

# PREVENTION OF INFECTION, HOUSE-KEEPING AND WASTE DISPOSAL

This module is designed for in-service orientation and continuing education of nursing personnel involved in care of newborn babies in the hospital.

## LEARNING OBJECTIVES

After going through this module, participants will be able to:

- Enumerate key points of prevention of infections in the hospital
- Enumerate six steps of effective hand washing
- Refer to housekeeping and disinfection routines for the hospital
- Learn waste disposal in the hospital
- Plan surveillance for infection

## MODULE CONTENTS

The module includes following elements:

- **Text material:** Easy to read format for quick reproduction and essential reference material for the participants. Key messages are highlighted in the boxes.
- **Demonstration:** Observing nursing routines for asepsis (house keeping, disinfectant use).
- **Skills:** Practicing skills in a hospital setting.
- **Self evaluation:** At the end of text a self evaluation based on what you have already learnt is included. Feel free to consult your test material, if you need assistance in recapitulating.
- **Video film:** Learn asepsis routines for prevention of infections and hospital waste disposal in baby care area.

## 1. IMPORTANCE OF ASEPSIS

Sepsis is the most important cause of neonatal deaths in hospital. Every hospital should establish its own detailed policies to prevent infection of newborn in the baby care area.

Normally the newborn is free from harmful organisms for initial few hours after birth. Health care providers working in the hospital tend to transmit organisms during routine procedures, thus leading to colonization of organisms on surrounding skin of the abdomen, the perineum, groins and respiratory tract.

Prevention of infection is more cost effective than treating infection in neonates.

## 2. ASEPSIS BASICS

### 2.1 Basic requirements for asepsis in a baby care area

- Running water supply
- Soap
- Elbow or foot operated taps
- Strict hand washing
- Avoid overcrowding, optimal number of nurses for care of more babies
- Plenty of disposables
- Rational antibiotic policy
- Strict adherence to with good housekeeping and asepsis routines

## 2.2 Guidelines for ENTRY into the baby care area

- Remove shoes, socks, woolens, watch, bangles, and rings
- Roll up the full sleeves up to elbow. Put on new slippers wash hands with soap and water for 2 minutes by following six steps of hand washing
- Put on sterile half sleeve gown

## 2.3 Policy regarding VISITORS

- Only parents of the babies should be allowed entry into the nursery
- Mothers are welcome any time, they can come every 2 to 3 hours to the baby care area
- Fathers should be allowed at the time of admission to the nursery, after stabilizing the baby, during hospital visiting hours (4 to 6 pm) or when the newborn is sick. Father should be allowed especially after the rounds or at a convenient time in the unit (this policy can be framed in consultation with your pediatrician)
- Parents should be guided and supervised about proper hand washing technique

**Personnel with active infection should not be allowed entry into the baby care area**

## 2.4 Sterile gloves

- Always use sterile gloves for invasive procedures like sampling, starting intravenous lines, giving intravenous injections etc.
- Wash gloved hands to remove the blood stains and secretions. Remove gloves and put in the polar bleach bucket. Wash hands again with soap and water
- Used gloves should be cleaned, dried, powdered and packed in a paper (e.g. a piece of newspaper) for re-autoclaving
- Adequate number of pairs should be prepared every day. One can use disposable gloves, if available

## 2.5 Full sleeve gown and masks

- Use them for all invasive procedures e.g. lumbar puncture, blood exchange transfusion etc.

## 2.6 Other basics

- Keep separate spirit and povidone iodine swab containers, stethoscope, tape measure and thermometer for each baby
- Change intravenous sets daily or as per set routine
- Feeding tubes can be left alone as long as baby can keep
- Do not keep fomites e.g. files, X-ray films, pens etc. on the baby cot
- Change antiseptic solution in suction bottles and sterile water in oxygen humidification chambers everyday and sterilize the bottles/chambers daily by dipping in 2% gluteraldehyde for 4 to 6 hours

