Nosocomial Infection (Hospital-Acquired Infection)

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Nosocomial infection

- An infection acquired in hospital by a patient who was admitted for a reason other than that infection.
- An infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission.
Impact of hospital-acquired infections

- Serious illness or death
- Prolonged hospital stay, which costs money
- Increasing the time of absence from work
- Need for additional antimicrobial therapy, which is costly and expose the patient to additional risks of toxicity
- The infected patient becoming a source from which others may become infected.
Sources of infection

The sources of hospital-acquired infection may be:

1- An endogenous source (patients own flora)

Patients own flora may cause infections in different tissues of the patient during certain surgical operations, manipulation by instruments, or nursing procedures.

https://www.google.com/search?q=Nosocomial+infection&source
2- An exogenous source: Is most important and occurs mostly from:

- Another patient
- A member of the medical and paramedical staff harboring the pathogens
- From the environment. includes inanimate objects (e.g., catheters), bed pans, and surfaces contaminated by the patient’s secretions. It also includes hospital food, water, and environmental air.
Microorganisms causing infections

- **Gram-positive organisms** like *Streptococcus pyogenes* and *methicillin-resistant Staphylococcus aureus* (MRSA).
- **Gram-negative enteric pathogens** including *Escherichia coli*, *Klebsiella*, *Enterobacter species*.
- **Pseudomonas and Acinetobacter species** developing resistance to most of the commonly used antibiotics.
- Many different viruses, fungi and parasites
The hospital staff did this to you?

No, the hospital staph.
Transmission of infections

Infections can be transmitted by following ways:

- **Air-borne transmission**: Hospital infections may be transmitted by
  - Air-borne droplets, dust particles, and aerosols.
  - Aerosols produced by humidifiers, and air conditioning apparatus

- **Transmission by direct contact**: is the principal route of transmission
  - Direct contact with hands and clothing's of medical personnel harboring microorganisms
  - Contact with certain hospital instruments (e.g., endoscopes)
Transmission by oral route
Transmission by hospital foods served to hospitalized patients.

Transmission by parenteral route
Blood-borne pathogens, such as hepatitis B and C and HIV, may be transmitted by transfusion of blood or blood products.
Common types of hospital-acquired infections

1- Urinary tract infections
- Account for as many as 40–45% of nosocomial infections.
- Associated with indwelling bladder catheters, which create a 3–10% risk of infection each day.

2- Nosocomial pneumonia
- Accounts for 15–20% of nosocomial infections.
- Caused by aspiration of endogenous or hospital-acquired oropharyngeal flora.
- Associated with more deaths than are infections at any other body site.
3- Surgical wound infections

- Account for nearly 30% of all hospital infections.

- These occur in up to 10% of patients undergoing clean surgery.

- Result from contamination of the surgical wound with the patient’s own flora or that of operating-room personnel or environment at the time of the surgery.
Diagnosis of infections

Diagnosis of hospital-acquired infections is made by:

- **Routine bacteriological methods**, such as
  - Direct demonstration of microorganisms in specimens by microscop.
  - Isolation by culture.
  - Testing bacterial isolates for their antibiotics sensitivity pattern.

- The specimens are usually sampled from possible sources of infections, such as environment, inanimate objects, water, air, food, hospital personnel, etc.
Prevention of hospital-acquired infections

- Compliance with hand washing protocols.
- Use of aseptic technique for insertion of intravenous and urinary catheters.
- Compliance with guidelines on antimicrobial use.
- Proper patient care.
- Short hospital stays.
- Early removal of invasive devices.
- Isolation of infectious patients.
- Staff vaccination
- Adequate sterilization and disinfection of surgical instruments
- Active surveillance for hospital-acquired infection.
Distribution of areas missed during hand washing.
(Ref: Taylor L., SRN, SCM. An evaluation of hand washing techniques. Nursing Times, Jan 1976.)
References

