Infection Prevention and Control in Correctional Settings
Prof. Carolyn Herzig, Columbia University
A Webber Training Teleclass

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Hosted by Nicole Kenny
Virox Technologies Inc.

Learning objectives

- Review infection control challenges specific to correctional settings
- Discuss prevalence and transmission of common infectious diseases
- Identify strategies to prevent transmission and opportunities for improvement

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Role of correctional system

- (Re-) incarceration
- Post-release exposures
- Concentration
- Dissemination
- Amplification

Correctional settings

- Jails
  - Short term
  - Locally operated

- Prisons
  - Longer term
  - Operated by state or federal governments

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Correctional populations

- About 6.9 million American residents were under the supervision of the adult correctional system at the end of 2013
- 1 in 110 adults were incarcerated
  - About 1.6 million in federal or state prisons
  - About 730,000 in local jails
- About 630,000 admissions and 620,000 releases from prisons
- 67% of released prisoners were arrested for a new crime within 3 years; 77% were arrested within 5 years

Glaze, 2014; Carson, 2014; Durose, 2014

Inmate health

Prevalence of ever having a disease among prison and jail inmates (2011-2012)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Prison inmates</th>
<th>Jail inmates</th>
<th>General population</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td>6.0 (0.6)</td>
<td>2.5 (0.3)</td>
<td>0.5 (0.1)</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>10.9 (1.0)</td>
<td>6.5 (0.5)</td>
<td>1.0 (0.1)</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>2.7 (0.4)</td>
<td>1.7 (0.2)</td>
<td>-</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>9.8 (1.0)</td>
<td>5.6 (0.5)</td>
<td>-</td>
</tr>
<tr>
<td>STIs</td>
<td>6.0 (0.5)</td>
<td>6.1 (0.5)</td>
<td>3.5 (0.1)</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>1.3 (0.3)</td>
<td>1.3 (0.2)</td>
<td>0.3 (0.1)</td>
</tr>
</tbody>
</table>

Maruschak, 2015
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Challenges to infection control

Priorities
- Medical care
- Expertise
- Movement
- Crowding
- Hygiene
- Sharing

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Challenges to infection control

- Priorities
  - Security and safety
- Medical care
  - Confidentiality
  - Resources
  - Variation across facilities

Challenges to infection control

- Expertise
  - Disease management
- Movement
  - Transfer between facilities
  - Movement within facility
  - Maintaining continuity of care

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Challenges to infection control

- Crowding
  - Lack of single cells
  - Large dormitories
  - Enclosed spaces

- Hygiene
  - Hand and personal hygiene
  - Laundry
  - Housekeeping

- Sharing
  - Personal items
  - Equipment used for tattooing, piercing, injection drug use
  - Exercise equipment
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Common infectious diseases

- Tuberculosis (TB)
- HIV infection
- Viral hepatitis
  - Hepatitis B virus (HBV)
  - Hepatitis C virus (HCV)
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
**Tuberculosis**

- **Overview**
  - Transmitted via airborne respiratory droplets
  - In the US, many cases of TB arise among individuals who are overrepresented in jails and prisons
  - Infection usually requires prolonged contact with an infected individual in an enclosed space
  - 5% of infected individuals develop active TB during the first year or two following infection

- **Prevalence**
  - US infection rate: 5-10%
  - Rates throughout the world vary widely: 32% on average
  - 4-6% of US cases were living in correctional facilities when diagnosed
  - Prevalence of LTBI in correctional settings can be as high as 25%

- **Risk factors**
  - Foreign born from high-incidence country
  - Injection drug use
  - Close contact with an active TB case
  - HIV infection
TB Strategies

- Early detection
  - Early identification and isolation of active TB cases is critical

- Education
  - During orientation and when appropriate

- Screening
  - Various strategies recommended: Symptoms, Chest radiograph, TST, IGRA
  - All inmates should be screened for symptoms at intake
  - Ongoing surveillance for active TB
  - Detection of latent TB infection
  - In general, TST should be performed at intake, annually, if active disease is suspected, as part of a contact investigation

TB Strategies

- Treatment
  - Active TB cases
  - LTBI to prevent disease development

- Contact investigations
  - Initiation depends upon index case characteristics
  - Identify new active cases
  - Identify and treat inmates with new LTBI
  - Multi-disciplinary team

