Blood Glucose Monitoring: Core Infection Prevention Practices Across All Healthcare Settings

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Objectives

- Review existing guidelines concerning infection prevention that are presently considered to be best practice
- Review practices involved in blood glucose monitoring that represent core practices relevant to the prevention of infection
- Using scenarios, demonstrate the importance of core prevention practices involved in blood glucose monitoring
- Identify practice gaps that currently exist in blood glucose monitoring and methods designed to minimize risks to patients and healthcare personnel

Best Practices Guidelines

- CDC guidelines that are based upon available evidence
- Healthcare Infection Control Practices Advisory Committee (HICPAC) has responsibility for guideline development, review, and update process
- Additional CDC documents
- International documents

Basic Infection Control And Prevention Plan for Outpatient Oncology Settings

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

Canadian Committee on Antibiotic Resistance
Comité canadien sur la résistance aux antibiotiques

www.ccar-ccra.org

Infection Prevention and Control Best Practices

for Long Term Care, Home and Community Care including Health Care Offices and Ambulatory Clinics

June, 2007

Sponsored by

The Canadian Committee on Antibiotic Resistance

WHO/HSE/EPR/2009.1

Core components for infection prevention and control programmes

Report of the Second Meeting
Informal Network on Infection Prevention and Control in Health Care

