Community acquired infections

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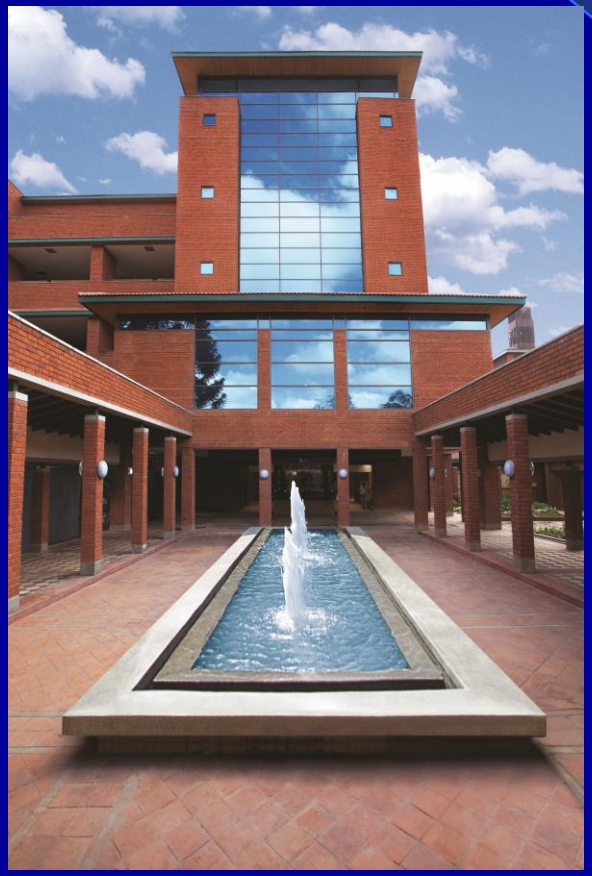
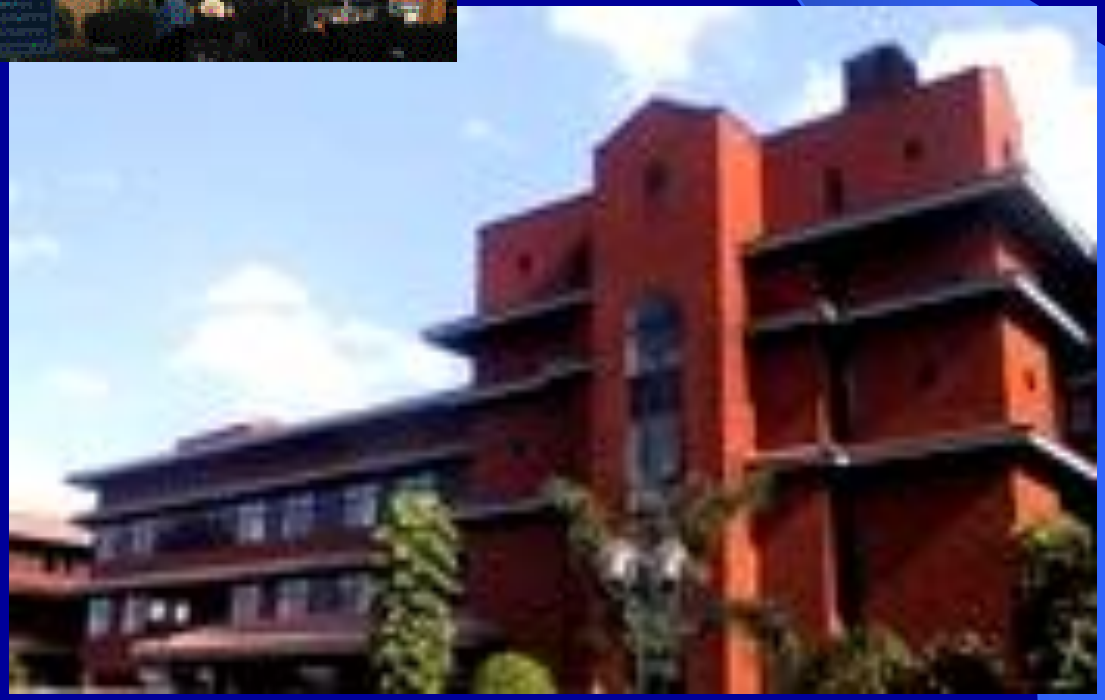
Aga Khan University Hospital

