Practical of CPM

Primary Health Care

Primary Health Care :is the method to deliver integrated essential health care comprehensively, continuously and in an appropriately accessible way to all individuals in the community.

Primary health care covers the majority of a person's health needs - promotion, prevention, treatment, rehabilitation, palliation -
PRIMARY
HEALTH
CARE
World Health
Organization

Elements of PHC

E Education about health problems ,their prevention and control

L Local endemic diseases prevention and control.

E Essential drugs provision.

M Maternal and child health including family planning.

E Expanded Immunization.

N Nutrition

T Treatment of common disease and injuries

S Sanitation of environment and safe water supply .

Principles of PHC

- Availability: all citizens ,"Equitable", 24 hours
- Accessibility: geographically "1 h. travel",
- Affordability: Cost
- Acceptability: Consumer's satisfaction
- Appropriateness: scientific
- Comprehensiveness: 4 levels + HCWs development
- Continuous: from womb to tomb
- Compatible.
- Coordinated: Multisectoral " agriculture + education.
- Community participation

PHC center team includes the following personnel

1.The general PHC practitioner.

2. The sanitarian.

3. Nurse midwife.

4. Lab. Technician, clerk

5. Drivers, workers.

Primary health care unit

Primary care services provide the first point of contact in the **healthcare** system, acting as the **'front door'** of the National Health System “NHS”.

Primary health care unit services:

1-Maternal care services.

2-Family planning.

3-Well baby care services.

4-Sick baby care services.

5.Immunization services.

6-Registration.

1. **All components of maternal health services**:

- ✓ Preconception ,
- ✓ Antenatal care. ,
- ✓ Natal care.
- ✓ Postnatal care.

2. **All component of reproductive health** (family planning)
3. **Screening test** as a part of PHC programs
4. **Investigation of outbreak /epidemic** under the direction of higher MOH levels
5. **Basic laboratory investigation** .
6. **Primary curative care services** .
7. **First aid services**.
8. **Minor surgery** .
9. Some PHCs **have ultrasound**

Premarital Services

A. **Premarital care** :is to **promote** the health of future parents , and to **prevent** health hazards for each of them and to **have a healthy future generation**.

B. **Premarital examination**

1. **Identification data** name, address ,age, sex ,education, occupations.
2. **Personal medical history** ask about relevant acute disease .
3. **Family History** ask about relevant familiar or hereditary diseases.
4. **Clinical Examination** include general and systemic examination

Premarital Services

C. Laboratory Investigation

- the routine for premarital examination is for the blood and urine.
- other test could be done to detect health problems that are prevailing in the community and manage them for the welfare of the client .

1. *Blood examination* includes blood group Rh blood picture and hemoglobin.
2. *Refer for the investigation* if needed (VDRL for syphilis).
3. *Urine examination* albumin and sugar .
4. *Tests according to requests* may include chromosomal studies .

Antenatal care services

1-Nutrition.

2-Screening for high risk.

3-Prevention of certain conditions as anemia.

4-Health education.

5-Treatment of mild diseases.

6-Immunization: against tetanus.

7-Recognition for danger signs.

Antenatal care services

A. Registration:

- For an antenatal care should start: as early as the first 6 weeks after the last menstrual cycle and within the first three months.
- Delay in the registration would miss the period of the neogenesis which has an important impact t on the health of the future baby .
- The mother is issued a card and given a registration number .
- Personal health card has been prepared to cover the whole lifespan of the individuals .

Antenatal care services

B. Schedule for antenatal visits :

- ✓ Monthly in the first 6 months.
- ✓Biweekly in 7,8 months.
- ✓Weekly in 9 month.

Antenatal care services

C. Investigation done for pregnant women:

- ✓CBC.
- ✓Blood glucose.
- ✓RH.
- ✓Blood group.
- ✓Urine analysis.

Antenatal care

Dangerous signs:

- Vaginal bleeding.
- Convulsions.
- Severe headaches with blurred vision.
- Severe abdominal pain.
- Offensive Vaginal discharge, high fever.
- Gush of fluid.
- Lower limb edema

Natal and post natal Services

- place of the delivery: some of the maternal child health facilities have beds for delivery .
- the rest would be Hospital delivers.
- birth attendant typically physician or trained nurse /midwife should be the one attending the birth

Natal and post natal Services

Principles of Good Natal Care :

- **Clean Delivery** :clean hands, clean delivery surface, clean cord cutting and cord care
- **Avoid** unnecessary vaginal examination and episiotomy
- **Early Detection and Referral** to specialized Hospital of cases with prolonged or obstructed labor
- **Resuscitation,** proper care for the newborn and sterile dressing for the umbilicus
- **Eye Drops** as a "chemoprophylaxis to prevent of *ophthalmia neonatorum*

Post natal Services

Postnatal visiting WHO are recommended the following timing for postpartum care

- **If the birth is in a healthy facilities** mother and newborn should receive postpartum care for at least 24 hours after birth.
- **If the birth is at home** the first post natal contact should be as early as possible within 24 hours of the birth
- **At least** three additional postpartum contacts are recommended for all mothers and newborns, on day 3, between days 7- 14 after birth and 6 weeks after birth

Post natal Services

- **First 24 hours after the birth :**
- Woman should have a regular assessment of the vaginal bleeding, uterine contraction ,fundal height and vital signs .
- Urine void should be documented within 6 hours
- Should examine the baby look for any birth injuries or trauma, apparent congenital abnormalities (hare lip, cleft palate). (If there are any normality the baby is immediately referred to pediatrician)
- Measure the height and weight , length and head circumference and record this measures.
- Exclusive breastfeeding:

- mother and family members are provided with information of the initial and proper techniques for the breastfeeding.
- should start within the 1st hour .

Family planning

- To avoid pregnancy outside the most safe childbearing period (20-34 years).
- To allow suitable number of children, and avoid unwanted
- For proper pregnancy spacing (2-3 year).

Methods for family planning

1. **Natural methods:** Safe period Isolation -Lactation.
2. **Mechanical:** Condom -Vaginal diaphragm -Cervical cap-IUD
3. **Chemicals :** Vaginal foam & tablets -Vaginal creams
4. **Hormonal:** Contraceptive pills, injection , intra dermal capsule.

Well baby care services

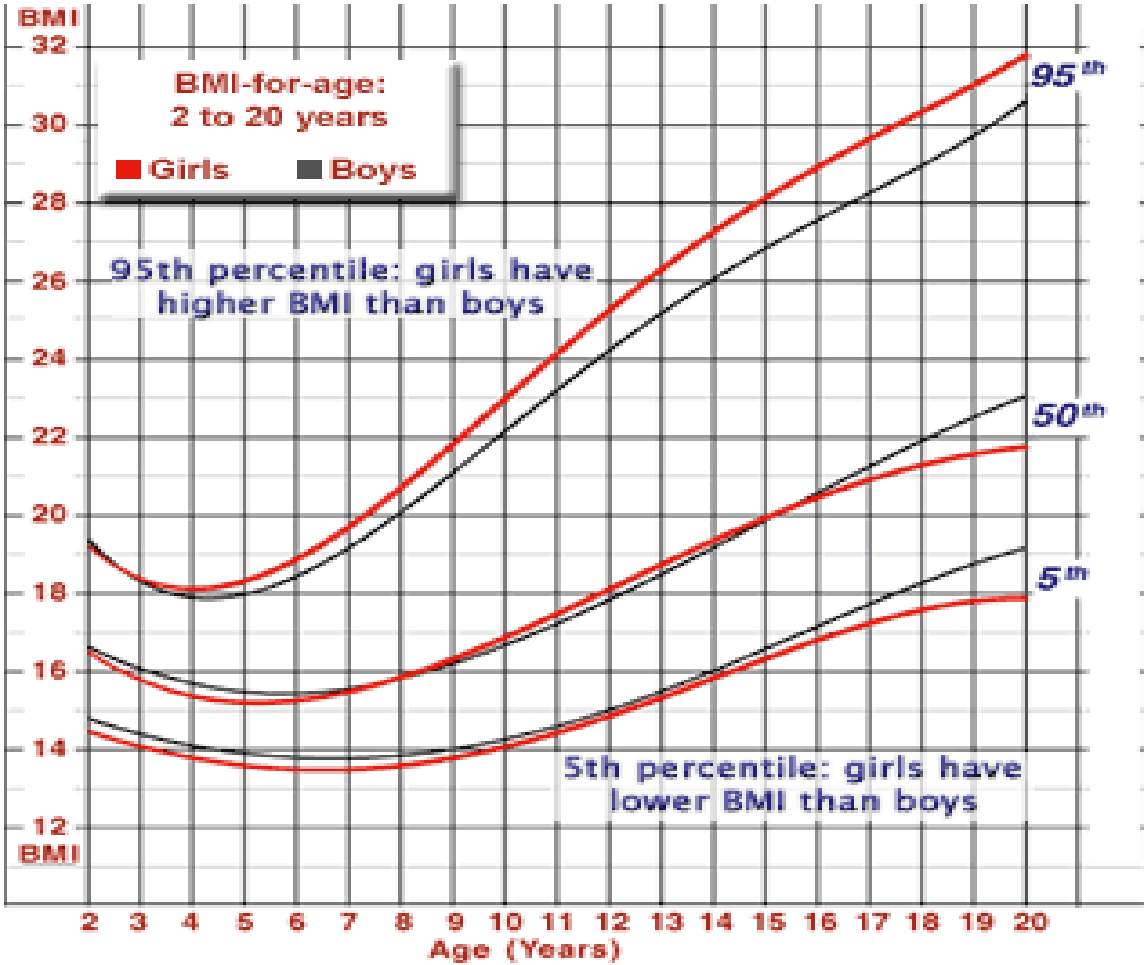
Monitor growth and development of children through:

1. Measure weight.
2. Measure height.

Well baby care services

Growth charts:

- Are percentile curves showing the distribution of selected body measurements in children.
- Growth charts are used by pediatricians, nurses, and parents to track the growth of infants, children, and adolescents.


BMI
32
30
28
26
24
22
20
18
16
14
12
BMI
BMI-for-age:
2 to 20 years
Girls
Boys
95th percentile: girls have higher BMI than boys
95th
50th
5th
5th percentile: girls have lower BMI than boys
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
Age (Years)

- Growth charts are used to compare child's height, weight, and head size against children of the same age.
- Growth charts can help both you and your health care provider follow your child as they grow.
- These charts may provide an early warning that your child has a medical problem.
- Normal lies between 5^{th} and 95^{th} curve.

Registration

-Birth registry.

-Death registry.

Immunization

- **Child vaccination.**
- **Pregnant women vaccination.**
- **Pilgrims, traveler vaccination.**

Types of vaccination

- Live attenuated vaccine.
- Killed vaccine.
- Toxoid vaccine.
- Surface antigen vaccine.
- Polysaccharide capsule vaccine.

Egypt National Childhood Immunization Schedule

Egypt National Childhood Immunization Schedule

Age	Vaccines	Site / Route of Administration	Notes
At birth	• BCG (Tuberculosis)	BCG: Intradermal injection in the left upper arm	BCG usually leaves a small scar on the arm
	• Zero dose of Polio (OPV)	OPV: Oral drops	
2 months	• Pentavalent vaccine (DTP + HepB + Hib)	Pentavalent: Intramuscular injection in the right thigh	Protects against diphtheria, tetanus, pertussis, hepatitis B, and *Haemophilus influenzae* type B
	• Polio (OPV)	OPV: Oral drops	
4 months	• Pentavalent vaccine (DTP + HepB + Hib)	Pentavalent: Intramuscular injection in the right thigh	IPV added to strengthen protection against polio
	• Polio (OPV)	OPV: Oral drops	
	• Polio (IPV – Salk)	IPV (Salk): Intramuscular injection in the left thigh	
6 months	• Pentavalent vaccine (DTP + HepB + Hib)	Pentavalent: Intramuscular injection in the right thigh	Completes the primary vaccination series
	• Polio (OPV)	OPV: Oral drops	
9 months	• Measles vaccine	Subcutaneous injection in the right upper arm	First dose of measles protection
12 months	• MMR (Measles – Mumps – Rubella)	Subcutaneous injection in the left upper arm	Very important primary dose
18 months	• Booster: Pentavalent + Polio (OPV)	Pentavalent: Intramuscular injection in the right thigh	Booster doses for long-term protection before school age
	• Booster: MMR	OPV: Oral drops	
		MMR: Subcutaneous injection in the upper arm	

Age	Vaccine	Dose	Route & Injection Site	Common Side Effects
At Birth	**BCG** (TB)	1	Intradermal, **left upper arm**	Redness, small ulcer at site, scar
	OPV Zero Dose	Oral drops	Oral	Mild diarrhea (rare)
	Hepatitis B (birth dose)	1	Intramuscular, **outer thigh**	Redness, fever, irritability
2 Months	**Pentavalent** (DTP + HepB + Hib)	1	Intramuscular, **outer thigh**	Pain, swelling, mild fever
	OPV	1	Oral	Same as above
4 Months	**Pentavalent**	2	Intramuscular, thigh	Local redness, fever
	OPV	2	Oral	
	IPV (Salk – inactivated polio)	1	Intramuscular, thigh	Pain, swelling, mild fever
6 Months	**Pentavalent**	3	Intramuscular, thigh	Pain, swelling
	OPV	3	Oral	
9 Months	**Measles** (monovalent)	1	Subcutaneous, **upper arm**	Fever, mild rash, swelling
12 Months	**MMR** (Measles, Mumps, Rubella)	1	Subcutaneous, **upper arm**	Fever, mild rash, joint pain (rare)
18 Months	**MMR booster**	2	Subcutaneous, upper arm	Same as above
Preschool (4–6 yrs)	**DTP booster + OPV booster**	Booster	DTP: IM, arm/thigh	Pain, fever, irritability
			OPV: Oral	
School entry campaigns	Extra OPV/Measles campaigns	As directed	Oral/Subcutaneous	Same as above

Non-Obligatory / Optional Vaccines in Egypt

(Available in private clinics, recommended but not free in the EPI)			
Vaccine	**Suggested Age**	**Route**	**Notes**
Rotavirus	2, 4, 6 months (depending on brand)	Oral	Prevents severe diarrhea
Pneumococcal (PCV)	2, 4, 6, + booster at 12–15 months	IM, thigh/arm	Protects against pneumonia, meningitis
Varicella (Chickenpox)	12 months + booster	Subcutaneous, arm	Prevents chickenpox
Influenza (seasonal)	≥6 months, yearly	IM, arm	Strongly recommended
Hepatitis A	From 12 months	IM, arm	Optional, for travel/extra protection
HPV	9–14 years	IM, arm	Prevents cervical cancer

جدول تطعيمات الأطفال

عند الـــولادة

العمر	الجرعة	الطعم	المرض	الجرعة	طريقة التطعيم
أول ٢٤ ساعة	الميلاد	كبدي ب رضع	الالتهاب الكبدي الفيروسي B	0.5 سم٣	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيمن
عند الميلاد	الصفرية	سابين	شلل الأطفال	نقطتان	بالفم
عند الميلاد	الدرن	بي سي جي BCG	الدرن	0.05 سم٣	حقنًا داخل الجلد (في الطبقة الأولى) أعلى الذراع الأيسر

جدول تطعيمات الأطفال

الشهر الثاني من العمر

العمر	الجرعة	الطعم	المرض	الجرعة	طريقة التطعيم
شهرين	الأولى	سابين	شلل الأطفال	نقطتان	بالفم
		الخماسي	الثلاثي البكتيري DPT، والكبدي ب، وهيموفيلاس إنفلونزا	0.5 سم٣	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيمن
		سولك	شلل الأطفال	0.5 سم٣	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيسر

جدول تطعيمات الأطفال

الشهر الرابع من العمر

العمر	الجرعة	الطعم	المرض	الجرعة	طريقة التطعيم
٤ شهور	الثانية	سابين	شلل الأطفال	نقطتان	بالفم
		الخماسي	الثلاثي البكتيري DPT، والكبدي ب، وهيموفيلاس إنفلونزا	0.5 سمً	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيمن
		سولك	شلل الأطفال	0.5 سمً	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيسر

جدول تطعيمات الأطفال

الشهر السادس من العمر

العمر	الجرعة	الطعم	المرض	الجرعة	طريقة التطعيم
٦ شهور	الثالثة	سابين	شلل الأطفال	نقطتان	بالفم
		الخماسي	الثلاثي البكتيري DPT، والكبدي ب، وهيموفيلاس إنفلونزا	0.5 سمً	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيمن
		سولك	شلل الأطفال	0.5 سمً	حقنًا بالعضل في الجزء الخارجي من العضلة الأمامية بالفخذ الأيسر

جدول تطعيمات الأطفال

الشهر التاسع من العمر

العمر	الجرعة	الطعم	المرض	الجرعة	طريقة التطعيم
٩شهور	الرابعة	سابين	شلل الأطفال	نقطتان	بالفم

جدول تطعيمات الأطفال

١٢ شهر

العمر	الجرعة	الطعم	المرض	الجرعة	طريقة التطعيم
١٢ شهر	الخامسة	سابين	شلل الأطفال	نقطتان	بالفم
		ام ام آر MMR	الحصبة، والنكاف، والحصبة الألماني	0.5 سمٍ	حقنًا تحت الجلد بالذراع الأيمن

Cold chain system

What is the cold chain system?

