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

COLUMBIA UNIVERSITY MEDICAL CENTER

Infection Prevention and Control in Correctional Settings

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Hosted by Nicole Kenny
Virox Technologies Inc.

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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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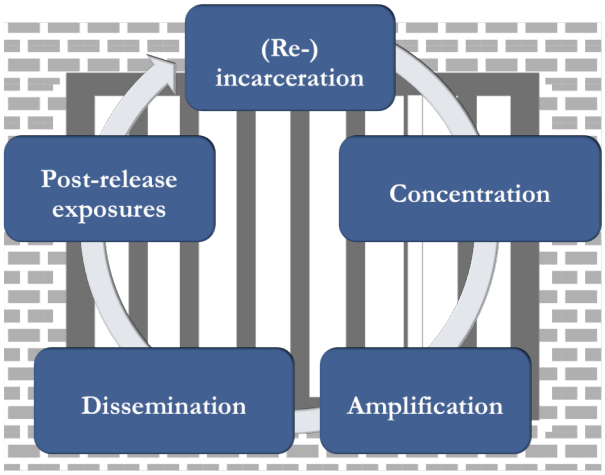
Role of correctional system



Awofeso, 2010

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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

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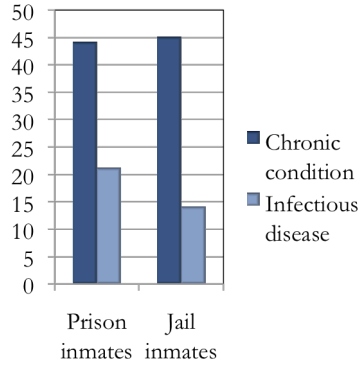
Inmate health

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



	Prison inmates		Jail inmates		General population	
	%	SE	%	SE	%	SE
TB	6.0	0.6	2.5	0.3	0.5	0.1
Hepatitis	10.9	1.0	6.5	0.5	1.0	0.1
Hepatitis B	2.7	0.4	1.7	0.2	-	-
Hepatitis C	9.8	1.0	5.6	0.5	-	-
STIs	6.0	0.5	6.1	0.5	3.5	0.1
HIV/AIDS	1.3	0.3	1.3	0.2	0.3	0.1

Maruschak, 2015

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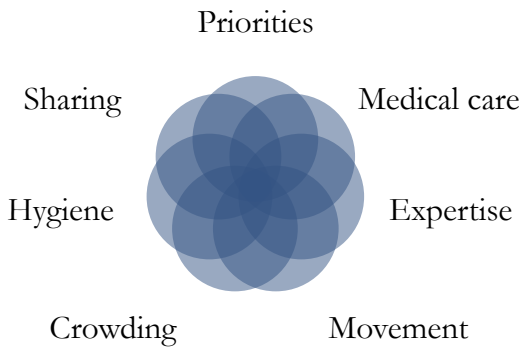
Challenges to infection control



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Challenges to infection control

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

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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

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Challenges to infection control

- 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)

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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

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Tuberculosis

- 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

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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

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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 (AII) 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

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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

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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

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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

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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

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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

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HCV Strategies

- Education/Counseling
  - During orientation or when appropriate
  - Risk reduction and substance abuse treatment
- Screening
  - Recommended for inmates with risk factors

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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

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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

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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

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MRSA Strategies

- 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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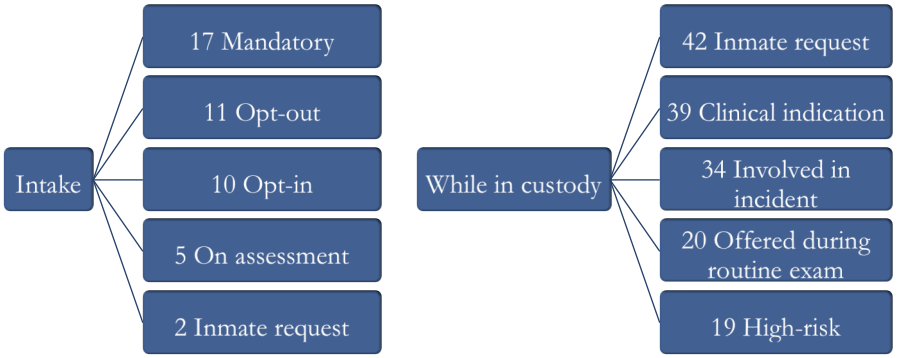
HIV testing in prisons (2012)



Maruschak, 2015

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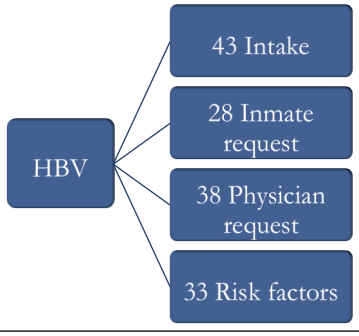
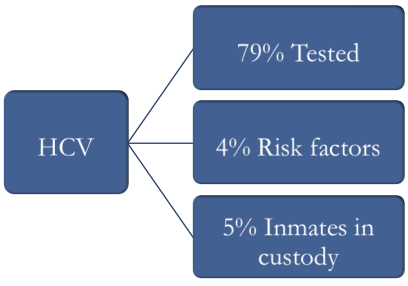
Hepatitis testing in prisons

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



Among 1584 state prisons (2000):



Hill, 2010; Beck, 2004

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Prison and jail inmates tested (2011-2012)

	% Prison inmates	% Jail inmates
HIV	71	11
TB	94	54
Hepatitis B	57	6
Hepatitis C	54	6
STIs	33	5

Maruschak, 2015

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Learning objectives

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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

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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

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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

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

Federal Bureau of Prisons Clinical Practice Guidelines for TB, HIV, MRSA, and HBV (http://www.bop.gov/resources/health_care_mngmt.jsp)

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THANK YOU!

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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

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Jessica Ng, Women's College Hospital, Toronto

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