

Cleaning / Disinfecting Glucometers in the LTC Setting

Long-term care facilities recently have been cited for inadequately cleaning or disinfecting glucometers used by multiple residents. In addition to outlining how/where glucometers are mentioned in the new infection control guidelines at F-Tag 441 of the CMS State Operations Manual, ASCP has also researched individual glucometer manufacturers' cleaning recommendations, along with the Centers for Disease Control and Prevention (CDC), Environmental Protection Agency (EPA) and American Diabetes Association (ADA) guidelines on this matter. The information provided below should be helpful when developing or assuring the adequacy of your facility's or facilities' policies and procedures.

Be sure you are familiar with which glucometer manufacturer(s) your facility(ies) use(s) and the cleaning procedures recommended by that manufacturer(s) (SEE CHART BELOW). **If the manufacturer does not provide specific cleaning recommendations or as a conservative approach to infection control for glucometers with minimal cleaning requirements, facilities may want to consider cleaning glucometers with high-level disinfectants.** Be familiar with the amount of time the disinfectant solution is supposed to contact the equipment or how long active cleaning should be performed to ensure complete disinfection. For example, simply wiping equipment with a disinfectant-soaked swab may not be adequate. Wiping for a specific length of time or ensuring the equipment is "wet" or saturated for a specific length of time may be required. Cleaning timeframes may be dictated by CDC guidelines or by the disinfectant manufacturer in their "instructions for use."

CMS State Operations Manual, F-Tag 441

In the section of the F-441 Interpretive Guidelines dealing with preventing the spread of illness, a variety of illnesses can be spread via indirect transmission, such as transmission through shared glucometers:

“Resident-care devices (e.g., electronic thermometers or glucose monitoring devices) may transmit pathogens if devices contaminated with blood or body fluids are shared without cleaning and disinfecting between uses for different residents.”

In the F-441 survey protocol, surveyors are directed to observe cleaning and disinfecting of equipment, such as:

- *“(Whether) small non-disposable equipment such as glucose meters, scissors, and thermometers are cleaned and appropriately disinfected after each use for individual resident care;*
- *“(Whether) single-use items (e.g., blood glucose lancet, other sharps) are properly disposed of after one use.”*

In addition, glucometer cleaning is mentioned in an example of the highest level citation, a Severity Level 4 or “Immediate Jeopardy” citation:

“Examples of negative outcomes that occurred or have the potential to occur at Severity Level 4 as a result of the facility’s deficient practices may include:

The facility failed to follow standard precautions during the performance of routine testing of blood sugars. The facility did not clean and disinfect the glucometers before or after use and did not use new glucometer lancets on residents who required blood sugar monitoring. This practice of not cleaning and disinfecting glucometers between every use and re-using glucometer lancets created an Immediate Jeopardy to resident health by potentially exposing residents to the spread of blood borne infections for multiple residents in the facility who required blood sugar testing.”

CDC Recommendations

Transmission of Hepatitis B Virus Among Persons Undergoing Blood Glucose Monitoring in Long-Term--Care Facilities --- Mississippi, North Carolina, and Los Angeles County, California, 2003--2004
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5409a2.htm>

The CDC has developed specific infection control recommendations pertaining to diabetes care in health care and group residence settings. These recommendations are based on a study conducted at three long-term care facilities between 2003 and 2004. Among the three nursing homes, the spread of Hepatitis B virus was more prevalent in those residents who were diabetics and receiving daily fingersticks. The reasoning for such high prevalence is not known definitively, but may be related to a variety of factors, such as:

- In two of the facilities, the spring-loaded fingerstick device was used for multiple patients;
- In one of the facilities the nurses did not wear gloves (to decrease the sense of a clinical environment) and hand hygiene was not performed between patients;
- Indirect transmission could have occurred through contaminated environmental surfaces or inadequately disinfected equipment.