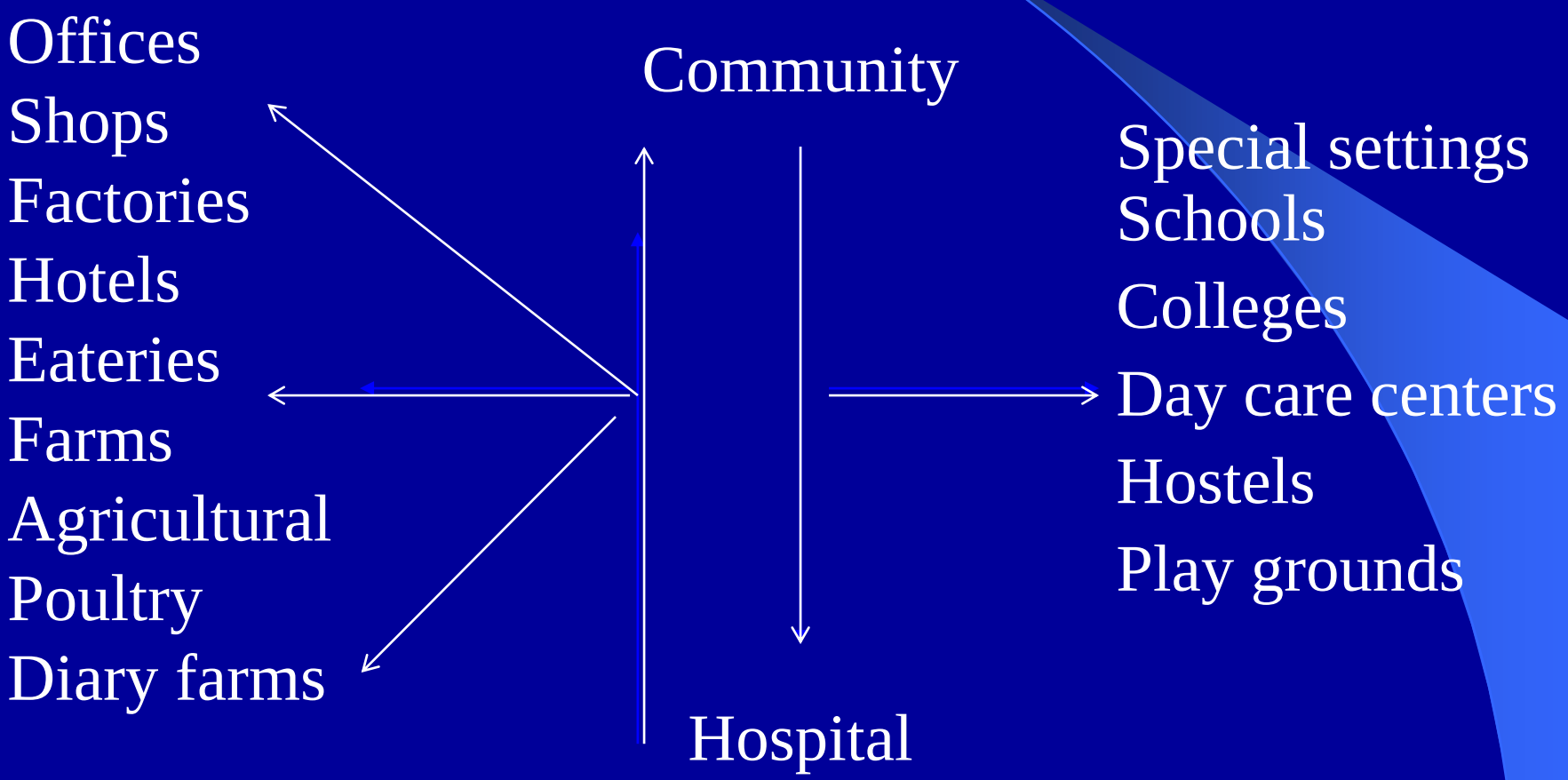




OBJECTIVES

- Define Community & Hospital Acquired infections
- Discuss the pathogenesis of community & hospital acquired infections
- Discuss the etiology & epidemiology of community & hospital acquired infections

Scope of infection control



What is the importance of IPC in communities

There are basic differences in the nature of infections

On the other hand, these two aspects of IPC can not be separated as strictly community and health care associated infections since both overlap at various points

Some common infections can not be categorized

Other common infections are difficult to define

TB, CMV , HSV are just a few examples

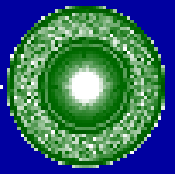
History of IPC in communities of ancient civilizations

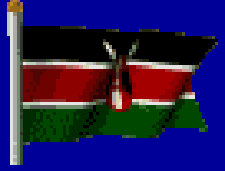
1. Egyptian civilization
2. Aryan civilization
3. Sumerian civilization

Evidence is found in literature regarding practices oriented to wards IPC goals.

