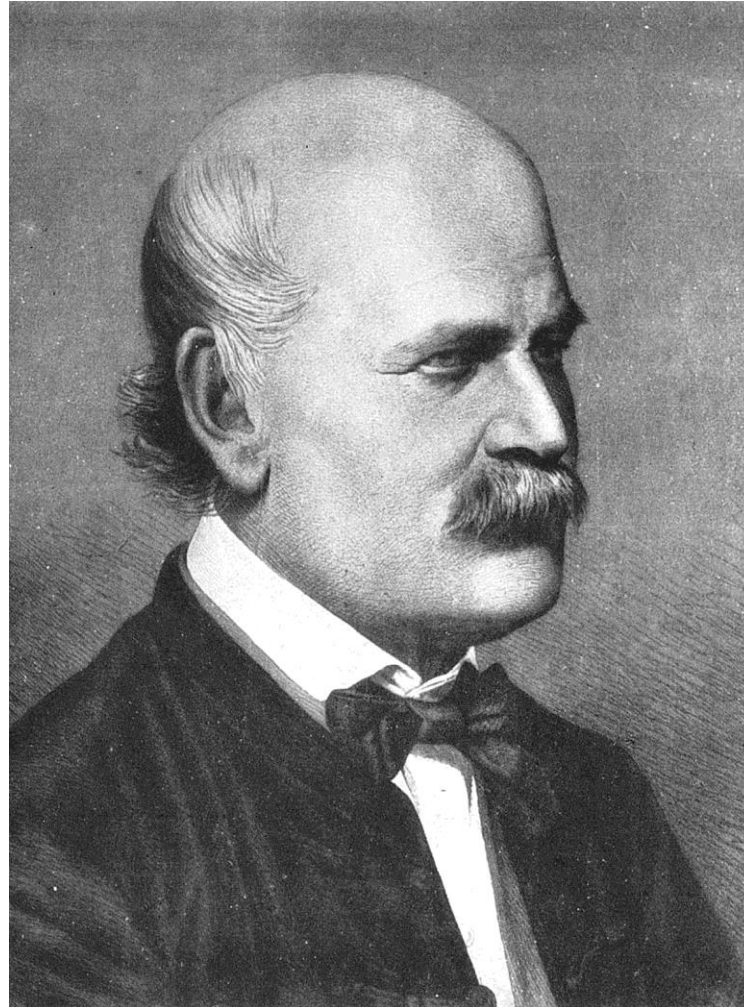




HAND HYGIENE, HOSPITAL CLEANING AND WASTE MANAGEMENT

HORATIUS

Ignaz Philipp Semmelweis



Mid-1800s

- Ignaz Philipp Semmelweis
- An Hungarian physician and scientist, now known as an early pioneer of antiseptic procedures and hand hygiene which he advanced in medical settings.

This is what we know

- Studies have shown that we touch our face more than 16 times in an hour (Citroner, 2020)
- Face touching is very unconscious
- Eyes, nose, mouth and ears are sites of entry for COVID-19
- COVID-19 transmission is droplets and contaminated hands touching face (eyes mouth and nose).

This is what we know

- Men are more affected by COVID-19 than women. **WHY?**
- Liquid Soap and running water is adequate to clean and remove the virus
- There are four genera of corona virus alpha, beta, gamma and delta
- Viability of the virus on surfaces for 5 days at temp 22-25°C and humidity of 40-50%

Face touching



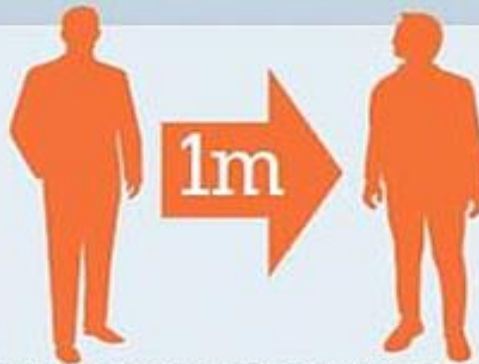
STANDING IN GOOD STEAD

No social distancing



13%
risk of infection

1 metre apart



2.6%
risk of infection

2 metres apart



1.3%
risk of infection

Source: The Lancet

Introduction

- Hand hygiene is the most effective and inexpensive measure to prevent cross transmission and healthcare associated infections
- Compliance remains universally low
 - Overall average 40%
- Duration of handwashing rarely meets a minimum standard of 10 to 15 seconds

Definitions

- **Hand hygiene**
 - Performing handwashing, antiseptic handwash, alcohol-based handrub, surgical hand hygiene/antiseptis
- **Handwashing**
 - Washing hands with plain soap and water
- **Antiseptic handwash**
 - Washing hands with water and soap or other detergents containing an antiseptic agent
- **Alcohol-based handrub**
 - Rubbing hands with an alcohol-containing preparation
- **Surgical hand hygiene/antiseptis**
 - Handwashing or using an alcohol-based handrub before operations by surgical personnel

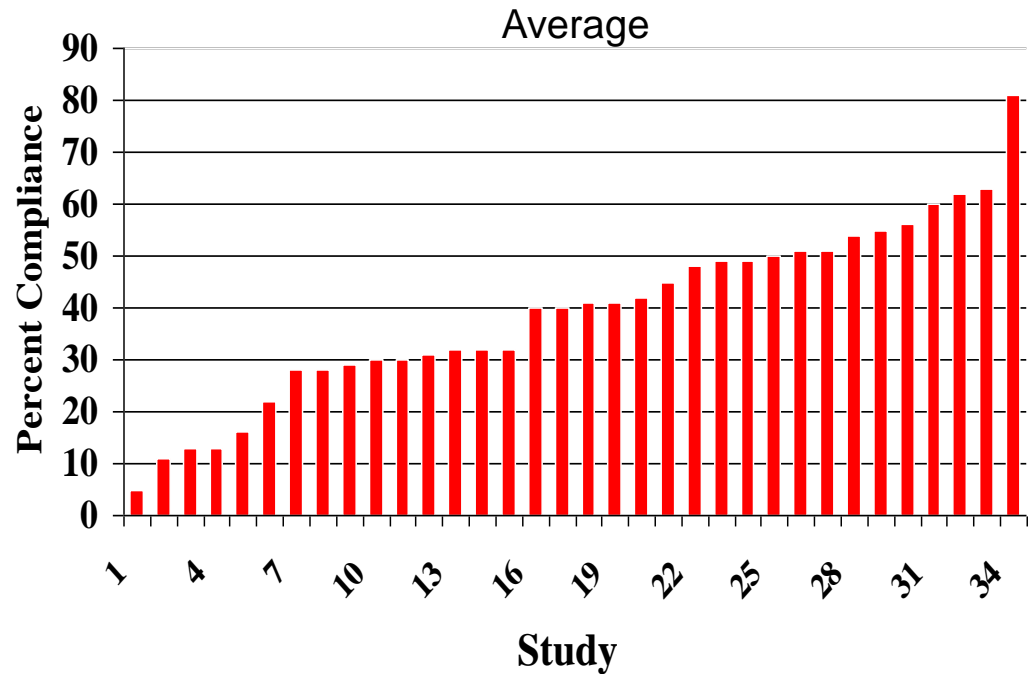
Guideline for Hand Hygiene in Health-care Settings. *MMWR* 2002; vol. 51, no. RR-16.

