

Infection Prevention and Patient Safety: Care Practices During Blood Glucose Monitoring

Ruth Carrico PhD RN FSHEA CIC

Associate Professor

Division of Infectious Diseases, School of Medicine

University of Louisville

Disclosure

- Thank you to Abbott for their support of this educational program
- No other disclosures relevant to this program

Objectives

- Review steps involved in blood glucose monitoring with identification of steps in the process that represent risk and prevention opportunities
- Identify practice questions where data are limited or unknown
- Explore solutions that bring existing practice closer to ideal practice

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As part of your approach for consistent infection prevention and control practice, you are observing practice in several patient care areas. One area of assessment involves how healthcare personnel are able to consistently apply basic infection prevention practices. All personnel must be able to think critically so they can apply that knowledge and skill regardless of the setting or task. Right!?

Competent Infection Prevention Practice

Recognizes the role of microorganisms in disease

Identifies modes of transmission

Demonstrates standard and transmission-based precautions

Demonstrates ability to problem solve and apply knowledge in varied situations and settings

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Basics of Infection Transmission

Pathogen transmission via:



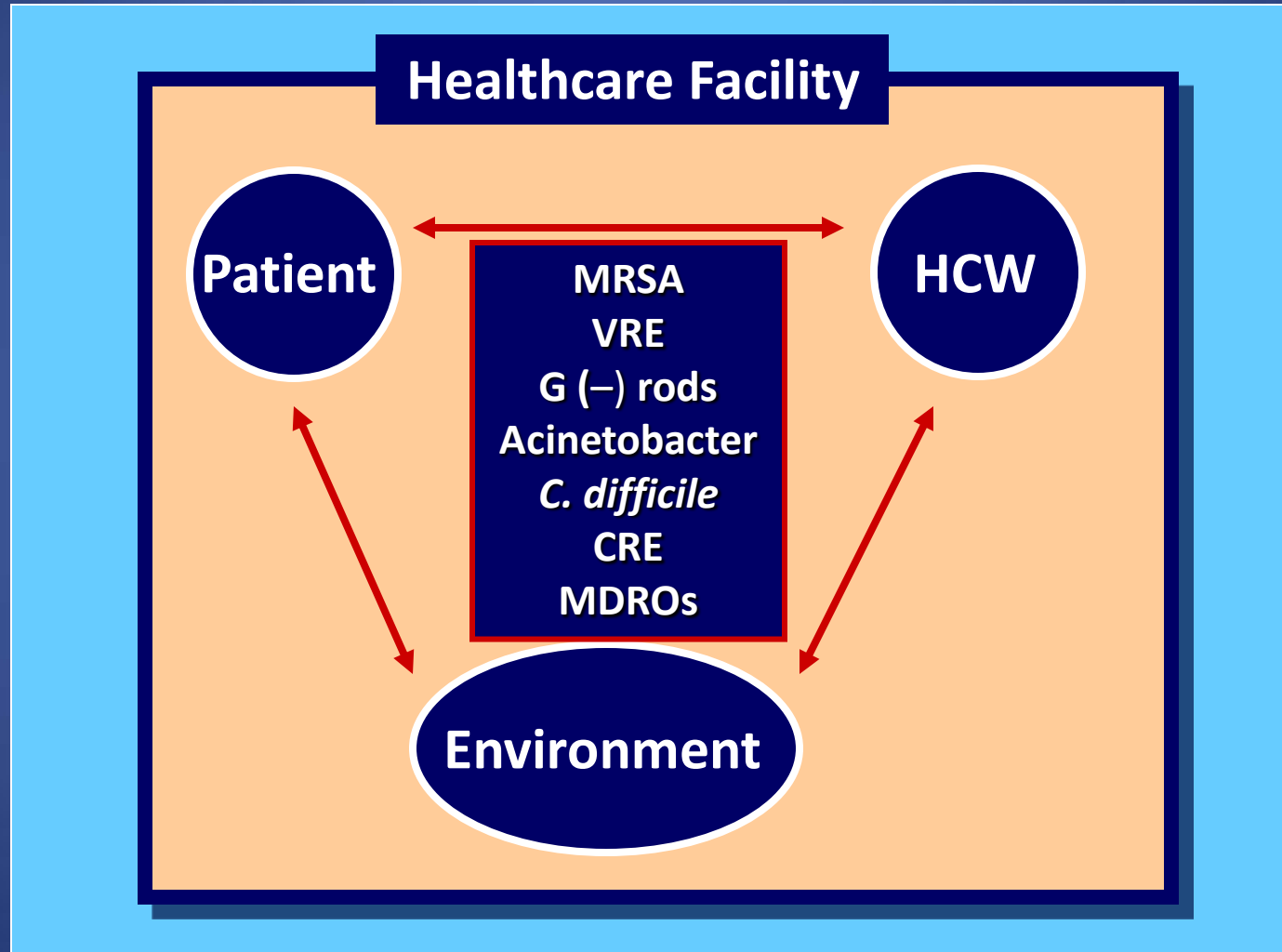
Infection Prevention in Practice

- Hand hygiene by healthcare personnel
- Patient-centered hand hygiene
- Environmental infection control
- Healthcare built environment
- Occupational health and workplace wellness
- Process management and identification of “standard work”
- Standardized training and educational approaches

One of your areas of evaluation involves the many activities that are used during blood glucose monitoring:

- Practices by the different healthcare personnel groups (nurses, patient care assistants)
- Environmental infection control
- How patients and family members are involved in the care process

