

A "Never" Event: Unsafe Injection Practices



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and Prevention**



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8 hepatitis cases linked to clinic

hot line was also set
788-2222.

doctors
anti-

DISEASE A

Hepatitis C is a
blood-borne virus.
The Centers for
Disease Control
estimate that
about 4 million
people in the
U.S. have the
virus.

Hepatitis C outbreak among clinic patients

ments inserted through
mouth or rectum to
examine intestinal

Post that she and her hus-
band were referred for
routine colonoscopies last
year by their doctor and
she was "worried."

Brooklyn Bug

Clinic linked to 8 cases of
hepatitis C; 2,200 at risk

The city's investigation center
has medical charts and pro-
cedures for the clinic
dated 2001.

MEDICAL MYSTERY

Hepatitis C outbreak

Strikes 8 endoscopy patients of B'klyn clinic

Patients of Brooklyn Clinic Are Sought After Outbreak of Hepatitis C

A patient says a
clinic is so clean that
'even the magazines
are new.'

some other way in which
contamination introduced
ed blood or other
the scopes or
themselves. There
the years have
sterilized
across

Health Department is try-
ing to find 2,200 people who
visited the clinic dat-
ing from 1999 to 2000 for
endoscopy.

procedure in which the lining of the
stomach or bowel is examined
with a flexible lighted instru-
ment.

Such procedures can be part
of the routine screening for
colon cancer.

Blood samples of the infected
patients have been forwarded to
the Centers for Disease
Control and Prevention to try to
determine the cause of the outbreak
and hepatitis C may
be spread on the
equipment.

By DIANE CARDWELL
Health officials are trying to contact
2,200 patients who underwent
endoscopy at a Brooklyn medi-
cal center.

Eight patients tested positive
for the virus. One such as outbreak
had occurred in the
year. They
underwent
the
able

No. 1 re
United
Dr.

508

WEDNESDAY, DEC. 12, 2007 | LONG ISLAND EDITION

NEWSDAY.COM

State Stalls Trump Beach Project A3



They Stole His Christmas Lights A3



THE SYRINGE MESS

8,500 More At Risk

Every patient doc treated for 5 years
should be tested, health officials say A5



Learning Objectives

- 1) Describe safe injection and other basic infection control practices, and be able to recognize and correct unsafe practices**
- 2) Understand the need for monitoring healthcare personnel practices in your facility relating to injection safety and basic infection control**
- 3) Describe the potential consequences of syringe reuse and other unsafe practices**
- 4) Locate related CDC infection control guidance and educational materials**

Outline

- **Example of a “Never Event”**
- **Review of Indirect Transmission**
- **Injection Safety**
 - **Examples of Unsafe Practices**
- **Prevention**
- **Some FAQs**
- **Summary**

Example of a *Never Event* Related to Injection Safety and Basic Infection Control

An Outbreak of Hepatitis C Virus Infections among Outpatients at a Hematology/Oncology Clinic

Alexandre Macedo de Oliveira, MD, MSc; Kathryn L. White, RN, BSN; Dennis P. Leachinsky, BS; Brady D. Beecham, BS; Tara M. Vogt, PhD;
Ronald L. Moolenaar, MD, MPH; Joseph F. Pass, DrPH; and Thomas J. Safranek, MD

**Macedo de Oliveira et al., Annals of
Internal Medicine, 2005, 142:898-902**



Never Event:

Nebraska Hepatitis C Outbreak

- September 2002 – 4 patients recently diagnosed HCV infection reported to Nebraska Health Department
 - All regularly had cancer chemotherapy at one clinic
- Initial investigation identified infection control breach related to catheter flushing, prompting the notification of over 600 patients
- 99 clinic-acquired HCV infections were identified
 - All genotype 3a (uncommon in U.S.)
 - Transmission period: March 2000 – July 2001

Never Event:

Nebraska Hepatitis C Outbreak

- Nurse drew blood from indwelling IV catheter, then reused same syringe to perform saline flush
 - New syringe was used for each patient
 - Solution from 500cc bag used for multiple patients
- Clinic was independently owned and operated
 - No active infection control program
- Breaches never reported to state health department
- 2004 – Oncologist's and RN's licenses revoked