Handwashing in healthcare facilities?

A review of 34 published studies of handwashing adherence among healthcare workers found that adherence rates varied from 5% to 81%

The average adherence rate was only 40%

Average Compliance of Personnel in 34 Studies of Handwashing

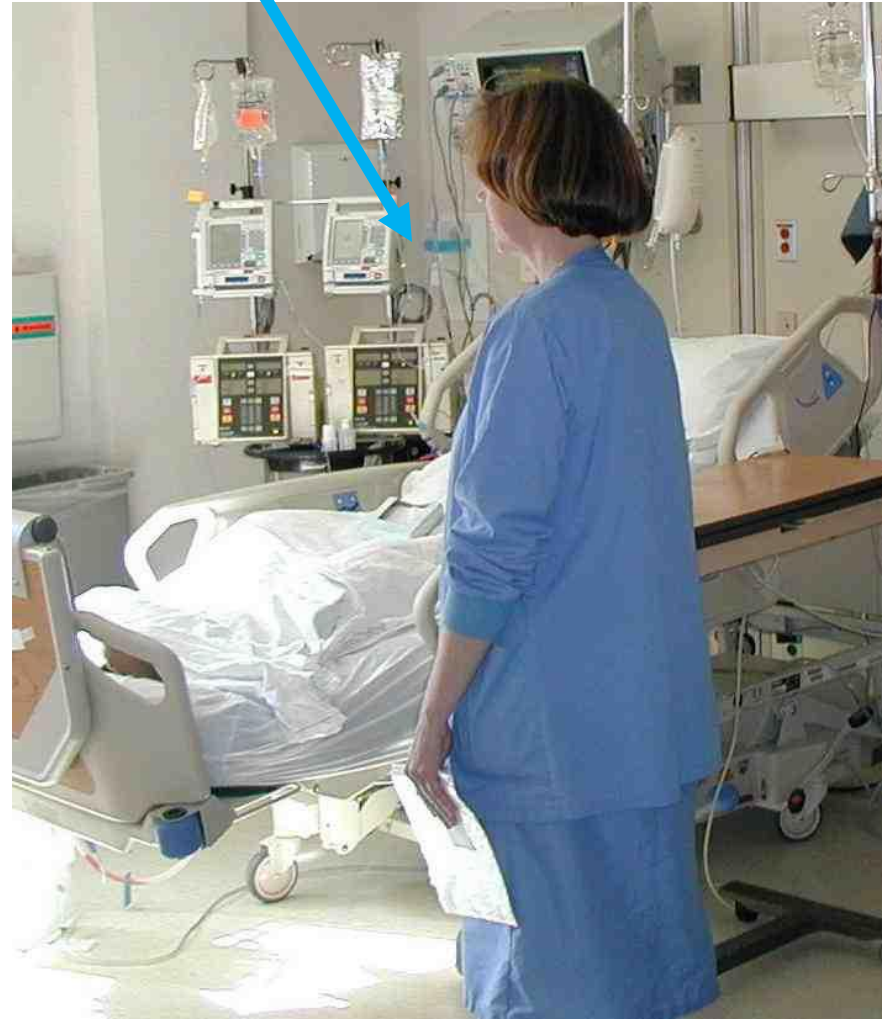


Why is compliance with recommended handwashing is poor?

- Here are some reasons why healthcare workers do not wash their hands as often as they should:
 - Heavy workloads (too busy)
 - Sinks are poorly located
 - skin irritation caused by frequent exposure to soap and water
 - Hands don't look dirty
 - Handwashing takes too long

Location, location, location ...

- The sink mentioned in the previous slide is located behind the patient's bed and behind several IV pumps.
- (see arrow)
- Personnel are unlikely to use handwashing sinks if they are not readily accessible.



Do we realize when bacteria get on our hands?

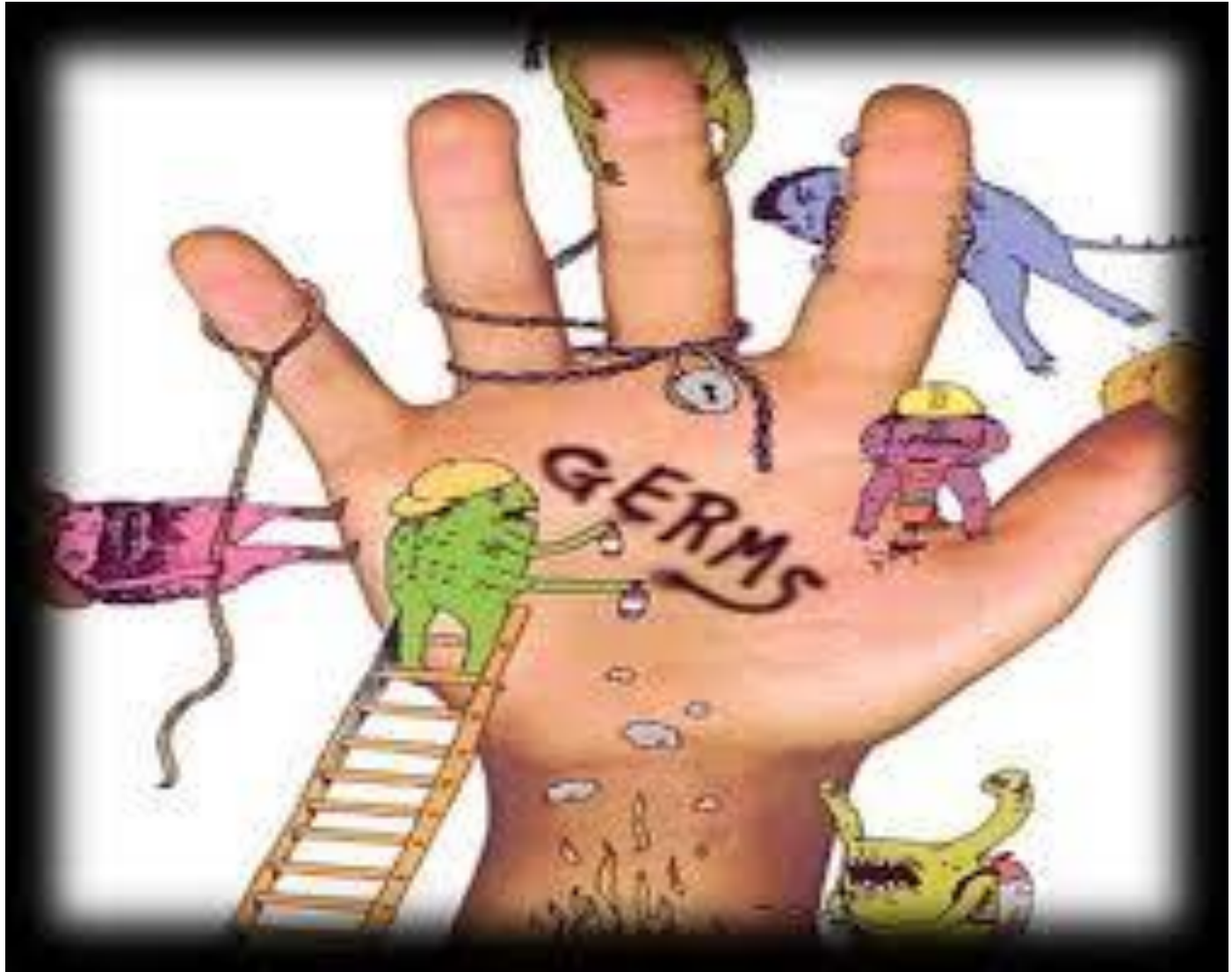
- While doing simple tasks, like
 - Moving patients up in bed
 - Taking a blood pressure or pulse
 - Touching a patient's hand
 - Turning patients over in bed
 - Touching the patient's gown or bed sheets
 - Touching equipment like bedside rails, over-bed tables, IV pumps