- a system for **distributing** vaccine in a potent state **from** the manufacturer **to** the actual vaccination site.
- It consists of a series of transportation in adequate refrigeration.

Cold chain equipments in health centers consists of:

a) Refrigerator

b) Cold box

c) Vaccine carrier

d) Ice packs

a)Refrigerators: temperature between 0°C and +8 °C-
Freeze ice packs for cold boxes and vaccine carriers.-
Freeze ice cubes for cooling vaccine in a cup during a vaccination session.

To pack the refrigerator:

1.Clearly **separate** the different types of vaccines.

2 .Leave 1-2 cm between **rows** of vaccine to permit air circulation.

3. Vaccine should not be kept in the door compartment.

4.Put a **thermometer** inside the refrigerator.

5.Check the temperature of the refrigerator **twice /d** and record it on temp. chart.

b)Vaccine cold box: Is used to: .

-Transfer **large** quantities.

-Carry vaccines for **several** days

c)Vaccine carrier: Is used to:

-Transport **small** quantities.

-Carry vaccine for only **one** day.

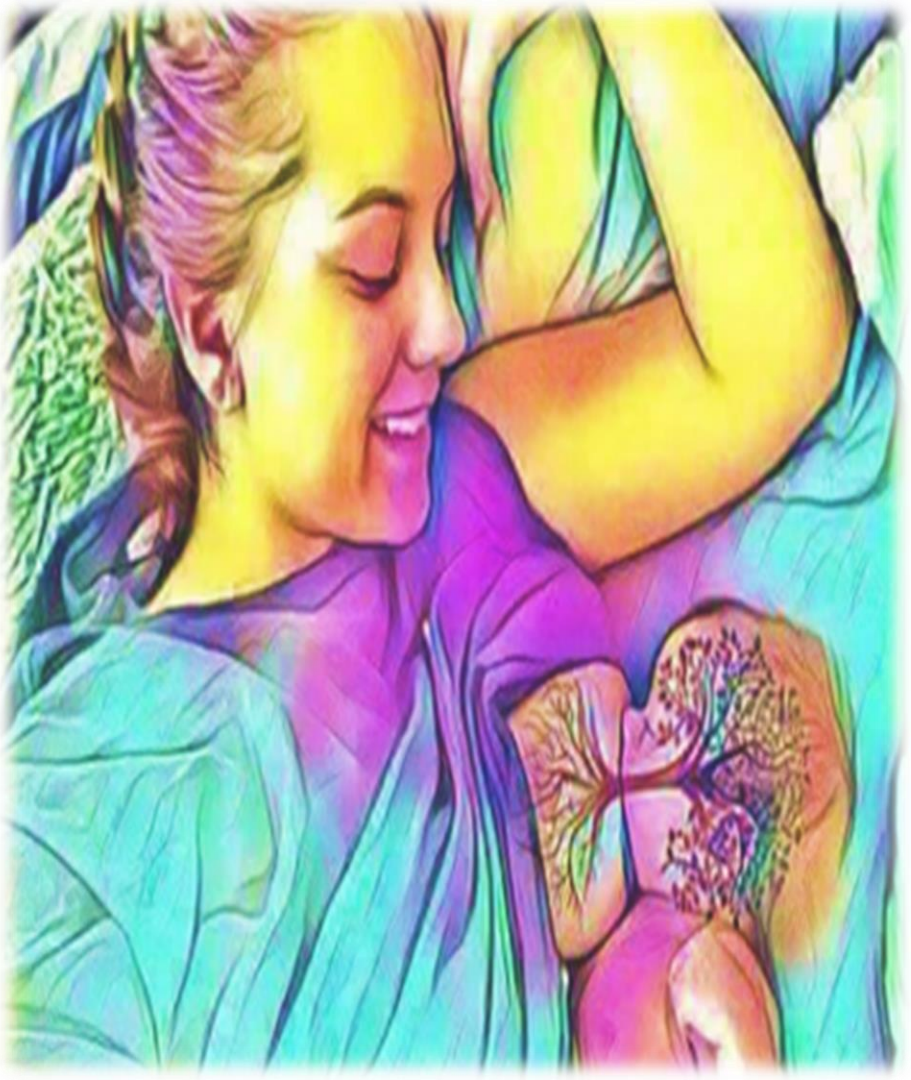
d)Ice packs:

Keep vaccines cool in boxes and vaccine carriers.

What damage vaccines?

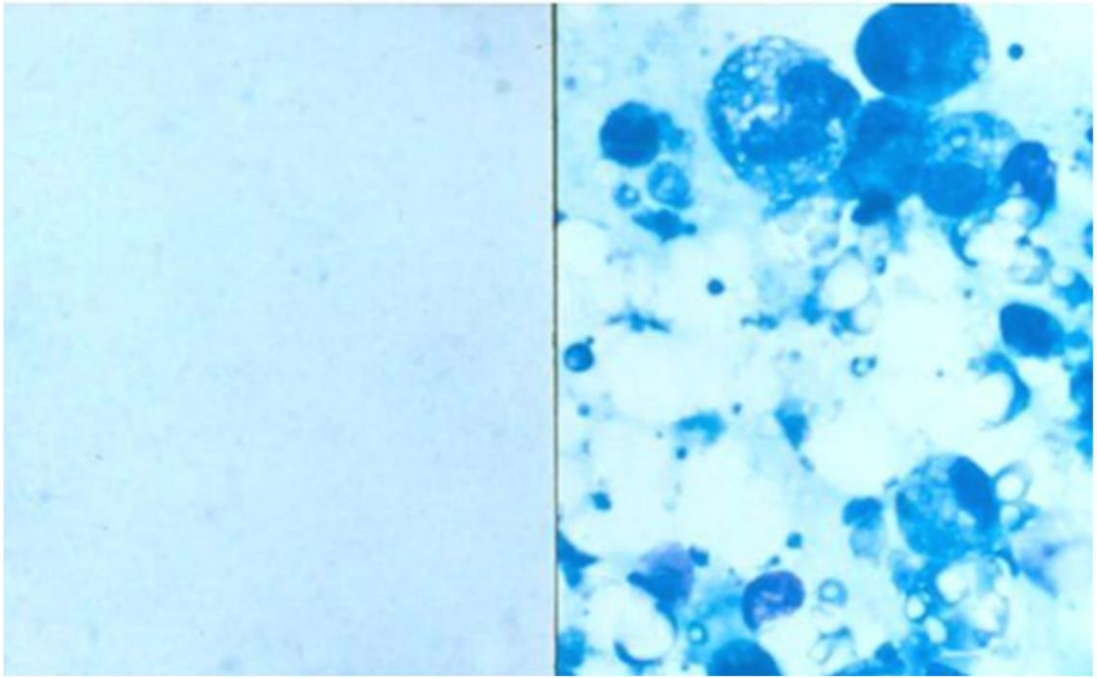
- Vaccines kept in temperature from 0-8
- Sun light and high temperature damage all vaccines especially live attenuated vaccines.
- Freezing damage killed and toxoid vaccines only.

Breastfeeding



A drop of formula

A drop of breast milk:
-White blood cells protect against infection
-Fat globules help eyes and brain grow faster



Importance of breastfeeding for the baby

- **Complete Nutrition:**

perfect balance of proteins, carbohydrates, fats, vitamins, and minerals, along with water, and is easily digestible for an infant's immature system.

- **Immune System Development:**

It contains antibodies, especially in colostrum (the first milk), which are crucial for protecting the baby against viruses and bacteria, and this protection can last a lifetime.

- **Disease Prevention:**

Breastfed babies have a lower risk of numerous illnesses, including ear infections, respiratory infections, gastrointestinal issues like diarrhea, and a reduced risk of developing conditions such as asthma, eczema, SIDS, childhood obesity, and even certain types of cancer and diabetes later in life.

Importance of breastfeeding for the baby

- **Cognitive and Developmental Benefits:**

Specific fats in breast milk are important for brain growth and nervous system development, and studies suggest breastfed babies may perform better on intelligence tests.

- **Customization and Adaptability:**

Breast milk changes from feed to feed and as the baby grows, adapting to their specific nutritional needs and even offering diverse flavors based on the mother's diet.

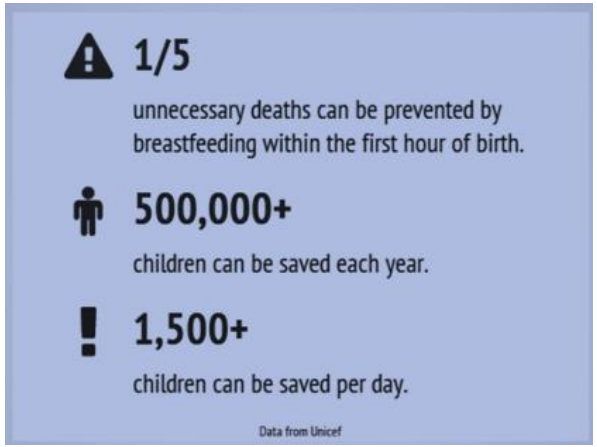
- **Emotional Bonding:**

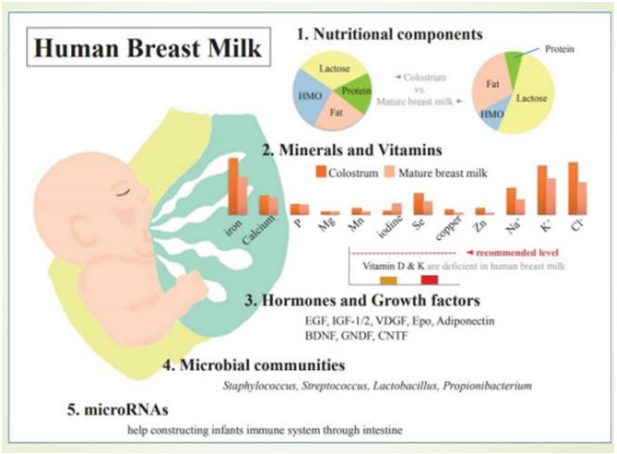
Breastfeeding fosters a strong emotional connection and bond between the mother and her baby.

Exclusive breastfeeding

an infant diet of exclusively human milk without the use of any artificial infant milk, infant cereal, other fluids (juices, sports drinks, herbal teas, etc.)or other solid food

Studies of unicef and WHO suggest that initiation of breastfeeding within the first hour of birth could prevent ***about 20 percent of neonatal deaths***.





Importance for mother

Postpartum recovery:

It helps the uterus return to its pre-pregnancy size more quickly and can aid in postpartum weight loss.

Convenience and cost-effectiveness:

- Breast milk is readily available and requires no preparation, saving mothers time and money compared to formula feeding.

Potential for delayed menstruation:

- Continuous breastfeeding can temporarily pause ovulation and menstruation, which can be seen as an added benefit for some mothers.

Importance for mother

○ Bonding and emotional well-being

- The release of oxytocin during breastfeeding promotes relaxation and strengthens the bond between mother and baby. It can also reduce the risk of postpartum depression

○ Skin-to-skin contact:

- Early and continued skin-to-skin contact with the baby, often facilitated by breastfeeding, calms both mother and baby, helps regulate the baby's blood sugar and breathing, and promotes brain developmen

○ Reduced risk of diseases:

- Breastfeeding is associated with a lower risk of breast cancer, ovarian cancer, type 2 diabetes, high blood pressure, and osteoporosis

Ten steps for successful breastfeeding

1. Have a written breastfeeding policy.
2. Train health care staff in skills necessary to implement these policies.
3. Inform all pregnant women about benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within half an hour of delivery.
5. Show mothers how to breastfeed, and how to maintain lactation even if they are separated from their child.
6. Give newborns no food or drink other than breast milk, unless medically indicated (Exclusive BF).
7. Practice rooming in allows mothers and infants to stay together for 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers to breastfed infants.
10. Foster establishment of breastfeeding support groups.

The TEN STEPS to Successful Breastfeeding


2
STAFF COMPETENCY
Hospitals support mothers to breastfeed by...
Training staff on supporting mothers to breastfeed
Assessing health workers' knowledge and skills

3 ANTENATAL CARE

Hospitals **support mothers** to breastfeed by...

4 CARE RIGHT AFTER BIRTH

Hospitals **support mothers** to breastfeed by...

Encouraging skin-to-skin contact between mother and baby soon after birth

Helping mothers to put their baby to the breast right away

5 SUPPORT MOTHERS WITH BREASTFEEDING

Hospitals **support mothers** to breastfeed by...

- Checking positioning, attachment and suckling
- Giving practical breastfeeding support
- Helping mothers with common breastfeeding problems

6 SUPPLEMENTING

Hospitals **support mothers** to breastfeed by...

