OPERATING ROOM (OR) - STRUCTURE, EQUIPMENTS
STERILIZATION, DESINFECTION
PREVENTION OF SURGICAL SITE INFECTION (SSI)

Prof. József Sándor MD, PhD, FACS
PAIN

BLEEDING

INFECTION
Mortality rate of puerperal fever
Allgemeines Krankenhaus, Vienna

<table>
<thead>
<tr>
<th></th>
<th>1st Clinic (medical students)</th>
<th>2nd Clinic (midwife students)</th>
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<tbody>
<tr>
<td>1844</td>
<td>8,23%</td>
<td>2,30%</td>
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<tr>
<td>1845</td>
<td>6,90 %</td>
<td>2,03 %</td>
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<tr>
<td>1846</td>
<td>11,44 %</td>
<td>2,79 %</td>
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Mortality rate of puerperal fever

St. Rochus Hospital, Pest

1855-56  0,39%
1860-61  0, %
L. Pasteur
J. Lister
ASEPSIS  (Semmelweis)

Summary of methods and behavioral characteristics to keep away microorganisms from the body – i.e.: PREVENTION

ANTISEPSIS  (Lister)

Fight against bacterial and other contaminations of the skin surface, objects and of the wounds – i.e.: TREATMENT
STERILIZATION

To kill all pathogens, spores, create germ-free circumstances

Methods

Autoklave – Steam with high pressure (4 x check up)
Gas sterilization with ethylen-dioxide
Cold sterilization with sporecide chemicals (glutaraldehid)
Gamma and electron radiation
Plasma sterilization
(low temperature hydrogenperoxide gas plasma – effect of free radicals)
DESINFECTION

Decrease the number or inactivate of live pathogens

Methods

Low temperature steam

Chemical desinfectants
(Phenol – and kwaterner ammonium derivatives, chlor containing compounds, alcohols)
LOCATION of the OPERATING ROOM IN THE HOSPITAL

Access, vicinity to Intensive Care Unit
Preparation room, wake up room
Sluice
Scrub room
STRUCTURE OF OPERATING ROOM

- Automatic, no touch door
- Walls covered with light coloured tiles
- Antistatic gap-free floor
- Central supply of electricity, automatic connection to battery
- Central suction and gas supply
- Air condition with laminar stream, dust and bacteria filter
ACCESSORIES IN THE OPERATING ROOM

Minimal number of devices
OR is not a store-room
Connection of devices to the ceiling

Accessories of the surgical procedure:

- Shadow-free lamp
- Operating table
- Sonnenburg table
- Large table for operating instruments
- Boxes for sterile textiles
- Suction device
- Electrocautery
- US-powered cutting device
- Laser
- Sac for used bloody and dirty items
- Portable X-ray
OPERATING STAFF

Operating surgeon – responsible for everything
First assistant: general helper for the operating surgeon
Second assistant: exposing the field of operation
Scrub nurse: instrumentation, responsible for sterility
Circulating nurse: help at the operation
BEHAVIOUR IN THE OR

Enter only after changing the clothes

As minimal number of persons into the OR as possible

Close door while operation, minimal number of door openings

Minimal movements, no walking, no mobile phone

Don’t leave OR Department with operating dress
Threats that can lead to errors:

- Patients
- Co-workers
- Surgical Procedure
- Drugs
- Comorbidity
- Unfamiliar Environment
- Emergency Cases
- Time pressure
- System Malfunction

Team Briefing
SAFE OPERATION

Preparation for the procedure (history, examinations)
Signed informed consent
Recommended check list
Team work
Counting the instruments pre-and post-operatively
Written documentation of the procedure
Surgical Safety Checklist

Before induction of anaesthesia (with at least nurse and anaesthetist)
- Has the patient confirmed his/her identity, site, procedure, and consent?
  - Yes
  - Not applicable
- Is the site marked?
  - Yes
  - Not applicable
- Is the anaesthesia machine and medication check complete?
  - Yes
- Is the pulse oximeter on the patient and functioning?
  - Yes
- Does the patient have a:
  - Known allergy?
    - No
    - Yes
  - Difficult airway or aspiration risk?
    - No
    - Yes, and equipment/assistance available
  - Risk of >500ml blood loss (7ml/kg in children)?
    - No
    - Yes, and two IVs/central access and fluids planned

Before skin incision (with nurse, anaesthetist and surgeon)
- Confirm all team members have introduced themselves by name and role.
- Confirm the patient’s name, procedure, and where the incision will be made.
- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable

Anticipated Critical Events

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

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

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

Is essential imaging displayed?
- Yes
- Not applicable

Before patient leaves operating room (with nurse, anaesthetist and surgeon)

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

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

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

Revised 1 / 2009 © WHO, 2009
BEHAVIOUR DURING THE OPERATION

Always according the rules of asepsis

Accepting the sterile area of operation
  signed by the isolating textiles

Operating personnel after handwashing
  turn to each other only face to face

Don’t touch cap, mask, spectacles, fallen instruments

Touch only sterile instruments

Don’t think of sterile area under the waist level

Change gloves if damaged, if long lasting procedure
  and before wound closure

Unintended mistake in sterility requires changing
  operating dress and gloves
Navigating The Glove Maze:
An Algorithm To Assist Perioperative Theatre Staff To Select The Right Glove For The Right Procedure

This algorithm has been developed by an independent working party in order to encourage best practice in the selection of gloves in the operating theatre environment. It was supported by an educational grant from Mölnlycke Health Care. The following healthcare professionals took part in the working party’s deliberations:

- Gill Bowker - Clinical Supplies Manager, NHS Lothian University Hospitals Division
- Linda Balmer - Theatre Manager, Rochdale Infirmary
- Lynne Grieff - Divisional Manager, Cardiothoracic Services, Royal Wolverhampton Hospitals NHS Trust
- Graham Latchford - Independent, Occupational Health Consultant, Liverpool

- David Yates - Head of Support Services, Great Western Healthcare NHS Trust
- Pat Olderton - Senior Nurse, Infection Control Team Leader, Leeds General Infirmary
- Morris Williams - Head of Sterile Services, County Durham and Darlington NHS Trust

When Should Gloves Be Used?