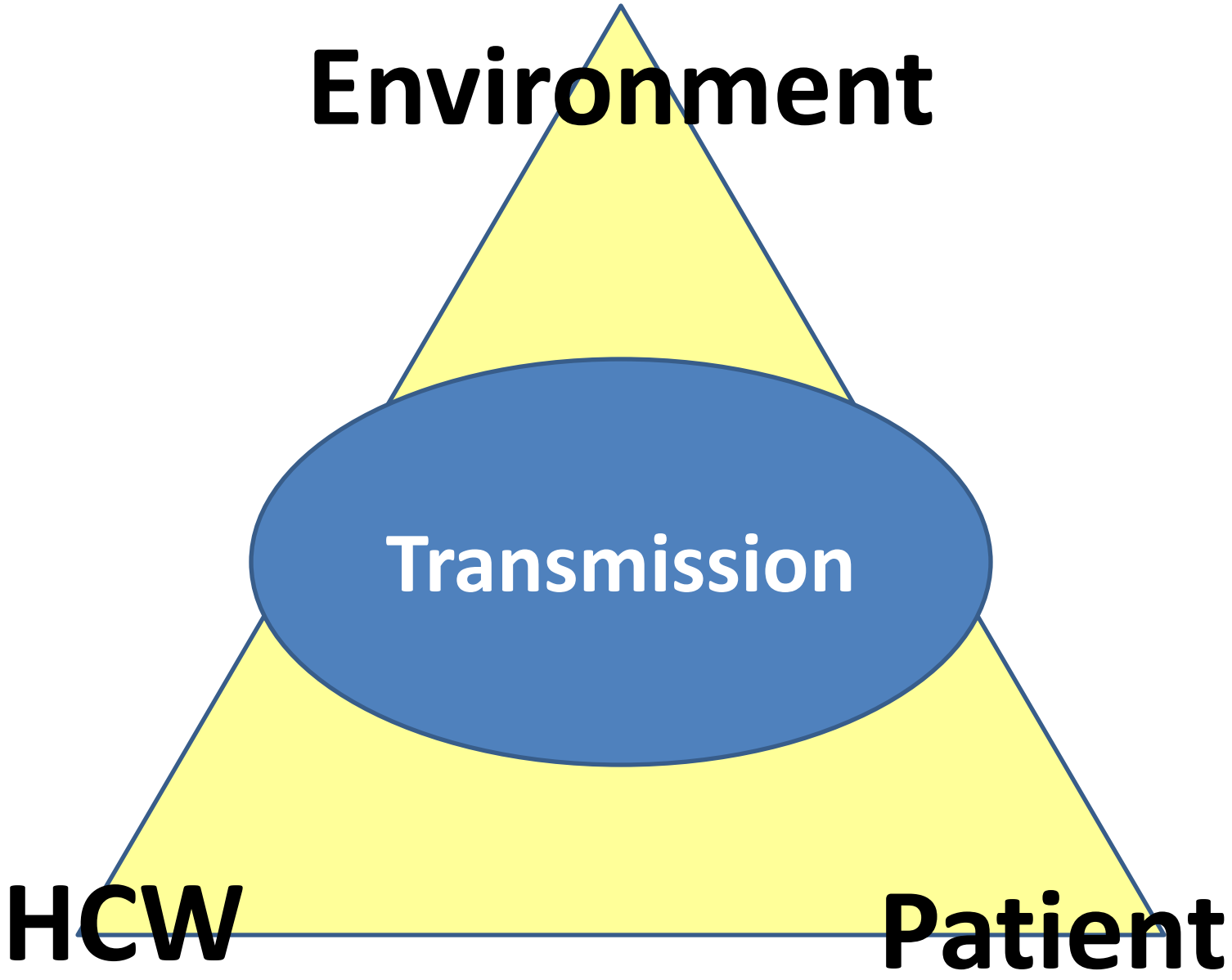
Geneva, Switzerland
26–27 June 2008

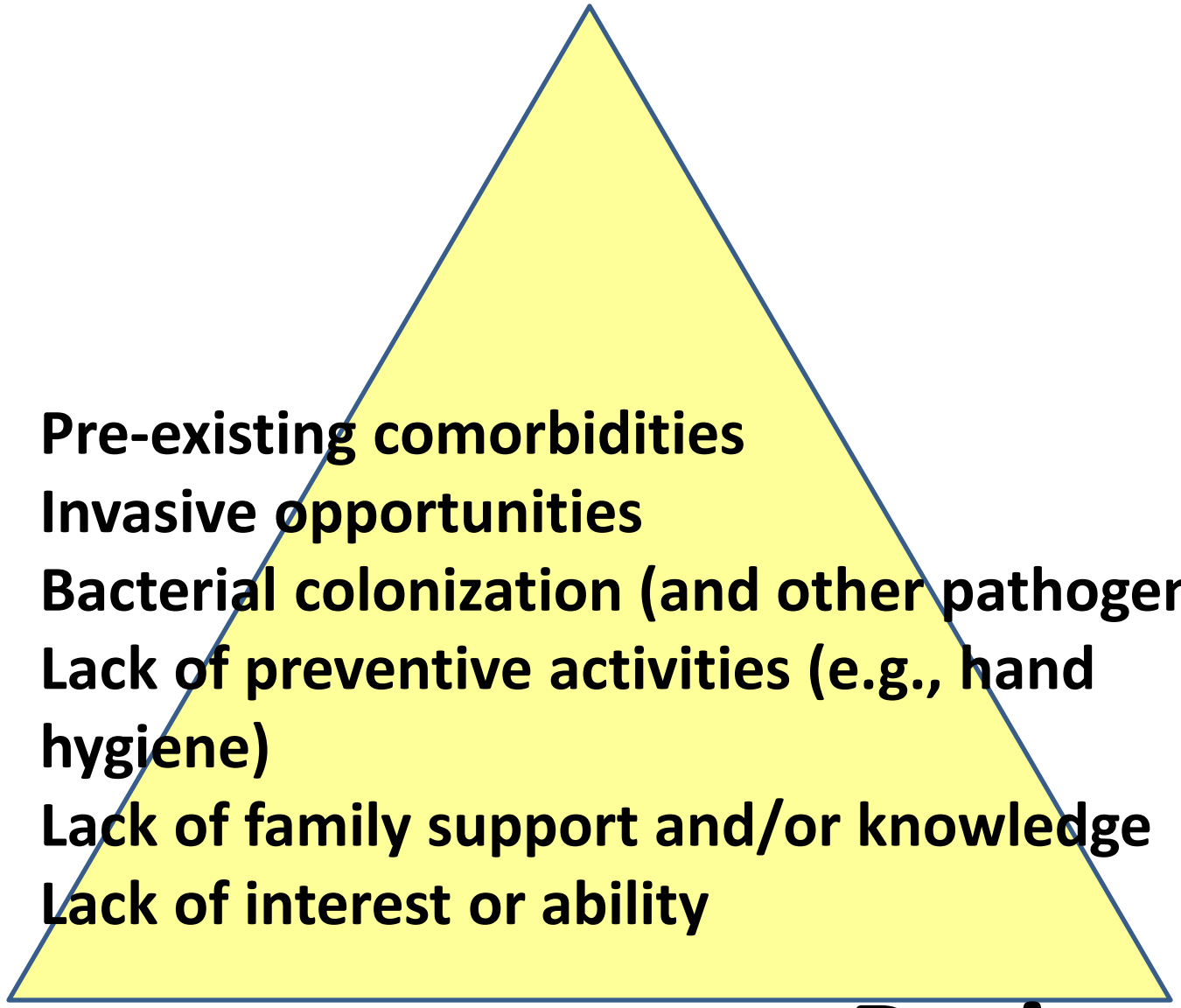
EPIDEMIC AND PANDEMIC ALERT AND RESPONSE