Based on this information, the CDC developed their infection control recommendations pertaining to diabetes care in health care and group residence settings. Those recommendations include, but are not limited to:

Diabetes-care procedures and techniques

- Never reuse needles, syringes, or lancets.
- Restrict use of fingerstick capillary blood sampling devices to individual patients.
- Consider using single-use lancets that permanently retract upon puncture.
- Dispose of used fingerstick devices and lancets at the point of use in approved sharps containers.
- Assign separate glucometers to individual patients. If glucometers are shared, the device must be cleaned and disinfected between each patient use.
- Store individual patient supplies and equipment, such as fingerstick devices and glucometers, within patient rooms when possible.
- Because of possible inadvertent contamination, unused supplies and medications taken to a patient's bedside during fingerstick monitoring or insulin administration should not be used for another patient. Do not carry supplies and medications in pockets.

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Hand hygiene and gloves

- Wear gloves during fingerstick blood glucose monitoring, administration of insulin, and any other procedure involving potential exposure to blood or body fluids.
- Change gloves between patient contacts and after every procedure that involves potential exposure to blood or body fluids, including fingerstick blood sampling. Discard gloves in appropriate receptacles.
- Perform hand hygiene with soap and water or alcohol hand sanitizer immediately after removal of gloves and before touching medical supplies intended for use on other patients.

CONCLUSION: Cleaning and disinfection between patients is important. However, the guidelines above do not provide specific recommended cleaning procedures or solutions for glucometers. See other CDC documents and the Glucometer Manufacturer chart below.

Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008

http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Disinfection_Nov_2008.pdf

Definitions:

- **Disinfection**- a process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects
 - Low-level disinfectants- kill most vegetative bacteria, some fungi and some viruses in a practical period of \leq 10 minutes
 - Intermediate-level disinfectants- might be cidal for mycobacteria, vegetative bacteria, most viruses, and most fungi but do not necessarily kill bacterial spores
 - High-level disinfectants- will kill all microorganisms except large numbers of bacterial spores
 - Chemical sterilants- kill spores with prolonged exposure times (3-12 hours)
- **Cleaning**- removal of visible soil from objects and surfaces and normally is accomplished manually or mechanically using water with detergents or enzymatic products
- **Decontamination**- removes pathogenic microorganisms from objects so they are safe to handle, use, or discard
- **Critical Items**- confer a high risk for infection if they are contaminated with any microorganism, objects that enter sterile tissue or the vascular system
 - Surgical instruments, cardiac and urinary catheters, implants, and ultrasound probes in sterile body cavities; use steam, EtO, hydrogen peroxide gas plasma, or liquid chemical sterilants
- **Semicritical Items**- contact mucous membranes or nonintact skin
 - Respiratory therapy and anesthesia equipment, some endoscopes, laryngoscope blades, esophageal manometry probes, cystoscopes, anorectal manometry catheters, and diaphragm fitting rings; use chemical disinfectants for high-level disinfection
- **Noncritical Items**- those that come in contact with intact skin but not mucous membranes; use low-level disinfectants
 - Noncritical patient care items- bedpans, blood pressure cuffs, crutches, and computers
 - Noncritical environmental surfaces

Disinfection of HBV-, HCV-, HIV-, or TB-Contaminated Devices- The CDC recommends high-level disinfection to these devices because experiments have demonstrated the effectiveness of high-level disinfectants to inactivate these and other pathogens that might contaminate semicritical devices.

OSHA Bloodborne Pathogen Standard

- Requires that all equipment and environmental and working surfaces be cleaned and decontaminated with an appropriate disinfectant after contact with blood or other potentially infectious materials
- In February 1997, OSHA stated that EPA-registered disinfectants labeled as effective against HIV and HBV would be considered appropriate; when pathogens other than HIV and HBV are of concern OSHA requires the use of EPA-registered tuberculocidal disinfectants or hypochlorite solution (diluted 1:10 or 1:100 with water)