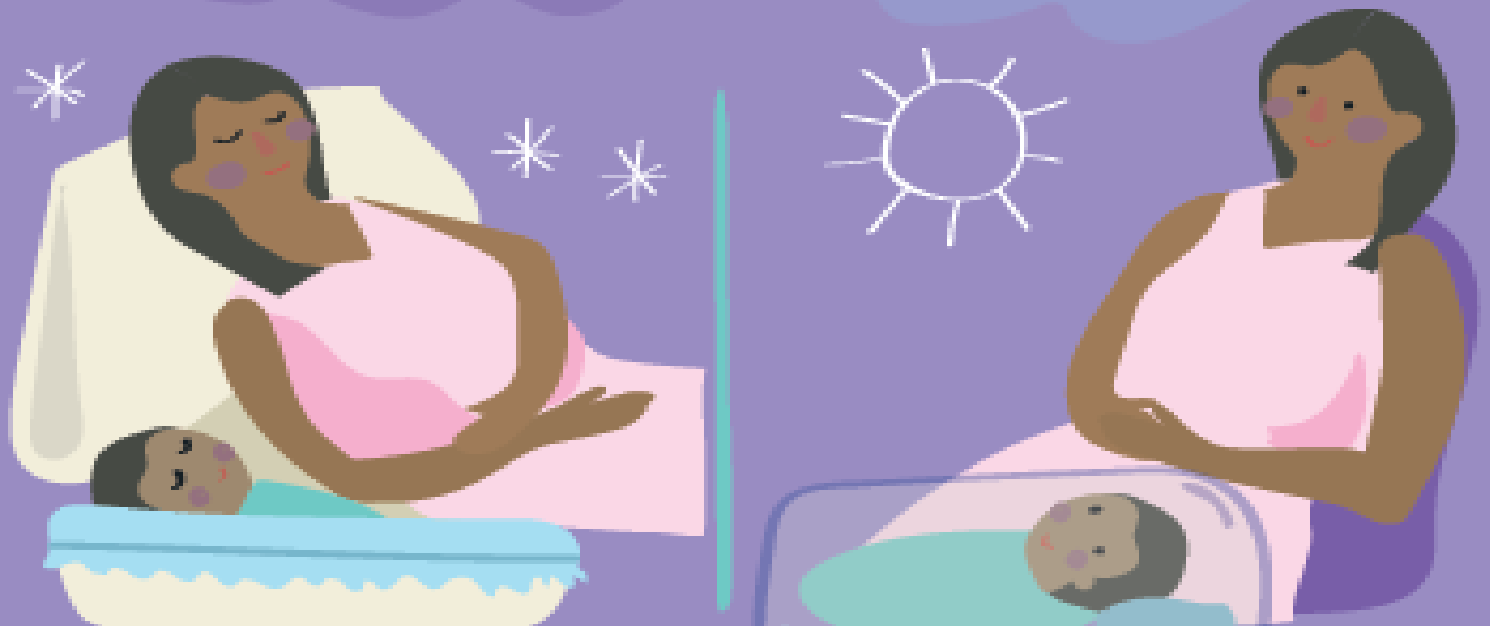
- Giving only breast milk unless there are medical reasons
- Prioritizing donor human milk when a supplement is needed
- Helping mothers who want to formula feed to do so safely

7 ROOMING-IN

Hospitals support mothers to breastfeed by...

Letting mothers and babies stay together day and night

Making sure that mothers of sick babies can stay near their baby



8 RESPONSIVE FEEDING

Hospitals **support mothers** to breastfeed by...

Helping mothers know when their baby is hungry

Not limiting breastfeeding times

9 BOTTLES, TEATS AND PACIFIERS

Hospitals **support mothers** to breastfeed by...

10 DISCHARGE

Hospitals support mothers to breastfeed by...

Referring mothers to community resources for breastfeeding support

Working with communities to improve breastfeeding support services

Breastfeeding preparation

Postpartum Breastfeeding Practices

•Encourage skin-to-skin contact: Healthy newborns should be placed on the mother's abdomen for easier breastfeeding.

•Adjust room temperature: If air-conditioned, provide a radiant warmer over the mother and infant

•prophylactic eye-drops: Mother, father, and infant should remain together for the next hour.

• Follow neonatal resuscitation guidelines: If the baby is breathing, has good color, and muscle tone, immediately dry off and place skin-to-skin on the mother and cover with warm blankets.

skin-to-skin contact important?

Skin-to-skin contact is a practice where a baby is dried and placed on the mother's chest after birth, covered in a warm blanket. It helps boost milk supply and bond parents and is crucial in neonatal units for better outcomes.

There is a **growing body of evidence that skin-to-skin contact after the birth helps babies and their mothers.**

- *calms and relaxes*
- *regulates the baby's heart rate and breathing*
- *stimulates digestion and an interest in feeding regulates temperature*
- *providing protection against infection*
- *stimulates the release of hormones*

- **also provides benefits for babies in the neonatal unit:**

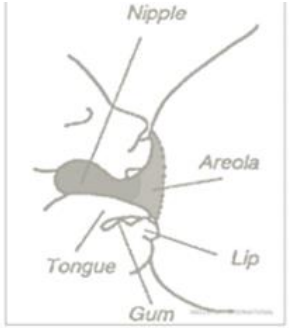
  - improves oxygen saturation
  - reduces cortisol (stress) levels, particularly following painful procedures
  - encourages pre-feeding behavior
  - may reduce hospital stay
  - improves milk volume if the mother expresses following a period of skin-to-skin contact

Attachment and position

Why learning proper attachment is important?

Results of poor attachment

- Painful nipples
- Damaged nipples
- Engorgement
- Baby unsatisfied and cries a lot
- Baby feeds frequently and for a long time
- Decreased milk production
- Baby fails to gain weight



Breastfeeding

Signs of a Good Latch

The baby's lips are flanged out and relaxed.

baby's body is close to the mother

baby's head is slightly tilted back, and he is directly facing the mother, so he doesn't have to turn his head or bend his neck.

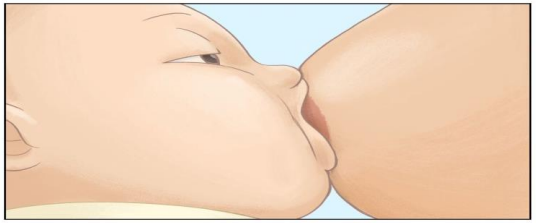
After a period of fast sucking, the baby's sucking deepens, and the mother may hear regular swallowing .

The baby will end the feeding on his own when he finishes.

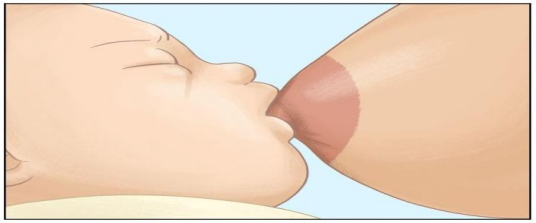
Breastfeeding is comfortable for the mother

NB :It is very normal for the mother to feel tenderness in her nipple in the first feeds, but this tenderness diminishes once the milk lets down and disappears within a few days.

Attachment to the breast



Good attachment



Poor attachment

Signs of good attachment	Signs of bad attachment
Chin is touching breast or nearly so	Chin is away from breast
Mouth is widely open	Mouth is not widely open
Lower lip is turned outward	Lower lip is pointing forward or turned in
Areola is more visible above than below the mouth	Areola is more visible below than above or equal amounts

Breastfeeding positions

- Whatever position the mother chooses, the mother should make sure the baby is held properly.
- He directly faces her breast and doesn’t have to turn his head , bend his neck, or must reach for the breast.
- His ear, shoulder, and hip are in a straight line and his head is tilted slightly back, so that he is not pulling at the breast and can swallow easily.
- nose and umbilicus on one line.
- Support the Breast when Needed

- **Make sure the mother's fingers are away from the areola, so that they don’t block the baby during latch on**

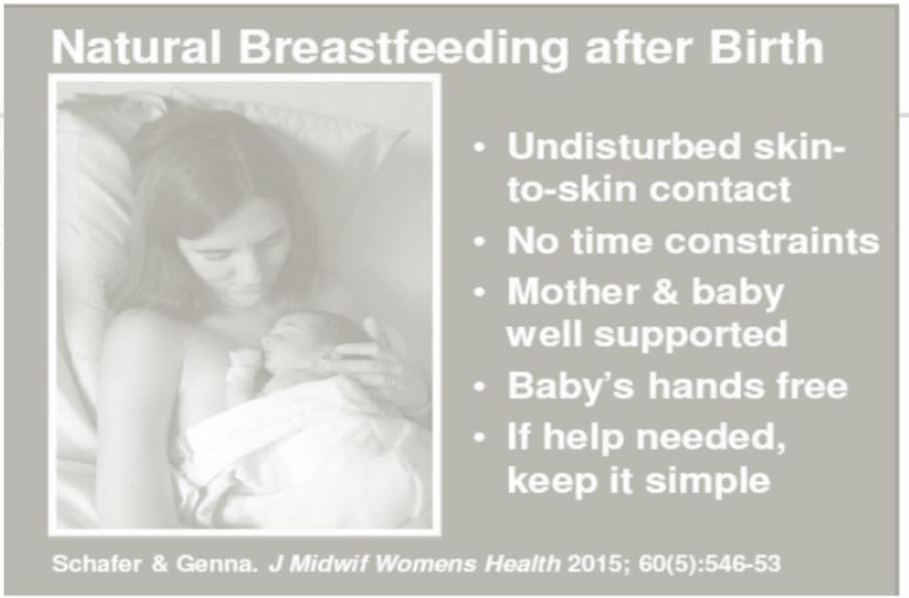
Breastfeeding positions

Adjust your body

- 30-65 degree
- Arm supported
- Completely relaxed

Adjust your baby this position triggers:

- Wide mouth
- Relaxed jaw
- Tongue forward
- Deeper latch

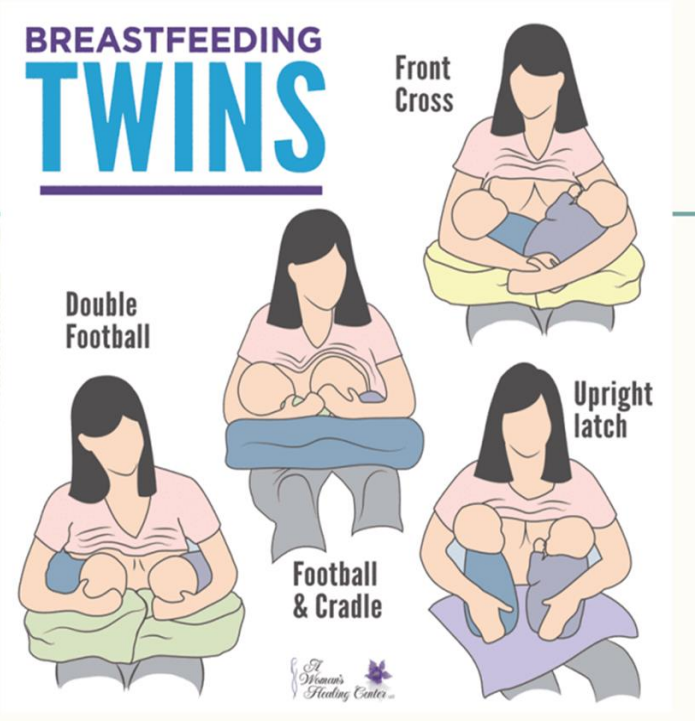


Under arm position

Cradle hold(Madonna)

- Nb:baby hand can be around mother`s back Or tucked alongside her body
- The infant`s head either in the bend of the mother`s elbow or midway down t forearm.
- Least control over the head

Straddle position



Nursing in a sling

Side lying

Milk Expression

- To relieve **engorgement or blocked ducts**
- If baby is **unable to effectively BF/ separated Concerns** about adequate milk production, working mother, other cultural/psychological reasons
- **Adopted babies**
- mothers with **mastectomy**
- To **encourage a baby to breastfeed** by expressing milk on the nipple
- To **pasteurize the milk** for the baby, as an option if the **mother is HIV-positive**.
- **medication incompatible** with BF

Milk is obtained through Hand expression or Pump

Breast milk -hand expression

When to Express Breast Milk

- Begin expressing as soon after birth.
- The length of time to express depends on the reason for expressing.

For colostrum, express for 5-10 minutes.

- For milk production, aim for about 20 minutes at least six or more times in 24 hours.

Preference for Hand Express

Hand expression is preferred overusing a pump due to its comfort, effectiveness, quickness, skin-to-skin stimulation, and less risk of cross-infection.

Milk Expressing Techniques

- Avoid pressing or pulling the nipple, which can damage the nipple.
- Educate the mother about the dangers of sliding or rubbing fingers along the breast during compression.
- Expressing should not hurt, but if it does, observe and adjust techniques·

Cup Feeding

Used for baby :

- Who are able to swallow but cannot (yet) suckle well enough.
  - —have difficulty attaching well
  - —attach & suckle for a short time
  - —tire quickly before obtain enough milk

Cup Feeding

- **Advantages :**
  - Easy to clean
  - Less risk of diarrhea , ear infection tooth decay .
  - Does not interfere with suckling at breast
- **Indications** :
  - Inability of latching as in hare lip or prematurity
  - For separated baby from his mother

Steps for Preparing Baby Formula

1
First, clean the area and wash your hands

2
Boil the water

3
Let the water cool and pour in a bottle

4
Add the exact amount of powdered formula

5
Assemble the bottle and mix

6
Cool the bottle quickly

7
Dry the bottle

8
Check the temperature of the formula

Storage of breast milk

➢ How to prepare the container :

Wash the cup in soap and water.

Pour boiling water and leave it for few minutes .

When ready to express milk , pour the water out of the cup.

➢ How to store breast milk :

- Fresh milk can be stored 4-8 hours at room temp. or 24 hours in a refrigerator.
- Frozen milk can be stored :

2 weeks in freezer compartment inside fridge

3 months freezer part of refrigerator-freezer

6 months in separate deep freeze

- Thawed in a refrigerator 24 hours (do not re-freeze) or place the container in a warm water to thaw quickly.
- It shouldn’t be heated but can be placed in a warm water

Breastfeeding Conditions

"An ounce of prevention is worth a pound of intervention"

- Most breast conditions can be prevented or improved when early diagnosed
- During prenatal visits , women should be screened for anatomic variations in the breasts, areolae , or nipples and lack of breast enlargement·
- Before discussing the more clinical aspects of breast-related problems, including surgery, it is important to address the emotional significance of the female breasts as breasts are part of a woman's internalized body image ·

Nipple pain is the second most common cause to weaning (after concerns about low milk supply)

- ***Abnormal nipple tenderness and damage***, typically **3-6 days postpartum**, is heightened during pregnancy and is caused by nipple flexibility defects or increased vascularity.
- It is ***most common in the first month of breastfeeding*** To alleviate discomfort, gently massage the breasts before suckling.
- Nipple trauma, including wounds and suction blisters, ***is the primary cause of nipple pain***, with ***secondary causes like infection or dermatitis***

1. Sore nipple

- Sore nipples during breastfeeding are most caused by **incorrect latch and positioning of the baby** at the breast, which can lead to pain, cracking, or even blisters, skin conditions (eczema, dermatitis), and even teething.

- **Most sore nipples resolve on their own by improving bf technique**

Treatments for sore nipples

through various methods including moisturizing, cool compresses, and proper latching techniques.

Nipple Drying and Wound Healing

- Avoid interpreting nipple dryness as dried out.
- Light lubrication.
- Hydrogel dressings reduce pain and feel cool.
- Precautions: handwash before use, wash after removal ,clean surface.

2. Engorgement

(The swelling and distension of the breasts, usually in the early days of initiation Of lactation 3-5 postpartum)

- *Some degree of breast fullness is considered physiologic and should be reassuring for the mother.*
- ***Symptoms include*** *breast swelling, firmness, tenderness, warmth, redness,low-grade fever, and flattening of nipple.*

•Engorgement usually begins on the 3rd to 5th day and lasts between 12 and 48 hours if properly treated.

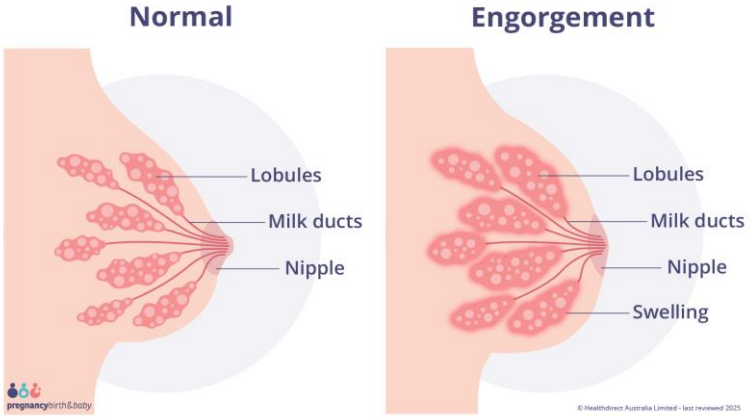
- ***Increased severity OF ENGORGEMENT in:***

✓ *delayed initiation of BF*
✓ *infrequent feeds*
✓ *time limited feed*
✓ *supplementary feeds*

Management of engorgement

How to resolve engorgement :

- Skin to skin
- warm packs before breast feed or hand expression for only few minutes until milk release only
- Hand expression if baby cannot latch successfully
- avoid electric pumping
- Cold packs 20 minutes, removing 20 minutes
- Gentle lymphatic massage
- Anti-inflammatory medications
- Applying heat not appropriate
- Wear an appropriately fitting supportive bra.