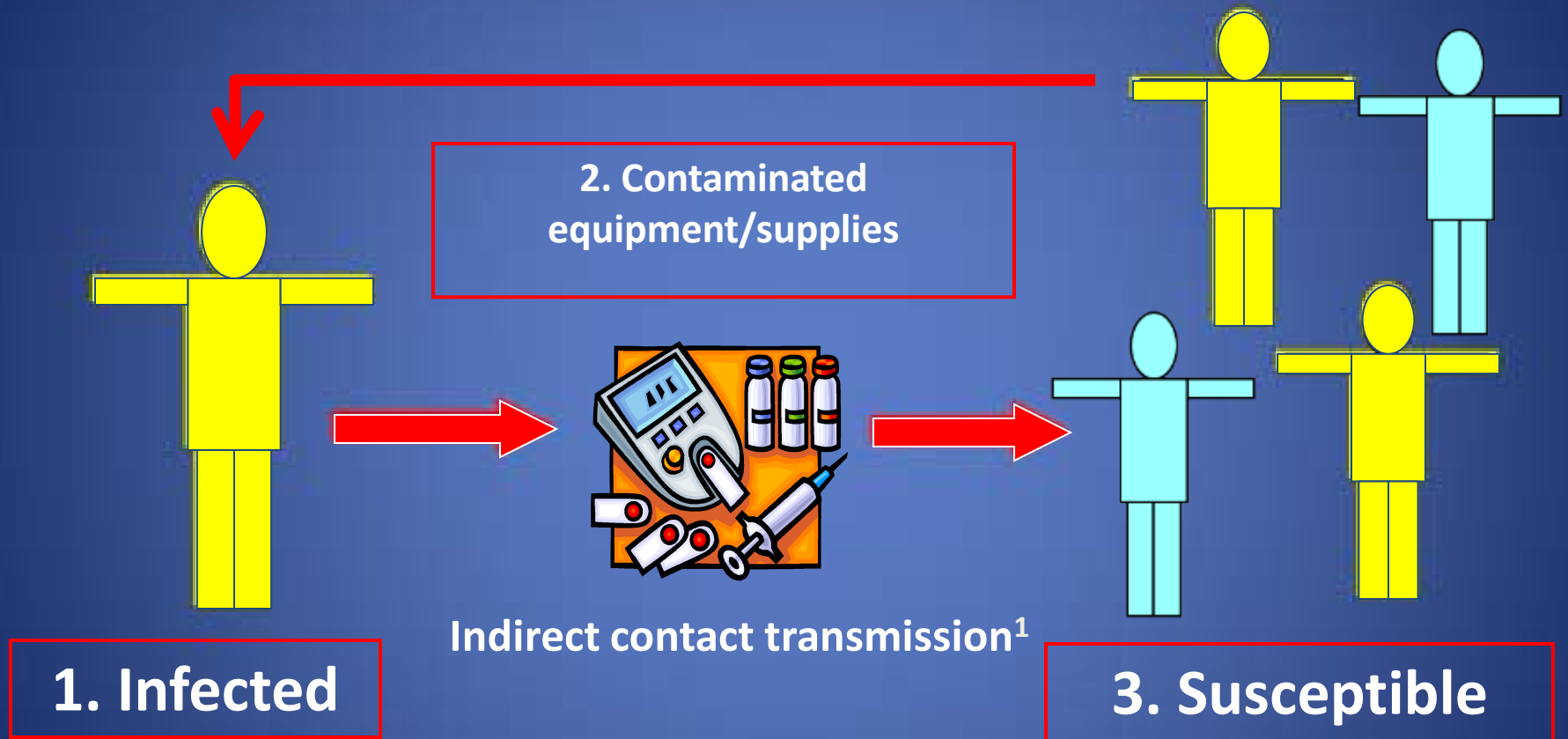
Transmission: General Principles



Recognized Best Practices During Blood Glucose Monitoring



Person-to-person transmission of bloodborne viruses during blood glucose monitoring



Blood Glucose Monitoring

Standard work in infection prevention includes:

- Hand hygiene prior to performance of testing
- Cleaning/disinfecting the meter
- Use of personal protective equipment (gloves)
- Use of single-use items (lancet and device)
- Use of test strips

The goal is to ensure that opportunities for transmission of pathogens to/from the patient and the healthcare worker are interrupted

Process Gaps

Inconsistent hand hygiene practices among healthcare personnel

Largely absent hand hygiene by patients

Inconsistent cleaning/disinfection of meters

Lack of standard approaches regarding when test strips are removed from vials

Result is difficulty in developing, applying, teaching, monitoring, and intervening with practices that are less than ideal