## 2.7 Nursery environment

- The nursery temperature should be maintained between 28-30° C
- The environment should be calm and clean
- Ensure 24 hours water and electricity supply with adequate lighting and ventilation.
- Over crowding should be avoided
- Floor should be cleaned with diluted phenyl once in each nursing shift and as and when required. No dry mopping, only wet cleaning should be done
- Clean the walls with 2% bacillocid once in each nursing shift
- Dustbins should be washed daily with soap and water; polythene should be changed daily or whenever full

### 3. HAND WASHING

- It is the single MOST IMPORTANT means of preventing nosocomial infections
- It is VERY SIMPLE and CHEAP

#### 3.1 Hand washing norm

- 2 MINUTES hand washing (6 steps) to be done before entering the unit
- 20 seconds hand washing to be done before and after touching babies

#### 3.2 Steps of effective hand washing

- Roll sleeves above elbow
- Remove wrist watch, bangles, rings etc.
- Using plain water and soap, wash parts of the hand in the following sequence:
  1. Palms and fingers and web spaces
  2. Back of hands
  3. Fingers and knuckles
  4. Thumbs
  5. Finger tips
  6. Wrists and forearm upto elbow

**Once you have washed your hands, do not touch anything e.g. hair, pen or any fomite till you carry out the required job.**

- Keep elbows always dependent, i.e. at a lower level than your hands
- Close the tap with elbow
- Dry hands using single-use sterile napkin or autoclaved newspaper pieces
- Discard napkin in the bin kept for the purpose, if newspaper pieces-in the black bucket
- Do not keep long or polished nails

**Remember - Rinsing hands with alcohol is NOT A SUBSTITUTE for proper hand washing**

### 4. SKIN PREPARATION FOR VENEPUNCTURE AND OTHER PROCEDURES

Skin preparation is an important part of asepsis routines. It should be performed meticulously to avoid entry of pathogens during insertion of IV cannula, pricks or procedure. The procedure of skin preparation is given in the box below:

#### Skin preparation for venepuncture

1. Wash and dry hands.
2. Wear sterile gloves.
3. Prepare skin site, confine to smallest possible area of skin.
4. Swab with alcohol first, allow it to dry.
5. Swab iodine on site and allow it to dry.
6. Swab again with alcohol to wipe off iodine, allow it to dry.
7. Skin is now ready for puncture of prick.

## 5. OTHER RECOMMENDATIONS

- Never use stock IV fluids (heparinised saline). Do not use a single dextrose/saline bottle for >24 hours
- There should be separate IV fluid bottle for each baby
- Label the bottle with date and time of opening
- After seal is removed, first clean with spirit swabs, then use povidone iodine soaked sterile cotton to cover the stopper of the bottle
- Change the burette set every 24 hour or as per policy of your unit
- Use syrups within 1 week of opening, write the opening date
- Antibiotic vials to be changed after 24 hrs. e.g. injections ampicillin and cefotaxime
- There is no need for flushing with heparinised saline to keep the IV line patent
- Use separate IV line for giving antibiotics (do not open the IV fluid line for giving injections)



### DEMONSTRATION

The facilitator will conduct a demonstration on 'Steps of hand washing' using a poster. This will be followed by another demonstration on 'How to wear gloves'.

# HAND WASHING – A SIMPLE AND EFFECTIVE METHOD FOR PREVENTION OF NOSOCOMIAL SEPSIS



Palm and fingers



Back of hands



Finger & knuckles



Thumbs



Finger tips



Wrists and forearms

Wash hands for 2 complete minutes before entering NICU & before any procedure

Wash hands for at least 20 seconds before and after touching baby

## Golden rules

- Remove all jewelry and watch before hand washing. Roll the shirt to above elbow level.
- Wet and apply soap on hands and forearm up to elbow level.
- A normal, non-medicated soap is good enough.
- Dry hands either in air or by single-use sterile towel or sterile paper. Multiple-use cloth towels are not recommended
- Alcohol-based hand rub solutions may be used as an alternative. The 5 ml solution should be spread on all parts of the hands; follow Above steps; rub hands to dry.