World Health Organization

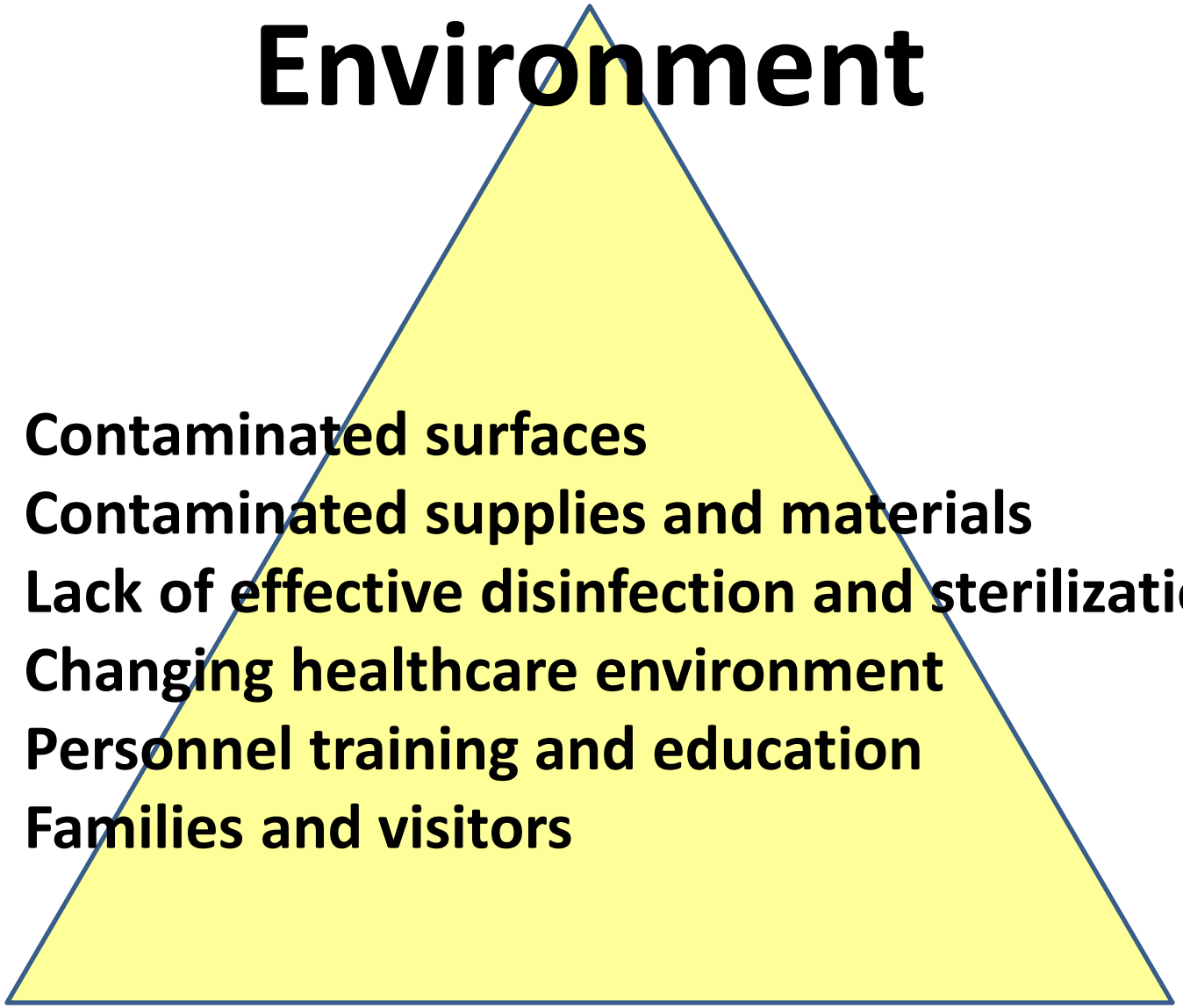
CDC Guidelines Relevant to Core Practices Discussion