11

UPM

Date Rec'd. 11/11/22
Date Opened 7/3/22
Exp. Date 11/3/22

Test for the glucose use in the and Met
in the
potent
before use
store in a
temperature
(66°F). Do
Replace and tight
Patents
© 1999 L
AW 052-71

PCR-3015



Human Factors Engineering

- Identification of steps in a process
- Determine what can be done/changed/implemented in order to enable correct technique
- Determine what can be done/changed/implemented in order to prevent incorrect technique
- Examples of these interventions

Single Use Supplies

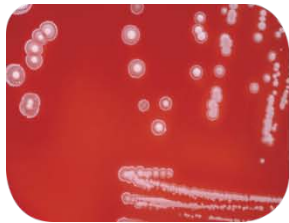
Individually packaged supplies for patient safety



Real-world issues: Bacterial cross-contamination, waste and cost

In independent lab analyses

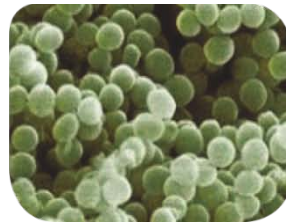
25.7%¹ to 78.9%² of test strips in open vials from two different manufacturers tested positive for bacteria.



Staphylococcus epidermidis



*Micrococcus luteus**



Staphylococcus auricularis



Enterococcus



Corynebacterium spp.