A clearly defined code of conduct was ingrained from child hood for preventing spread of bugs.

The practices are strongly inculcated since child hood by observing family that an individual can not help following them





- A lot of temple rituals in Buddhist Monasteries and Hindu temples
- Jewish traditional practices
- Some of the Zoroastrian Practices of Persia

  Followed to date by the survivors

- Practices in Hindu Brahman families

  Hindu traditions are very much alive in India today.

Importance of Hand washing

- Hand washing was built into religious rituals - Washing feet and hands of a person was symbolic of respect and commitment of love.
- Water was provided at the entry of houses to wash feet before coming inside – Has other benefits too in hot climates in addition to cleanliness

Personal Hygiene

- A shower mandatory for men in the evening after return from work
- A daily bath was built into religion- Do not go to temple if you could not bathe
- Several different sets of rules for various personal grooming procedures including cutting nails and hair
- Strict set of rules for massages
- Regulations on behavior during congregations

Food Hygiene Practices

- Eat only freshly cooked food – Left overs are given away to support workers and domestic staff but never stored – Ensures 100% safety
- Pickled items had scientific procedures and protocols on preparation, storage and keeping from spoilage.
- Water was stored in Copper containers and drinking water was served using earthen/silver or copper vessels.

The principles of isolation were clearly known.

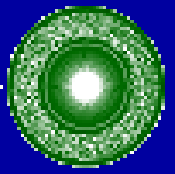
New born care-Mother kept in isolation for 40 days

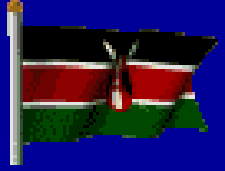
- Baby not handled by strangers for 60 days

Men not to handle baby due to their exposure to infections out side house holds

- Death -Family practiced isolation for various lengths of time depending on type of death. Attending social gatherings was not permitted until after 40 days
- A complete bath and discarding the clothes for washing after attending funerals
- Sick members kept outside home stead to prevent

Spread to community





IN THE TWENTIETH CENTURY,

MEN LOST THEIR FEAR OF GOD AND

ACQUIRED A FEAR OF MICROBES.

ANONYMOUS

COMMUNITY ACQUIRED INFECTIONS

"An infection contracted outside of a health care setting or an infection present on admission"

http://medical-dictionary.thefreedictionary.com/community-acquired+infection

"An infection acquired in the community"

http://www.medterms.com/script/main/art.asp?articlekey=38208

HOSPITAL ACQUIRED INFECTION (NOSOCOMIAL INFECTION)

"A hospital-acquired infection is usually one that first appears three days after a patient is admitted to a hospital or other health care facility"

http://medical-dictionary.thefreedictionary.com/Hospital-Acquired+Infections

"An infection acquired in a hospital by a patient who was admitted for a reason other than that infection"