- Isolation
  - Inmates with suspected pulmonary TB
  - Airborne Infection Isolation (AI) room
  - Use airborne precautions and personal respiratory protection

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HIV Infection

- Overview
  - Bloodborne pathogen spread through percutaneous and mucosal exposures to infectious blood and body fluids
  - Challenges related to continuing treatment despite frequent movement and protecting against other diseases

- Prevalence
  - Among prison inmates in 2010, prevalence of HIV/AIDS cases was 1.5% and prevalence of confirmed AIDS cases was 0.5%
  - Rate of HIV among prison inmates has declined from 194 cases per 10,000 inmates in 2001 to 146 cases per 10,000 inmates in 2010

Maruschak, 2012

HIV Infection

- Risk factors
  - Consensual and nonconsensual sexual activity
    - 4-30% of inmates reported sexual activity while incarcerated
  - Injection drug use
    - 3-28% adult inmates reported IDU during incarceration
  - Tattooing or piercing with contaminated equipment
  - Open wound

Weinbaum, 2005
HIV Strategies

- **Education/Counseling**
  - During orientation and when appropriate
  - For all inmates about the importance of preventing blood exposures
  - Reinforce risk reduction for HIV infected inmates
  - Adherence to medication schedules

- **Testing**
  - All sentenced inmates should be offered HIV testing at the time of incarceration
  - Voluntary (opt-in, opt-out)
  - Mandatory
  - Involuntary

- **Continuity of care**
  - When transferred to another facility or returning to the community

Hepatitis B virus

- **Overview**
  - Bloodborne pathogen spread through percutaneous and mucosal exposures to infectious blood and body fluids
  - Acute and chronic infection

- **Prevalence**
  - Up to 47% of prison inmates have serologic evidence of HBV infection
  - 1 – 3.7% of prison inmates have chronic infection

- **Risk factors**
  - Sexual activity and injection drug use
  - Tattooing or piercing with contaminated equipment
  - Sharing personal items such as clippers, razors, or toothbrushes
HBV Strategies

- Education
  - During orientation or when appropriate

- Screening
  - Strategies are available using various serological markers
  - Baseline screening recommended for sentenced inmates with risk factors

- Vaccination
  - Should be considered for at-risk inmates

Hepatitis C virus

- Overview
  - Bloodborne pathogen spread through percutaneous exposures to infectious blood
  - Acute and chronic infection

- Prevalence
  - Up to 41% of prison inmates have serologic evidence of HCV infection
  - 12 – 31% of prison inmates have chronic infection

- Risk factors
  - Injection drug use
  - Sexual activity
  - Tattooing or piercing with contaminated equipment

Spaulding, 2006
HCV Strategies

- Education/Counseling
  - During orientation or when appropriate
  - Risk reduction and substance abuse treatment

- Screening
  - Recommended for inmates with risk factors

MRSA

- Overview
  - Leading cause of skin and soft tissue infections (SSTIs) in communities throughout the US (MSSA is also a common cause of SSTIs)
  - Transmission is person-to-person via contaminated hands or environment
  - Can be transmitted by individuals with asymptomatic carriage

- Prevalence
  - About 30% of healthy individuals in the community are asymptomatically colonized with *S. aureus*
  - <1.5% colonized with MRSA in the community
  - 1-16% colonized with MRSA in correctional settings
MRSA

- Risk factors
  - History of MRSA infection or colonization, “spider bite”
  - Close contact with someone with an infection
  - Recent antibiotic use
  - Crowded living conditions
  - Poor personal hygiene (e.g., infrequent showering)
  - Sharing soap, towels, and exercise equipment
  - Sharing injection drug and tattooing equipment
  - Draining own abscesses

MRSA Strategies

- Education
  - Prevention, transmission, treatment
  - Hand and personal hygiene
  - Seeking medical evaluations when appropriate
- Screening/Surveillance
  - Evaluate for skin infections at intake and during examinations
  - Recently hospitalized and at-risk inmates
  - Review of bacterial culture reports and determination of predominant circulating pathogen
- Environment
  - Appropriate sanitation measure