Are Gloves Really Necessary?

- No
- Yes

Gloves are NOT required for procedures where there is minimal risk of cross-infection between patients and staff (see box 1), e.g.:
  - Basic care procedures without contact with blood/body fluids
  - Taking recordings (e.g., blood pressure, temperature, pulse)
  - Closed extraction suction
  - Inappropriate or unnecessary use of latex gloves (e.g., in non-sterile settings) may increase risk of latex sensitisation, with life-threatening consequences (see box 4)
  - Prolonged use of any gloves may increase the risk of contamination and cross-infection

Gloves ARE required for procedures where there is a risk of cross-infection between patients and staff:

Is there a high risk of exposure to blood or bodily fluids?

- NO - use non-sterile vinyl (e.g., for examination purposes)
- YES - is a sterile field required?

Procedures with a lower risk of glove perforation include:
  - Soft tissue
  - Superficial cavity
  - Minimally invasive (e.g., laparoscopy)
  - Procedures lasting < 1 hour
  - However, remember that although the perforation risk may be lower, it is still significant

Any glove perforation arising from the use of sharps (whether in high- or low-risk procedures) carries the risk of needlestick injury and transmission of infection (e.g., hepatitis B, hepatitis C, HIV/AIDS, blood-borne viruses)

It is for you and your Trust to decide whether or not these risks are acceptable and to what extent other issues (e.g., cost, raised patient potential) should influence single- or double-gloving decisions

Don’t forget – unnecessary prolonged use of gloves increases the risk of cross-infection and contamination. Dispose of gloves as soon as possible after procedure in hand has been concluded.
POSSIBLE SOURCES OF SURGICAL SITE INFECTION

Patient himself before the procedure

Operating Staff

Non sterile devices in the OR

Air – born pathogens
PREVENTION OF SURGICAL SITE INFECTION

**Before operation**
- Careful handwashing
- Wearing sterile dress in OR
- Managing risk factors (diabetes)
- Antibiotic prophylaxis – if necessary

**During operation**
- Atraumatic operative techniques
- If necessary: changing gloves, dresses
- Optimize body temperature
- Appropriate tissue oxygenisation

**After operation**
- Surgical site infection starts 20 hours after contamination
- To change dress of wounds always use sterile gloves
Hand Hygiene

28% of Doctors hand hygiene before patient contact
More do it after patient contact (32%)!
Commissioner Garling recommended a “three strikes and you are out” Policy
January 2010 Q-Tip

What is CAUTI?
Catheter Associated Urinary Track Infections

**GOAL:** Remove Foley Catheter on or by Post-Op Day 2 on surgical patients (exceptions UROLOGY)

The CDC states that reducing CAUTIs requires avoiding the use of indwelling catheters whenever possible and removing them as soon as indicated.

**PHYSICIAN DOCUMENTATION:** If the Foley is to remain in on Day 2, then the physician must document a reason for leaving the Foley in.

**NURSING DOCUMENTATION:** Please document date and time of Foley catheter removal in the shift assessment in COLD.

**FOLEY CARE:**
1. Avoid kinked tubing
2. Maintain urine bag below the level of the bladder AT ALL TIMES.
3. Use the new ‘Grip Lock’ device to secure the Foley
4. Daily perineal care, document in shift assessment in COLD
5. No dependent looping of the Foley tubing.

Please call Quality Improvement & Patient Safety at 3037 with any feedback.
INFECTION

SURGEON  →  PATIENT
Handwashing—the Semmelweis lesson forgotten?

Hospital-acquired infection is still a major cause of morbidity and mortality throughout the world. As hospitals admit more severely ill patients and as use of invasive procedures and devices becomes more frequent, the risk of transmission of pathogens from patient to patient via the hands of health care workers (HCWs) increases. A simple and effective method of preventing this is handwashing. However, studies repeatedly show
British Medical Journal, 2009 September:

Simple interventions – handwashing, masks, gloves – may reduce transmission of epidemic respiratory viruses

Lancet, 2009 October:

It is a tragedy that diarrhea, which is little more than an inconvenience in the developed world, kills an estimated 1,5 million children each year.

40% of fatal cases of childhood diarrhea could be prevented by hand washing with soap.
Study to determine the contamination rate of healthcare workers’ mobile phones and hands in operating room and ICU

94.5% of phones demonstrated evidence of bacterial contamination with different types of bacteria.

Gram negative strains isolated from mobile phones: 31%, from hands 39%.

S. aureus strains isolated from mobile phones: 52%, and those strains isolated from hands of 37% were methicillin resistant.
Intensive care X-ray equipments may spread nosocomial infection.

39% of machine surface samples resulted drug-resistant bacteria

Wearing Surgical Attire Outside the Operating Room: A Survey of Habits of Anesthesiologists and Surgeons in Israel
Special Days, Commemorative Days

February 4: World Cancer Day

April 2: World Autism Awareness Day

May 19: World Hepatitis Day

June 8: World Brain Tumor Day

October 15: Global Handwashing Day