

Introduction to Environmental Health



Lesson 8.
Disease & Injury:
Causation and Control

11 April 2012

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Announcement

❖ DEOHS Seminar:

- Title: *Air Pollution and Cardio-vascular Disease*
- Speaker: Nick Mills, MD, PhD
BHF Intermediate Clinical Research Fellow, University of Edinburgh
- Date: Thursday, 12 April 2012
- Time: 12:30-1:30 pm
- Room: T-435 Health Sciences Center

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Announcements

❖ The Peace Corps

- General Information Session
- Wednesday, April 11th
- 5:00-6:30 p.m.
- Thomson Hall Room 125.



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Course Information

- ❖ **Course Drop-Box:**
 - > EH 311 Drop Box 2012-2
 - > Exercise #1 - Available now, Closes 5 June
 - > Exercise #2 - Available now, Closes 5 June
 - > Extra Credit Papers - Available 1 May

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Lesson Overview

- ❖ Finish Epidemiology
- ❖ The disease process
- ❖ Generic Control Strategies

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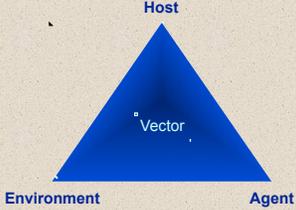
Lesson Objectives

- ❖ Understand how diseases are transmitted within populations
- ❖ Be able to use the **Epidemiological Triangle** to describe infectious and non-infectious disease and injuries
- ❖ Know and be able to give examples of the 4 engineering **Generic Control Strategies**

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Causative Factors

- ❖ **Determinants**
 - > Agent
 - > Host
 - > Environment



Epidemiological Triangle

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Agent Factors

- ❖ **Biological Agents**
 - > Micro-organisms
 - Bacteria
 - Viruses
 - Helminths
 - > Plants
 - > Animals



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Agent Factors Continued

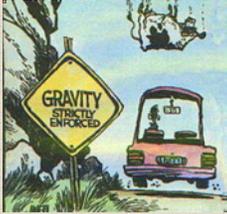
- ❖ **Chemical Agents**
 - > Inorganic Chemicals
 - Heavy Metals
 - > Organic Compounds
 - Solvents
 - > Pesticides



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Agent Factors *Continued*

- ❖ Physical Agents
- ❖ Sharps
- ❖ Force
- ❖ Noise
- ❖ Radiation
 - > Ionizing
 - > Non-Ionizing



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Host Factors



- ❖ Physiological
 - > Age, Gender, Ethnicity
 - > Genetic Predisposition
- ❖ Behavioral
 - > Education
 - > Occupation
 - > Lifestyle
 - > Etc.

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Environmental Factors



- ❖ Physical Environment
- ❖ Geo-Chemical Factors
 - > Geology & Geography/ Topography
 - > Climate and Weather
 - > Water
- ❖ Biological Factors
 - > Habitat
 - > Life forms (Nutrients/ Food Webs)

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Environmental Factors Continued



- ❖ Built Environment
 - > Shelter from Elements
 - > Provision of Basic Necessities
 - Food & Water
 - Sanitation & Hygiene
 - > Exclusion of Agents
 - Vectors & Pests

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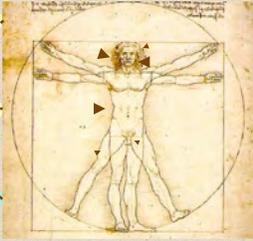
Disease Transmission



- ❖ Direct
 - > Contact
 - > Through the air
- ❖ Vehicle
 - > Food
 - > Water
 - > Fomites
- ❖ Vector