Disinfection in Ambulatory Care, Home Care, and the Home

- Ambulatory Care setting - follow the Spaulding classification scheme (noted above – e.g.,
 - Strategy for reprocessing contaminated medical devices
 - Classifies a medical device as critical, semicritical, noncritical, or environmental surfaces on the basis of risk to patient safety from contamination on a device
 - Establishes three levels of germicidal activity, sterilization, high-level disinfection, and low-level disinfection, for strategies with the three classes of medical devices
 - Home environment
 - Reusable objects that touch mucous membranes
 - 70% iso-propyl alcohol (IPA) for 5 minutes
 - 3% hydrogen peroxide for 30 minutes
 - Noncritical items
 - Cleaned with a detergent
 - Blood spills
 - Handled according to previously mentioned OSHA guidelines
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Guideline for Environmental Infection Control in Health Care Facilities, 2003

http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf

Within the section “Principles of Cleaning and Disinfecting Environmental Surfaces,” the following information can be found regarding choosing a disinfectant solution/procedure:

Factors that influence the choice of disinfection procedure for environmental surfaces:

1. The nature of the item to be disinfected
2. The number of microorganisms present
3. The innate resistance of those microorganisms to the inactivating effects of the germicide
4. The amount of organic soil present
5. The type and concentration of germicide used
6. Duration and temperature of germicide contact
7. If using a proprietary product, other specific indications and directions for use

General Cleaning Strategies for Patient-Care Areas:

- Cleaning of Medical Equipment
 - Manufacturers of medical equipment should provide care and maintenance instructions specific to their equipment
 - In the absence of manufacturer instructions non-critical medical equipment usually only requires cleansing followed by low- to intermediate-level disinfection, depending on the nature and degree of contamination
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Glucometer Manufacturers' Cleaning/Disinfecting Procedures

NOTE: Many manufacturers do not provide recommendations for cleaning between multiple patients because they assume the glucometer is used by only one patient, as seen in the ambulatory setting.

If the manufacturer does not provide specific cleaning recommendations or as a conservative approach to infection control for glucometers with minimal cleaning requirements, facilities may want to consider cleaning glucometers with high-level disinfectants.

Company	Meters available	Cleaning procedure	Contact information
Abbott	FreeStyle Freedom Lite FreeStyle Lite Precision Xtra	Wipe down meter with damp cloth, no disinfectant recommended	www.abbottdiabetescare.com 1-800-527-3339
AgaMatrix	WaveSense Jazz WaveSense KeyNote WaveSense KeyNote Pro WaveSense Presto WaveSense Presto Pro	Use mild soap and water, 70% iso-propyl alcohol (IPA), or 1:10 diluted bleach solution; wipe front and back with soft damp cloth	www.wavesense.info 1-866-906-4197
Arkray	Glucocard 01 Glucocard 01-mini Glucocard X-Meter	Cleaning- clean outside of meter using a lint free cloth dampened with soapy water or IPA Disinfecting- 1:10 dilution of water and bleach (or bleach wipe), dampen a paper towel and thoroughly wipe down the meter Or use Super Sani-Cloth® & Sani-Cloth® HB Germicidal disposable wipes	www.glucocardusa.com 1-800-566-8558
Bayer	Breeze2 Contour Contour TS	Use infection control procedure of the facility Clean exterior with lint free	www.simplewins.com 1-800-348-8100

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		tissue moistened with 1:10 bleach/ water disinfectant, wipe dry	
Bionime	Rightest GM100 Rightest GM300	Use water, alcohol wipe, or clorox wipe	www.bioimeusa.com 1-888-481-8485
Diabetic Supply of Suncoast	Advocate Advocate Duo Advocate Redi-Code	Disinfection with bleach solution as per update of guidance for F441 in Nov 2009	www.pharmasupply.com 1-866-373-2824
Diagnostic Devices	Prodigy Autocode Prodigy Pocket Prodigy Voice	May use a dry tissue or sanitary wipe to clean, avoid port	www.prodigymeter.com 1-800-243-2636
Entra Health	MyGlucoHealth Wireless	Use warm water and soap, avoid sensor	www.myglucohealth.net 1-877-458-2646, ext. 3
Fifty50 Medical	Fifty50 Control	No recommendations	www.fifty50.com 1-800-746-7505
Fora Care	Fora D10 Fora D15 Fora G20 Fora G90 Fora V10 Fora V12 Fora V20 Fora V22	Use damp cloth or paper towel with water and mild soap to clean the outside; do not use organic solvents	www.foracare.com/usa 1-888-307-8188 1-866-469-2632 1-866-563-3764
Gluco Com	Codefree	Cleaning wipe or damp cloth with warm/hot water on the outside	www.gluco.com 1-800-678-1446
Home Diagnostics	Sidekick True2Go Trueresult Truetrack	Wipe with a cloth, do not use alcohol	www.homediagnostics.com 1-800-342-7226, ext. 3300
Infopia	Eclipse Element Envision	Wipe with dry cloth; only the strip will touch the patient, use discharge button to eject	www.infopiausa.com 1-888-446-3246