3.Breast Edema

is fluid accumulation in the interstitial space caused by - generalized fluid accumulation late in pregnancy -or -as a result of large amounts of intravenous fluids during labor LEADS to edema around the areola and nipple

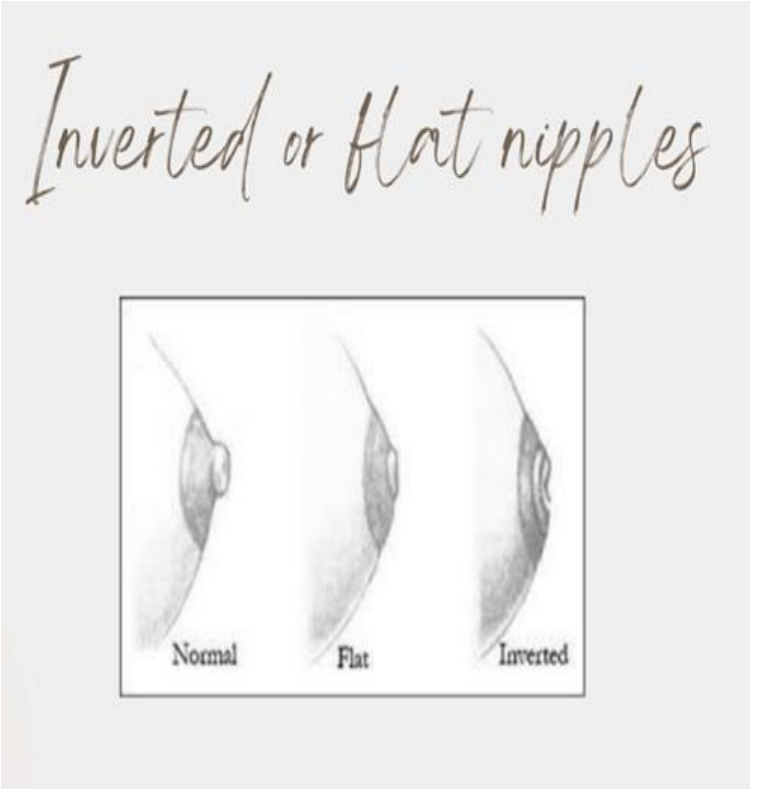
- Breast Edema is hard as rocks
- **How to resolve edema**

1· Ice in a bag
2· Lymphatic drainage
3· Reverse pressure softening
4·Ask the mother to press around the areola 60 seconds ,Press until edema subside

4.Inverted/Flat nipples

Nipple protractility cannot be visually assessed

- *The mother must manually compress the tissue behind the nipple.*
- *The nipple either: evert, flatten or collapse inward in a telescoping fashion*



Management of flat/inverted nipple

1·Flat nipple (non inverted): massage, apply cold cloth

2· Inverted : instruct the mother to shape her nipple by placing thumb about 1·5 to 2 inches
behind the nipple and rest of fingers beneath and pulling back into her chest · Best inside lying position Or pumping immediately before bf Or silicone nipple shield

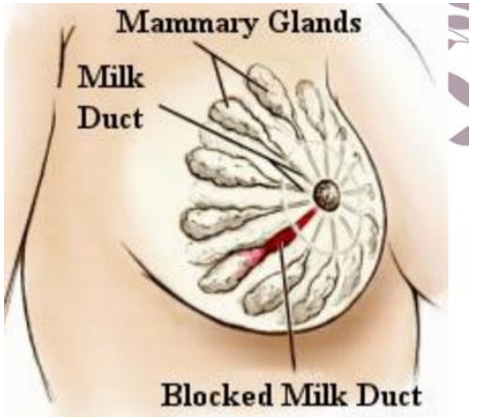
3·Severe inversion (invaginated or Grade III): surgical intervention with special techniques to minimize damage or more recently a minimally invasive gradual traction technique

Commercial "nipple enhancers" or nipple corrector designed to evert flat or inverted nipples

5.Plugged duct

Specific cause not known

Plug : stasis, clogging of milk , local accumulation of milk or dead cells



Predisposing factors :

Abundant milk supply and inadequate drainage
skipped feeding
constricting bra
baby carrier straps
poor nutrition, stress and winter

Symptoms :

1) tenderness, heat, possible redness in one area of the breast
2)a palpable lump of well-defined margins without generalized fever (focal area of engorgement)
3)Sometimes: a tiny white milk plug at the opening of the duct on the nipple
(Blocked nipple pore shows itself as solitary white bleb on the tip of the nipple which is shiny smooth and less than 1mm in diameter)

Management of plugged duct

no need to prescribe an antibiotic unless fever and mastitis develop

- **Therapeutic hand massage by**

massage towards axillae to facilitate lymph circulation

- **Six Step Recanalization Manual Therapy Consists of**

1)preparation, 2)clearing the plugged duct outlets 3)nipple manipulation , 4)pushing and pressing the areola , 5)pushing and kneading the breast , 6)checking for

The bleb may need a health professional to open it with a sterile needle

- **Breastfeeding Tips for**
  - Frequent breastfeeding for drainage·
  - Massage affected breasts before and during feeding·
  - Soak affected breasts in warm water and gently massage·
  - Change infant's position during feedings for drainage·
  - Avoid constricting clothing

6.Candidiasis:

- Candidiasis is a common thrush infection caused by Candida albicans.
- Infected nipples may appear red, shiny, and have sloughing skin or tiny blisters.
- Mothers may experience burning, itchy, painful nipples.

- ***Treatment includes antifungal medication, topical cream, and intravaginal preparations.***

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7.Mastitis:

An Inflammatory Process Affecting Breastfeeding

typically occurring in the first three weeks postpartum.

- *It can be acute or chronic, leading to breast abscess if not treated well.*
- *mastitis can lead to decreased milk supply.*
- *It can result from ductal inflammation and can lead to engorgement, ductal narrowing, inflammatory mastitis, bacterial mastitis,abscess.*

- ***Treatment recommendations include*** *feeding the infant on demand, minimizing breast pump usage, avoiding nipple shields, wearing a supportive bra, manual lymphatic drainage, ice pack application, nonsteroidal anti-inflammatory drugs, pain relief, and daily lecithin.*

8.Breast Abscess

- **Incidence:** 5-11% of women with infectious mastitis.
- **Abscess: Localized collection of pus, serious and painful condition.**
- **Ultrasound** is more effective than mammogram in diagnosing and locating abscess.
- **Causes:** Untreated mastitis, delay in treatment, incorrect treatment.
- **Classification:**

Sub areolar (23%),
Inflammatory unilocular (12%),
Sub mammary multilocular (65%).

- **Treatment: Draining, antibiotics, rest.**

Disadvantages of artificial feeding

- Interferes with bonding
- More diarrhoea and persistent diarrhoea
- More frequent respiratory infections
- Malnutrition; Vitamin A deficiency
- More allergy and milk intolerance
- Increased risk of some chronic diseases
- Obesity
- Lower scores on intelligence tests
- Mother may become pregnant sooner
- Increased risk of anaemia, ovarian cancer, an breast cancer in mother

Outbreak Investigation Applied Practical Exercises

Introduction

- **Epidemic** refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area.
- **Outbreak** carries the same definition of epidemic but is often used for a more limited geographic area.

Epidemiologic Steps of an Outbreak Investigation

1.Prepare the field work

2.Establish the exitance of outbreak

3.Verify the diagnosis

4.define,identify the case

5.Perform descriptive epidemiology(Time, Place and Person)

6.Develop hypothesis

7.Evaluate hypothesis

Epidemiologic Steps of an Outbreak Investigation

8. Refine hypothesis, carry out additional studies
9. Implement control, prevention measures
10. Communicate findings
11. Initiate or maintain surveillance

Case study

A doctor in a village observed an excessive number of people seeking help for diarrhea and/or vomiting during a week in late may.

usually, two or three villagers per week would report to the health office with these symptoms; however, 23 villagers sought help in a two-day span. The doctor reported the observation to the local health department, and they started investigating.

Did this meet the definition of an outbreak? Why or why not?

Yes, A disease outbreak is the occurrence of cases of disease in excess of what would normally be expected in a defined community at a given time.

Normally, two or three villagers per week would report to the health office with these symptoms; however, 23 villagers sought help in a two-day span

1.Prepare the field work

Requires team of people with skills in:

- Epidemiology
- Questionnaire design
- Interview techniques
- Biostatistics
- Data management
- Microbiology (including access to lab)

Step 2: Establish the Existence of an Outbreak

- Is there an **increase in the number** of cases than expected in the population/time/place?
- Before making decision on outbreak existence, **determination** for the expected number of cases within the target area should be done **first**, through reviewing

  ⇨ Department of health surveillance records for notifiable disease.

  ⇨ Hospital discharge records, mortality records

Step 3: Verify the Diagnosis

- Basically, the diagnosis needs to be confirmed by both the **clinical** information and **laboratory** results.
- ***In outbreak investigations***, some of the first few cases do need to be laboratory confirmed (if there is a laboratory test available)
- followed cases can be included, just with clinical information, if they're linked to the outbreak like: they had contact with someone who has been lab confirmed. If they had similar exposures, and also had the clinical signs and symptoms

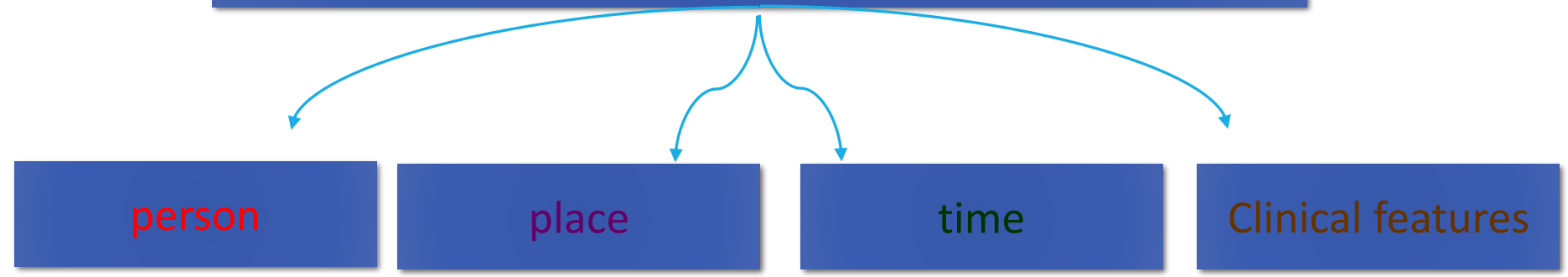
Step 4: Define and Identify Cases

Establishing "**Case definition**"**:** a standard **set** of criteria for deciding whether a person should be classified as having the disease under study **or** not.

Example of a typical case definition:

"All children in classroom 3 of the local school who took part in the field trip on November 20, and who fell ill with vomiting and/or diarrhea between the evening of the 20th and the evening of the 21st."

Case definition include criteria for



describes key characteristics the patients share in common

describes specific geographic location or facility associated with the outbreak

describe a period of time associated with illness onset for the cases under investigation

-should be simple and objective (e.g., sudden onset of fever and cough).

-Later, characterized by the presence of specific laboratory findings

Step 4: Define and Identify Cases. cont,

- Conduct active surveillance to ascertain any additional cases.

  --- In “closed” populations (e.g. day care center), may be able to identify and interview all persons potentially exposed.

  --- In “dynamic” situations (e.g. restaurants), may need to contact local physicians, emergency rooms, and other sources.

- Collect demographic information and means to contact each case.

Step 4: Define and Identify Cases.cont,

Collect potential risk factor information including **person**, **place**, and **time** of illness

--- Person (age, gender, underlying illnesses)

--- Place (closed environment locations such as schools, sites of routine activities such as pools, and location where the person lives).

--- Time (onset of clinical manifestations , activities during potential exposure period, and dates of any medical evaluations).

Step 5: Descriptive Epidemiology

It provides a comprehensive description of an outbreak by showing its trend over time, its geographic extent (place) and the populations (people) affected by the disease.

Step 5. Perform Descriptive Epidemiolog

- **Time *(epidemic curve)***
  - Ideally, when were they infected?
  - More practically, when did they become ill?
- **Place *(spot map, shaded map)***
  - Ideally, where were they infected?
  - More commonly, where do they live, work?
- **Person *(tables)***
  - Who was infected?
  - Numerators and denominators
  - What do the cases have in common?

Step 5: Descriptive Epidemiology Time (The Epidemic Curve):

The Epidemic Curve: Course of an epidemic is shown by a graph of the number of cases by their date of onset.

To draw an epidemic curve **X axis** represents time (in hours , days , weeks…..) while **Y axis** represents the number of cases by the date of onset of clinical manifestations .

Step 5: Descriptive Epidemiology Time (The Epidemic Curve):

You can learn a lot about an outbreak from an epi curve, such as:

1−General sense of the outbreak's magnitude

2- Time trend of the outbreak i.e., distribution of cases over time

3−“Outliers,” or cases that stand apart from the overall pattern

Step 5: Descriptive Epidemiology Time (The Epidemic Curve):

4–Most likely time of exposure:If a disease is identified and incubation period is known, probable time period of exposure can be estimated, and a questionnaire can be developed focusing on that time period ; to identify the source .

5-Provide inferences about the epidemic pattern: Common source exposure, Person- to- person (Propagated) spread

Estimation of Time or Period of Exposure:

- The epidemic curve can be used to identify a likely period of exposure.
- Knowing the likely period of exposure allows you to ask questions about the appropriate period of time so you can identify the source of the epidemic.

To identify the likely period of exposure from an epidemic curve of an apparent point source epidemic - If organism is known, and the time of onset is known:

- Look up the average , minimum and maximum incubation periods of the disease.
- This information can be found on disease fact sheets of WHO available on the Internet or in the Control of Communicable Diseases Manual.

