

1. Infections in Immunocompromised Hosts: Introduction Slide

**Infections in  
Immunocompromised Hosts**

**David R. Snyderman, M.D.**

(c) 2004, David R. Snyderman, M.D.

2. Immune Defects and Commonly Associated Pathogens (1)

**Immune Defects and Commonly Associated Pathogens**

| <u>Immune Defect</u>       | <u>Pathogens</u>                                                                                              |
|----------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Barrier breakdown</b>   |                                                                                                               |
| Burns                      | <i>Pseudomonas aeruginosa</i> , <i>Staphylococcus aureus</i>                                                  |
| Trauma                     | <i>Streptococcus pyogenes</i> , <i>Staphylococcus epidermidis</i>                                             |
| <b>Phagocytic function</b> |                                                                                                               |
| Absolute decrease          | Enteric Gram-negative bacteria, <i>Pseudomonas aeruginosa</i> , <i>Aspergillus spp.</i> , <i>Candida spp.</i> |
| Chemotaxis                 | <i>Staphylococcus aureus</i> , enteric Gram-negative bacteria                                                 |
| Microbial killing          | <i>Staphylococcus aureus</i> , <i>Burkholderia cepacia</i> , Gram-negative bacteria, <i>Aspergillus spp.</i>  |

(c) 2004, David R. Snyderman, M.D.

3. Immune Defects and Commonly Associated Pathogens (2)

| <b>Immune Defects and Commonly Associated Pathogens</b> |                                                                                                                                                                      |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Immune Defect</u>                                    | <u>Pathogens</u>                                                                                                                                                     |
| <b>Humoral immunity</b>                                 |                                                                                                                                                                      |
| Hypogammaglobulinaemia                                  | Streptococcus pneumoniae, Haemophilus influenzae                                                                                                                     |
| IgA deficiency                                          | Pyogenic bacteria, Giardia lamblia.                                                                                                                                  |
| Asplenia                                                | Streptococcus pneumoniae, Haemophilus influenzae                                                                                                                     |
| Complement deficiency                                   | Pyogenic bacteria, Neisseria spp.                                                                                                                                    |
| <b>Cell-mediated immunity</b>                           |                                                                                                                                                                      |
|                                                         | Intracellular bacteria (e.g. Listeria monocytogenes), viruses (e.g. Herpes family), fungi (e.g. Candida spp., Cryptococcus spp.), parasites (e.g. Toxoplasma gondii) |

(c) 2004, David R. Snyderman, M.D.

4. Principles of Infection in Compromised Host (1)

| <b>Principles of Infection in Compromised Host</b>                                                                                     |  |
|----------------------------------------------------------------------------------------------------------------------------------------|--|
| <u>Neutropenic Patient</u>                                                                                                             |  |
| <ul style="list-style-type: none"><li>• Granulocyte count and fever association</li><li>• Infection presentation “different”</li></ul> |  |
| Abscess                                                                                                                                |  |
| Pulmonary Infiltrate                                                                                                                   |  |
| <ul style="list-style-type: none"><li>• Fever work up</li></ul>                                                                        |  |

(c) 2004, David R. Snyderman, M.D.

5. Principles of Infection in Compromised Host (2)

**Principles of Infection in Compromised Host**

- Etiology can be ANYTHING
- Sometimes more than one pathogen!
- Aggressive approach to diagnosis
  - CT Scan
  - BAL
  - Biopsy
- Presumptive Treatment

(c) 2004, David R. Snyderman, M.D.

6. Principles of Infection in Compromised Hosts (3)

**Principles of Infection in Compromised Hosts**

- Timing
- Type of immunosuppression
- Net state of immunosuppression
- Pathogen-pathogen interactions
- Type of transplant

(c) 2004, David R. Snyderman, M.D.