- Guideline for Infection Control in Healthcare Personnel, 1998
- Guideline for Prevention of Surgical Site Infection, 1999
- Guideline for Hand Hygiene in Health-Care Settings, 2002
- Guidelines for Prevention of Nosocomial Pneumonia, 2003
- Guidelines for Environmental Infection Control in Health-Care Facilities, 2003
- Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005
- Management of Multidrug-Resistant Organisms in Healthcare Settings, 2006
- Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, 2007
- Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008
- Guidelines for Prevention of Catheter-Associated Urinary Tract Infection, 2009
- Guidance for Control of Infections with Carbapenem-Resistant or Carbapenemase-Producing Enterobacteriaceae in Acute Care Facilities, 2009
- Updated Norovirus Outbreak Management and Disease Prevention Guidelines 2011
- Updated Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011

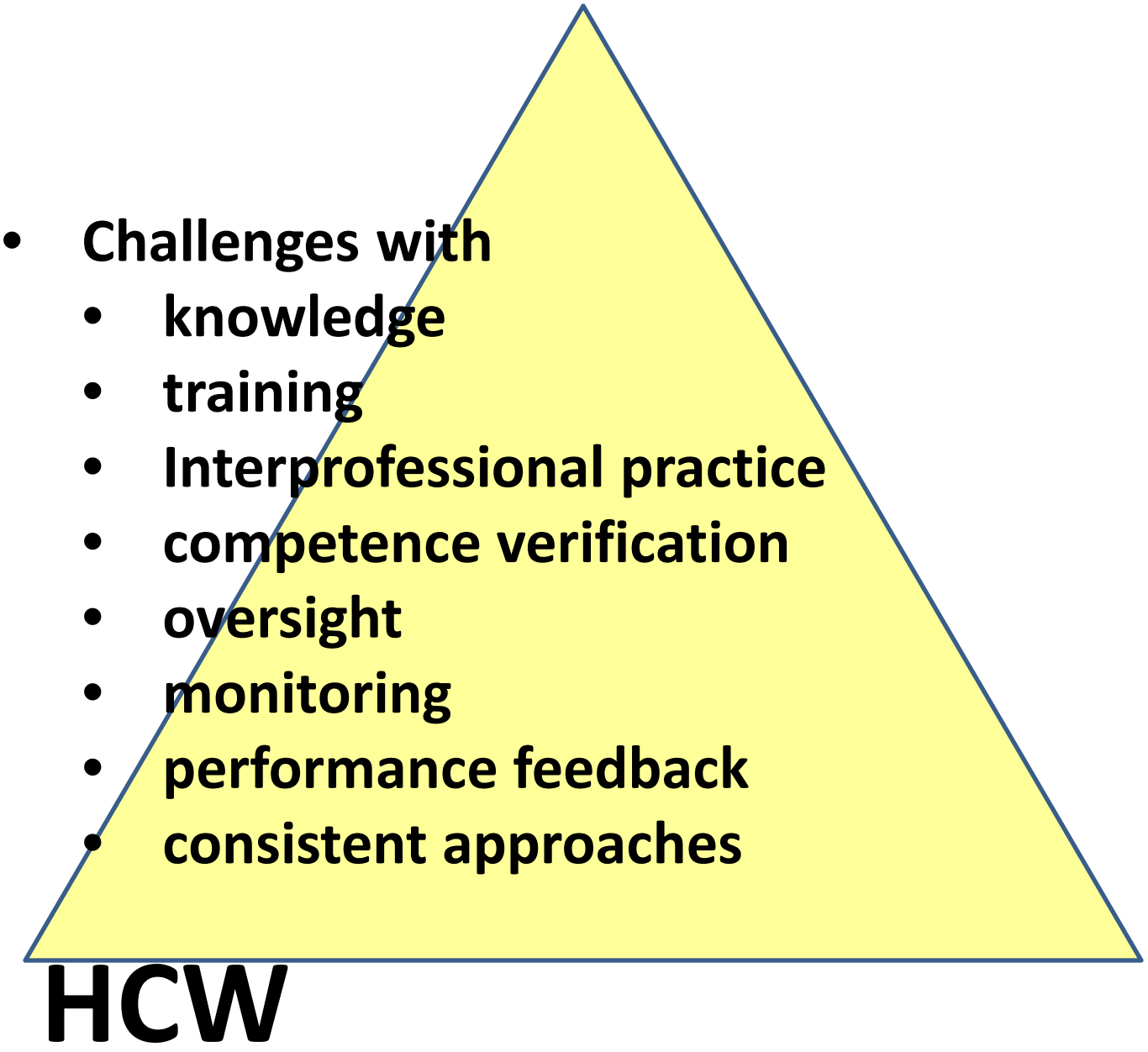

Environment
Transmission
HCW
Patient


• Pre-existing comorbidities
• Invasive opportunities
• Bacterial colonization (and other pathogens)
• Lack of preventive activities (e.g., hand hygiene)
• Lack of family support and/or knowledge
• Lack of interest or ability
Patient