Sample of Germs from a Nurse's Hand

Culture plate showing growth of germs 24 hours after a nurse placed her hand on the plate



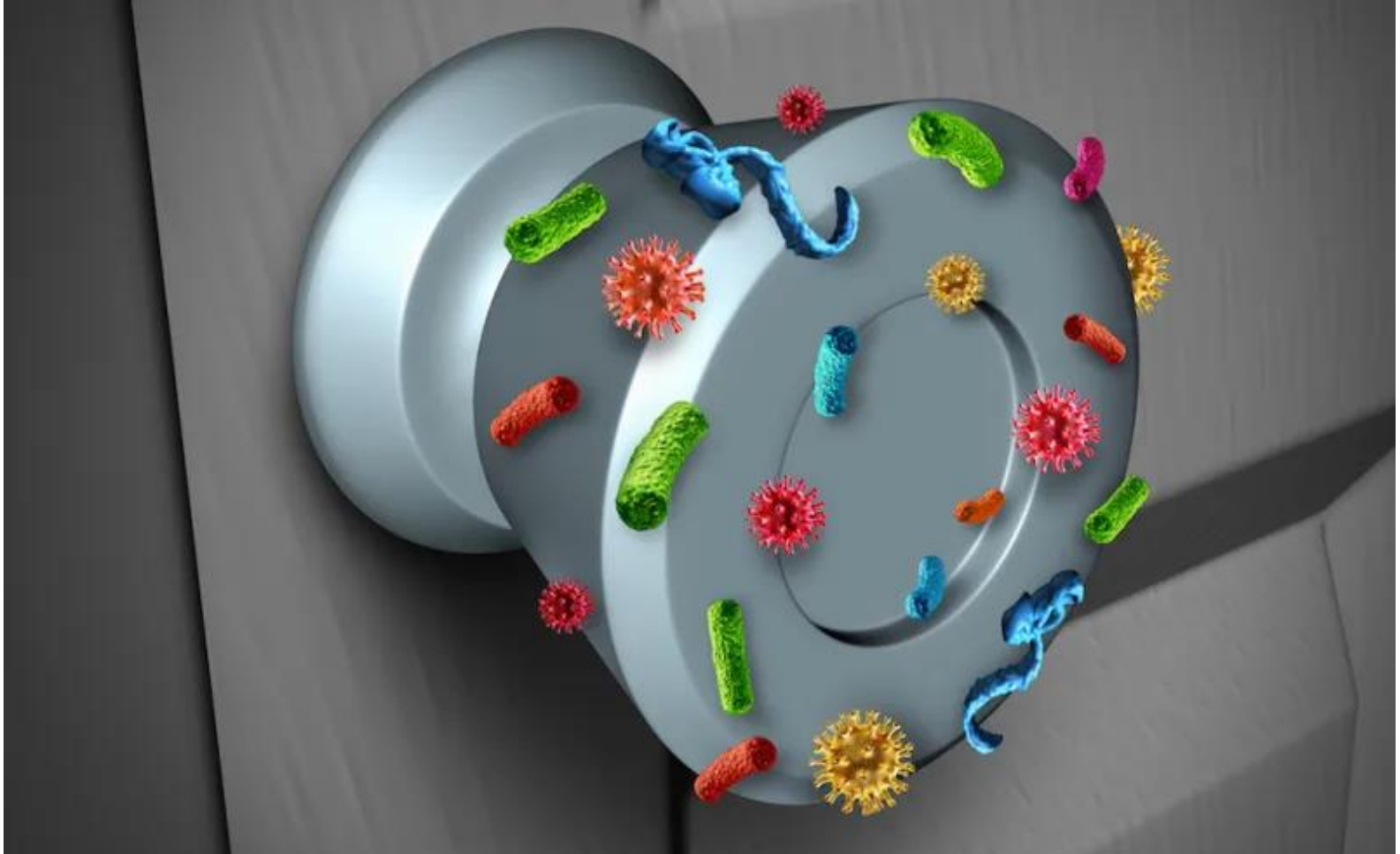
The killer hands



Killer hands cont...