WHO

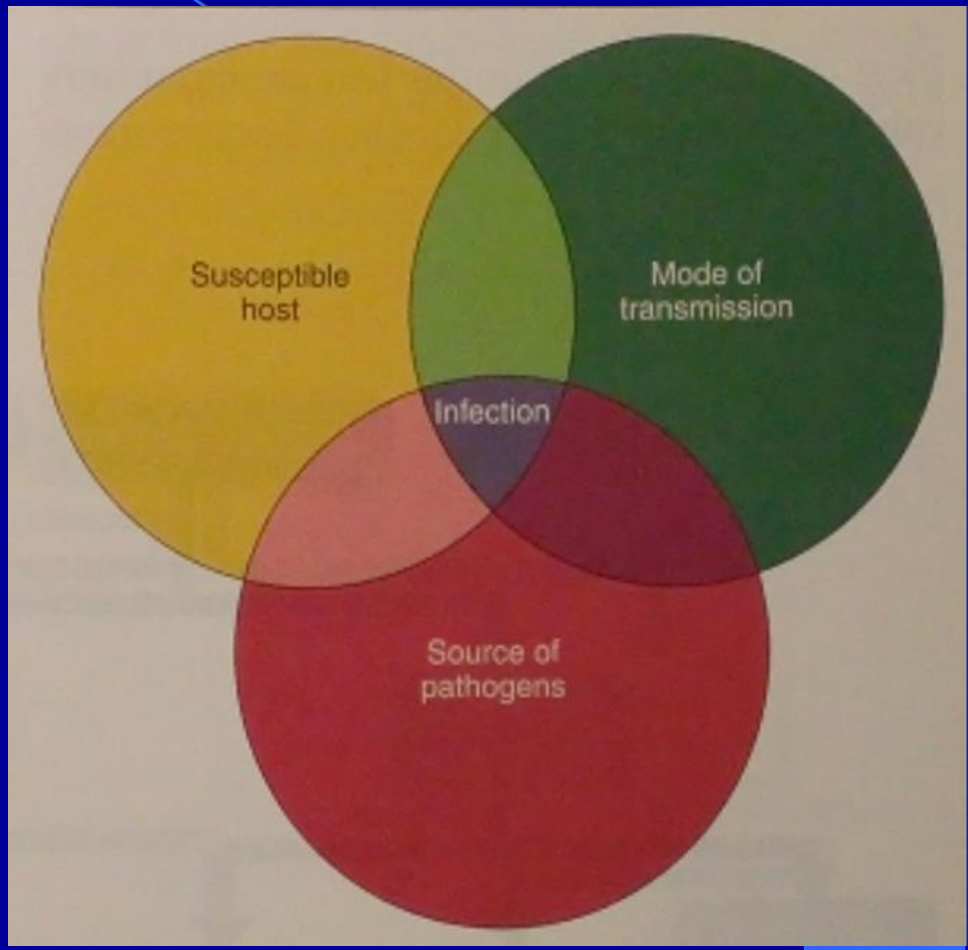
HOSPITAL ACQUIRED INFECTION (NOSOCOMIAL INFECTION)

"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"

WHO Definition

COMMUNITY ACQUIRED INFECTIONS

- For infection to occur, susceptible host, pathogen and mode of transmission all must act together
- Yellow fever prevalent in Africa & America but not in Asia(Pathogen Not present)
- In Europe/ Scandinavian countries-No case of Diphtheria (No susceptible host)



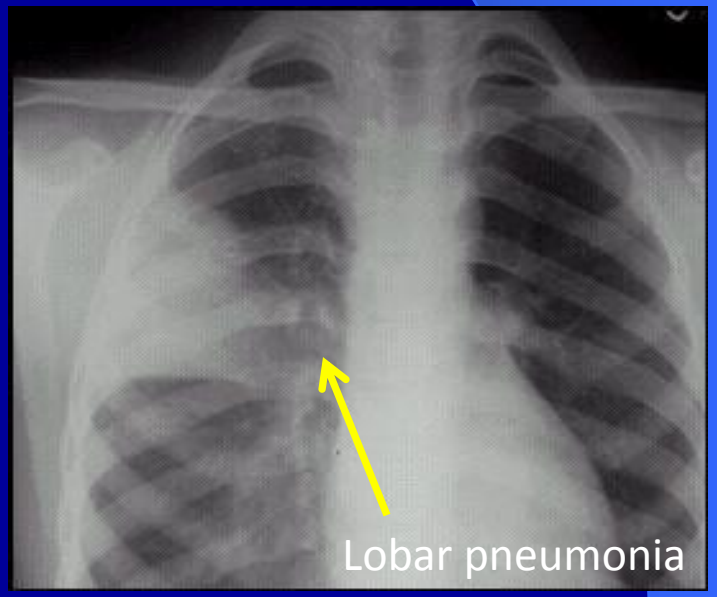
COMMUNITY ACQUIRED INFECTIONS

All infections that we acquire in community

- RTI (Sinusitis, Pharyngitis, Pneumonia etc.)
- GIT Infection(Ac GE, Dysentery, etc.)
- UTI (Cystitis, pyelonephritis etc.)
- CNS infections (Meningitis, Brain abscess)
- Skin & soft tissue infection (Boil, Impetigo, Cellulitis, Herpes simplex)

COMMUNITY ACQUIRED INFECTIONS

- Causative organisms of Community Acquired Infections are different from Hosp Acq Inf
- Most infections are viral esp. Respiratory Tract Infections
- Bacterial pathogens are usually susceptible to multiple conventional antimicrobials
- Highly resistant organisms e.g. MRSA, VRE, MDR TB are acquired from community in low frequency