Environment



- Contaminated surfaces
- Contaminated supplies and materials
- Lack of effective disinfection and sterilization
- Changing healthcare environment
- Personnel training and education
- Families and visitors


Challenges with
knowledge
training
Interprofessional practice
competence verification
oversight
monitoring
performance feedback
consistent approaches
HCW

Gaps in Practice Guidance

- Revision of guidelines is time consuming and costly
- Based upon available evidence
- Rapidly changing healthcare environment clash with a process that is less than nimble
- Need to provide healthcare personnel with concise direction concerning basic practice
- Must be applicable in all settings where care is delivered

Infection Prevention and Control Core Practices

- Leadership Support
- Education and Training of Healthcare Personnel
- Patient, Family and Caregiver Education
- Performance Monitoring and Feedback
- Standard Precautions
- Hand hygiene
- Personal Protective Equipment
- Respiratory Hygiene and Cough Etiquette
- Injection and Medication Safety
- Transmission-Based Precautions
- Preventing Cross-Contamination of supplies and Equipment
- Environmental Hygiene and Disinfection/Sterilization of Equipment
- Invasive Medical Devices
- Occupational Health

HICPAC Document 2014

Core Infection Prevention Practices and Blood Glucose Monitoring

54 year old female with diabetes. Currently a resident of a long term care facility, but frequently admitted to hospital for complications of diabetes. Sees multiple physicians in the office setting (nephrology, endocrinology, neurology, ophthalmology).

Infection Prevention and Control Core Practices

- Leadership Support

1. **Ensure that the governing body of the agency delivering healthcare is accountable for supporting the infection prevention activities.**
2. **Allocate appropriate resources, both human and material, to infection prevention activities .**
3. **Empower and support positional authority to those responsible for the infection prevention activities.**

Infection Prevention and Control Core Practices

- Education and Training of Healthcare Personnel

1. **Include training specific to infection prevention as appropriate to job responsibilities.**
2. **Develop processes to ensure that all healthcare personnel understand and are competent to perform their roles and responsibilities in a manner that will minimize the likelihood of infection**

Competence

- Knowledge
- Ability to put knowledge into action
- Ability to apply across settings
- What actions represent practice basis
- How to translate this into training programs and orientation
- Measuring effectiveness

Infection Prevention and Control Competencies

- Role of microorganisms in disease
- Transmission of microorganisms in healthcare settings
- Standard and Transmission Precautions
- Occupational health practices that protect the patient and the healthcare worker
- Ability to problem solve
- Emergency/disaster preparedness

Carrico R, Rebmann T, English JF, Mackey J, Cronin, SN. Infection Prevention and Control Competencies for Hospital-Based Healthcare Personnel. American Journal of Infection Control. 2008 Dec; 36(10):691-701.

Recognized Best Practices During Blood Glucose Monitoring

5 independent laboratory analyses found blood on exterior and interior surfaces of vials in active use in a clinical environment.

Of 111 vials tested:

- **3 vials tested positive for blood on the interior.**
- **4 vials tested positive for blood on the exterior. The blood on 1 vial was not visible to the eye.**

Visible blood smears on actual glucose test strip vials collected from clinical settings

Analysis funded by Abbott Diabetes Care 2013-2014

Infection Prevention and Control Core Practices

- Patient, Family Caregiver Education

1. **Provide infection prevention education to patients, family members, and others included in the caregiving network, as appropriate**

Individually wrapped packaging for glucose test strips

- Individually wrapped test strips help prevent cross-contamination by testing personnel
- Supports human factors approach by removing ability to perform incorrectly or unsafely

FDA also supporting restricting use of devices to the patient. Family members and others should not be part of the sharing process. FDA.gov 6/25/14