Estimation of Time or Period of Exposure:

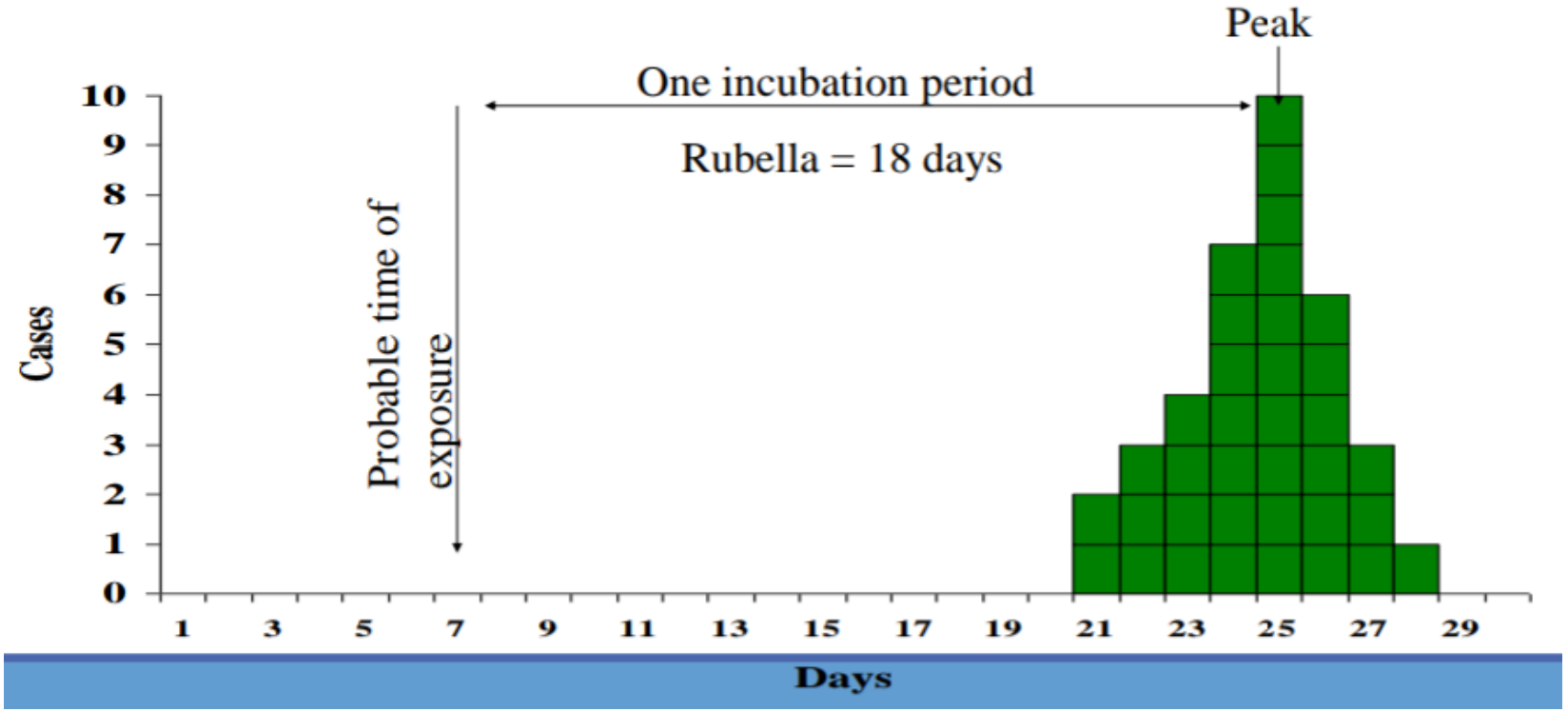
1. Identify the peak of the outbreak or the median case and count back on the x-axis one average incubation period - Note the date.

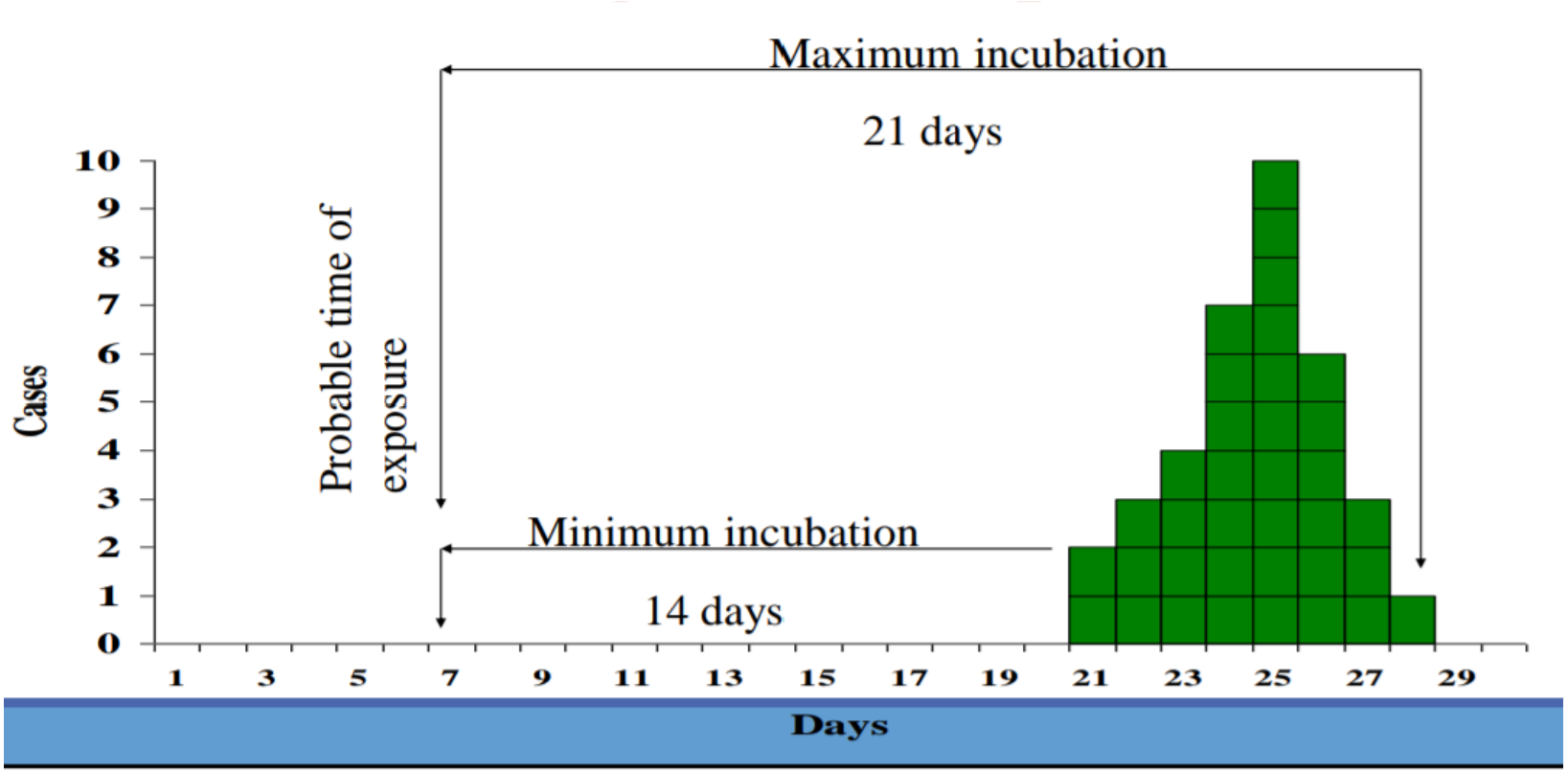
2. Start at the earliest case of the epidemic and count back the minimum incubation period - Note this date as well.

3. Identify the last case in the outbreak and count back the maximum incubation period - Note that date.

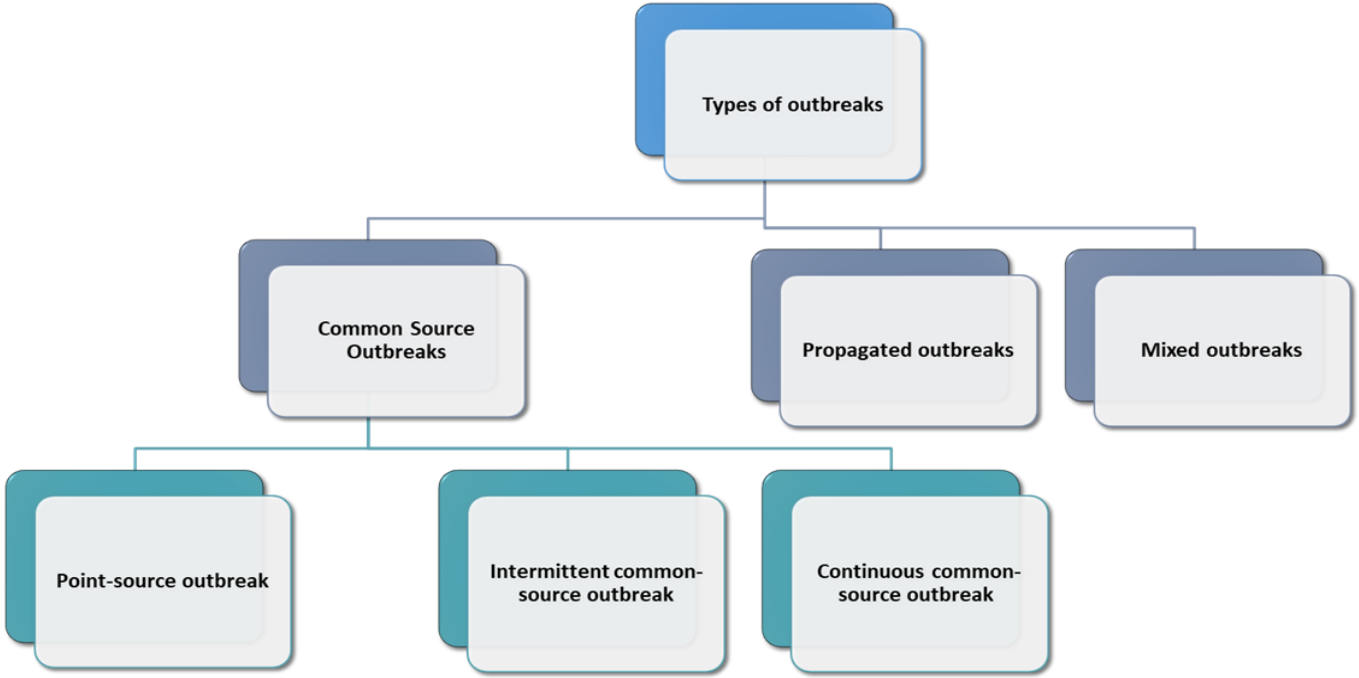
- The range of dates identified in those three steps represent the most likely period of exposure and ideally should fall within a few days of each other.

- If the three dates are widely separated, this indicates that the incubation period has a wide range, or the outbreak is not a point source outbreak.


Peak
One incubation period
Rubella = 18 days
Probable time of exposure
Cases
10
9
8
7
6
5
4
3
2
1
0
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
Days


Maximum incubation
21 days
Probable time of exposure
Minimum incubation
14 days
Cases
0
1
2
3
4
5
6
7
8
9
10
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
Days

There are three basic types of epidemic curve/outbreaks .



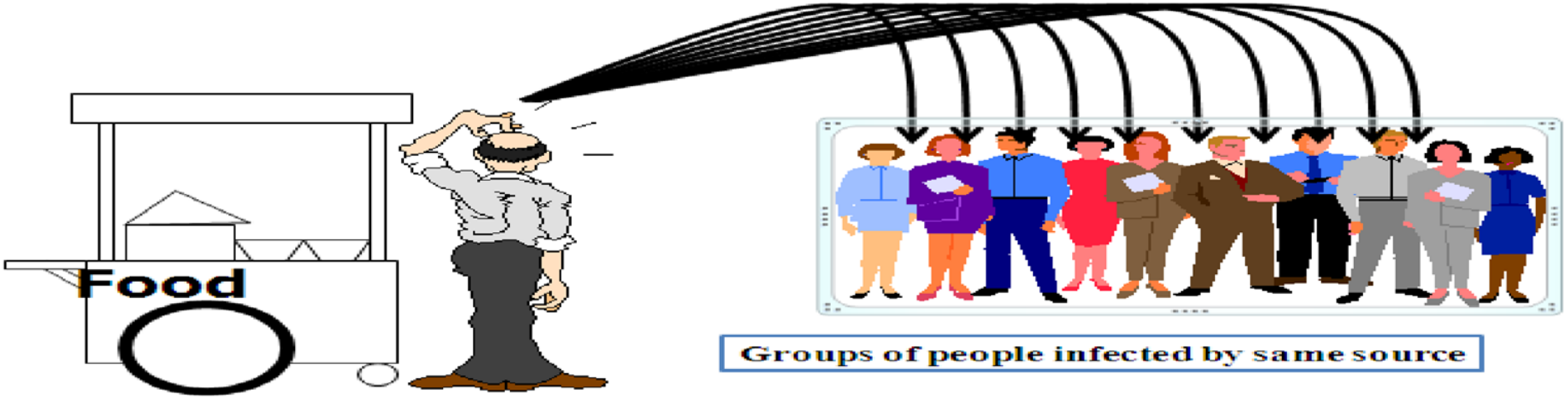
Let us explore the types of outbreaks & their related Epi curves:

1-Common Source Outbreaks

❖ The biggest groups of outbreaks are the **common source outbreaks**, these outbreaks **all began from a single origin**.

❖ The cases of disease arise from a single, shared or 'common' source, such as a batch of bad food, or a contaminated water supply. Controlling the source stops the outbreak.

❖ Common source outbreaks can be further classified based on when the disease appeared.



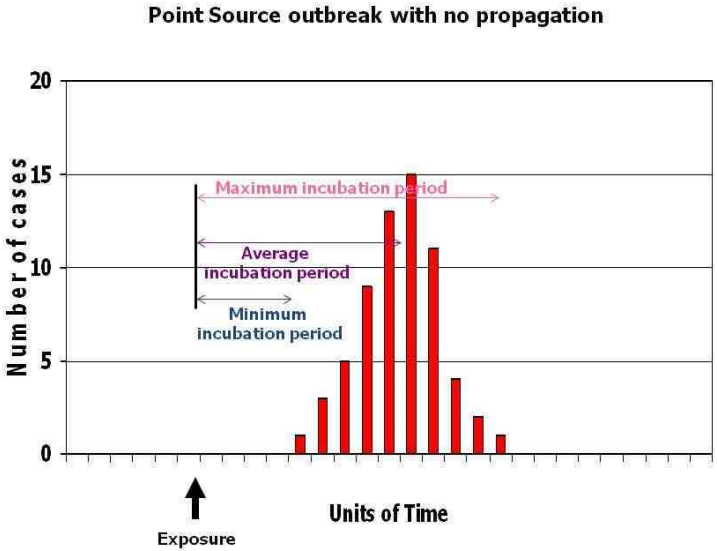
1.1 A point-source outbreak

- It describes a very specific, single event that caused the outbreak.

· Here, all cases appear to occur within one incubation period, suggesting that cases did not arise from person-to-person spread. The outbreak was of short duration suggests that it was a single, short-term (hence "point") exposure that did not persist over time.

- Examples: A restaurant serving burgers from contaminated meat could be the source of a point-source outbreak.

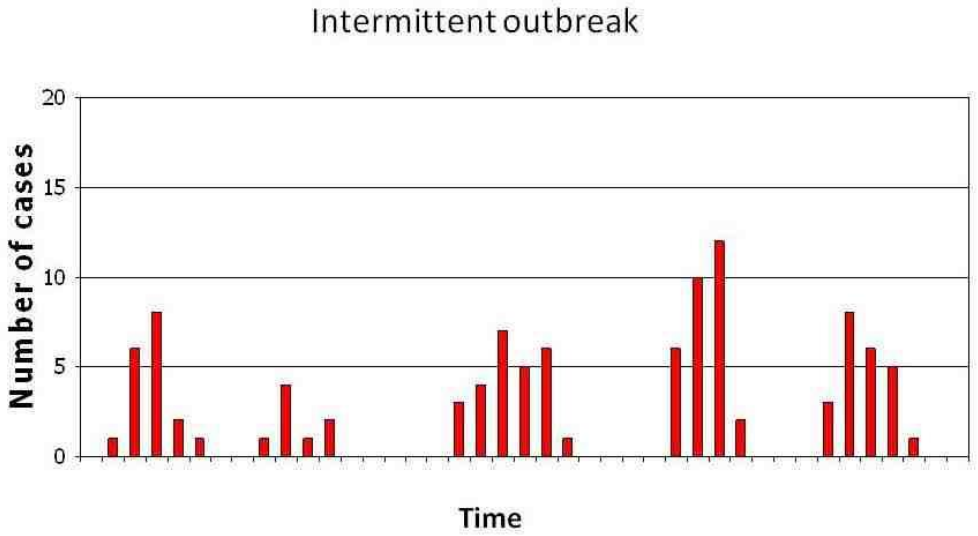
- All of the patients would get sick within a certain time frame, and no others would be affected afterwards.