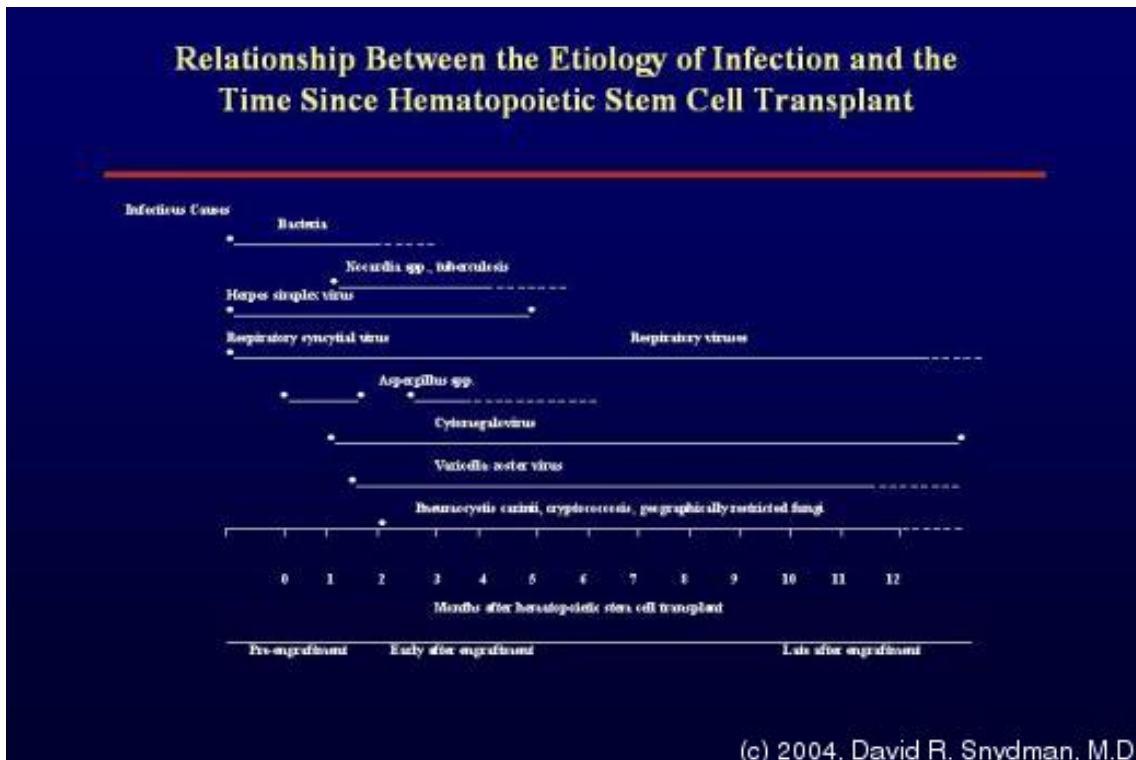
7. Epidemiologic Clues

## Epidemiologic Clues

- Travel
- Endemic Exposures
- Nosocomial Problems
- Family Exposures
- Temporal Illness

(c) 2004, David R. Snyderman, M.D.

8. Relationship Between the Etiology of Infection and the Time ...



9. Select Common Pathogens in Compromised Host

**Select Common  
Pathogens in Compromised Host**

- **CMV**
- **Aspergillus**
- **Nocardia**
- **Pneumocystis carinii**

(c) 2004, David R. Snyderman, M.D.

10. Cytomegalovirus

**Cytomegalovirus**

- **Herpes Family**
- **Common**
  - Reactivation**
  - Primary Infection**
- Disease: Fever, hepatitis, colitis, retinitis,  
pneumonia**
- **Treatment**
  - Ganciclovir**

(c) 2004, David R. Snyderman, M.D.

11.

## Aspergillus

**Aspergillus**

- **Mold**
- **Nosocomial/Environmental**
- **Pneumonia - focal, halo sign**
- **Diagnostic Difficulty**
- **Silver stain: 45 degree, septae, filamentous, “fingers of death”**
- **Therapeutic Difficulty**

(c) 2004, David R. Snyderman, M.D.

12.

## Pneumocystis carinii

**Pneumocystis carinii**

- **Fungus (previously parasite!)**
- **Endogenous reactivation**
- **Pneumonia - Diffuse interstitial**
- **Dx: Methanamine silver stain, looks like small cups**
- **Prevention**
- **Treatment - TMP-SMX, Pentamidine**

(c) 2004, David R. Snyderman, M.D.

13.

## Nocardia

### **Nocardia**

---

- **Gram variable branching rod**
- **Modified “acid fast”**
- **Treatment - TMP-SMX, Imipenem, Amikacin**
- **Cavitary pneumonia, brain abscess, skin**

(c) 2004, David R. Snyderman, M.D.