Common areas with microorganisms



In comparison mobile phone is dirtiest



Toilet Seat **Dirty**



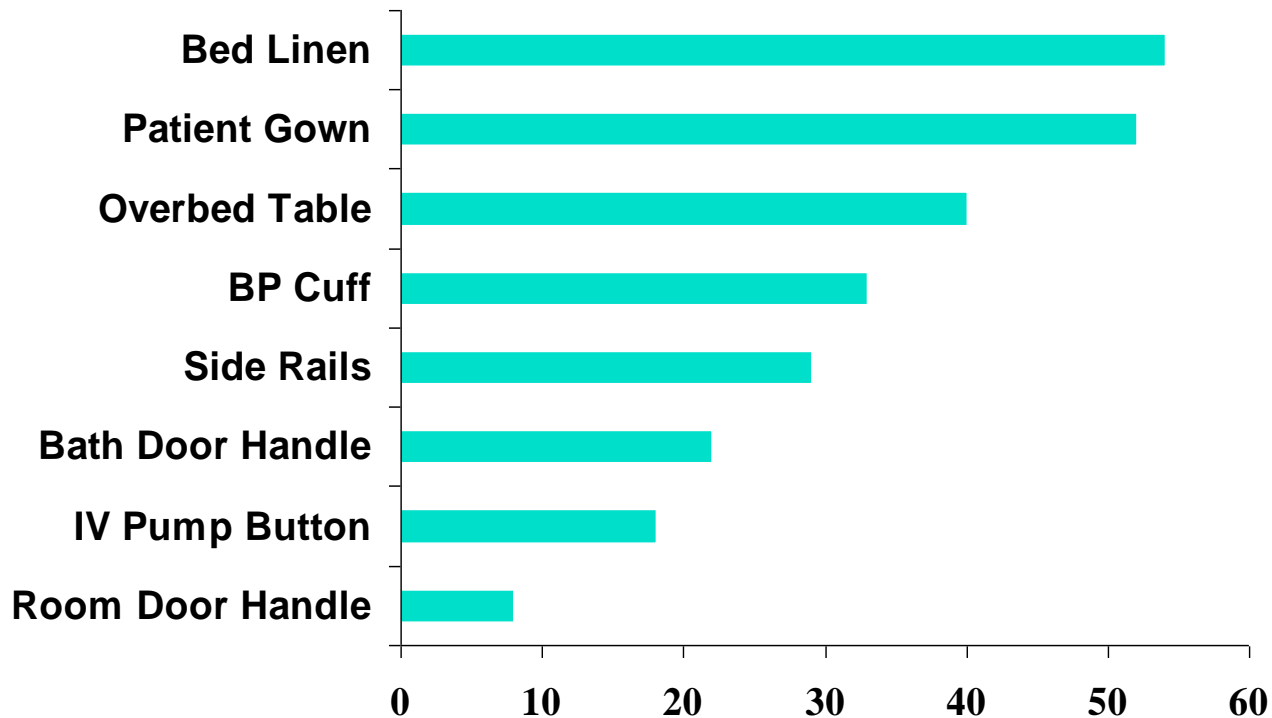
Key board **Dirtier**



Cell phone **Dirtiest**

Frequency of Environmental Contamination

frequency of Environmental Contamination of Surfaces in the Rooms of Patients with Methicillin-Resistant *S. aureus* (MRSA)



Advantages of cleaning hands with alcohol-based handrubs

- **When compared to traditional soap and water handwashing, alcohol handrubs have the following advantages:**
- **Take less time to use**
- **can be made more accessible than sinks**
- **cause less skin irritation and dryness**
- **Are more effective in reducing the number of germs on hands**
- **Making alcohol-based handrubs readily available to personnel**
- **Has led to improved hand hygiene practices**

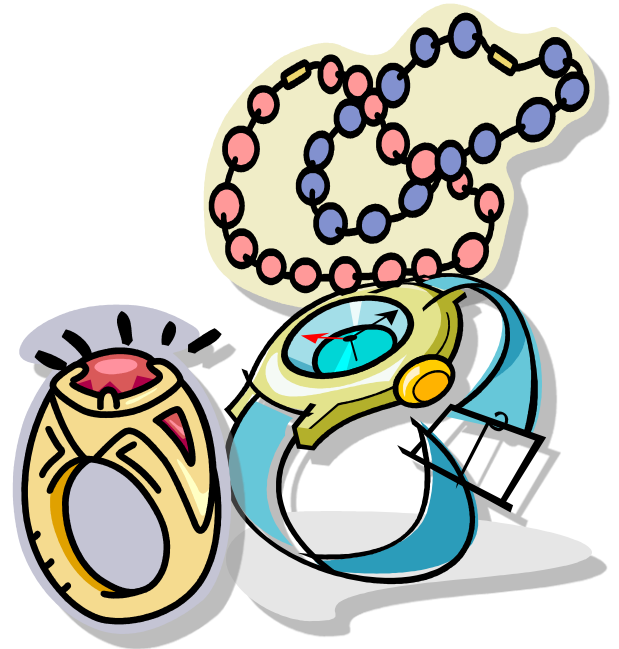
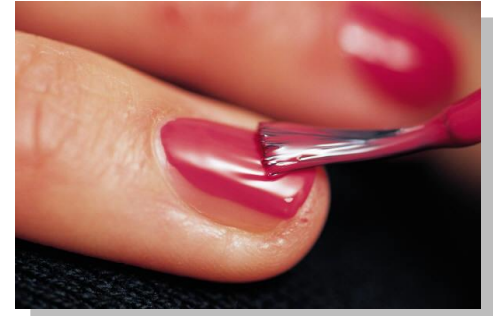
New CDC Guidelines

A new 2020 guideline has been developed by the Centers for Disease Control and Prevention (CDC) and infection control organizations which recommends that:

- healthcare workers use an alcohol-based handrub (a gel, rinse or foam) to routinely clean their hands between patient contacts, as long as hands are not dirty.**
- CDC recommends use ABHR with 60-95% alcohol in healthcare settings.**

Hand Preparation

- Hand preparation increases the effectiveness of decontamination.
- You should:
 - Keep nails short, clean and polish free
 - Avoid wearing wrist watches and jewellery, especially rings with ridges or stones
 - Artificial nails must not be worn
 - Any cuts and abrasions should be covered with a waterproof dressing.