Growing Concern

- **CDC and state and local health departments have investigated an increasing number of outbreaks**
 - Unsafe injection practices
 - Other breaches in basic infection control
 - Detection is haphazard
- **Outbreaks are occurring across the healthcare spectrum**
 - Ambulatory, home and long-term care settings
 - Infection control programs and oversight

Outbreak of Catheter-Associated *Klebsiella oxytoca* and *Enterobacter cloacae* Bloodstream Infections in an Oncology Chemotherapy Center

John T. Watson et al. Arch Intern Med. 2005;165:2639-2643

History Forgotten is History Relived: *Nosocomial Infection Control is Also Essential in the Outpatient Setting*

Dennis G. Maki and Christopher J. Crnich

Arch Intern Med. 2005;165:2565-2567



Transmission:

Understanding the Basics

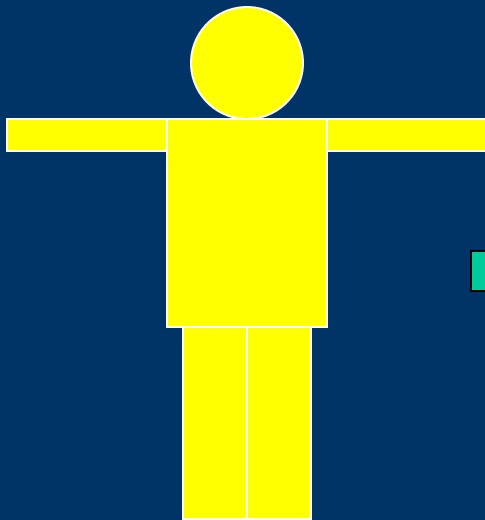
Indirect Contact Transmission

- **Transfer of an infectious agent through a contaminated intermediate object or person**
 - **Hands of healthcare personnel**
 - **Patient care devices (e.g., glucometers)**
 - **Instruments (e.g., endoscopes) that are not adequately reprocessed**
 - **Medications and injection equipment**