COMMUNITY ACQUIRED INFECTIONS

RESPIRATORY TRACT INFECTIONS

- Upper RTI-mostly viral (Adenovirus, Rhinovirus, Coronavirus etc.)
- Lower RTI-mostly bacterial (*Strep pneumoniae*, *Haemophilus influenzae*, *Mycoplasma pneumoniae*, *Legionella pneumophila* etc.)
- Acquired from other patients through droplet infection
- *Strep pneumoniae*-from oropharynx

COMMUNITY ACQUIRED INFECTIONS

GIT INFECTIONS

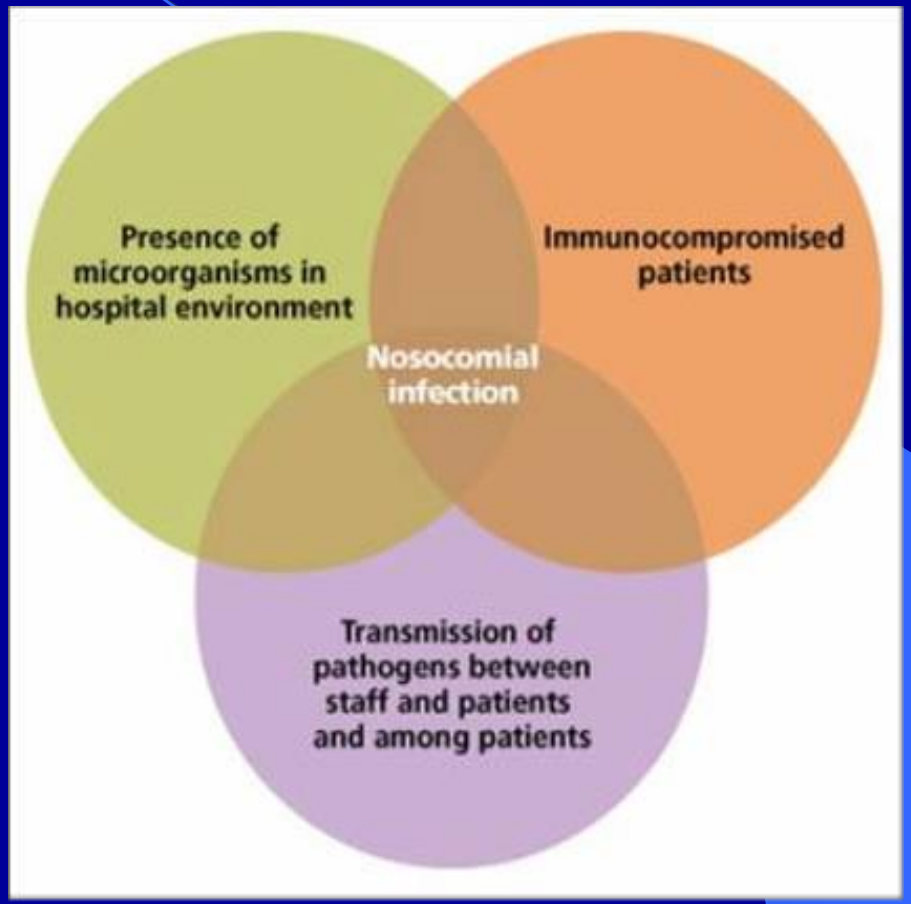
- Bacterial (*Shigella*, *Campylobacter*, *Vibrio cholerae* etc.), Parasitic (*E histolytica*, *Giardia*, etc.)
- Feco-oral route in community setting e.g. school, campus, etc.

UTI

- Mainly female
- Usually pregnant
- Bacteria (*E coli* 75%, *Klebsiella*, *Proteus* spp.)