Remove chipped nail polish

- it can harbour micro-organisms

Wash under rings

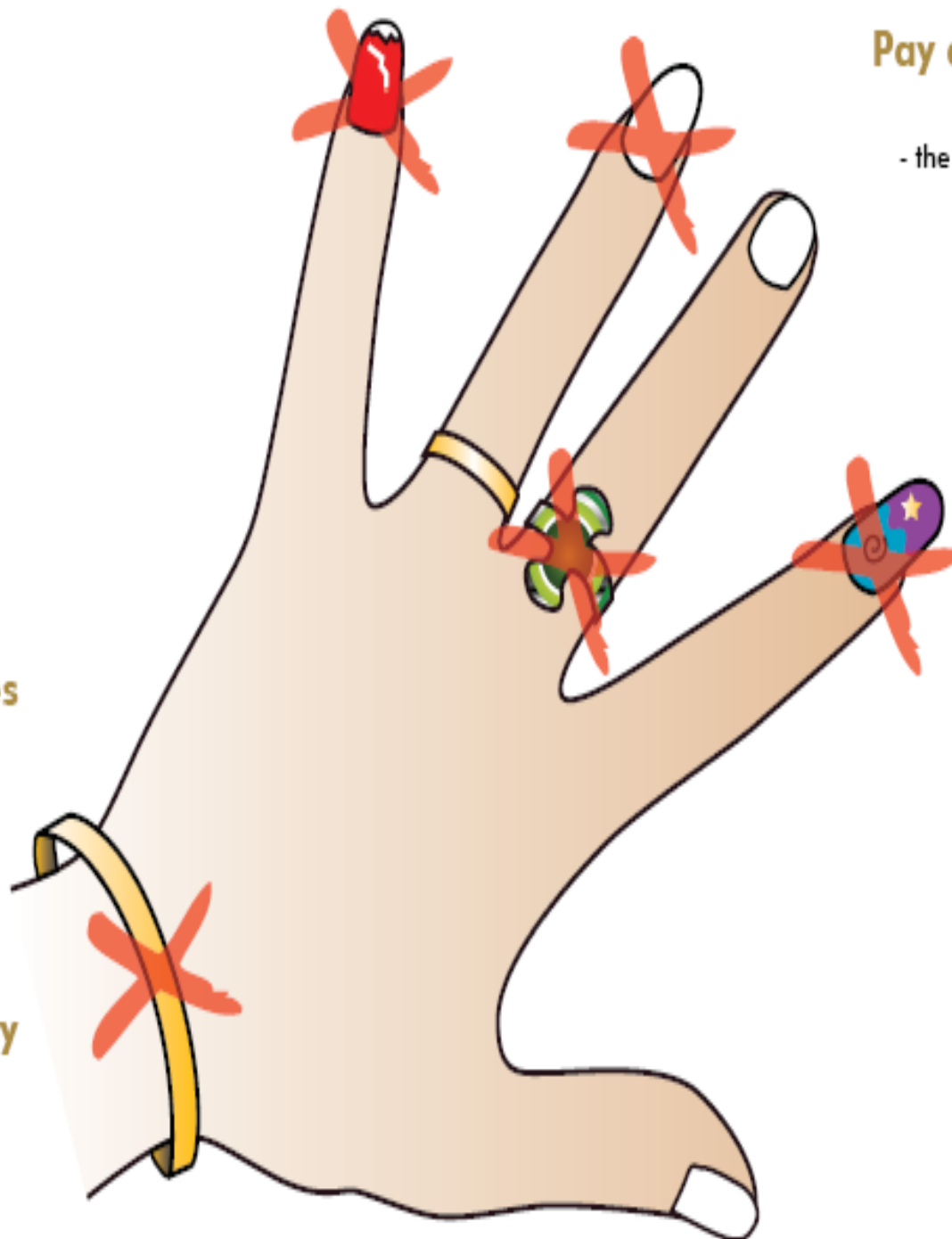
- guidance permits a plain wedding band

Do not use nailbrushes

- they can lead to abrasions:
a potential site for infection

Remove wrist jewellery

- stay bare below the elbow



Pay attention to washing under the nails

- the majority of micro-organisms are found here

Keep nails short

- they are easier to clean and less likely to tear gloves

Do not wear artificial nails

- they have been linked to fungal infections

Remove rings

- they may tear gloves and harbour micro-organisms

Tips on How to Wash Your Hands Effectively

- **When washing hands with plain or anti-microbial soap:**
- **Wet hands first with water (avoid HOT water)**
- **Apply a nickel or quarter-sized amount of soap to hands**
- **Rub hands together for at least 15 seconds**
- **Cover all surfaces of the hands and fingers**
- **Rinse hands with water and dry thoroughly**
- **Use paper towel to turn off water faucet**

When should you use an alcohol-based handrub?

- If hands are not visibly soiled or contaminated with blood or body fluids, use an alcohol-based handrub for routinely cleaning your hands:
- before having direct contact with patients
after having direct contact with a patient's skin

When not to use ABHR

- after having contact with body fluids, wounds or broken skin
- after touching equipment or furniture near the patient
- after removing gloves

Tips on How to Use an Alcohol-based Handrub

- Apply nickel or quarter-sized amount of an alcohol gel or rinse to the palm of one hand, and rub hands together
- cover all surfaces of your hands and fingers
- include areas around/under fingernails. Use the six steps of hand washing.
- continue rubbing hands together until alcohol dries
- if you have applied a sufficient amount of alcohol handrub, it should take at least 10 - 15 seconds of rubbing before your hands feel dry

More Tips on How to Use an Alcohol-Based Handrub

- **If after cleaning your hands 5 to 10 times with an alcohol-based handrub, you feel a “build-up” of emollients on your hands, wash your hands with soap and water.**
- **If you clean your hands with an alcohol-based handrub before putting on gloves, make sure the alcohol has dried completely before putting on gloves.**

Before and After Hand Rub

Before

After



Agent used

	ALCOHOL	SOAP & WATER
Surgeons	28%	72%
Physicians	44%	57%
Anesthetists	22%	78%
Pediatricians	43%	57%
ICU Doctors	20%	80%
A&E Doctors	50%	50%
Nurse	27%	73%
Physiotherapist	17%	83%
Radiographers	17%	83%
Phlebotomist	25%	75%

Hand hygiene Solutions?

- Aim to change the culture of the organisation in relation to hand hygiene
 - Top-level management support
 - Role modelling by senior staff
 - Alcohol-based hand hygiene products located at the point-of-care
 - Education program
 - Visual cues such as posters
 - Performance monitoring and feedback

To improve hand hygiene

- Healthcare staff must better understand the precise moments when they need to clean their hands and why.
- World Health Organization (WHO) five moments for hand hygiene, which are?