TRANSMISSION OF PATHOGENS VIA CONTAMINATED EQUIPMENT OR MEDICATIONS

SOURCE

Infectious person,
e.g. chronic, acute



CONTAMINATED EQUIPMENT OR MEDICATION



CASE

Susceptible,
non-immune person



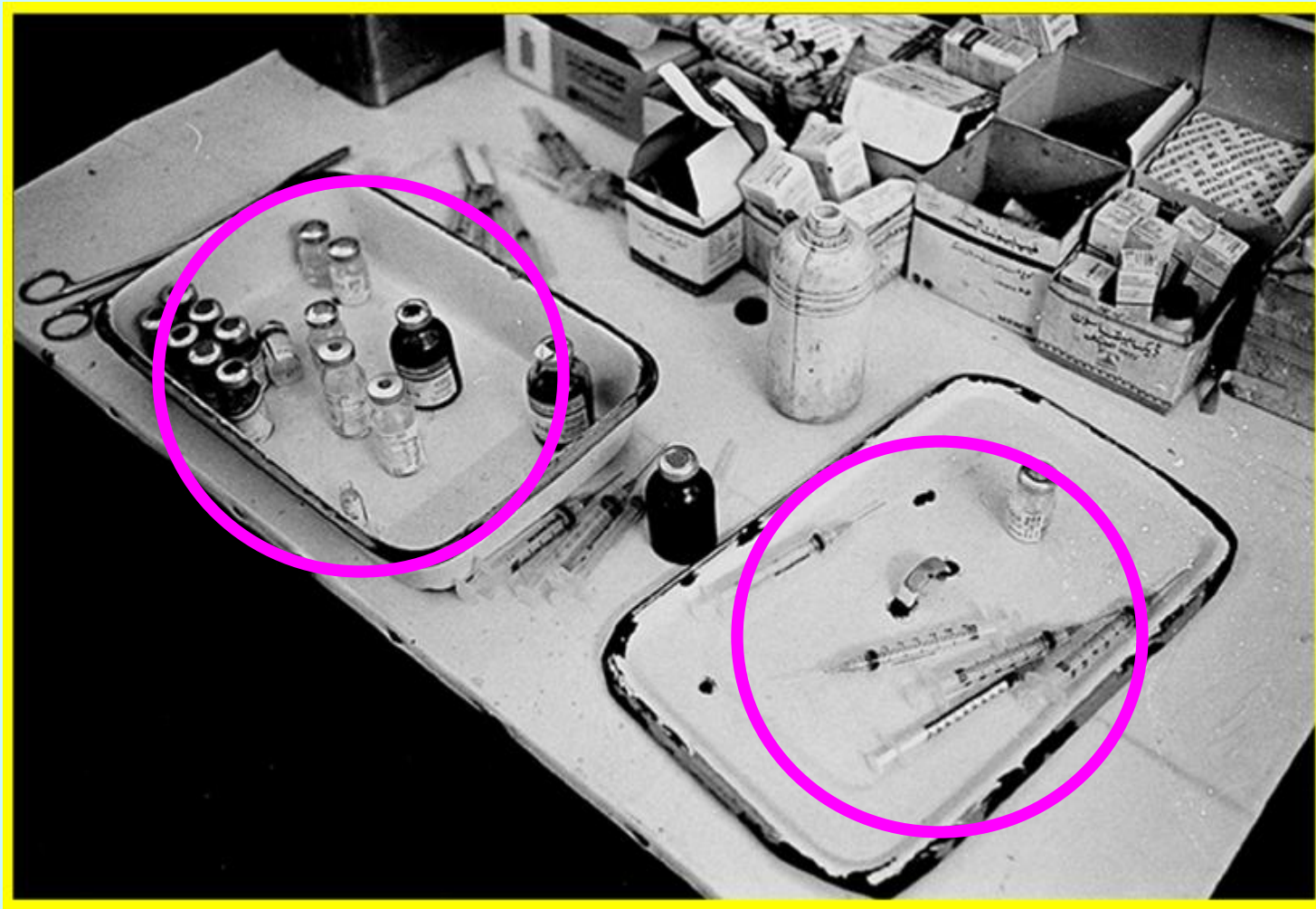
Blood Glucose Monitoring and Risks for Bloodborne Pathogen Transmission



Photo courtesy of the Statewide Program for Infection Control and Epidemiology (SPICE) at the University of North Carolina



Injection Preparation Table, Pakistan



http://www.who.int/injection_safety/en/



What is Injection Safety?

- **Injection safety** includes practices intended to prevent transmission of infectious diseases between one patient and another, or between a patient and healthcare provider, and also to prevent harms such as needlestick injuries