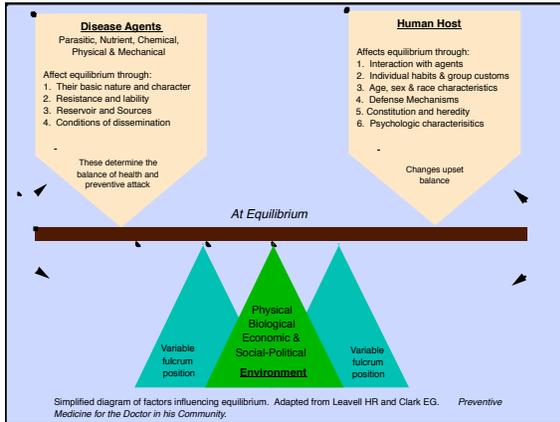
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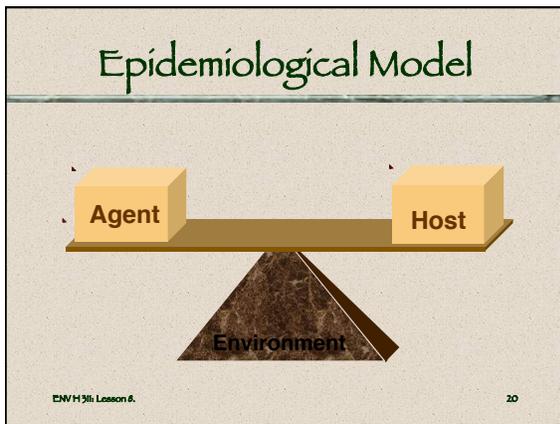
Portals of Entry

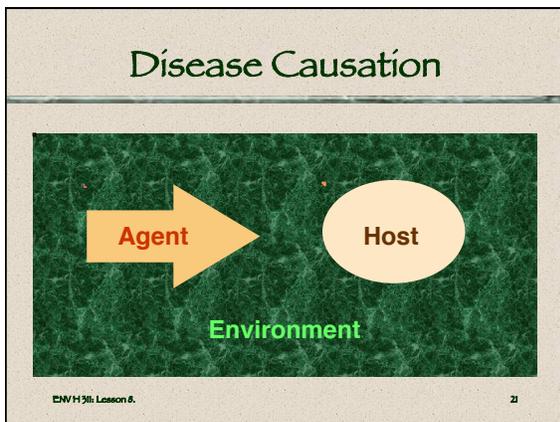


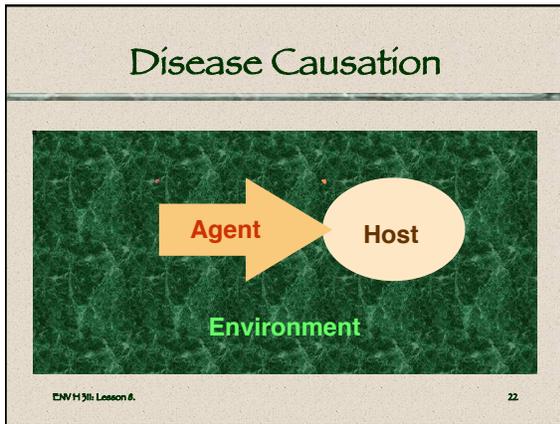
- Nose Inhalation
- Skin Absorption
- Skin Injection
- Eyes Conjunctiva
- Mouth Ingestion
- Genitourinary

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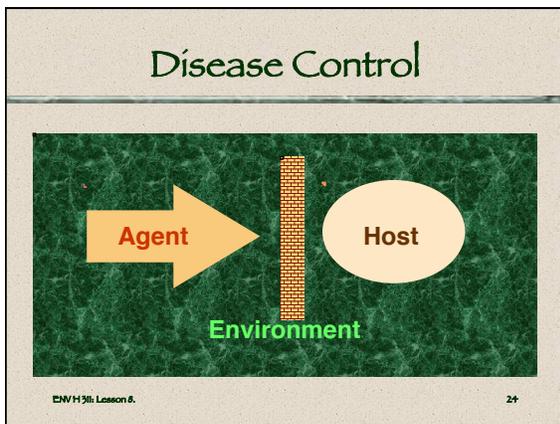








- ### Disease & Injury
- ❖ Acute Effects
 - > Infectious Diseases
 - > Injuries
 - ❖ Chronic Effects
 - ❖ Intermediate Effects
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Prevention & Control