Shared meters and dedicated strips represent financial concerns (direct costs and waste) that can be managed

Linking Best Practices Guidelines to Existing Practices

Centers for Disease Control and Prevention:

“Unused supplies and medications taken to a patient’s bedside during finger stick monitoring or insulin administration should not be used for another patient because of possible inadvertent contamination.”¹



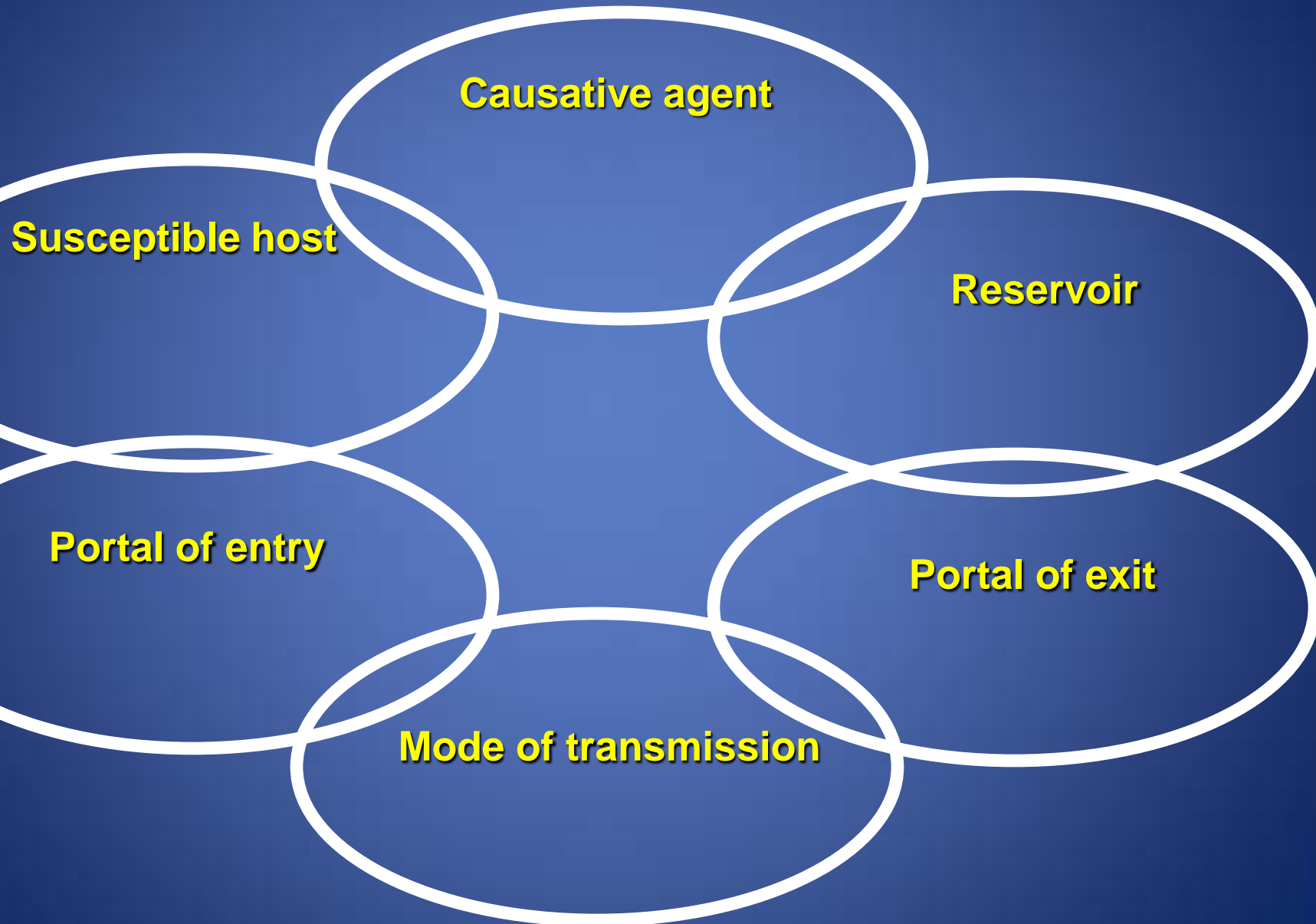
Individual vials to single patient use adds cost—does not eliminate contamination risk

• Study found that opened vials stayed with a single patient had same contamination rate as those that moved from room to room²