Infection Prevention and Control Core Practices

- Performance Monitoring and Feedback

1. **Monitor adherence to practices that impact infection prevention in order to enhance performance**
2. **Provide regular feedback of outcomes to staff performing the processes being monitored and to facility leadership**

Infection Prevention and Control Core Practices

- Standard Precautions

Use Standard Precautions to care for all patients in all settings. Standard Precautions includes:

1. **Hand Hygiene**
2. **Personal Protective Equipment**
3. **Respiratory Hygiene/Cough Etiquette**

Best practice: Mandatory change of gloves and hand washing after each and every testing event

Infection Prevention and Control Core Practices

- Hand Hygiene

1. **Require healthcare personnel to perform hand hygiene in accordance with Centers for Disease Control and Prevention (CDC) or World Health Organization (WHO) recommendations.**
2. **Use an alcohol-based hand rub or an antimicrobial or non-antimicrobial soap**
3. **Use soap and water handwash when hands are visibly soiled**

Infection Prevention and Control Core Practices

- Personal Protective Equipment

1. **Educate all healthcare personnel on proper selection and use of personal protective equipment (PPE) including :**
   a. **When to wear gloves, gowns, and face/eye protection**
   b. **When and how to remove and dispose**
2. **Ensure access by patients and others**

Infection Prevention and Control Core Practices

- Respiratory Hygiene and Cough Etiquette

1. **Help patients and essential visitors with symptoms of respiratory infection to contain their respiratory secretions**
2. **Particularly during periods of increased respiratory infection activity in the community, offer procedure or surgical masks to patients who are coughing.**
3. **When space and chair availability permit, separate patients with respiratory symptoms from others as soon as possible.**

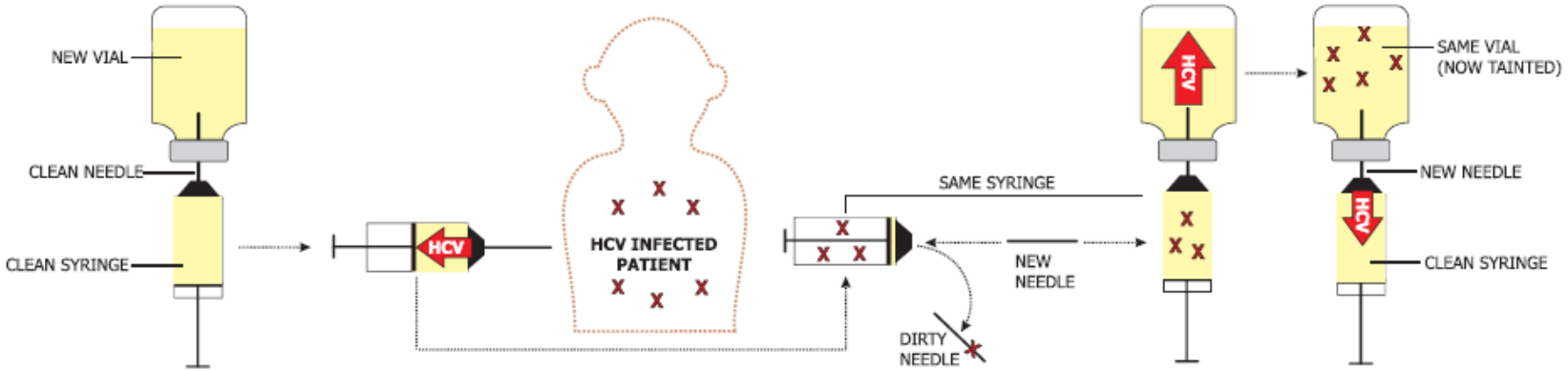
Infection Prevention and Control Core Practices

- Injection and Medication Safety

1. **Use aseptic technique when preparing and administering medications**
2. **Disinfect the access diaphragms of medication vials before inserting a device into the vial**
3. **One needle, one time, one patient**
4. **Do not share or reuse single dose vials**
5. **Dedicate multidose vials when possible**
6. **Point of use disposal**
7. **Masks for spinal injections**
8. **Protect healthcare personnel**

Indirect Syringe Reuse

Nevada endoscopy center HCV outbreak investigation, 2008



- Syringes were reused to withdraw multiple doses for individual patients
- Remaining volume in single dose propofol vials was used for subsequent patients
- The vial became the vehicle for HCV spread