- ① Modify the environment
 - ➡ Engineering Controls
- ② Modify Behavior
 - ➡ Legal/Regulatory Controls
 - ➡ Administrative Controls
 - ➡ Education

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Engineering Controls Tactics

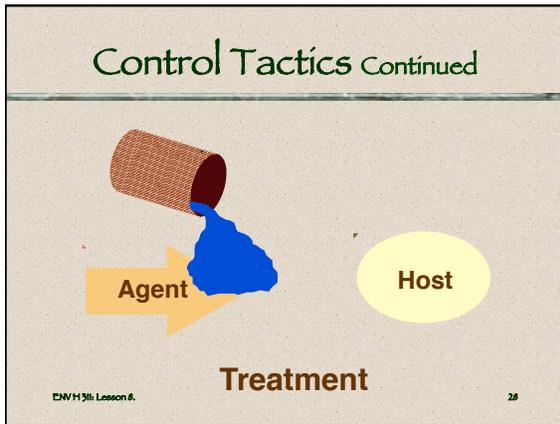
- ① Substitution
- ② Treatment
- ③ Isolation
- ④ Shielding

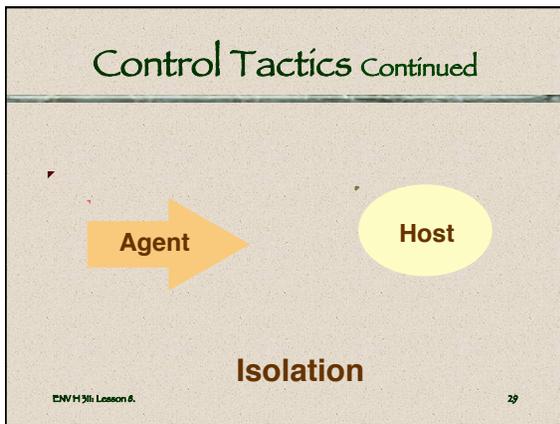
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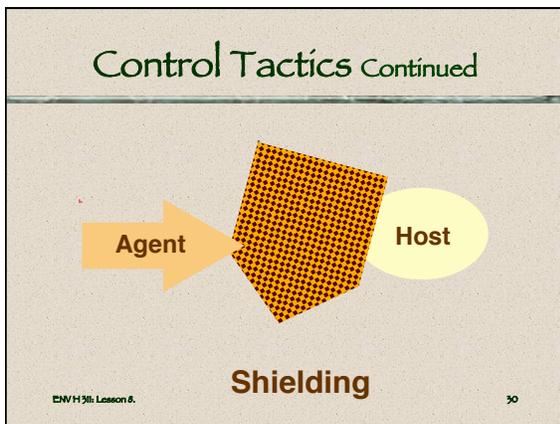
Control Tactics Continued

The diagram illustrates the substitution control tactic. It features a yellow arrow labeled 'Agent' pointing towards a yellow oval labeled 'Host'. Above the arrow is a pink box labeled 'New compound or process', with a red arrow pointing from this box to the 'Agent' arrow. Below the diagram, the word 'Substitution' is written in bold.

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Regulatory Controls

- ❖ Statutes
- ❖ Rules and Regulations
- ❖ Enforcement Programs
- ❖ Private Sector Control

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Administrative Controls

- ❖ Planning
- ❖ Supervision
- ❖ Biological Monitoring
- ❖ Work Scheduling

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Education

- ❖ Education
- ❖ Training
- ❖ Safety campaigns

- ❖ Administrative priority

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Control Strategies *Continued*

- ❖ In order of effectiveness
 - > Engineering Control Tactics
 - > Legal / Regulatory Controls
 - > Administrative Controls
 - > Education
- ❖ How do we operationalize these?

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Summary

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Group Assignments

- ❖ If you can not be here on Monday . . .
 - > Group assignments will be posted on the course web site
 - > However, the groups will choose their topic, so you miss your chance to weigh in on this decision
 - > You will need to contact the other members of your group to catch up.

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