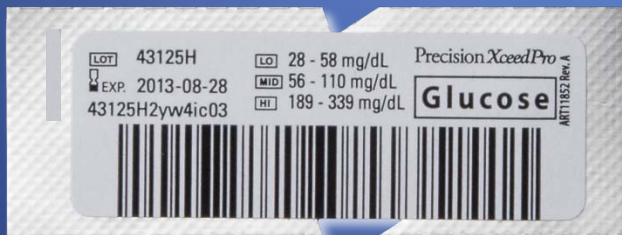
1. Diabetes and Viral Hepatitis: Important Information on Glucose Monitoring, Centers for Disease Control: <http://www.cdc.gov/hepatitis/Settings/GlucoseMonitoring.htm>. Accessed February 14, 2013.
2. Vanhaeren s, Duport C, Magneey M. Bacterial Contamination of glucose test strips: Not to be neglected. Am J Inf Control 2011;39:611-613.

Chain of Transmission



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



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Contamination and opened vials

- Multicenter evaluation of strip contamination found majority of open vials in use in 5 hospitals have contaminated strips:

27-70% of opened vials tested positive for bacteria regardless of vendor (LifeScan SureStepPro; Roche Accu-Chek Comfort Curve)

vs. 0-4% of individually foil-wrapped strips (Abbott)

- Test strips culture-positive for a variety of bacterial (enteric and skin flora) species ¹

Real-life estimate of strip vial wastage when assigned single-patient use

What are the financial consequences of switching from common-use testing vials to single patient-use testing vials, and discarding unused strips in open vials?

Based on a set of assumptions of patient census, glucose test workload and hospital LOS: estimated annual cost of test strip waste ranged from \$80,000 w/ 25-strip vials to > \$170,000 w/ 50-strip vials

This study highlights that in the process of switching glucose vendors, minor differences in vial count (25 vs 50 – count , or single-use packaging versus multi-strip vials) have potentially substantial financial impact ¹

Individually-wrapped test strips do not require strip wastage to become compliant w/ CDC & CLSI guidelines