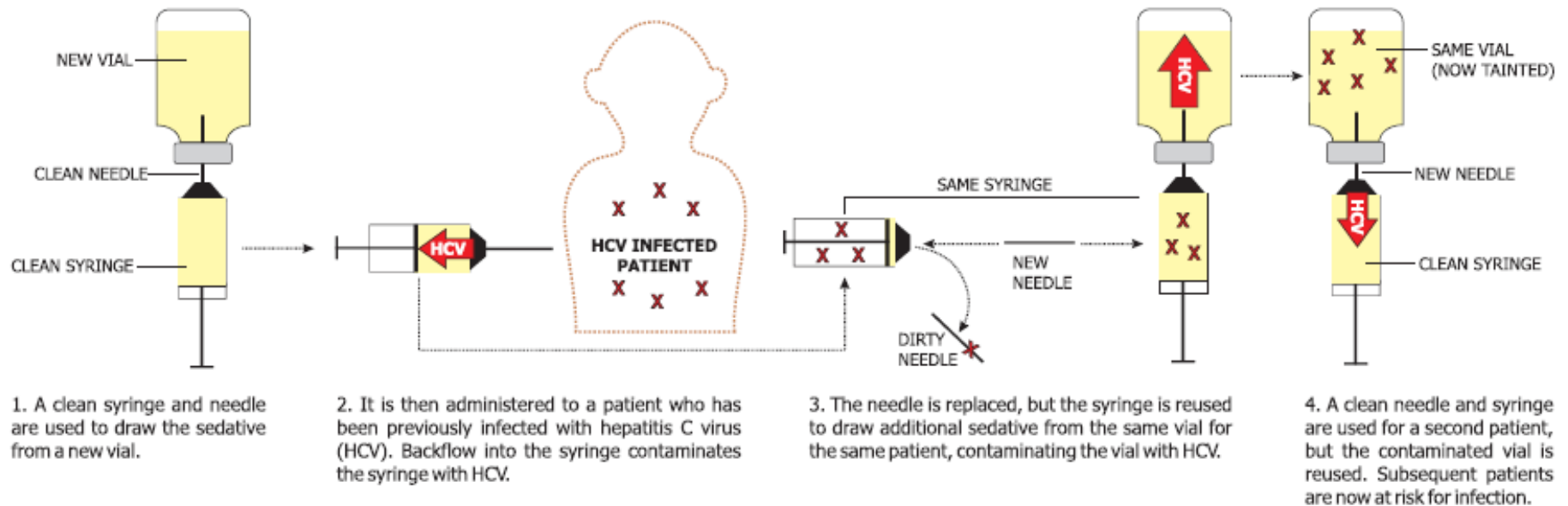
A safe injection does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for the community

What are some of the incorrect practices that have resulted in transmission of pathogens?

- Using the same syringe to administer medication to more than one patient, even if the needle was changed
- Using a common bag of saline or other IV fluid for more than one patient, and
 - Leaving an IV set in place for dispensing fluid
 - Accessing the bag with a syringe that has already been used to flush a patient's IV or catheter
- Accessing a shared medication vial with a syringe that has already been used to administer medication to a patient

Unsafe Injection Practices and Disease Transmission

Reuse of syringes combined with the use of single-dose vials for multiple patients undergoing anesthesia can transmit infectious diseases. The syringe does not have to be used on multiple patients for this to occur.



Source: www.southernnevadahealthdistrict.org

Unsafe injection practices put patients at risk* and have been associated with a wide variety of procedures

- **Administration of anesthetics for outpatient surgical, diagnostic and pain management procedures**
- **Administration of other IV medications including chemotherapy, cosmetic procedures and alternative medicine (e.g., chelation therapy; vitamins/steroids)**
- **Flushing IV lines or catheters**
- **Administration of IM vaccines**

*** infectious and non-infectious adverse events**

Examples

Outbreak of Mesotherapy-Associated Skin Reactions — District of Columbia Area, January–February 2005

Mesotherapy is a treatment involving local subcutaneous injections of minute quantities of various substances (e.g., vitamins or plant extracts) for cosmetic purposes (e.g., fat and wrinkle reduction or body contouring) or relief of musculoskeletal pain.

BOX. Infection-control and safe-injection practices

Injections

- Inject only substances approved by the Food and Drug Administration.*
- Use a sterile, single-use, disposable needle and syringe for each patient and discard intact in an appropriate sharps container after use.
- Use single-dose medication vials, prefilled syringes, and

Nosocomial Malaria and Saline Flush

**Sanjay K. Jain,* Deborah Persaud,*
Trish M. Perl,* Margaret A. Pass,*
Kathleen M. Murphy,* John M. Pisciotta,*
Peter F. Scholl,* James F. Casella,*
and David J. Sullivan***

An investigation of malaria in a US patient without recent travel established *Plasmodium falciparum* molecular genotype identity in 2 patients who shared a hospital room. *P. falciparum* can be transmitted in a hospital environment from patient to patient by blood inoculum if standard precautions are breached.

