all goes well, the end result is an efficient team with the patient's best interest in mind. It allows each team member to provide inputs within the realms of his or her role and encourages each team member to promote the team's success. Every attending surgeon should continue to advance his or her self-awareness/mindfulness and recognize when he or she is most vulnerable to demonstrating disruptive behaviour.

Table 2: Guidelines for Civility Applicable to the Operating Room Environment; Villafranca, et al. 2017

John Hopkins Rules on Civility	Ontario Medical Association Fundamentals of Civility
Acknowledge others; their presence, worth and effort	Respect others and yourself
Respect other's opinion, time and space (physical and emotional)	Communicate effectively
Speak kindly	Be aware
Do not blame	Be responsible
Keep it down	Take good care of yourself
Respectfully assert yourself	

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