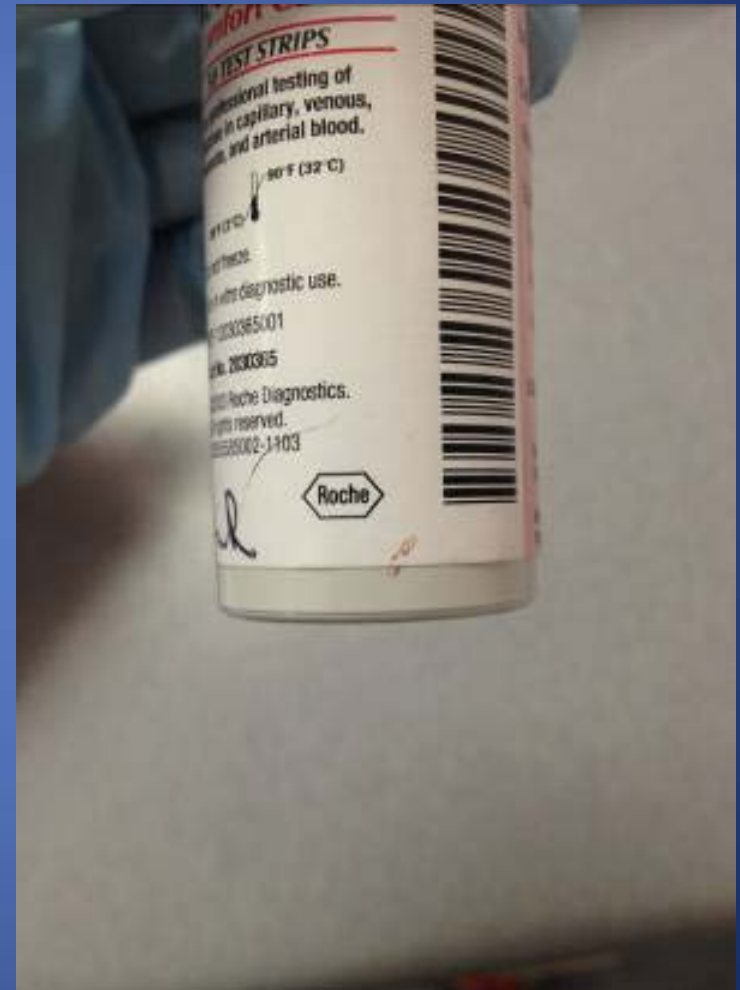
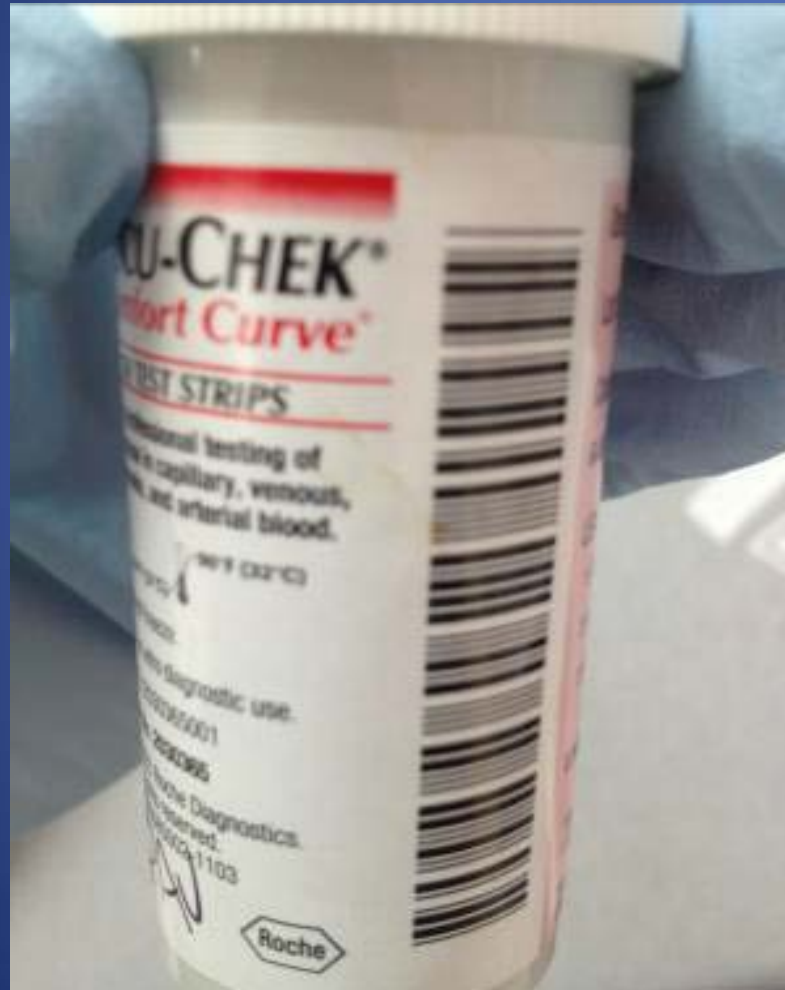
1.Nichols JH. Estimated strip wastage from glucose meter infection control recommendations. Clin Chem Acta 2012 Dec 24;414:91-2. doi: 10.1016/j.cca.2012.08.007. Epub 2012 Aug 16.

Dedicating individual vials to single patients:
adds cost ; may not eliminate contamination risk

- Study found that opened vials stayed with a single patient had same contamination rate as those that moved from room to room ¹

Vanhaeren s, Duport C, Magneney M. Bacterial Contamination of glucose test strips: Not to be neglected. Am J Inf Control 2011;39:611-613.