Simple advice for health care workers

- Carry your own sanitizer
- If u do not trust a sanitizer don't use it
- Wash hand and sanitize frequently

Let us practice

- This requires return demonstration
- Remember frequently left areas



Most frequently missed



Less frequently missed

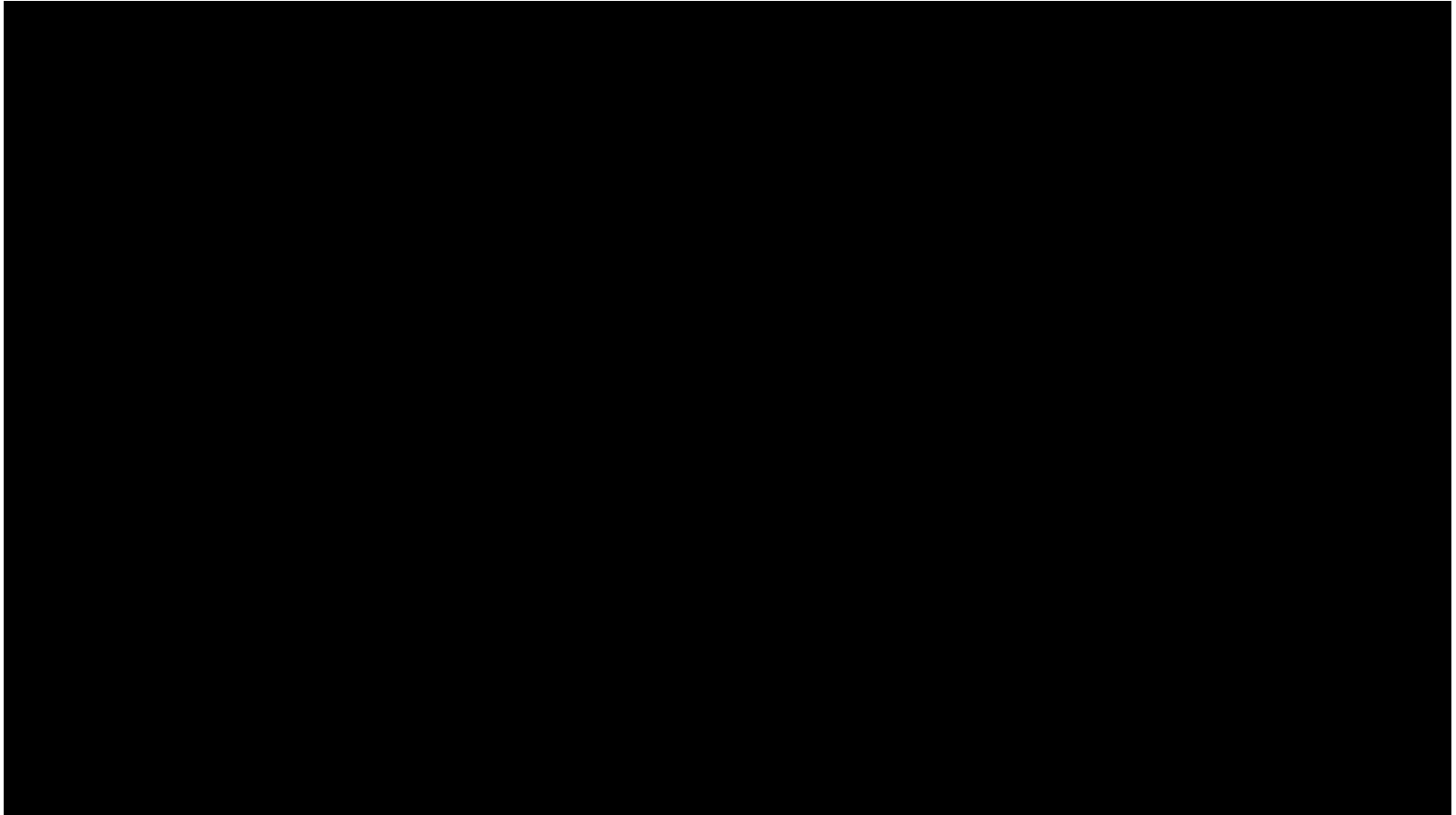


Frequently missed

Missed areas



Transferring infections very serious





Infection Control: It's in your hands

Clean your hands break the chain

University Hospital Birmingham 
NHS Foundation Trust

video



questions


- ???




HOSPITAL CLEANING & WASTE MANAGEMENT



Standard precaution in healthcare

- 
- They are a set of clinical practice recommendations designed to help minimize the risk of exposure to infectious materials, such as blood and other body fluids by both patients and staff.
 - These practices are designed to both protect the Health Care Provider and prevent Health Care Provider from spreading infections among patients

- 
- They are part of Infection Prevention Precautions Measures designed to “break the chain” of transmission
 - Because it is not always possible to tell who is infected, these practices should be the approach for the care of **all patients all the time**
 - They were formerly known as **“Universal Precautions”**


FLUIDS THAT CAN TRANSMIT DISEASE

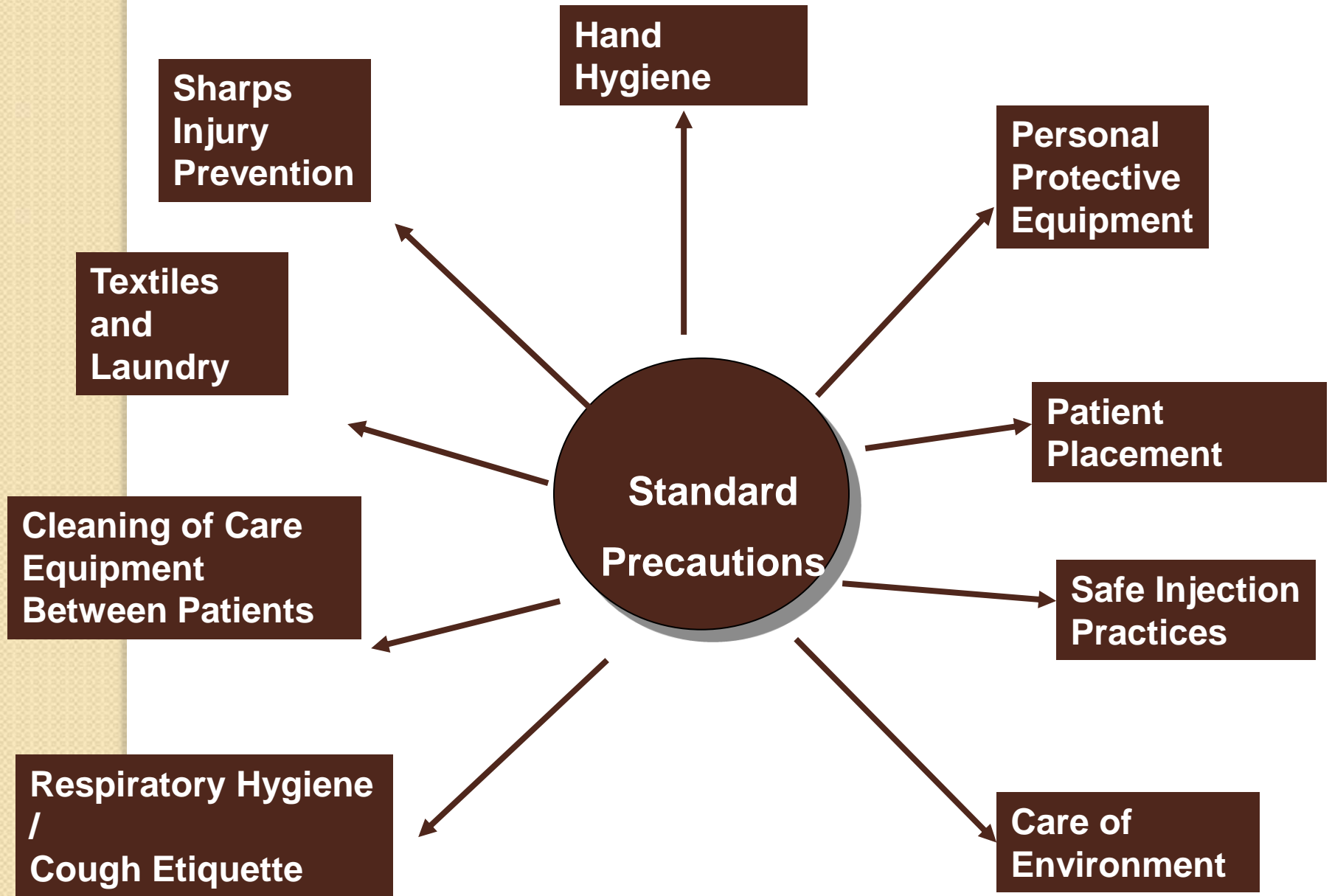
Note:

- Sweat
- Urine and feces
- semen
- Saliva
- Pus
- Vomit
- Broken or non – intact skin
- Mucus
- Breast Milk
- Amniotic Fluid
- Pleural Fluid
- Cerebrospinal Fluid
- Mucus Membrane

ELEMENTS OF STANDARD PRECAUTIONS


- Hand hygiene
- The wearing of personal protective clothing, including gloves, aprons, goggles, gowns
- Respiratory hygiene/cough etiquette
- Safe handling and disposal of sharps
- Dealing with blood spills promptly
- Decontamination of equipment

- 
- Disposal and correct segregation of waste
 - Disposal and correct segregation of Linen
 - Environmental hygiene
 - Personal health and hygiene of staff
 - Patient placement/isolation



Inanimate reservoirs of infection

- Equipment and materials in use in hospitals often become contaminated with micro-organisms which may subsequently be transferred to susceptible body sites on patients.
- Gram-positive cocci, derived from the body flora of the hospital population, are found in the air, dust and on surfaces where they may survive along with fungal and bacterial spores of environmental origin.

- 
- Gram-negative aerobic bacilli are common in moist situations and in fluids, where they often survive for long periods, and may even multiply in the presence of minimal nutrients.

Air-borne transmission

- Infections may be spread by air-borne transmission from the respiratory tract (talking, coughing, sneezing) from the skin by natural shedding of skin scales, during wound dressing or bed making and by aerosols from equipment such as respiratory apparatus and air-conditioning plants. Infectious agents may be dispersed as small particles or droplets over long distances.

Serious viral infections spread by droplet transmission, including:

- Corona Virus (COVID-19)
- Adenovirus*
- Influenza
- Mumps
- Parvovirus B19
- Rubella

PREVENTION AND CONTROL

- **The infection control policy**
- infection control organization is the responsibility of good management of any hospital.
- There will normally be two parts.

I. Infection control committee

- Establish an infection control committee, meeting regularly to formulate and update policy for the whole hospital on matters having implication for infection control and to manage outbreaks of nosocomial infection

Functions of this committee

- The functions of the infection control team include surveillance and control of infection and monitoring of hygiene practices, advising the infection control committee on matters of policy relating to the prevention of infection and the education of all staff in the microbiologically safe performance of procedures.

infection control nurse

- ICNurse Close working links between the microbiology laboratory, infection control nurse and the different clinical specialties and support services (including sterile services, laundry, pharmacy and engineering) are important to establish and maintain the infection control policy, and to ensure that it is rationally based and that the recommended procedures are practicable.

2. Hospital Cleaning and disinfection

- The general hospital environment can be kept in good order by attention to basic cleaning, waste disposal and laundry.
- The use of chemical disinfectants for walls, floors and furniture is necessary only in special instances, such as spillages of body fluids from patients with blood-borne virus infections.

Hospital Cleaning and disinfection

- Ward equipment such as bed-pan washer/disinfectors and dishwashers should be monitored to ensure reliable performance, and cleaning materials such as mop heads and cloths should be heat disinfected and stored dry after use.

Hospital Cleaning and disinfection

- Pre-cleaning of contaminated instruments and equipment, preferably by means of an automatic washing process with an ultrasonicator, is an essential step before disinfection or sterilization

WARD HYGIENE

- The ward should be scrupulously clean at all times.
- All services must be kept clean and disinfected
- beds and bedding clean

Cleaning and disinfecting bed and mattresses

- General ward bed
- Isolation room for infectious disease
- What do you use in your hospital?
- Hospital rooms undergo terminal cleaning prior to a new patient being placed in the room.

Commonly used disinfectants

- Jik
- Hibitine
- Presept
- Industrial soap
- Alcohols 60-95% ethyl or isopropyl alcohol/denatured ethyl alcohol
- Iodophors
- Quaternary Ammonium Compounds ('QUATs')

Commonly used disinfectants

- Chlorine and Chlorine Compounds
- NaDCC (Sodium dichloroisocyanurate)
- Calcium Hypochlorite
- Sodium Hypochlorite ('bleach')
- Phenolic
- Aldehydes (to be used only for environmental and/or equipment disinfection as per product contents)
- Hydrogen Peroxide (to be used only as an antiseptic)

Importance of incinerator

- It is a requirement for all health care facilities to construct an incinerator or identify and have a contract where they incinerate their clinical waste

Agar plating

- is commonly used to determine the level of microorganisms in theatres and other specialized units

WHO guidelines on waste management

- develop the legal and regulatory framework for health-care waste management
- rationalize the waste-management practices within health-care facilities
- develop specific financial investment and operational resources dedicated to waste management



WHO guidelines on waste management

- launch capacity building and training measures
- set up a monitoring plan
- reduce the pollution associated with waste management

Procedures for Handling Liquid Waste (Body Fluids Including Blood, Urine, Vomit, Feces)

- Procedures for Handling Liquid Waste (Body Fluids Including Blood, Urine, Vomit, Feces)
- Primary handling of liquid waste should occur in the patient's room and be performed by the primary healthcare workers
- Pour waste, avoiding splashing by pouring from a low level, into the toilet.
- Close the lid first, and then flush toilet.