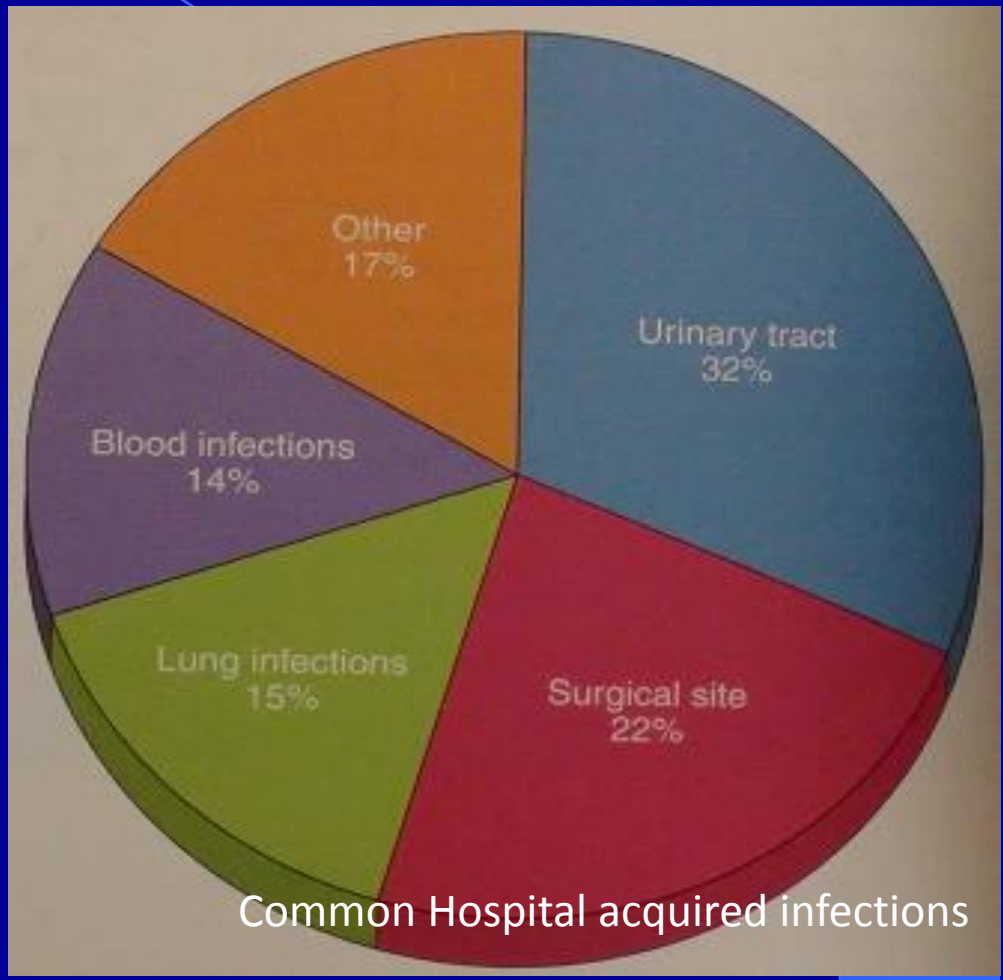
HOSPITAL ACQUIRED INFECTIONS

- Infections acquired while in the hospital
- Excludes all disease that patient is incubating during admission (e.g. Chicken pox incubation period is 10-21 days)
- Hospital acquired infections are different from community acq inf



HOSPITAL ACQUIRED INFECTIONS

- The host is usually immunocompromised of varying degree
- Pathogens encountered in the hospital settings are different
- Mean of transmission in hospital setting are also different from community setting