Hepatitis B Outbreak Associated With Blood Glucose Monitoring

- Schaftzin JK, Southwick KL, Clement EJ, Konings F, Ganova-Raeva L, Xia G, Khudyakov Y, Johnson GS. Transmission of hepatitis B virus associated with assisted monitoring of blood glucose at an assisted living facility in New York State. Am J Infect Control. 2012;40:726-731.
- Patel AS, White-Comstock MB, Woolard D, Perz JF. Infection control practices in assisted living facilities: a response to hepatitis B virus infection outbreaks. Infect Control Hosp Epidemiol. 2009;30:209-214
- Thompson ND, Barry V, Alelis K, Cui D, Perz JF. Evaluation of the potential for bloodborne pathogen transmission associated with diabetes care practices in nursing homes and assisted living facilities, Pinellas County. J Am Geriatr Soc. 2010;58:914-918.


TEAR HERE

FACT: injection preparation on surfaces where contaminated substances are handled can lead to the spread of infections

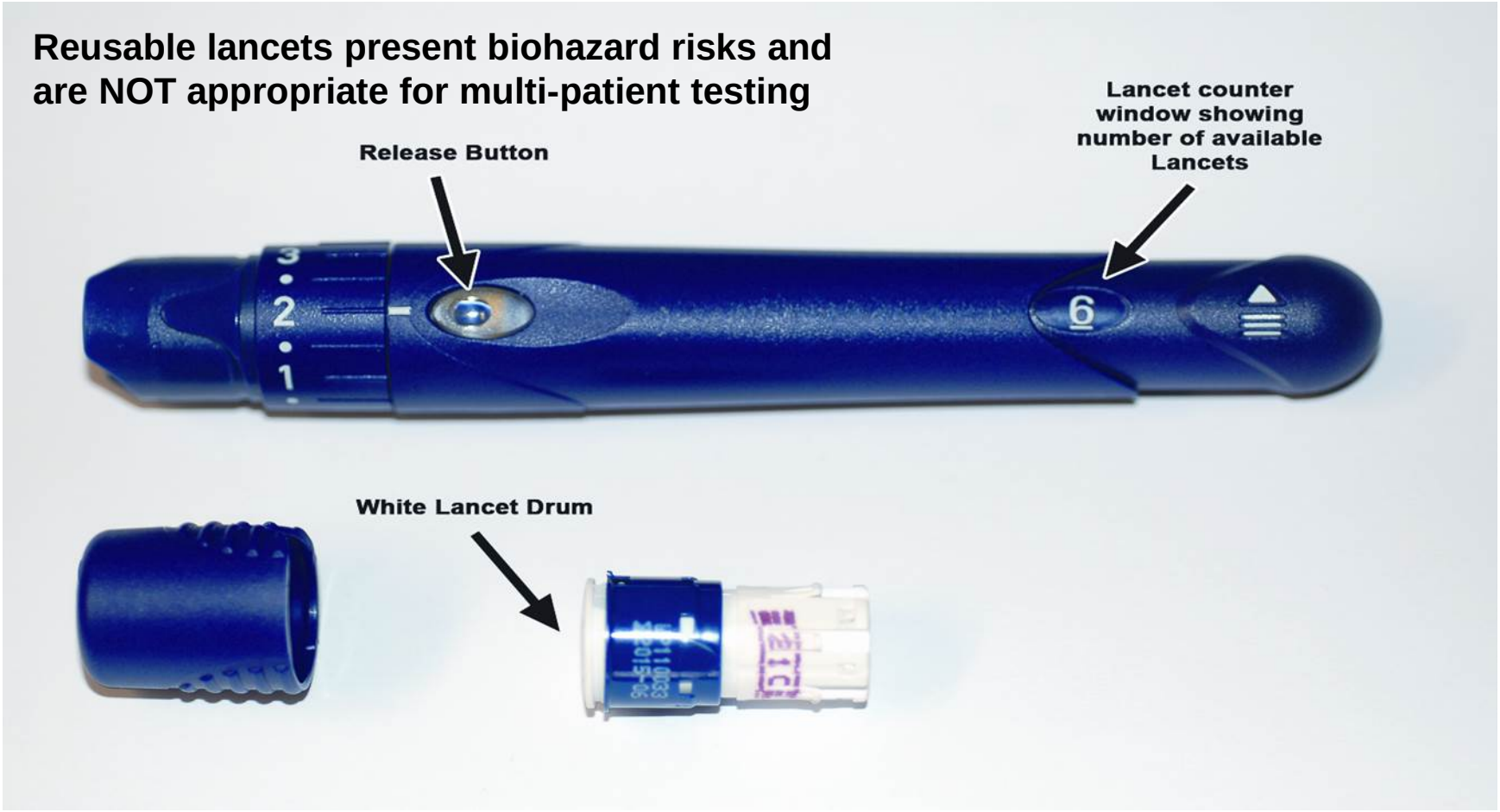
Storage of multidose vials and preparation of injections in same area that used needles and syringes were dismantled and discarded

