Peripheral Level

First point of contact of ill person with health services

Patient usually seen by clinical person

Tasks: (diagnosis, case management, reporting of case, simple tabulation & graphing of data)

Community-based surveillance & non-governmental organizations (NGO's)

Intermediate Level (I.L.)

Data collected from peripheral level

Main function ongoing data analysis from periphery to recognize outbreaks/changes in disease trends

Should be able to respond with investigation & intervention

Countries may have 2 levels: district & region (depends on size & development)

Intermediate Level Tasks

- Case management not done at peripheral level
- Analysis of peripheral data for epidemiological links, trends, control targets
- Supportive lab data (diagnosis)
- Investigating outbreaks
- Feedback of info. to peripheral level
- Reporting of data & suspected/confirmed outbreaks to central level

Central Level

Usually national level (policies set & resources allocated)

Often level epi. skills/lab support only at this level

Collaboration with non-medical sectors (e.g., agriculture, veterinary medicine, & environment)

- water-borne, food-borne, vector-borne diseases
Central Level Tasks

- Analysis of I.L. data for: epi. links, trend, control targets met
- Support I.L. for outbreak control: case management, lab, epi., education, & logistics
- Feedback to intermediate level & possibly peripheral level
- Report to W.H.O. as required (International Health Regulations or specific needs of control programs)

National Plans for Communicable Disease Surveillance:

Important: Priority Diseases list – as short as possible as diseases can spread rapidly across boundaries

To Determine Priority:

- Does disease result in high disease impact?
- Does disease have significant epidemic potential?
- Will information collected lead to significant public health action?
- In addition to diseases, specific syndromes should be considered for surveillance & specific public health issues

Disease Reporting System for Notifiable Diseases

U.S. Federal government; city, county, state & country health departments

3 categories of notifiable-disease reports:
- Information collected on each individual with disease/injury
- Conditions for which only total # of patients seen is reported
- Conditions for which total # of cases is reported if, & only if, there is an epidemic

Passive Surveillance

Most states have comprehensive, passive disease surveillance systems “as required by law in all 50 U.S. states”

Regular contact initiated by health department & directed to all possible reporting sources is neither feasible nor required

How do Diseases Get Reported?

In the simplest situation, a physician diagnoses reportable condition – sending appropriate form to local health department

Case data are added to appropriate disease surveillance system
Then What?

- Report summaries reviewed regularly & analyzed at local HD
- Information forwarded to state HD, consolidated & composite data examined for trends
- Each state HD voluntarily reports these cases to CDC weekly

Completeness & Timeliness

- should be assessed regularly (variables to include)
- at local health department, analyzed by reporting source (clinician, hospital, laboratory, etc.)
- feedback & training/information to improve any deficiencies

Notifiable Diseases

- National
- State
- County

Notifiable Diseases - USA

Originally Council of State & territorial Epidemiologists (CSTE) in 1950; makes recommendations annually for additions & deletions

CDC responsible for collection & publication of data since 1961

Required Reading #2

Notifiable Diseases - Florida

Mandated by Florida Statute 381

“Any practitioner licensed in this state to practice medicine, osteopathic medicine, chiropractic medicine, naturopathy, veterinary; any hospital licensed under sub-part I of chapter 395; or any licensed laboratory...shall immediately report the fact to the Department of Health”

See Required Reading #3

Hillsborough County

- uses FL notifiable diseases list
- different call numbers for AIDS/HIV, TB, STD, all others, & after hours
- for HIV/AIDS, do not allow faxing of reports
Timely reporting of diseases imperative in age of bioterrorism

Overview of Infection Control Concepts

What is Infection Control?
Who practices infection control?
What are content areas?

Definition of Infection Control

Prevention of transmission of infection/disease between patients, employees, & visitors as well as the investigation of such events should they occur. To accomplish this involves the development of policies & procedures, education, surveillance, & a multi-disciplinary effort that is regulated/guided/overseen/monitored by numerous county, state, & federal agencies.

Infection Control Program Goals

Protect patient
Protect healthcare workers, visitors, & others in healthcare environment
Establish this in a cost-effective manner


Diagram of Infection Prevention

Who Practices Infection Prevention & Control?

Infection Preventionist
Hospital Epidemiologist
Support staff
Model of Disease Causation

Environment

Host

Agent

In the healthcare setting...

Environment

Patient room
Operating room
Units (Burn, NICU)
Hydrotherapy
Procedure rooms

Host

Patients
Employees
Visitors
Others

Agent

Microorganisms
Diseases
Devices
Systems

Chain of Infection: Components of the Infectious Disease Process

Causative agent
Reservoir
Susceptible host
Portal of entry
Mode of transmission
Portal of exit

Susceptible Host

Person or animal lacking effective resistance to particular pathogenic agent

Host characteristics influencing susceptibility: age, underlying disease, immunization status, procedures, medications, pregnancy, trauma, nutritional status

See slide #26

Modes of Transmission

Mechanism for transfer of an infectious agent from reservoir to susceptible host

• Contact (direct, indirect, droplet)
• Airborne
• Common vehicle (active, passive)
• Vector-borne (external, internal) of minimal importance in U.S. but not so in developing countries

Antimicrobial Resistance

Serious problem in healthcare facilities

MRSA (methicillin-resistant Staphylococcus aureus) (AKA “ORSA”)

VRE (vancomycin-resistant Enterococci)

VRSA (vancomycin-resistant Staph. Aureus)

CRE (carbapenem-resistant Enterobacteriaceae)
Why a Problem?
- Poor prescribing practices
- Persons not completing antibiotic therapy
- Mutations with new drugs
- Susceptible hosts
- Ease of transmission
- Environmental components?

Infection vs. Colonization
- **Infection**: entry & multiplication of an infectious agent in the tissues of the host
- **Colonization**: presence of microorganisms in or on a host with growth or multiplication but without tissue invasion or damage
- **Contamination**: presence of microorganisms on inanimate objects or in substances

In the healthcare setting...
- **Colonization** is an important concept
- Important reservoir for HAI spread
- Contamination of equipment can occur
- Underscores need for good patient care practices, environmental cleaning, & disinfection/sterilization

Cohorting of Patients
- Placement of patients with like diseases or infections together when private rooms not available
- Requires consultation with Infection Preventionist
- Requires consideration of epidemiology & mode of transmission of infecting pathogen & patient population

Hand Hygiene
- **Single most important** procedure for preventing HAI
- Many hospital outbreaks related to inadequate hand hygiene
- Universal term
- What’s new? (examples)

So what does I.C. have to do with Surveillance?
- I.C. personnel responsible for:
  - reporting diseases
  - conducting surveillance
  - analyzing surveillance data
  - making recommendations based on surveillance data
  - designing patient care practices & employee policies to decrease transmission of infections