Cont,,

- Clean and disinfect flush handles, toilet seat, and lid surfaces
- Discard cleaning cloths in biohazard bags.
- Discard emesis and portable toileting containers as solid waste.
- Follow recommended procedures for disinfecting visibly soiled PPE and removal of PPE.

Handling Spills

- Basic principles for spills of blood and other potentially infectious materials
- Spills should be managed by the doctors and nurses caring for the **Ebola and Covid-19** patient and by wearing recommended PPE as designated in the guidance for hospitals.
- Isolate the area of the spill; do not let other individuals access the area until disinfection is completed.

Handling Spills

- Place absorbent material on the spill (a solidifier agent can be used).
- Pour the disinfectant external over the spill and allow sufficient contact time
- Use disposable absorbent towels to remove bulk spill material.
- Apply the hospital disinfectant external to the cleaned surface and allow the specified contact time.

Handling Spills

- Use disposable cleaning cloths or wipes to wipe the treated area.
- Follow handling of solid waste protocol as described above to discard materials used for containing the spill and for cleaning and disinfection.
- Follow recommended procedures for disinfecting visibly soiled PPE and taking off PPE.

waste-segregation

- hazardous waste
- nonhazardous general waste.
- infectious waste
- Used sharps
- Others
- chemical and pharmaceutical wastes
- pathological waste

Waste containers, colour codes and labels

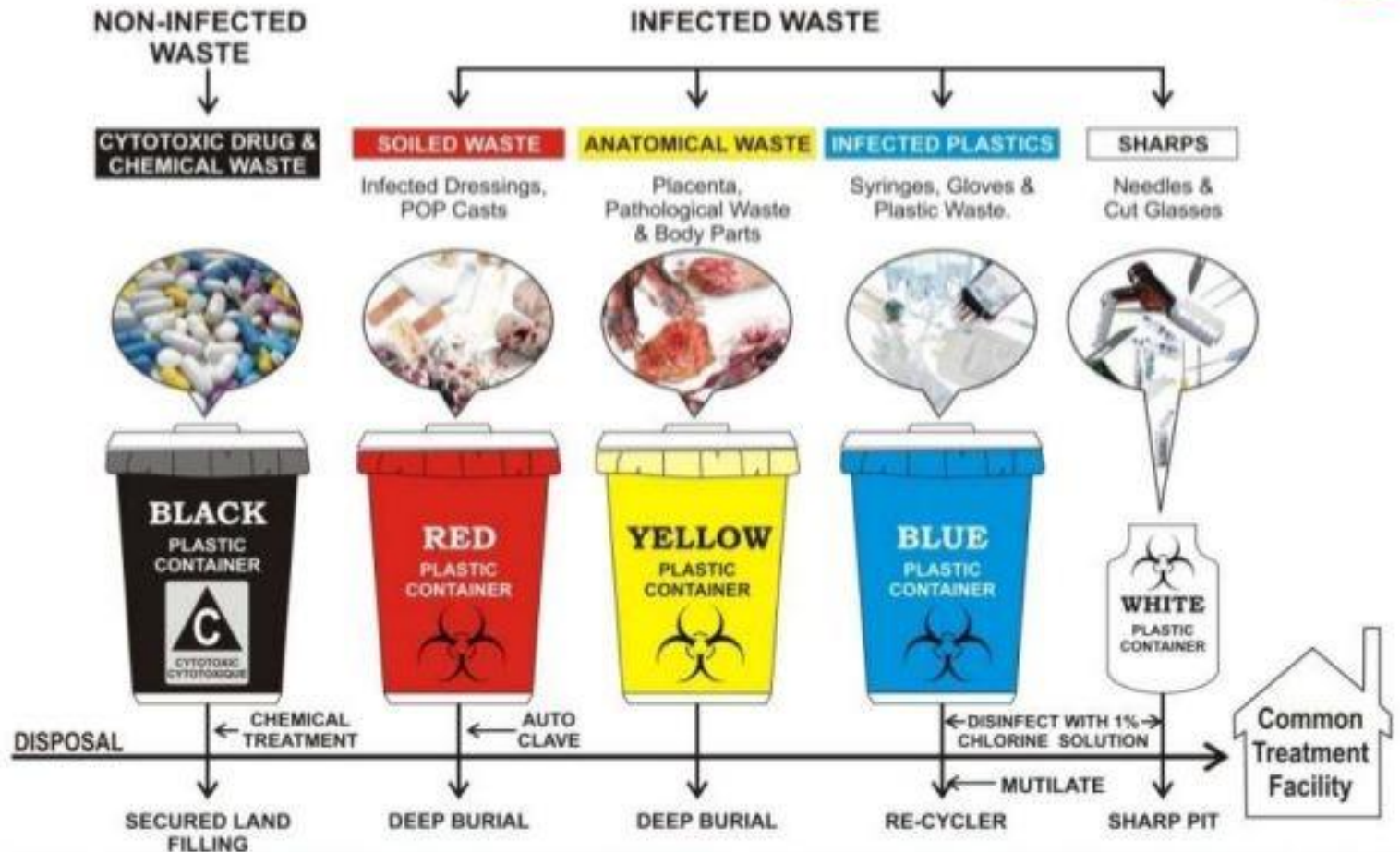
- Where there is no national legislation, a World Health Organization (WHO) scheme is available
- Colour coding makes it easier for medical staff and hospital workers to put waste items into the correct container
- to maintain segregation of the wastes during transport, storage, treatment and disposal.
- Colour coding also provides a visual indication of the potential risk posed by the waste in that container.

COVID-19 waste handling

- Segregate waste at source,
- Treat coronavirus waste as infectious waste would be according to your national system
- Deposit in an infectious waste bin, with a suitably color coded liner red or yellow
- Collect the waste at least daily, and transport in leak-proof, puncture proof containers, labeled with the biohazard symbol



SEGREGATION OF SOLID BIO-MEDICAL WASTE



NOTE:- USE ANY COLORED BIN OTHER THAN BLACK, RED, YELLOW, BLUE & WHITE FOR DISPOSAL OF GENERAL WASTE

questions

- ???????


Recommendations

- Each hospital to have an infection committee
- Develop policies on IPC as a County
- Ensure an Incinerator is in place for incinerating clinical waste

- CDC

<http://www.cdc.gov/handhygiene/materials.htm>

- Citroner, G. (2020). You Probably Touch Your Face 16 Times an Hour: Here's How to Stop. *Diakses dari: <https://www.healthline.com/health-news/how-to-not-touch-your-face> [2020, 13 Juni].*

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- Hand Hygiene Resource Center
http://www.handhygiene.org/educational_tools.asp
 - The Five Moments for Hand Hygiene
http://www.who.int/patientsafety/information_centre/ghhad_download/en/index.html