1.2 An intermittent common-source outbreak

· It is like a series of point-source outbreaks. If the restaurant fails to fix its refrigerator, another wave of patients could contract food poisoning, followed by another, and another.

· It shows multiple peaks

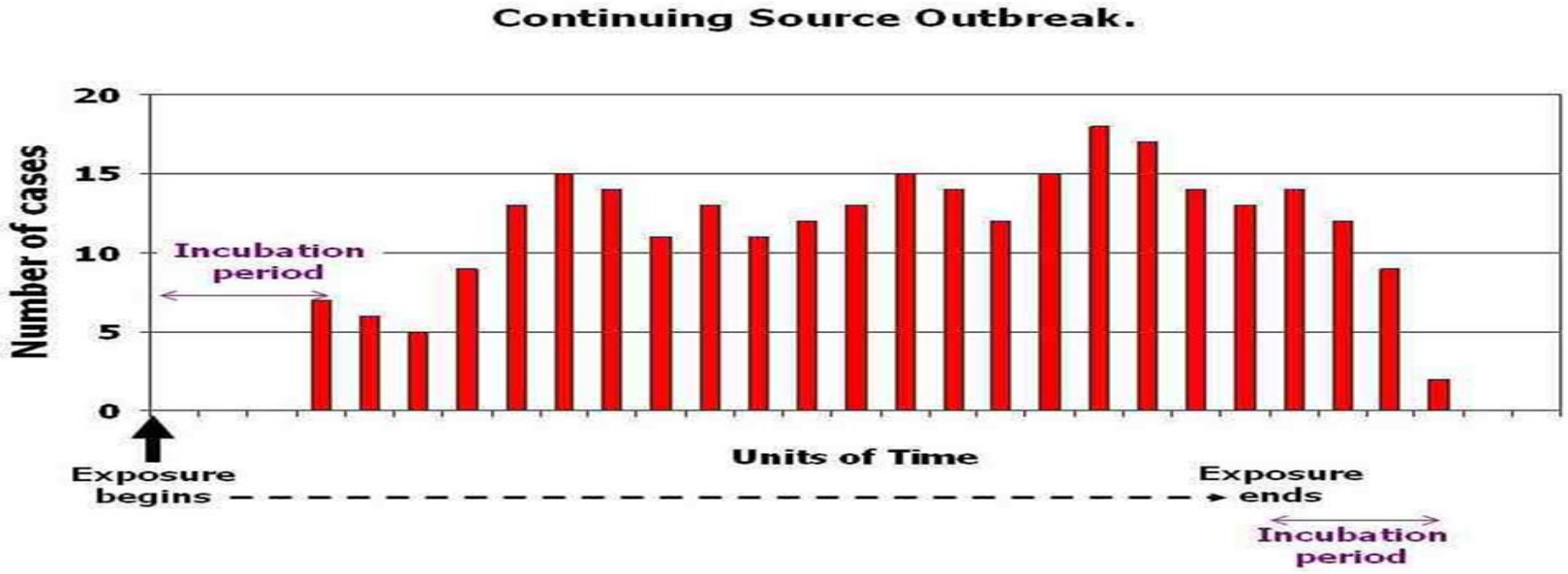


1.3 A continuous common-source outbreak

· It involves a source that causes sickness over time. The source of the illness builds up, making more and more people sick.

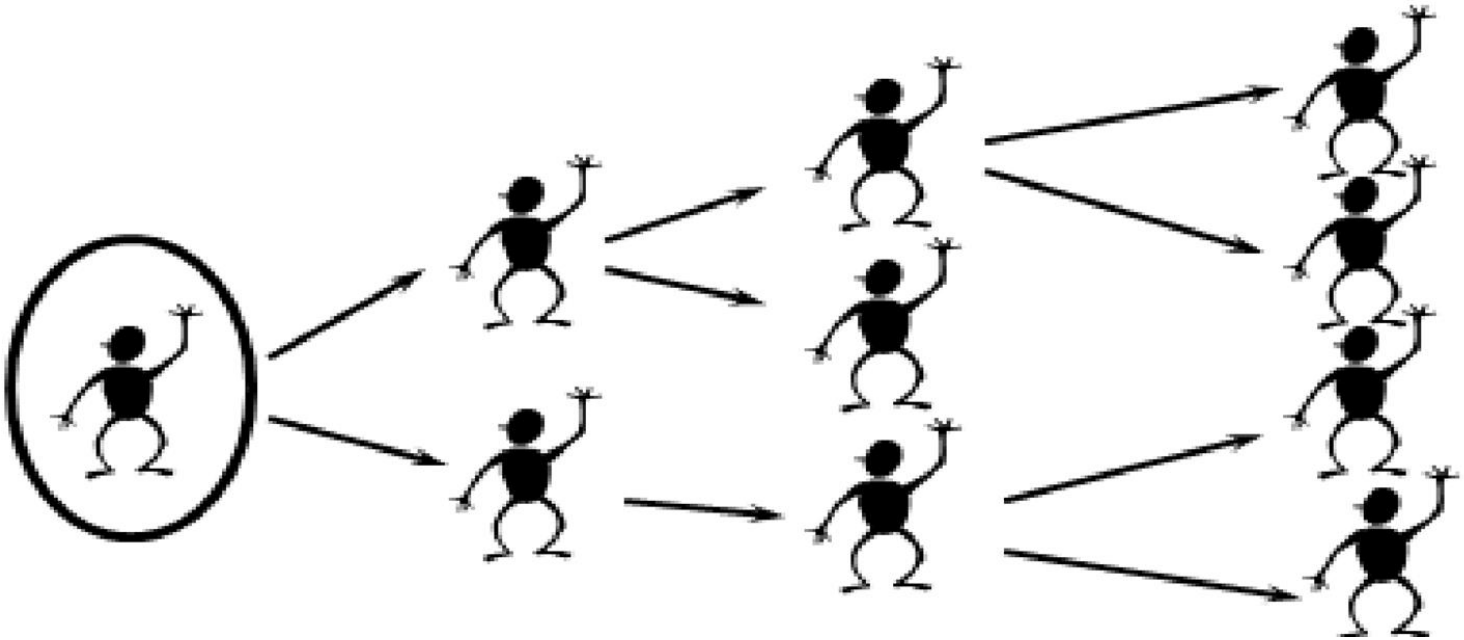
· Pollutants being released into water could cause this type of outbreak. Some people who are more susceptible will become ill immediately, while others will become sick after greater exposure.

· An abrupt increase in the number of cases but, new cases persist for a longer time (plateau)

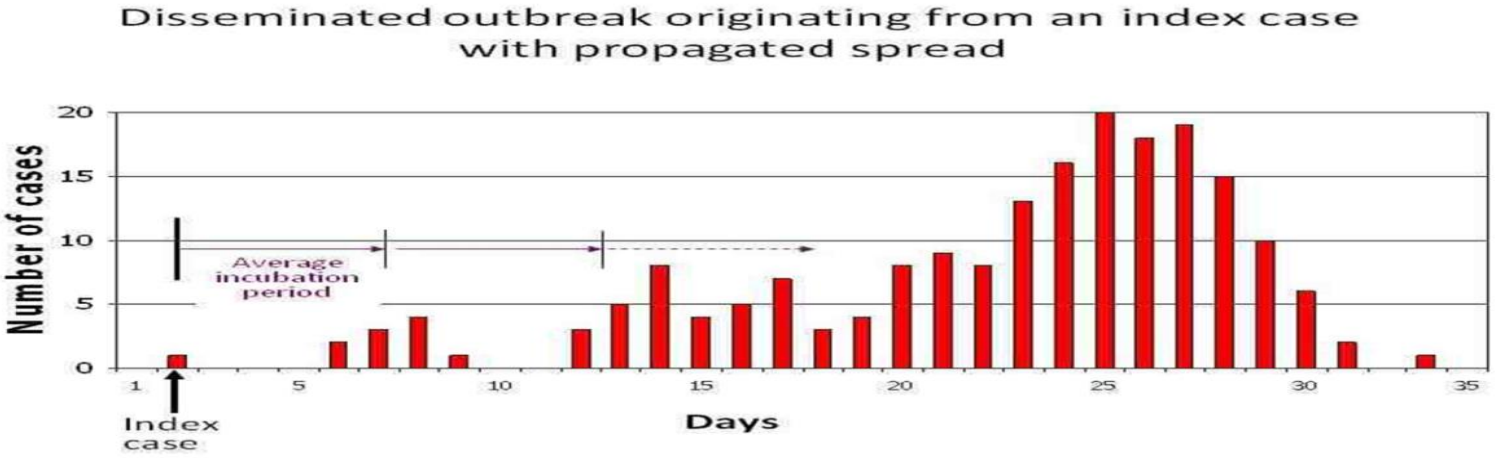


2- Propagated Outbreaks

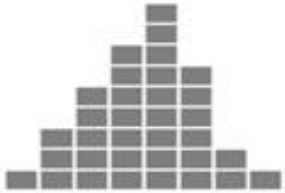
- **Propagated outbreaks** are caused by infections that can be passed from one person to the next.



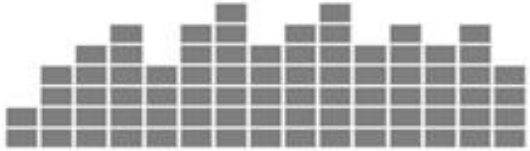
- They begin with an **index case,** the first case, and then spread.
- There are two or more incubation periods during a propagated outbreak, indicating person-to-person spread.
- As time goes on, the number of cases increases. This is because one person can infect two people; those two people can each infect two more, and so on.
- Increase in the number of cases with progressive peaks



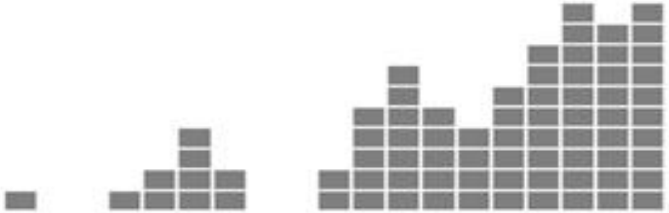
Patterns of epidemic curves



Point source



Continuous source



Propagated source

Intermittent source

Spot map / place in descriptive epidemiology

- In 1854 there was a massive cholera outbreak in Soho, London – in three days over 120 people died from the disease.
- Famously, John Snow plotted the locations of the deaths on a map and found they clustered around a pump in Broad Street
- He suggested that the pump be taken out of service – thus helping to end the epidemic.
- This then helped him formulate his theory of the spread of cholera by dirty water.

John Snow's famous cholera analysis data

Spot map / place in descriptive epidemiology

6-Develop hypothesis

Review signs/symptoms of disease exhibited by cases

- Develop list of all potential risk factors associated with infection.
- Generate hypothesis(es) and select appropriate study design to assess potential risk factors.

7.Evaluate hypothesis

Retrospective cohort study	Case control study
Used if we have a **well-defined population;** if a comprehensive **list** of people that were present during the outbreak is **available**	used when the population at risk is **unknown**, or complete list **unavailable** or is **too large** Like Nationwide food-borne outbreaks.
Enroll everybody in our study in a given population (whether they've been sick or not)	It was hard to know the population at risk, so we can't enroll the entire population in a cohort
Measure of association: **Attack rate** &**Relative risk (RR)**	Measure of association: **Odds ratio (OR)**

Exercise 8: Calculating Attack rates

After a dinner attended by 100 people, 12 individuals become ill. All 100 people are interviewed about their food consumption at the dinner. The interviews show that 8 of the 12 people who are ill and 25 of the 88 who are healthy ate fish.

Calculate the following:

1- Overall attack rate.

2- Food specific attack rates

3- Calculate and interpret the Relative risk

Answer: Draw the 2x2 table

Incriminated Food	**Ill**	**Well**	**Total**
Ate fish	8	25	33
Did not eat fish	4	63	67
Total	**12**	**88**	**100**

1- **Overall attack rate** = Number of new cases/population at risk

Overall attack rate = (12/100)×100=12%

2- **Food specific attack rate (for Fish)** = Number of people who ate the food and became ill

Total number of people who ate the same food

Fish specific attack rate = (8/33) × 100 =24.2%

3- **Attack rate of those who did not eat fish** =

Number of those who did not eat fish & became ill

Total number of people who did not eat fish

Attack rate of those who didn't eat fish = (4/67) × 100 = 5.9% @ 6.0%

4- **Relative risk** = Incidence among exposed/ Incidence among non-exposed = 24.2 / 6 = 4

Interpretation:

Those who ate fish were at risk of getting sick 4 times more than those who did not eat fish. Therefore, fish was the incriminated item in this outbreak

Case control study design (example):

Several college students presented with GI-related symptoms thought to have been associated with food served in the cafeteria

Hypothesis: Contaminated macaroni salad was source of the GI infection.

Exposure status	Cases	Controls
Ate salad	12	4
Did not eat salad	6	14

$$OR = \frac{12 / 6}{4 / 14}$$

OR = 7.0

8.Refine hypothesis, carry out additional studies

Consider what questions remain unanswered and

what kind of study to be used

9.Implement control, prevention measures

Initial control measures

--- **Interrupt transmission** from suspected reservoir

- When multiple control measures are possible, select those most effective for interrupting the epidemic, ease of implementation, expense, and safety.

--- Engineering changes (e.g. Destroy contaminated food) are usually easier to implement than behavioral changes (e.g. alter food practices).

- Conduct follow-up studies to assess whether the incidence of illness has been reduced.

10.Communicate findings

Prepare report:

- Prepared after control measures have been instituted and effectiveness has been evaluated.
- Report typically describes:

--- Extent of outbreak

--- Results of investigation

--- Control measures implemented

--- Effectiveness of control measures

11.Initiate or maintien surveillance

- Once control and prevention measures have been implemented, they must **continue to be monitored**.
- If surveillance has not been ongoing, now is the time to initiate active surveillance.
- If active surveillance was initiated as part of case finding efforts, it should be continued.

Health Care associated infections and infection prevention and control

Health care associated infections

- **Health care associated infections (HAIs):**are infections which occur on attending hospital or **any** healthcare facility to receive **any** type of medical service (**preventive/curative**). These infections were **neither present nor incubating** at the time the patient was initially attending the health care facility and appears after **72hours** of admission.

- **Magnitude of the problem**: The **incidence, type and magnitude** of HAI vary from hospital to hospital; it is estimated to be around **10%** of hospital admissions. Given the prevailing unhygienic conditions in hospitals in developing countries, this is likely to **increase.**

Burden of the problem:

- They are considered major causes of
  - Enhanced (aggravated) morbidity.
  - emotional stress,
  - prolonged stay in hospitals, and
  - mortality,
- They also account for a significant **economic** burden.