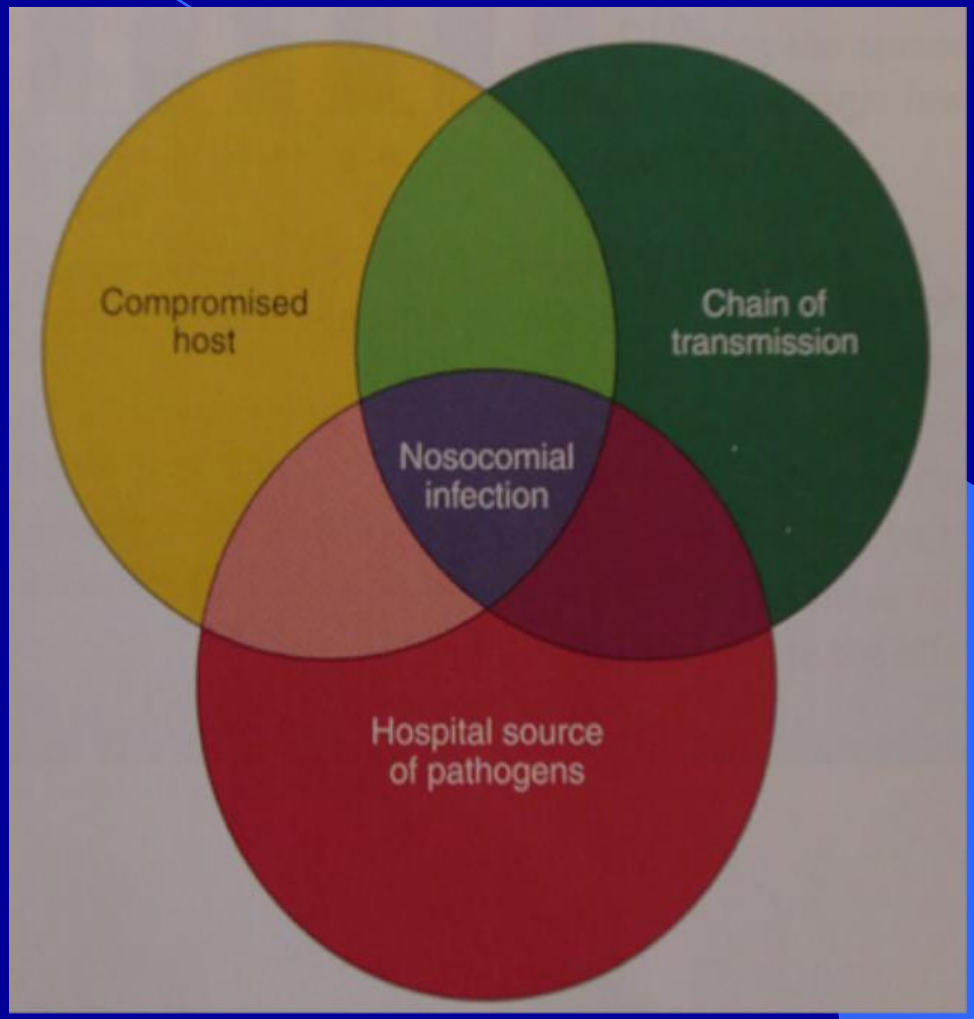


Common Hospital acquired infections

HOSPITAL ACQUIRED INFECTIONS

COMPROMISED HOST

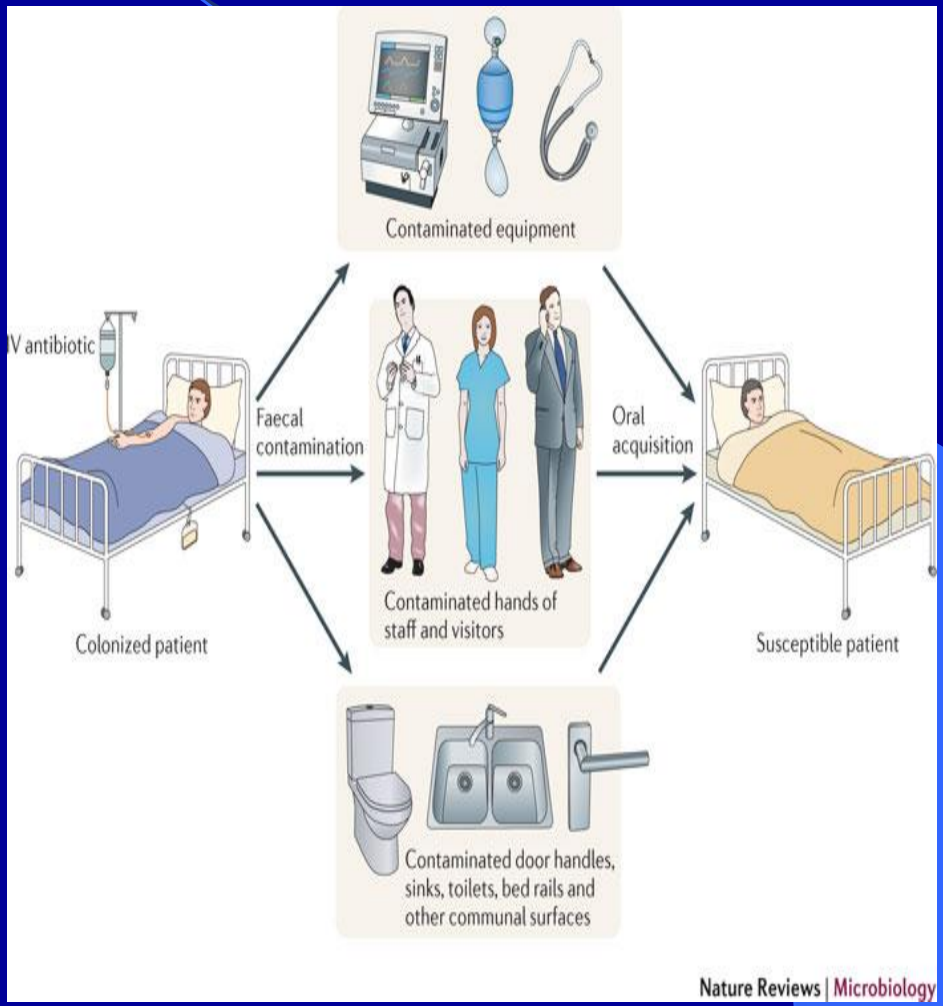
- Some form of physical injury
- Burn, trauma etc.-bacteria can enter body
- Low immunity-body own flora cause disease e.g. *Candida* infection of GIT



HOSPITAL ACQUIRED INFECTIONS

CHAIN OF TRANSMISSION

- Direct contact b/w patients, visitors, healthcare staff
- Indirect contact-through dust, environment, equipment etc.
- Indwelling equipment most imp source-urinary or I/V catheters, ventilators, N/G tube, etc.