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	Evolution GlucoLab	strip; nursing providers must wear gloves	
LifeScan	One Touch Ultra 2 One Touch UltraMini One Touch UltraLink One Touch UltraSmart	Newer meters listed here do not require cleaning Older meters that required cleaning with soap and water on a cloth have been discontinued	www.lifescan.com 1-800-227-8862
Nova Biomedical	Nova Max Nova Max Link	Use a damp cloth with alcohol, avoid the face of the meter	www.novacares.com 1-800-681-7390
Roche	Accu-Chek Aviva Accu-Chek Compact Plus Accu-Chek Advantage	Refer to the users manual for specific instructions of each meter Cleaning- cloth with warm soapy water or 70% IPA Disinfecting- 10% bleach/water solution made fresh daily or purchase a bleach cloth/ disinfecting wipe	www.accu-chek.com/us 1-800-440-3638 1-800-858-8072
U.S. Diagnostics	Acura EasyGluco Infinity Maxima	Use any disinfectant on the outside of the meter, Clorox wipe, alcohol pad; avoid getting products in the meter	www.usdiagnostics.net 1-866-216-5308

List of meters and companies available from American Diabetes Association, Diabetes Forecast, January 2010

EPA-Registered Disinfectants

EPA's Registered Disinfectants current as of January 9, 2009:

- Antimicrobial Products as Sterilizers
 - http://www.epa.gov/oppad001/list_a_sterilizer.pdf
- Tuberculocide Products Effective Against *Mycobacterium tuberculosis*
 - http://www.epa.gov/oppad001/list_b_tuberculocide.pdf
- Antimicrobial Products Effective Against Human HIV-1 Virus
 - http://www.epa.gov/oppad001/list_c_hiv.pdf
- Antimicrobial Products Effective Against Human HIV-1 and Hepatitis B Virus
 - http://www.epa.gov/oppad001/list_d_hepatitisbhiv.pdf
- Antimicrobial Products Effective Against *Mycobacterium tuberculosis*, Human HIV-1, and Hepatitis B Virus
 - http://www.epa.gov/oppad001/list_e_mycobact_hiv_hepatitis.pdf
- Antimicrobial Products Effective Against Hepatitis C Virus
 - http://www.epa.gov/oppad001/list_f_hepatitisC.pdf
- Antimicrobial Products Effective Against *Norovirus*
 - http://www.epa.gov/oppad001/list_g_norovirus.pdf
- Antimicrobial Products Effective Against Methicillin Resistant *Staphylococcus aureus* (MRSA) and Vancomycin Resistant *Enterococcus faecalis* or *faecium* (VRE)
 - http://www.epa.gov/oppad001/list_h_mrsa_vre.pdf
- Antimicrobial Products Effective for Medical Waste Treatment
 - http://www.epa.gov/oppad001/list_j_medicalwaste.pdf

“The above EPA-registered disinfectant lists are updated periodically to reflect label changes, cancellations, and transfers of product registrations. Information on the above list does not constitute a label replacement. Inclusion of products in these lists does not constitute an endorsement of one product over another. Before applying any EPA-registered disinfectant product, users must determine if the product is approved for the intended use site/pest. Check the container/package label to determine if the intended use site/pest is written on the label. Always read the product label of an EPA-registered product label thoroughly before use. It is a violation of Federal Law to use an EPA registered product in a manner inconsistent with its label and labeling.

ADA Recommendations

- ADA recommends calling the manufacturer of the glucometer product