Chain of Infection

Next Sick Person

(Susceptible Host)

- Babies
- Children
- Elderly
- People with a weakened immune system
- Unimmunized people
- Anyone

Germs

(Agent)

- Bacteria
- Viruses
- Parasites
- Fungi

How Germs Get In

(Portal of Entry)

- Mouth
- Cuts in the skin
- Eyes

Where Germs Live

(Reservoir)

- People
- Animals/Pets (dogs, cats, reptiles)
- Wild animals
- Food
- Soil
- Water

Germs Get Around

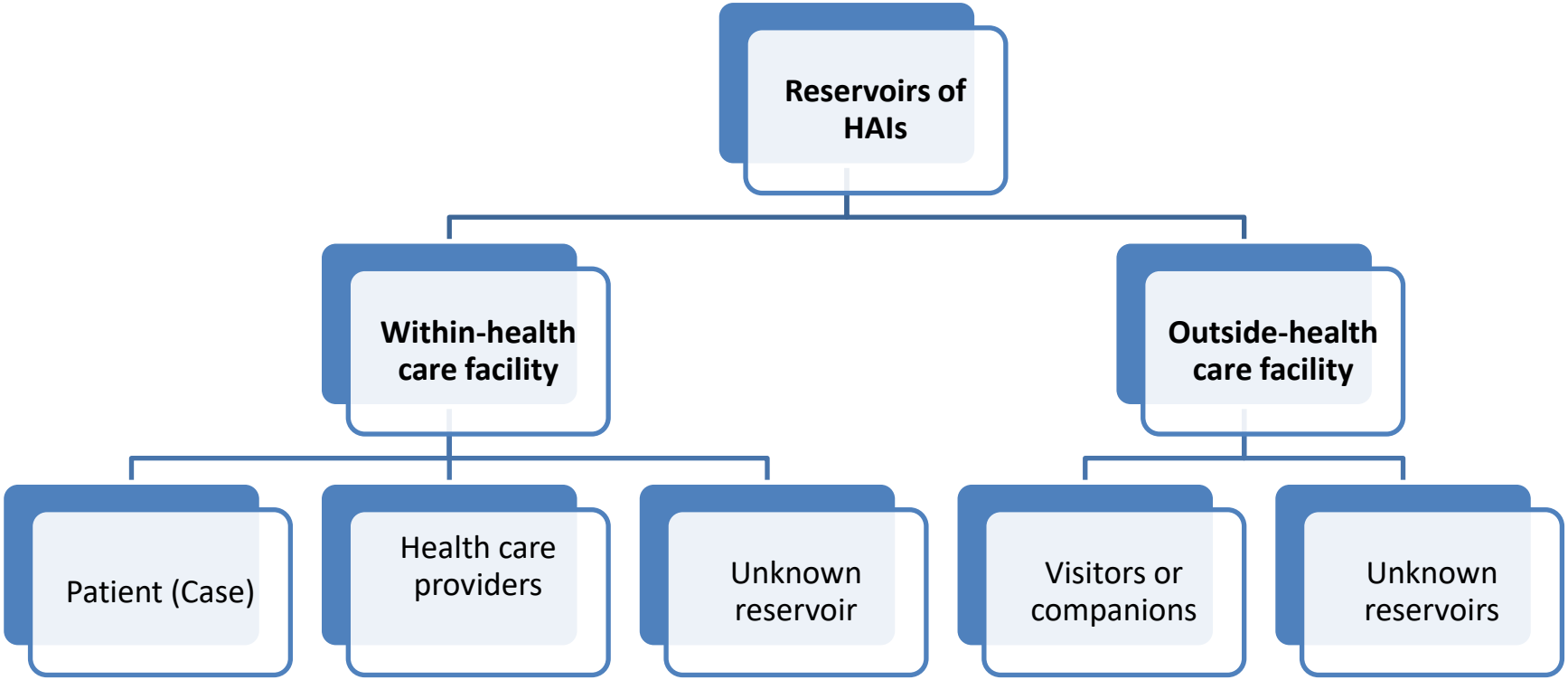
(Mode of Transmission)

- Contact (hands, toys, sand)
- Droplets (when you speak, sneeze or cough)

How Germs Get Out

(Portal of Exit)

- Mouth (vomit, saliva)
- Cuts in the skin (blood)
- During diapering and toileting stool)


Reservoirs of HAIs
Within-health care facility
Outside-health care facility
Patient (Case)
Health care providers
Unknown reservoir
Visitors or companions
Unknown reservoirs

I. Within-health care facility reservoirs:

- **Patient (Case):** may infect
  - Himself (**autoinfection**).
  - Others.

- **Health care providers :**

  a) Reservoir role: a case (mild or unapparent) or carrier.

  b) Third-person role (not reservoir): infection is carried on contaminated **hands, clothing, or footwear**.

- **Unknown reservoir** *:* the patient may be infected through **insanitary health care facility environment** e.g. improperly sterilized linen or medical equipment

II. Outside-health care facility reservoirs:

- **Visitors or companions:**
  - **reservoir role** when anyone is a case (mild or unapparent) or carrier.
  - They may also play **non-reservoir role,** through food they carry to patients or using their unclean contaminated hands in feeding the patient.

- **Unknown reservoirs:**

Infection may be indirectly carried by vehicles and vectors of insanitary surrounding environment.

Modes of Transmission

- **Most commonly:**
  - Contact(most common).
  - Injection.
  - Inhalation infections.
- **Occasionally:**
  - Food born.
  - Arthropod born.

Causative organisms:

- Any type of organisms:
  - bacterial,
  - viral,
  - parasitic
  - fungal.
- However, the most considered are the **three blood borne** viral infections;
  - HBV,
  - HCV,
  - human immunodeficiency virus (HIV).

Forms of HAIs Infections:

- Common community infections: may also occur in health care facilities e.g. influenza, diarrhea
- Particular infections: vary according to the **scope** of services provided by the health facility

Prevention of HAIs

A. Effective Infection Control Committee
B. Measures for the Health Care Providers (HCP)
- ❖ Standard precautions
- ❖ Transmission based precautions

C. Surveillance of HAIs
D. Sanitary Environment
E. Sterilization and Asepsis
F. Chemoprophylaxis for the patients
G. Administrative Regulations

Prevention of HAIs

A. Effective Infection Control Committee (ICC):

- Infection control committee should be developed in any health care facility that has inpatient departments of ***more than 30 beds.***

- The ICC should be made up of ***key personnel*** from various health facility departments with the ***director*** or his deputy to ensure commitment.

- The ICC has to set **policies and regulations**, **train** HCWs, and **monitor** the performance in prevention and control of hospital infection.

Prevention of HAIs

A. Effective Infection Control Committee
B. Measures for the Health Care Providers (HCP)
- ❖ Standard precautions
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C. Surveillance of HAIs
D. Sanitary Environment
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F. Chemoprophylaxis for the patients
G. Administrative Regulations

B. Measures for the Health Care Providers (HCP):

1. **Free of infection:**

   pre-employment and periodic examination and medical investigations (chest X ray, nose and throat swabbing are particularly important).

   When infectious case is **suspected: segregated** until proven free of infection.

2. **Protection** by **active immunization** , chemoprophylaxis or seroprophylaxis when necessary.

Recommended vaccination for HCWs:HBV, influenza ,chickenpox, meningococcal and other according to conditions and individual variations

.

B. Measures for the Health Care Providers (HCP):

3. **Management** of occupational exposures to infections, and monitoring infections among them (will be discussed with further details later).

4. **Education and training:** about the infection prevention and control standards "**Standard Precautions** and **Transmission-based precautions**" , together with **supervision** at work.

Definitions :

Infection prevention and control (IPC): is a practical, evidence-based approach which prevents **patients** and **health workers** from being harmed by avoidable infection and as a result of antimicrobial resistance.

Standard precautions :are the **minimum** infection prevention and control practices that must be used at all times in any setting where health care is delivered for all patients, **regardless** of suspected or confirmed status of the patient.

Transmission-based precautions: are based upon the mode of transmission of the infectious agent**.** For patients **known** or **suspected** to have infectious diseases or particularly susceptible to infection .

Standard Precautions include at least five items:

1) Hand hygiene: single most important practice

2) Use of personal protective equipment

3) Safe injection practices

4) Safe handling of potentially contaminated equipment or surfaces

5) Respiratory hygiene

1)Hand Hygiene

- In health care settings, the most common mode of transmission of pathogens is via hands.
- Healthcare workers can contaminate their hands by doing simple tasks, including:
  - Taking a patient's blood pressure or pulse.
  - Touching the patient's gown or bed sheets.
  - Touching equipment like bedside rails, over-bed tables, IV pumps.
- Good hand hygiene is the simplest, most effective measure for preventing HAIs.

Before performing hand hygiene :

A. Expose forearms .
B. Remove **all** hand and rest jewelry.
C. Ensure fingernails are clean and short .
D. Cover **all** cuts and apparitions with waterproof dressing .

Types of hand hygiene :

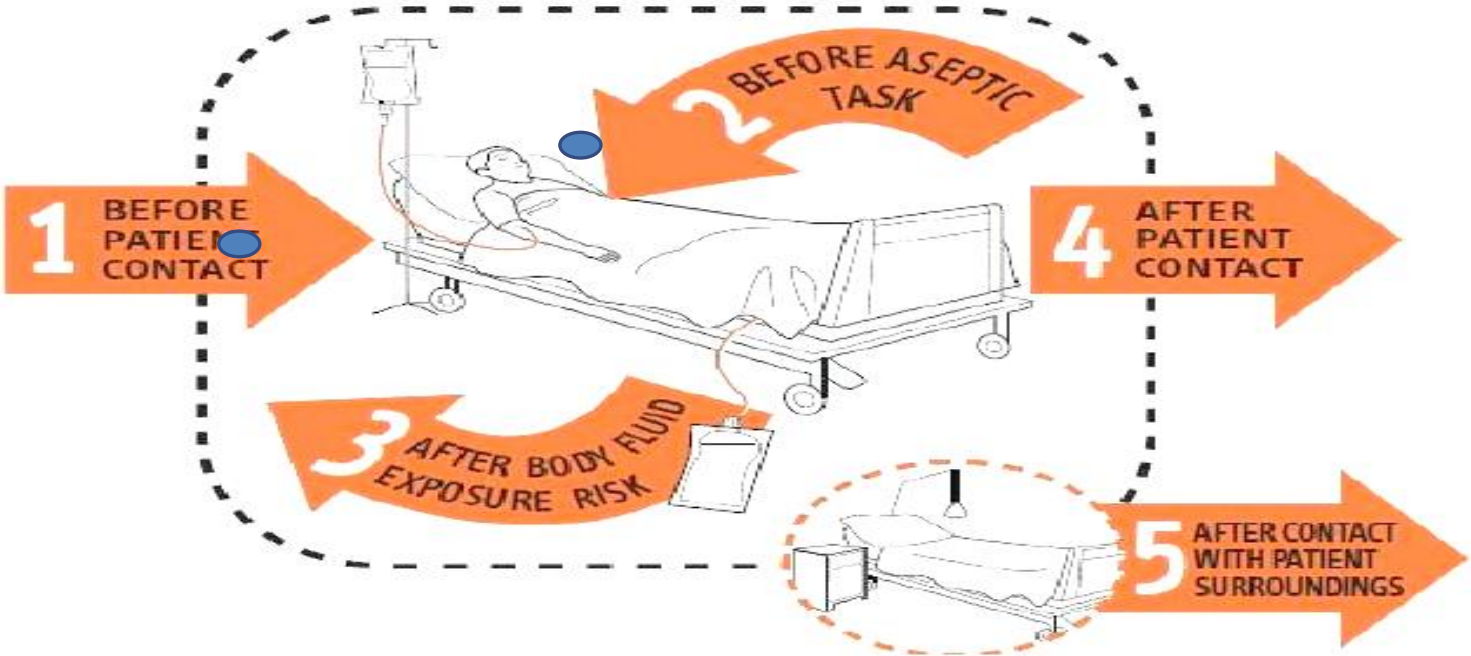
A. Routine hand wash.
B. Antiseptic hand wash.
C. Alcohol-based handrub.
D. Surgical hand hygiene(scrub).

Hand hygiene: Definitions

Definitions:

- **Hand hygiene:** Performing hand washing, antiseptic hand wash, alcohol-based hand rub, surgical hand hygiene/antisepsis.
- **Routine/** traditional **hand washing:** Washing hands with plain soap and water
- **Antiseptic hand wash:** Washing hands with water and antimicrobial soap or other detergents containing a **licensed antiseptic** agent.
- **Alcohol-based hand rub/waterless hand rubs:** Rubbing hands with an 60% alcohol-containing preparation as an alternative to routine hand washing with soap and water.

Your 5 moments for HAND HYGIENE



SOAP & WATER ROUTINE HAND WASH

- Hands are visibly soiled (dirty)
- Hands are visibly contaminated with blood/body fluids
- Before eating
- After using the restroom

WATERLESS (ALCOHOL-BASE) HAND RUB

- ❖ Before and after having direct contact with patients
- ❖ After touching equipment or furniture near the patient
- ❖ After removing gloves

For routine medical hand washing6 movements, repeat each 5 times

1 Palm to palm

2 Right palm over left dorsum and left palm over right dorsum

Back of hands

3 Palm to palm fingers interlaced

Between fingers

4 Backs of fingers to opposing palms with fingers interlocked

5 Rotational rubbing of right thumb clasped in left and vice versa

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

Finger tips | **Thumb and wrists** | **Nails in the palm of the hand**

NB: Do not use a waterless hand-rub when hands are **visibly** soiled or contaminated with blood or body fluids**.**

NB: Alcohol kills organisms by withdrawing water from them while drying off the skin. So, **leave the alcohol to dry off your skin** and do not wash it or dry it yourself.

Do not wash gloves

Do not wear the same pair of gloves for the care of more than one patient

Remove gloves after caring for a patient

The use of gloves does not eliminate the need for hand hygiene

Wear gloves when contact with blood or other potentially infectious materials is possible

Encourage patients and their families to remind HCWs to practice hand hygiene

Surgical hand wash / Hand scrub:

To wash the hands and forearms (till elbows) very thoroughly using an antiseptic and water.

To scrub implies the use of a soft brush or sponge (and often an implement to clean under the nails).

Surgical hand wash

- Before any surgical procedure.
- Before invasive procedures to sterile areas of the body e.g. central IV line.
- Before invasive procedures to immune- deficient patients e.g. canula
- Before IV solutions preparations.

Standard Precautions include at least five items:

1) Hand hygiene: single most important practice

2) Use of personal protective equipment

3) Safe injection practices

4) Safe handling of potentially contaminated equipment or surfaces

5) Respiratory hygiene

Personal Protective equipment:

Gloves, Eyewear (goggles, face shields, masks), Apron, head cover, closed shoes or rubber boots

Before examining any patient, for any procedure, you should:

1. **Wash Hands** properly and thoroughly between patient contact and other contact with body fluids or soiled equipment.

2. **Use of personal protective equipment:**

✓**Wear gloves** while handling blood, body fluids, nonintact skin or soiled items. Change gloves between patients. **Wash hands after** removing gloves.

Before examining any patient, for any procedure, you should:

✓**Wear Mask** with eye protection or face shield to protect mucous membranes of the eyes, nose and mouth when likely to be splashed.

✓**Wear Gown** to protect skin and prevent soiling of clothing when likely to be splashed or sprayed. Wash hands after removing gown.

Standard Precautions include at least five items:

1) Hand hygiene: single most important practice

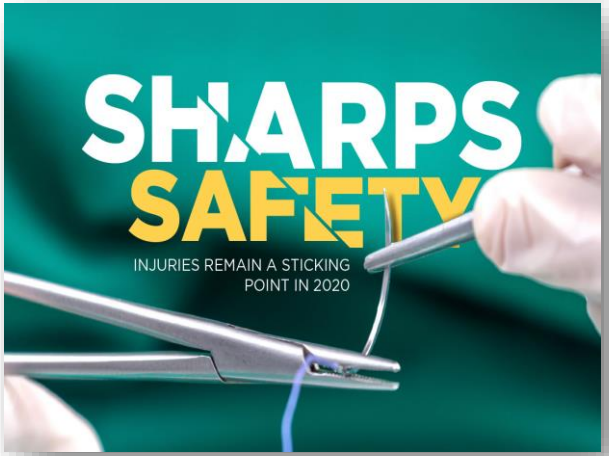
2) Use of personal protective equipment

3) Safe injection practices

4) Safe handling of potentially contaminated equipment or surfaces

5) Respiratory hygiene

3)What are sharps?



“Sharps” means needles, syringes, blades, laboratory glass, or other such objects capable of causing punctures or cuts.