New finding: Bloody contamination of glucose test strip vials in acute care institutions

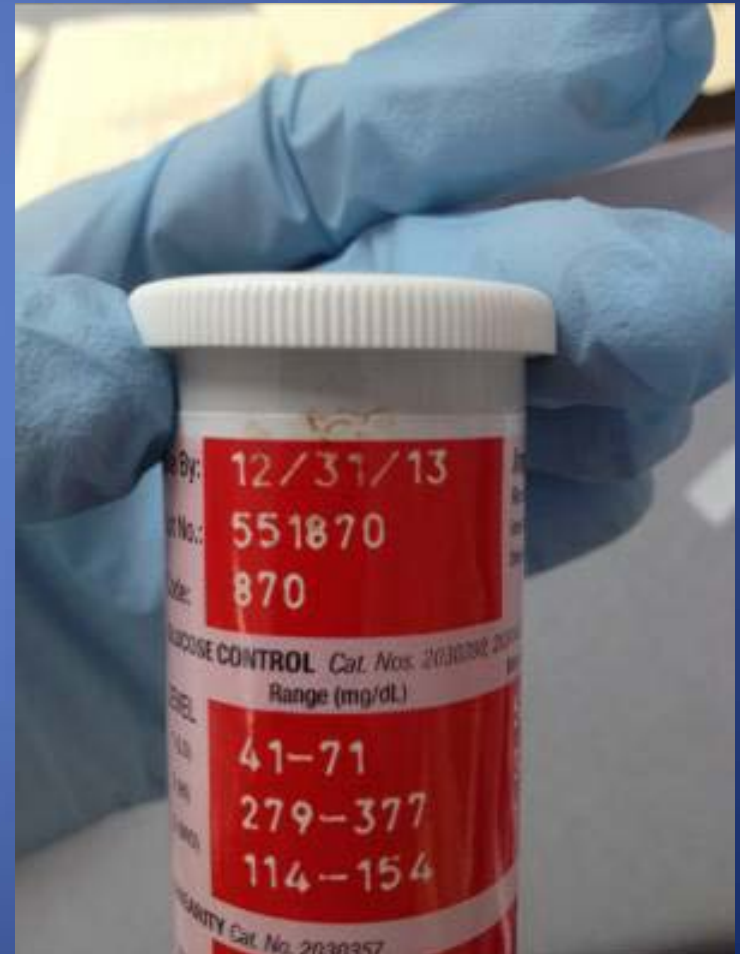


Abbott sponsored study data July 2013.

Some questions for you...

Multi-test strip vials in use at acute care facilities can pose health risk due to blood contamination

- 81 vials in active use, with ≤ 10 strips remaining, submitted by users were blood-contaminated in 2 of 3 institutions
- Blood contamination on outside (2) and inside (1) of vials confirmed by sensitive test methodologies
- Vial disinfection may expose unused test strips to bleach-based agents, add staff time
- Additional study required to establish incidence



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Critical Thought Points

- Confusion and lack of knowledge is evident regarding safe and appropriate use of blood glucose monitoring equipment, including finger stick devices and blood glucose meters
- Current public health efforts by agencies (CDC & U.S. FDA) serve to educate and inform accountable parties in health care settings
- Test strips and test strip vials have not been systematically examined for blood contamination in the course of investigations, but need to be in audit tools
- Manufacturers are responsible for provision of improved product labeling & package instructions, and for improved, effective validated cleaning and disinfection protocols

Reduce Risks of Cross-Contamination

Single use skin puncture devices

Restrict point-of-care meter use to a single patient whenever possible

Properly clean and disinfect shared equipment between uses

Use, then change, gloves during procedure and after completion

Hand hygiene between all patient contact

Assess practices involving shared test strip bottles

Employ single-use packaging of test strips

Reduce Risks of Cross-Contamination

Look for ways to intervene when deviations from ideal practices occur.

Not every practice or intervention is identical or appropriate for every setting.

It is everyone's responsibility to identify gaps in practice, then investigate how those gaps can be corrected

It is then possible to identify who needs to be part of the team to investigate options that place the patient as the focus of safety actions

Practice Assessment

What is current practice?

How does it differ from ideal practice (or does it)?

How to measure existing practice?

How to determine generalizability of practice observations?

Can observed practice outcomes help develop a roadmap for safer care?