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MRSA Strategies

- Antibiotic use
  - Antibiotic prescribing practices should be monitored to reduce development of resistance
- Hand hygiene
  - Training for correctional staff, health care workers, inmates
  - Monitoring and supplies
- Correctional standard precautions & contact precautions
  - Adapted from hospital standard precautions
  - Account for housing area sanitation and specific modes of transmission
- Housing/Transfers
  - Appropriate housing decisions based on a number of factors
  - Do not transfer until fully evaluated and treated

Outbreaks

- Similar antibiotic susceptibility profiles among 2 or more isolates from epidemiologically linked inmates
- Enhanced infection control measures
- Surveillance
- Detect potential modes of transmission
- Education for inmates and correctional staff

Decolonization

- Not routinely recommended but considered on a case-by-case basis for recurrent infections and in outbreak situations

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**HIV testing in prisons (2012)**

- **Intake**
  - 17 Mandatory
  - 11 Opt-out
  - 10 Opt-in
  - 5 On assessment
  - 2 Inmate request

- **While in custody**
  - 42 Inmate request
  - 39 Clinical indication
  - 34 Involved in incident
  - 20 Offered during routine exam
  - 19 High-risk

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**Hepatitis testing in prisons**

**Based on survey responses from 44 US correctional systems (2009):**

- HBV
  - 43 Intake
  - 28 Inmate request
  - 38 Physician request
  - 33 Risk factors

**Among 1584 state prisons (2000):**

- HCV
  - 79% Tested
  - 4% Risk factors
  - 5% Inmates in custody

Hill, 2010; Beck, 2004

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Prison and jail inmates tested (2011-2012)

<table>
<thead>
<tr>
<th></th>
<th>% Prison inmates</th>
<th>% Jail inmates</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>71</td>
<td>11</td>
</tr>
<tr>
<td>TB</td>
<td>94</td>
<td>54</td>
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<tr>
<td>Hepatitis B</td>
<td>57</td>
<td>6</td>
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<tr>
<td>Hepatitis C</td>
<td>54</td>
<td>6</td>
</tr>
<tr>
<td>STIs</td>
<td>33</td>
<td>5</td>
</tr>
</tbody>
</table>

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Opportunities for improvement

- Inmates are disproportionately affected by infectious diseases
- High-risk behaviors occur outside of correctional settings
- Incarceration provides opportunity to reach underserved populations with health care services and prevention initiatives

Opportunities for improvement

- Comprehensive screening programs
- Condom availability
- Needle exchange programs
- Education about risk reduction and prevention

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Opportunities for improvement

- Enhanced information exchange
- Disease surveillance
- Collaborative approaches including correctional health care, public health departments, corrections professionals

Resources

CDC Correctional Health
http://www.cdc.gov/correctionalhealth/

Federal Bureau of Prisons
http://www.bop.gov/

National Commission on Correctional Health Care
http://www.ncchc.org/

American Correctional Association
http://www.aca.org/ACA_Prod_IMIS/ACA_Member/HomeACA_Member/Home.aspx
References


Centers for Disease Control and Prevention. Prevention and Control of Tuberculosis in Correctional and Detention Facilities: Recommendations from CDC. MMWR 2006;55(No. RR-9)

Centers for Disease Control and Prevention. Prevention and control of infections with hepatitis viruses in correctional settings. MMWR 2003;52(No. RR-1)

THANK YOU!

E-mail: cth2115@columbia.edu

Coming Soon

March 26  PREVENTION OF CLOSTRIDIUM DIFFICILE INFECTION – WHAT WE FIND IN GUIDELINES
   Prof. Walter Zingg, University of Geneva Hospitals, and Dr. Maria Martin,
   University Medical Center Freiburg

April 09  FAECES MANAGEMENT: TIME TO ADDRESS THE RISKS
   Jim Gauthier, Providence Care, Kingston, Ontario
   Sponsored by Meiko (www.meiko.de)

April 14  (British Teleclass)
   SURGICAL SITE INFECTION: A SURGEON’S PERSPECTIVE
   Prof. David Leaper, University of Huddersfield, UK

April 16  A PRAGMATIC APPROACH TO INFECTION PREVENTION AND CONTROL GUIDELINES IN AN AMBULATORY CARE SETTING
   Jessica Ng, Women’s College Hospital, Toronto

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