Ref: Samandari et al. ICHE 2005; 26: 745-750

Photo: Don Weiss / NYCDOHMH

Recognized Best Practices During Blood Glucose Monitoring

Best practice: Never use fingerstick devices on more than one patient



Infection Prevention and Control Core Practices

- Transmission-Based Precautions

1. **Implement additional precautions (i.e., Contact, Droplet, and/or Airborne Precautions) in situations where contact with the patient, their body fluids, or their environment presents a substantial transmission risk despite adherence to standard precautions**

Minimizing cross-contamination risk with isolation bags

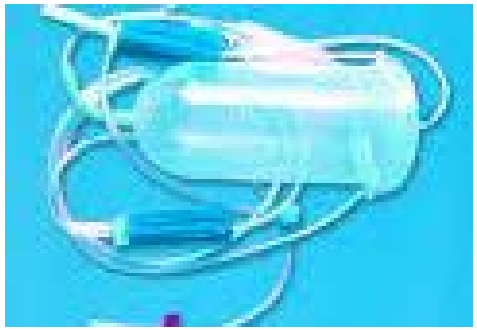
Isolation bag provides additional protection from possible meter contact, while allowing normal operation

Infection Prevention and Control Core Practices

- Preventing Cross-Contamination Supplies/Equip

1. **Separate clean from soiled**
2. **After using patient care equipment, clean and disinfect the equipment before use on another**
3. **Store patient care supplies and equipment in clean storage spaces**
4. **Do not reuse or share between patients any items packaged or labeled as single patient use unless reprocessing of the item is FDA-approved**
5. **Store patient care items in areas that are free from conditions that may compromise the item**

What Goes Where?
Clean and Dirty Cannot Mix



Indirect Contact Transmission of Infectious Agents

Even in the absence of visible blood, infectious pathogens can be transmitted through indirect contact transmission

Infection Prevention and Control Core Practices

- Environmental Hygiene/Sterilization/Disinfect

1. **Assign responsibility for routine cleaning and disinfection to appropriately trained personnel**
2. **Follow manufacturer's recommendations for use of cleaners and EPA-registered disinfectants**
3. **Clean and disinfect or sterilize reusable medical equipment (e.g., blood glucose meters and other point-of-care devices, surgical instruments, endoscopes) in accordance with the degree of risk for infection transmission, intended use of the equipment, and manufacturers' instructions.**

Best Practice: Clean and Disinfect the Meter After Each and Every Use

Infection Prevention and Control Core Practices

- **Recognition that the environment is "living"**
- **Right process**
  - **Disinfect v. sterilize**
- **Right product**
- **Right practice**
- **Right duration**
- **Right person, right time**

Environmental hygiene

Infection Prevention and Control Core Practices

- Invasive Medical Devices

1. **During each healthcare encounter, assess the medical necessity of any invasive medical device (e.g., vascular catheter, indwelling urinary catheter) in order to identify the earliest opportunity for safe removal.**
2. **Ensure that healthcare personnel adhere to recommended insertion and maintenance practices**

Infection Prevention and Control Core Practices

- Occupational Health

1. **Immunization according to ACIP and OSHA**
2. **Refrain from work when ill (e.g. fever, cough, diarrhea, vomiting, or draining skin lesions) to prevent spreading their infections to patients and other healthcare personnel.**
3. **Develop systems to encourage healthcare personnel to report signs, symptoms, and diagnosed illnesses that may represent a risk to their patients, coworkers, and their communities**

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Core Practices for Infection Prevention: Minimum Expectations for Safe Care in All Settings Where Healthcare is Delivered

HICPAC 2014

Working Group

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Co-chairs: Gina Pugliese (HICPAC) and Deborah Yokoe (HICPAC)
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Neil Fishman, HICPAC
Jeff Hageman, CDC
Silvia Munoz-Price, America's Essential Hospitals
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