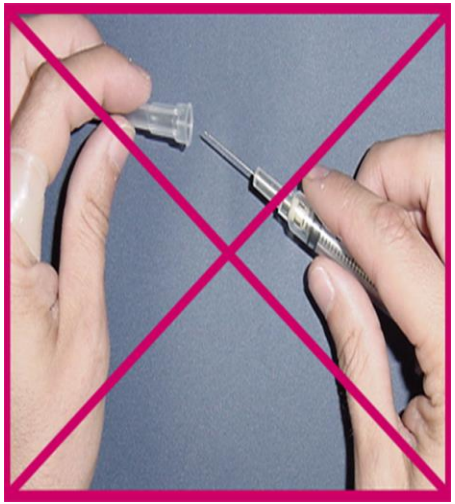
“Biomedical Waste Sharps” means sharps that have been in contact with human or animal tissue, blood, secretions or excretions.

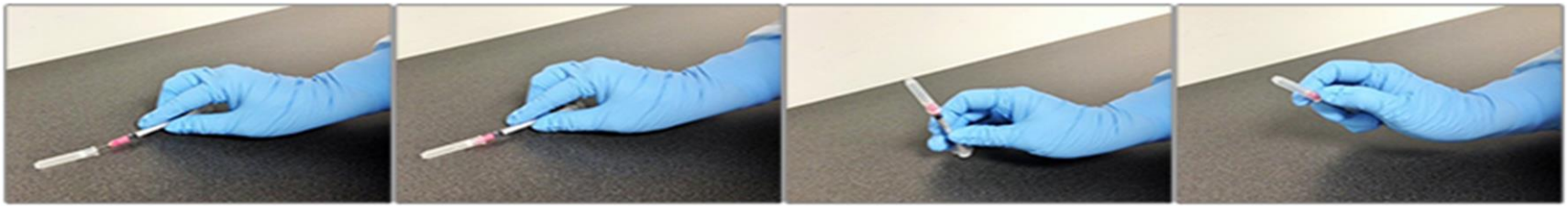
Guidelines for the Safe Handling of Sharps

1. Use caution when handling sharps to avoid auto-inoculation:

- **Don't recap** needles (use one hand technique if a must).
- **Don't remove, bend or break needles.**
- **Don't** pick up broken glass or other sharps (even if non-contaminated) with your hands or gloved hands; use mechanical means such as forceps.

2. For work with biological agents: The use of needles, syringes, and other sharp objects to be strictly limited.





First, place cap on a level horizontal surface; gently slide needle half-way into cap...

Then, slowly tip up needle end of the device and allow cap to slide over needle...

Finally, use the thumb of the hand holding the device to secure the cap on the syringe.

Guidelines for the Safe Handling of Sharps

3. Use safety-engineered or disposable sharps.

4. All sharps, including safety-engineered sharps, must be properly disposed in sharp boxes/puncture resistant (they should be disposed when they are 2/3 full and in red bags and labeled)

1 Visually check sharps container for hazards before handling. Read all labels.

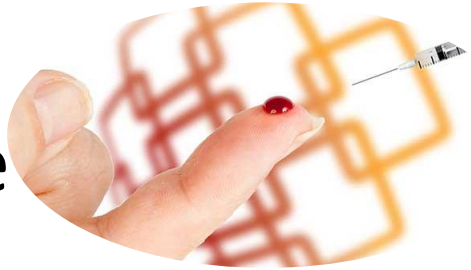
MAKE SURE
container is not overfilled or damaged.

CHECK
that container is large enough to fit your sharp.

2 Put sharp in container immediately after use.

Keep your hands behind the sharp tip.

Protocol to be followed after a needle stick injury/blood exposure



1. First aid:
   - Contaminated Wound - Encourage bleeding from the skin wound and wash the injured area with copious soapy water, disinfectant, scrub solution or water.
   - Contaminated Intact Skin - Wash the area with soap and water.
   - Contaminated Eyes - Gently rinse the eyes while open with Saline or water.
   - Contaminated Mouth - Spit out any fluid - rinse the mouth with water and spit out again.
2. Report accident

Protocol to be followed after a needle stick injury or blood exposure, cont.

3. Blood testing for both the source patient and the exposed HCW

   HIV, HCV, HBV

4. Immediate action PEP for HIV within 72 hrs after exposure(if indicated) with 3 antiretroviral HIV medications for 28 days.

Protocol to be followed after a needle stick injury or blood exposure, cont.

5. Further actions

Eligibility for PEP for HBV

Exposed person status	Recommended action
Unvaccinated	Administer HBV immunoglobulin within 48 hours of exposure Initiate full HBV vaccination schedule, as soon as possible
Vaccinated; anti-HBs level ≥ 10 mIU/ mL	Reassure the individual No specific post-exposure prophylaxis
Vaccinated; anti-HBs level ≤ 10 mIU/ mL	Administer HBV immunoglobulin Administer one dose of HBV vaccine and plan to re-vaccinate
Vaccinated; anti-HBs levels not known	Test for anti-HBs levels and take appropriate recommended action
HBsAg positive (HBV carrier)	Counsel the individual No specific PEP

Protocol to be followed after a needle stick injury or blood exposure, cont.

6. Follow up

- Complete the course of hepatitis vaccine(if indicated)
- Follow up HIV serology 1-3-6 months

NB: Risk after needle stick injury for :

- HIV is less than 1 %
- HCV is 1.8% **(No PEP)**
- HBV is : 0% if previously vaccinated with persistent immunity and up to 30 % if unvaccinated

Standard Precautions include at least five items:

1) Hand hygiene: single most important practice

2) Use of personal protective equipment

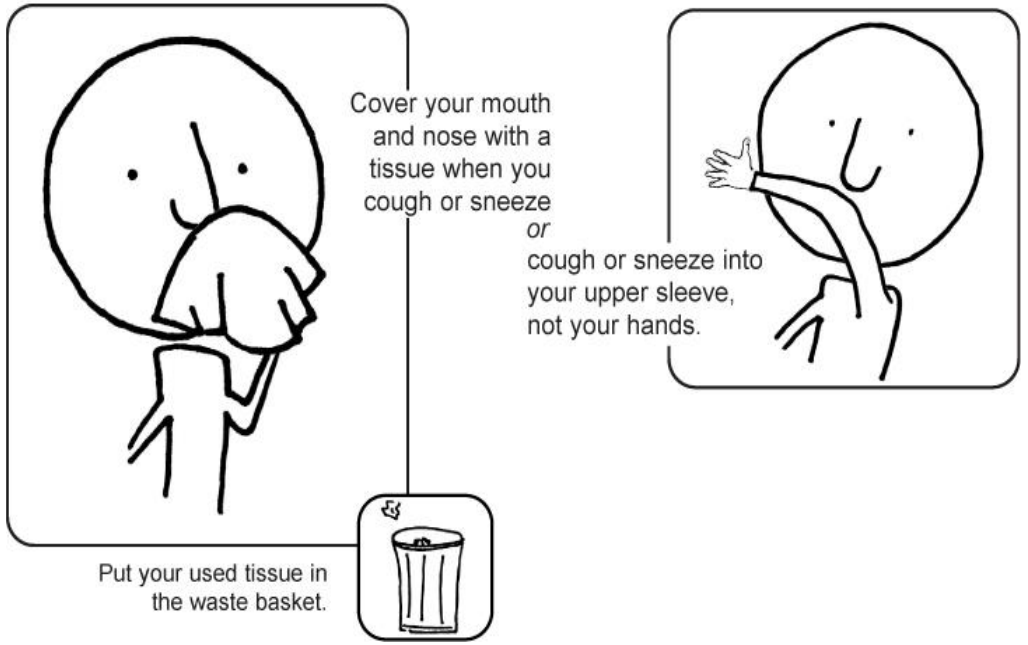
3) Safe injection practices

4) Safe handling of potentially contaminated equipment or surfaces

5) Respiratory hygiene

5)Respiratory hygiene and cough etiquette:

- Do not cough or sneeze in the face of others or in your hand, but into a **tissue** and **immediately** throw it in the trash.
- If you do not find a tissue, do it in the **sleeve of your upper arm.**



Respiratory Hygiene and cough Etiquette

Transmission-based precautions

	Mode of Transmission	Personal Protective Equipment (PPE)	Room Type
Contact	Prevent transmission of infections spread by direct or indirect contact with the patient or patient's environment	Gown and Gloves	Single-Patient Room
Droplet	Prevent transmission of infections spread via air droplets by coughing, sneezing, talking, or close contact with respiratory secretions/mucous membranes	Surgical Mask	Single-Patient Room
Airborne	Prevent transmission of infections that remain infectious over long distances when suspended in the air	N95 or Higher Level Respirators	Airborne Infection Isolation Room (AIIR) Negative Pressure, Special Ventilatio

Prevention of HAIs

A. Effective Infection Control Committee
B. Measures for the Health Care Providers (HCP)
- ❖ Standard precautions
- ❖ Transmission based precautions

C. Surveillance of HAIs
D. Sanitary Environment
E. Sterilization and Asepsis
F. Chemoprophylaxis for the patients
G. Administrative Regulations

C. Surveillance of HAIs:

- Same principles of public health surveillance can be applied to the health care facilities (hospital surveillance is essentially ***active and Lab. based***).
- So, active surveillance is essential for early case-finding on regular health appraisal and supervision of hospitalized cases: to screen, diagnose, proper management any who has acquired infection.

D. Sanitary Environment :

– **Sanitary health care facility environment**, including :

- Sanitary handling, treatment and **disposal of biomedical waste.**
- **Disinfection of air** of operating theaters, premature units, and certain laboratories and wards, when necessary: by ultraviolet radiation.

– **Sanitary surrounding area:**

- a suitable area, all around the health facility must be clean, and free of breeding places of insects, rats, dust & waste collections.

E. Sterilization and Asepsis:

- Must be strictly followed throughout all processes that may be associated with the risk of infection.

6. Chemoprophylaxis for the patients:

- it is valuable *only under certain circumstances* of unsatisfactory fulfillment of asepsis, and unavoidable risk of infection.

7. Administrative Regulations:

Needed to:

- Ensure adherence to infection control rules; staff performance, sterilization and asepsis.
- Control of hospital visits, companions.

checklist for water purification plant-E

- **A comprehensive audit of a drinking water treatment plant in Egypt should include checks on raw water sources, treatment processes, storage and distribution, water quality monitoring, and operational procedures. It's crucial to verify compliance with Egyptian standards (No-458/2007) and WHO guidelines.**

Here's a detailed checklist:

I. Raw Water Source and Intake:

- **Source Assessment:**

Verify the source's suitability (groundwater, surface water) and identify potential sources of contamination.

- **Intake Structure:**

Check the design and maintenance of intake structures to prevent debris and other materials from entering the treatment process.

- **Raw Water Quality:**

Review records of raw water quality testing and compare with relevant standards.

- **Sampling Points:**

Ensure proper placement and accessibility of sampling points for raw water.

II. Treatment Processes:

- **Process Design:**

Verify that the treatment process is appropriate for the raw water quality and complies with design specifications.

- **Chemical Addition:**

Check the calibration and proper functioning of chemical dosing systems for coagulation, disinfection, etc.

- **Filtration:**

Inspect filters (sand, membrane, etc.) for proper operation, backwashing procedures, and media condition.

- **Disinfection:**

Verify the effectiveness of disinfection processes (chlorination, UV, etc.) and monitor residual chlorine levels.

- **Sludge Management:**

Assess the handling and disposal of sludge generated during treatment.

III. Storage and Distribution:

- **Storage Tanks:**

Check the condition of storage tanks, including cleaning schedules and potential for contamination.

- **Distribution Network:**

Inspect the distribution network for leaks, dead ends, and potential cross-contamination.

- **Pressure Management:**

Verify proper pressure regulation within the distribution network to prevent backflow and contamination.

- **Sampling Points:**

Ensure adequate and representative sampling points throughout the distribution network.

IV. Water Quality Monitoring:

- **Monitoring Plan:**

Review the established water quality monitoring plan and its alignment with Egyptian and WHO standards.

- **Testing Frequency:**

Verify that water quality parameters (e.g., turbidity, pH, chlorine residual, bacteria, etc.) are tested at the required frequency.

- **Testing Methods:**

Ensure that appropriate testing methods are used and that staff are trained on their use.

- **Record Keeping:**

Check the maintenance and accuracy of water quality monitoring records.

- **Corrective Actions:**

Verify that corrective actions are taken when water quality parameters exceed acceptable limits.

V. Operational Procedures:

- **Standard Operating Procedures (SOPs):**

Review the SOPs for all treatment processes and ensure they are up-to-date and followed.

- **Maintenance Schedules:**

Check the implementation of preventative maintenance schedules for equipment.

- **Staff Training:**

Verify that staff are adequately trained on all aspects of plant operation and maintenance.

- **Safety Procedures:**

Assess the implementation of safety procedures for plant personnel.

- **Emergency Procedures:**

Review emergency procedures for handling incidents like power outages or chemical spills.

VI. Hygiene and Sanitation:

- **Plant Hygiene:** Assess the overall hygiene and sanitation of the plant, including waste management and pest control.
- **Personal Hygiene:** Verify that staff adhere to personal hygiene practices.

VII. Documentation and Reporting:

- **Record Keeping:**

Review the maintenance and accuracy of all records related to plant operation, maintenance, and water quality monitoring.

- **Reporting:**

Verify that reports on water quality and plant performance are submitted to relevant authorities as required.

- **Compliance:**

Ensure that the plant is compliant with all relevant Egyptian regulations and standards.

Environmental Checklist

No	Checklist point	Observation	Comment
١	الموقع الخارجي والبيئة المحيطة والتأثير البيئي ***Plant location and its surroundings***		
٢	حالة المباني داخل الشركة ***Building structure (good-danger-damaged)***		
٣	الممرات داخل العنابر خالية من المعوقات والأضرار ***Workplace environment free from hazards***		
٤	هل توجد مواد قابلة للإشتعال؟ ***Hazardous or combustible material/ condition noticed***		
٥	مدى توافر معدات الوقاية الشخصية وطرق صيانتها ***PPE (personal protective equipment) :availability – used-maintained***		
٦	المخازن خالية من التعرضات الضارة مثل الغازات، الأتربة ، الأبخرة والكيماويات ***General housekeeping conditions: Free from gases-dust-chemicals or fumes***		
٧	النظافة الشخصية للعاملين وحالة دورات المياه وتوافر المنظفات ***Personal Hygiene***		
٨	مدى توافر طفايات الحريق وتاريخ المتابعة الدورية وصيانتها وتدريب العاملين عليها وهل توجد وسائل إطفاء ذاتية؟		

Comment	Observation	Checklist point	No
		التعرضات الفيزيائية مثل الحرارة، الرطوبة، الضوضاء، الإهتزازات وقياساتها ***Physical hazards as temperature-lightening-noise and vibration in offices-workplaces-toilets – general areas***	٩
		التوصيلات الكهربائية ومدى سلامتها في الشركر عامة ***Electrical outlets and wiring are safe in administrative area and work departments***	١٠
		التهوية داخل الشركة (طبيعية، صناعية (طرد- شفط) في جميع العنابر والإدارات ***Proper air quality through ventilation (Natural-propellant or exhaust) in administrative area and work departments***	11
		خطة التخلص من النفايات ***Waste management plan***	12
		السجل البيئي للشركة ***Environmental records keeping (control pollution levels)***	13
		عينات جودة المياه (مطابقة للمواصفات) ***Water quality sample***	14
		خطة تدريب العاملين ***Staff training programs***	15
		خطة إخلاء وطوارئ عند الأزمات والكوارث	16
		الإسعافات الأولية والتدريب عليها ***1st. Aid plan & training***	17