Emerging Infectious Diseases

www.cdc.gov/eid • Vol. 11, No. 7, July 2005



Nosocomial HIV-transmission in an outpatient clinic detected by epidemiological and phylogenetic analyses

**Terese L. Katzenstein^a, Louise B. Jørgensen^b, Henrik Permin^a,
Jan Hansen^c, Claus Nielsen^b, Roberto Machuca^b, Jan Gerstoft^a**

AIDS 1999, 13:1737–1744

Transmission of Hepatitis B and C Viruses in Outpatient Settings — New York, Oklahoma, and Nebraska, 2000–2002

- Endoscopy Clinic: New York City, 2001
 - 19 HCV infections likely due to contamination of multiple-dose anesthetic vials
- Oncology Clinic: Nebraska, 2002
- Pain Remediation Clinic: Oklahoma, 2002
- Private Medical Practice: New York City, 2001

Newsday

NEW YORK CITY

day.com

WEDNESDAY, JULY 3, 2002 • CITY EDITION

50¢



2001 HEPATITIS OUTBREAK

DOCTOR DID IT

**State: Anesthesiologist
Contaminated
Vial of Medication
With Dirty Needle**

Page A3



Newsday Photo / Ken Savelle

At least 19 people were infected at this Brooklyn clinic.

Oklahoma Pain Remediation Clinic

- August 2002 – 6 patients with acute hepatitis C
 - All received treatment at a single pain clinic
- Outpatient clinic affiliated with a hospital
 - Anesthesia staff were contractors
 - One afternoon per week
- Nurse anesthetist was reported for poor practice
 - First report – not acted upon
 - Second report (June 2002) – formal reprimand and change in practice but DOH not notified

Oklahoma Pain Remediation Clinic

- Anesthetist filled single syringe with sedation medication to treat up to 24 sequential patients
 - Administered through heparin locks
- Lookback investigation for entire two year time period of clinic operation
 - Serologic results for 795/908 (88%) patients
 - 71 (9%) clinic-associated HCV infections
 - 31 (4%) clinic-associated HBV infections
- US \$25 million settlement

HEPATITIS C?

CALL

Law Firm

528-2222

LINDMARK

Oklahoma State Dept. of Health



New York City – Private Medical Practice



December 2001:

Two patients aged >75 years
developed acute hepatitis B

- Admitted same hospital
- Attended same private
medical practice

New York City – Private Medical Practice

- Notification of >1000 patients; >200 tested
- 38 patients with acute HBV infection
- HBV sequenced from 28 patients was identical
- All staff members negative for HBV markers
- Associated with injection of vitamins and steroids
 - 2 or 3 medications together in one syringe

Common Themes and Findings

- Investigations were resource-intensive and disruptive
 - Notification, testing, and counseling of hundreds of patients
- Delayed recognition and missed opportunities
 - Prolonged transmission
 - Growing reservoirs of infected patients
- IC programs lacking or responsibilities unclear
 - Clinic space rented from a hospital (NE)
 - Contractors (NYC and OK)
- Entirely preventable
 - Standard precautions + **aseptic technique**

MMWR 2003 52:901-6 / CID 2004; 38:1592–8



Prevention

Safe Injection Practices and Basic Infection Control



Basic Patient Safety

- Healthcare should not provide any avenue for transmission of bloodborne viruses
 - Basic patient safety / “red flag”
 - Risks of patient-to-patient spread on par with HCW and blood safety efforts
- Entirely preventable
 - Standard Precautions / **Aseptic Technique**
 - Aseptic techniques for handling parenteral medications, administering injections, and sampling blood

Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007

Suggested citation: Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, June 2007
<http://www.cdc.gov/ncidod/dhqp/pdf/isolation2007.pdf>



2007 Guideline for Isolation Precaution

Executive Summary

- The **transition of healthcare delivery** from primarily acute care hospitals to other settings (e.g., home care, ambulatory care, free-standing specialty care sites, long-term care)
- **Standard Precautions**, first recommended in the 1996 guideline, has led to a reaffirmation of this approach as the **foundation for preventing transmission** of infectious agents in **all healthcare settings**
- Strong evidence base: **Outbreaks of hepatitis B and hepatitis C viruses in ambulatory settings** indicated a need to re-iterate safe injection practice recommendations as part of Standard Precautions

IV.H. Safe injection practices

The following recommendations apply to the use of needles, cannulas that replace needles, and, where applicable intravenous delivery systems ⁴⁵⁴