[www.newbornwhocc.org](http://www.newbornwhocc.org)

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# हाथ धोना अस्पताल में होने वाले संक्रमण (नोसोकोमियल स्पेसिस) की रोकथाम का एक साधारण उपाय।



हथेली एवं अंगुलियां



हाथों के पीछे



अंगुलियां एवं चोर



अंगूठे



अंगुलियों के अग्रभाग



कलाई एवं कोहनी तक हाथ

नर्सरी में प्रवेश से पहले और किसी प्रक्रिया के पहले 2 मिनट हाथ धोएं।

शिशु को स्पर्श करने से पूर्व तथा उसके पश्चात् कम से कम 20 सेकेंड तक हाथ धोएं।

## निम्न बातों का ध्यान रखें

- हाथ धोने से पूर्व अपनी घड़ी, चूड़िया व अंगूठी इत्यादि उतार दें। अपनी शर्ट की बांह को कोहनी से ऊपर तक मोड़ लें।
- अपने हाथों को कोहनी तक साबुन से अच्छे से मलकर धोयें।
- एक सामान्य साबुन ही इसके लिए पर्याप्त है।
- हाथों को हवा या तौलिये से सुखायें। तौलिया धुला व विसंस्मित होना चाहिए एक तौलिया का उपयोग एक बार ही करें।
- आइसो प्रोपाईल एल्कोहल का भी इस्तेमाल किया जा सकता है। 5 मिली. घोल को हाथ के सभी भागों में लगाकर; उपर्युक्त चरणों का पालन करते हुए हाथों को मलकर सुखाएं।

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नवजातविज्ञान प्रभाग, बालचिकित्सा विज्ञान विभाग, अखिल भारतीय आयुर्विज्ञान संस्थान, नई दिल्ली

## 6. SURVEILLANCE

### What is surveillance?

- It is the monitoring of infections in the unit by conducting periodic surveys in order to identify unusual pattern of flora and infections
- It also includes monitoring of antibiotic use and resistance, whereby positive culture are reviewed every 4-6 months based on which antibiotic policy of the unit is revised, if necessary

### How frequently should surveillance be carried out? What all should be cultured?

- Room air - weekly
- Surfaces (viz. laminar flow, warmer, incubator, trolleys) - weekly
- Equipment (viz. laryngoscopes, AMBU bags, mask, stethoscopes, oxygen hoods, B.P. cuffs) - weekly
- Liquids (viz. water in humidifier bottles) - twice weekly

### Babies

- Blood / CSF culture whenever indicated
- Pus cultures whenever present
- Personnel: hands, nasal / throat swabs as required

### Terminal Disinfection

Terminal disinfection is done after transferring out, discharge or death of a baby. Preferably all items of the baby to be kept in the incubator and fumigated with 40% formalin (grossly infected baby). Otherwise one can just do routine cleaning thoroughly.

## 7. OTHER STEPS

### Assignment in the NICU and nursery

Baby should be assigned to the nurses, based on the total number of babies, sick babies, stable babies and the number of nurses present on duty in each shift. It helps the babies as well as the nurses and helps in the prevention of infection also.

### Primary nurse assignment

Primary nurse is one who receives the baby in the nursery. She should be assigned that baby in each shift, whenever she is on duty. She should discuss with the parents the condition of the baby from the time of the admission till discharge. Parents will also have more confidence on that nurse.

### Parents role

Parents are the part and parcel of newborn care team. They should be informed every morning and evening about the condition of the baby. They should be trained and supervised about the asepsis routines of the unit. Mother is welcome any time in nursery except during the rounds when the discussions are on, or caring for a very serious newborn.

Mother should be involved fully in the care of her baby. She should come in and look at her baby. If baby is stable, she can lift her baby, keep him in her lap, give breast feeds, or give katori spoon feed. She can help in changing napkin. She should be counseled regularly regarding:

- Her doubts/queries
- How to look after the baby in special care room/at home
- Risk factors and identification of signs of illness
- Prognosis of the baby and
- Follow up

### **Setting of a bed**

Keep a warm bed ready for the new admission:

- Clean the radiant warmer with soap water/Bacillocid
- Use autoclaved linen
- Keep oxygen hood and source of oxygen ready
- Keep suction machine, suction catheter ready
- Keep supplies for initiating I.V. line ready
- Keep the following articles near the warmer for exclusive use of each baby:
  - i. Spirit swab container
  - ii. Povidone iodine swab container
  - iii. Thermometer (clinical)
  - iv. Stethoscope
  - v. Tape measure
  - vi. Adhesive tape for fixing lines / probes

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***\*You will be given individual feedback after you have evaluated yourself.***



## SELF EVALUATION

1. Basic requirements for asepsis in baby care area include:

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2. Single most important, very simple and cheap method for prevention of infection in baby care area is

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3. The key features of good hand washing technique include:

a. \_\_\_\_\_ steps

b. \_\_\_\_\_ minutes hand washing before entering the newborn care area.

c. \_\_\_\_\_ seconds hand washing in between and after touching the baby.

4. Sterile gloves should be worn for the following procedures (Enumerate any three).

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5. What are the steps of skin preparation for IV cannula insertion or needle prick?

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**\*You will be given individual feedback after you have evaluated yourself.**



## ORAL DRILL

There will be an oral drill by the facilitator on 'Disinfection routines'.

Name	Disinfection method	Frequency & other considerations
Baby linen, blanket cover	Wash and autoclave	Use autoclaved linen each time
Cotton gauze	Autoclave	As required.
Feeding utensils (paladai, spoon & katories etc.)	Wash with soap and water and then boil for 10 minutes	Before each use
Swab container, injection and medicine tray	Wash with soap and water / autoclave	Daily morning shift use separate swab containers for each baby
Sets for procedures	Autoclave	After each use ; every 72 hours if not used
Cheattle forceps	Autoclave	Daily. Put in sterile autoclaved bottle containing dry sterile cotton
Stethoscope, measuring tape, thermometer, BP cuffs, probes of radiant warmer/incubator pulse oximeter	Clean with spirit swab	Daily
Laryngoscope	Clean with spirit swabs thoroughly daily and after each use. Wrap in autoclaved cloth, put date on cover.	If used for an infected baby, wash with soap and water. Put the blade in 2% gluteraldehyde after removing the bulb. Wash thoroughly after removing from gluteraldehyde.
Syringe pumps	Clean with wet clean cloth. If blood stained, use soap and water.	Daily in morning shift ; if possible, in each shift
Oxygen hood	Wash with soap and water ; dry with Clean linen	Daily in morning shift.
Face mask	Clean with soap and water, immerse in gluteraldehyde for 20 min, rinse in distilled/running water, dry and wrap with autoclaved linen	Daily and after each use
Resuscitation bag and reservoirs, oxygen tubing, bottle and tubing of suction machine	Clean with detergent/soap and water after dismantling. Immerse in gluteraldehyde for 4-6 hours. Rinse in distilled water. Dry, wrap in autoclaved linen and put a date	Weekly for resuscitation bag and reservoir. Daily for others. Use savlon for suction bottle, change daily
Weighing machine	Wipe with 2% Bacilloid	Daily in morning shift and when required
Radiant warmer & Incubator	Clean with soap water daily, if occupied. If not occupied, clean with 2% Bacilloid	Daily

## 8. SAFE DISPOSAL OF HOSPITAL WASTE

Proper disposal of hospital waste is important to keep the environment clean. The waste should be disposed off in a proper way. All health professionals should be well conversant with their local hospital policies for waste disposal which may vary from place to place.

The following are different colour drums with different color polythene for different type of waste, to be disposed off in a different way.

### a. **Black drums / Bags**

Left over food, fruits, feeds, vegetables, waste paper, packing material, empty box, bags etc. This waste is disposed off by routine municipal council committee machinery.

### b. **Yellow drums / Bags**

Infected non-plastic waste e.g. human anatomical waste, blood, body fluids, placenta etc. This type of waste requires incineration.

### c. **Blue drums / Bags**

Infected plastic waste such as used disposable syringes, needles (first destroy the needle in the needle destroyer).

Used sharps, blade and broken glass should be discarded in puncture proof containers before discarding.

Patients' IV set, blood transfusion set, endotracheal tube, catheter, urine bag etc. should be cut into pieces and disposed in blue bag. This waste will be autoclaved to make it non-infectious. This is then shredded and disposed off.