Community Acquired Infections

The discussion should revolve around two aspects of this problem

1. Infections spreading in families, communities

at various levels during normal routine activities of life

2. Infections that bring patients to hospital with serious illness for admission with continuing consequences

For various purposes of order and ease of discussions the distinction is very important

But practically it is difficult to draw a line

The specter of respiratory infections

An acute respiratory viral infection

spread is taking place all the time at home, out side house, in the clinic, lab waiting room, hospital wards and back at home after discharge

UTI ,URTI and GITIs

Leading causes of massive antibiotic use in Out patient setting

Diagnosis is clinical/syndromic etc//

Challenges in resource poor settings

Lab diagnosis is not always possible even if tests are available

Ignoring CA BSIs and Pneumonia

Mary Schiavanni/Panos Pictures

People in refugee camps with limited water and sanitation facilities are particularly at risk of infection during a dysentery epidemic.

One example
CARTIs
The Challenges

1. Range of possible pathogens.
2. Difficulty in determining the causative pathogen.
3. Choosing appropriate antibiotic.
4. The variety of available antibiotic.
5. Increasing antibiotic resistance.

CARTIs – PATHOGENS

- 1970s
- Strep. pneumoniae
- Mycop – pneumo
- Staph aureus
- Oral flora (aspiration pneumonia)

CARTIs PATHOGENS (cont'd)

- 1990s
- Haem. Influenza
- Moraxella catarhalis
- GNB
- Chlamydia
- Legonella

CHALLENGES IN IDENTIFYING CAUSATIVE AGENT

- Laboratory tests often insensitive
- Slow in identifying causative pathogen
- Pathogen isolated in few cases only
- Therapy therefore presumptive
- Choice of appropriate antibiotics "**with full cover**"
- Increasing resistance

CHALLENGES IN MANAGEMENT

Choice of Antimicrobial

- Wide array of agents
- Local knowledge of resistance
- Cost
- New vs Old
- Spectrum

SELECTION OF EMPIRICAL ANTIBIOTIC IN OUT-PATIENT THERAPY

- Community-acquired RTIs often treated empirically
- Therapy choice depends on :
  - Clinical presentation
  - Severity of infection
  - Affordability of drug
- Local resistance patterns are rarely known to the doctor

Consensus 2002

Principles for appropriate prescribing and effective (locally compliant) guidelines:

- **TREAT** bacterial infection only
- **OPTIMIZE** diagnosis / severity assessment
- **MAXIMIZE** bacterial eradication
- **RECOGNIZE** (local) resistance prevalence
- **UTILIZE** pharmacodynamics - for effective agents and dosage
- **INTEGRATE** local resistance, efficacy and cost-effectiveness
- Appropriate prescribing conforms to these criteria

Ball *et al. J Antimicrob Chemother* 2002; 49:31–40

WHAT IS CLINICAL CONFIDENCE?

- Ability to treat infections empirically and safely with one agent.
- The option to treat patients in the community rather than hospital.
- To enable patients to return to normal activities sooner and not worry about callbacks or return visits to the office.
- Maintain antimicrobial activity for future empiric use.

Should restrict and rationalize antibiotic use

Antimicrobial stewardship

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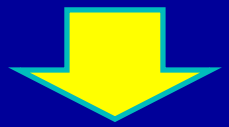
Infection control program



Can limit the emergence and transmission of antimicrobial-resistant bacteria

The Monster TB –

Spreads at home, gatherings like schools colleges, markets, trains, buses, cinema theaters

various work places, churches and temples numerous examples.

- Testing of induced sputum (Children and adults), naso-pharyngeal aspirates and gastric lavage aspirates from children
- Obtaining such specimens, especially in primary care settings very difficult.
- A quick survey of private HC facilities can reveal how many of them provide safe sputum collection facilities for patients for spot sample collection.
- Is this a Hospital acquired problem or community problem?

Thank you…