- IV.H.1. Use aseptic technique to avoid contamination of sterile injection equipment ^{1002, 1003}. *Category IA*
- IV.H.2. Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed. Needles, cannulae and syringes are sterile, single-use items; they should not be reused for another patient nor to access a medication or solution that might be used for a subsequent patient ^{453, 919, 1004, 1005}.
Category IA
- IV.H.3. Use fluid infusion and administration sets (i.e., intravenous bags, tubing and connectors) for one patient only and dispose appropriately after use. Consider a syringe or needle/cannula contaminated once it has been used to enter or connect to a patient's intravenous infusion bag or administration set ⁴⁵³.
Category IB
- IV.H.4. Use single-dose vials for parenteral medications whenever possible ⁴⁵³. *Category IA*
- IV.H.5. Do not administer medications from single-dose vials or ampules to multiple patients or combine leftover contents for later use ^{389 453, 1005}. *Category IA*
- IV.H.6. If multidose vials must be used, both the needle or cannula and syringe used to access the multidose vial must be sterile ^{453, 1002}.
Category IA
- IV.H.7. Do not keep multidose vials in the immediate patient treatment area and store in accordance with the manufacturer's recommendations; discard if sterility is compromised or questionable ^{453, 1003}. *Category IA*
- IV.H.8. Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients ^{453, 1006}. *Category IB*

Standard Precautions

Examples of Safe Injection Practices

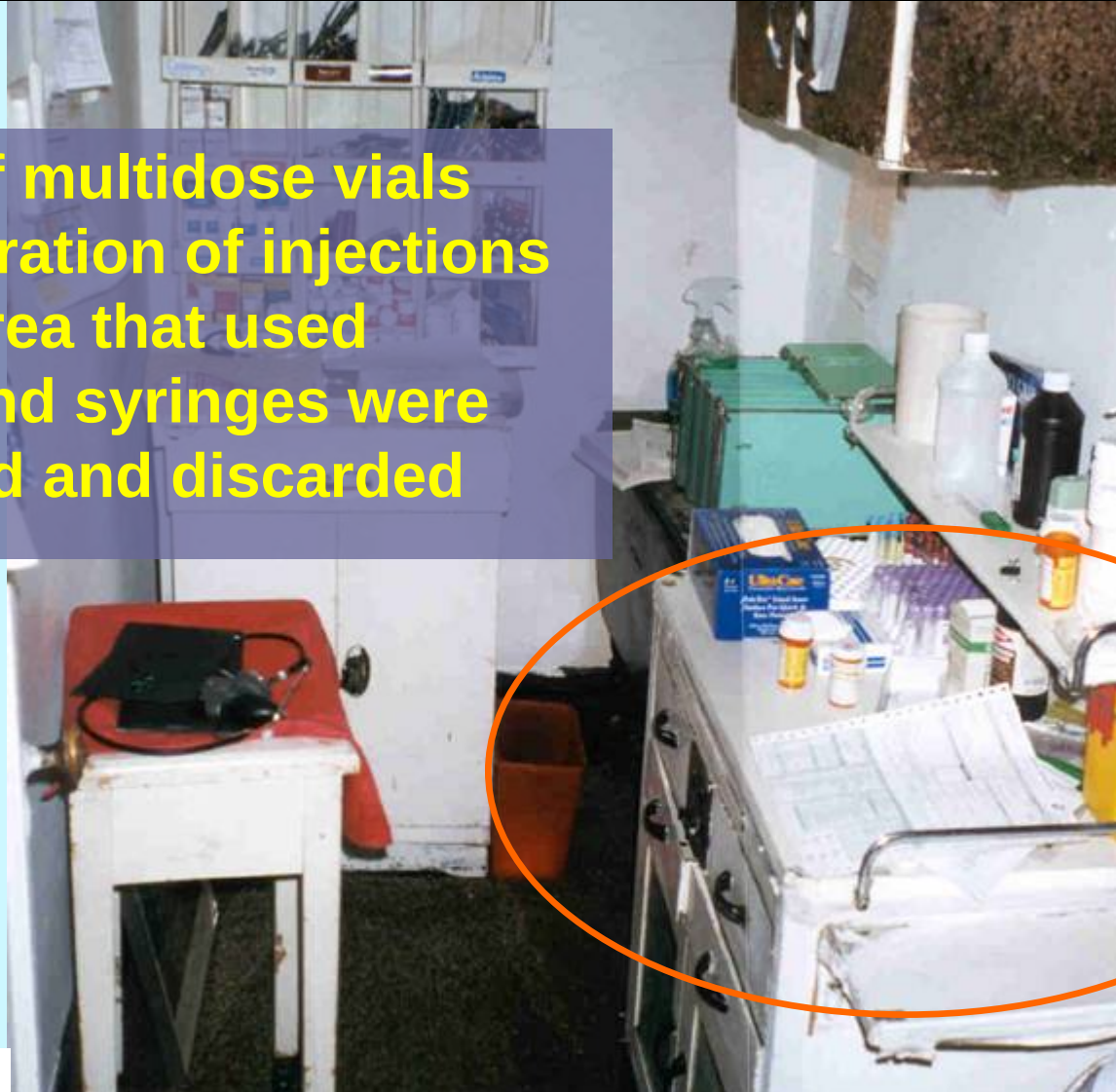
- Use aseptic technique to avoid contamination of sterile injection equipment
- Use single-dose vials for parenteral medications whenever possible
- Needles, cannulae and syringes are sterile, single-use items; they should not be reused for another patient nor to access a medication or solution that might be used for a subsequent patient
- Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients

What is Aseptic Technique?

- **Handling, preparation, and storage of medications and all supplies used for injections and infusions—e.g., syringes, needles, intravenous (IV) tubing—in a manner that prevents microbial contamination**
- **Medications should be drawn up in a designated “clean” medication preparation area**
 - **In general, any item that could have come in contact with blood or body fluids should be kept separate**

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



Safe Handling of Parenteral Medications

- **Always use a new sterile syringe and needle to draw up medications**
- **Proper hand hygiene should be performed before handling medications**
- **Parenteral medications and injection equipment should be accessed in an aseptic manner**

Maintaining Sterility of Vials

- A new sterile needle and syringe should be used for each injection
- Medications should be discarded upon expiration or any time there are concerns regarding the sterility of the medication
- Leftover parenteral medications should never be pooled for later administration
- A needle should never be left inserted into a medication vial septum for multiple uses
 - This provides a direct route for microorganisms to enter the vial and contaminate the fluid

Minimizing the use of shared medications reduces patient risk

- Single-use medications vials (e.g., propofol) should never be used for more than one patient**
- Assign multi-dose vials to a single patient whenever possible**
- No not use bags or bottles of intravenous solution as a common source of supply for more than one patient**
- Absolute adherence to proper infection control practices must be maintained during the preparation and administration of injected medications**

Robert A. Weinstein, Section Editor

Viral Hepatitis Transmission in Ambulatory Health Care Settings

I. T. Williams, J. F. Perz, and B. P. Bell

Epidemiology Branch, Division of Viral Hepatitis, National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia

Administrative

Tailor infection-control measures to individual practice setting
Clearly designate responsibility for oversight and monitoring
Periodically review staff practices (e.g., at least annually)
Establish procedures and responsibilities for reporting and investigating breaches in infection-control policy

Prepare medications in areas physically separated from those with potential blood contamination.

Use barriers to protect surfaces from blood contamination when blood samples are obtained.

Clean and disinfect blood-contaminated equipment and surfaces in accordance with recommended guidelines.

Hand hygiene and gloves

Perform hand hygiene (i.e., hand washing with soap and water or use of an alcohol-based hand rub) before preparing and administering an injection, before and after donning gloves for obtaining blood samples, after inadvertent blood contamination, and between patients.

Wear gloves for procedures that might involve contact with blood and change gloves between patients.

Administrative

Inf: **Clinical Infectious Diseases 2004; 38:1592–8**
Re:
Per:
Pro: **www.cdc.gov/hepatitis**

Procedures and responsibilities should be established for reporting and investigating breaches in infection-control policy.