## DEMONSTRATION

There will be demonstration by facilitator on safe disposal of hospital waste using a demonstration aid.



## SELF EVALUATION

1. Indicate the bucket you will use for following wastes:

- Paper towel after use \_\_\_\_\_
- Soiled nappy of the baby \_\_\_\_\_
- Used disposable syringe \_\_\_\_\_

2. How do you sterilize the following?

- Thermometer \_\_\_\_\_
- Ambu bag \_\_\_\_\_
- Cheattle forceps \_\_\_\_\_
- Probe of pulse oximeter \_\_\_\_\_
- Oxygen tubing \_\_\_\_\_
- Stethoscope \_\_\_\_\_

3. B/o Rajkumari is a 32 wk preterm baby with birth weight of 1.3 kg. The baby is 2 days old now. Mother is now recovered from her delivery problems and wants to help you in baby's work, what are the areas you would like to involve the mother?

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

4. Indicate the waste disposed based on colour of bag/drum in your hospital

- Black \_\_\_\_\_
- Yellow \_\_\_\_\_
- Blue \_\_\_\_\_

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***\*You will be given individual feedback after you have evaluated yourself.***



## ORAL DRILL

There will be an oral drill by the facilitator on 'Disinfectants and House-keeping routines':

### I. Disinfectants and Germicides

Name	Indication for use	Direction for use and special considerations
Bacillocid spray (2%)	<ul style="list-style-type: none"> <li>Walls of nursery</li> <li>Incubators &amp; warmers (when not in use)</li> <li>Surface of weighing machine</li> </ul>	Put off air conditioners at the time of spray
2% gluteraldehyde (Cidex)	<ul style="list-style-type: none"> <li>Face mask &amp; Ambu bag</li> <li>Reservoir</li> </ul>	Before immersing into cidex, clean thoroughly with soap and water time of contact : <ul style="list-style-type: none"> <li>For sterilization : 4-6 hours</li> <li>For disinfection : 15 - 20 mins (once prepared, solution is active for 14 days)</li> </ul>
Formalin 40% (Prepare solution as per instruction of manufacturer)	Fumigation of nursery	<b>Routine fumigation:</b> 30 ml formalin with 90 ml water per 1000 cubic feet area. Nursery is to be sealed properly - switch off AC and seal AC duct-Take desired amount of formalin and water in the OT care Switch on the machine for half an hour. Open and clean the nursery after 6 hrs
Sodium hypochlorite (bleach)	Sharps / needles and disposables	Keep the solution covered, change it every 24 hours
Spirit	Skin preparation, cleaning laryngoscope blades, tape measure, and stethoscope	Do not use to clean incubators and warmers
Soap and water	Oxygen hood, feeding utensils, swab containers, injection tray, face mask, buckets	After washing in soap and water, boil the feeding utensils for 20 min
Phenyl	Cleaning floors	Daily in the morning shift or as required
Povidone-iodine	Skin preparation	Use with caution in extremely preterm babies

### II. House-keeping routines

Name	Disinfection method	Frequency & other considerations
Floors	Wet-mopping with phenyl	Once in each shift NO dry sweeping DO NOT use 2% glutearldehyde (Cidex)
Walls	2% Bacillocid	Once in each shift
Fans	Wipe with wet clean cloth	Once a week
Window AC	Surface and filters to be washed with soap and water	Once a week
Refrigerator	Defrost and clean with soap and water	Once a week
Buckets	Soap and water	Daily in the morning shift
Sinks	Vim/surf	Daily in the morning shift or as required

\* These are general guidelines which may be adapted based on the availability of disinfectants and the infection control policy of the hospital



## VIDEO

There will be video demonstration on 'Asepsis routine and disposal of hospital waste'. The video demonstration will be followed by discussion.

1. Video demonstration covered following aspects for prevention of infection

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2. Following should have been included in the video

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3. Video covered

Hand washing	Yes/No
Equipment disinfection	Yes/No
Daily housekeeping	Yes/No
Waste disposal	Yes/No