Some Frequently Asked Questions

Q: Is it OK to use the same syringe to give intramuscular (IM) or subcutaneous (SC) injections to more than one patient if I change the needle between patients?

A: **NO.** Once they are used, the syringe and needle are both contaminated and must be discarded. Use a new sterile syringe and needle for each patient.

Q: Is it OK to use the same syringe to give an IM or intravenous (IV) injection to more than one patient if I change the needle between patients and I don't draw back before injecting?

A: **NO.** A small amount of blood can flow into the needle and syringe even when only positive pressure is applied outward. The syringe and needle are both contaminated and must be discarded.

Q: If I used a syringe only to infuse medications into an IV tubing port that is several feet away from the patient's IV catheter site, is it OK to use the same syringe for another patient?

A: **NO.** Everything from the medication bag to the patient's catheter is a single interconnected unit

- Separation from the patient's IV by distance, gravity and/or positive infusion pressure does not ensure that small amounts of blood are not present in these supplies
- A syringe that intersects through ports in the IV tubing or bags also becomes contaminated and cannot be used for another patient

Q: Are these recommendations new?

A: **NO.** These recommendations are part of established guidance.

- It is a well established practice to never use the same syringe or needle for more than one patient nor to enter a medication vial with a syringe or needle used for one patient if the same vial might be used for another patient

Q: How can healthcare providers ensure that injections are performed correctly?

A: To help ensure that staff understand and adhere to safe injection practices, consider the following:

- Designate someone to provide ongoing oversight for infection control issues
- Develop written infection control policies
- Provide training
- Conduct quality assurance assessments

Q: Can I reuse a syringe during a procedure for a patient who requires additional medication as long as the vial will not be used for another patient?

A: It is preferable to always use a new sterile syringe to withdraw medications, even if the medication will only be used for one patient. This provides an extra layer of protection for patients and is encouraged

Q: Why can't I just visually inspect syringes to determine whether they are contaminated or can be used again?

A: Pathogens including HCV, HBV, and human immunodeficiency virus (HIV) can be present in sufficient quantities to produce infection in the absence of visible blood

Similarly, bacteria and other microbes can be present without clouding or other visible evidence of contamination

Just because you don't see blood or other material in a used syringe or IV tubing, e.g., does not mean the item is free from potentially infectious agents

All used injection supplies and materials are potentially contaminated and should be discarded



SUMMARY

Improper use of syringes, needles, and medication vials can result in:

- **Transmission of life-threatening infections to patients**
- **Notification of patients of possible exposure to bloodborne pathogens and recommendation that they be tested for hepatitis C virus, hepatitis B virus, and human immunodeficiency virus (HIV)**
- **Referral of providers to licensing boards for disciplinary action**
- **Malpractice suits filed by patients**

Some Key Take-Home Messages

All healthcare providers are urged to carefully review their infection control practices and the practices of all staff under their supervision

In particular, providers should:

- Never administer medications from the same syringe to more than one patient, even if the needle is changed
- Never enter a vial with a syringe or needle that has been used for a patient if the same medication vial might be used for another patient

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Injection Safety

Injected medicines are commonly used in healthcare settings for the prevention, diagnosis, and treatment of various illnesses. Injection safety, or safe injection practices are measures taken to perform injections in an optimally safe manner for patients, healthcare providers, and others. A safe injection does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for the community. Injection safety includes practices intended to prevent transmission of infectious diseases between one patient and another, or between a patient and healthcare provider, and also to prevent harms such as needlestick injuries.

- > [Injection Safety for Providers](#)
- > [Injection Safety Facts](#)
- > [Safe work practices to prevent HCW exposure to bloodborne pathogens](#)
Excerpted from [Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007](#).
- > [A Patient Safety Threat – Syringe Reuse](#)

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<http://www.cdc.gov/ncidod/dhqp/injectionsafety.html>



Thank You

WWW.CDC.GOV

DHQP Inquiries

(inquiries about safe injection practices)

1-800-311-3435, option 1

-or-

email us at: hip@cdc.gov



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