

Clean vs Sterile: Management of Chronic Wounds

This document is a collaborative effort of the Association for Professionals in Infection Control and Epidemiology, Inc. (APIC) and the Wound Ostomy Continence Nurses Society (WOCN). Its purpose is to review the evidence on which chronic wound care practice is based and to present approaches for chronic wound care management. Areas of controversy include a lack of agreement on the definitions of “clean” and “sterile” technique and a lack of consensus as to when each is indicated in the management of chronic wounds. Current wound care practices are extremely variable and are frequently based on rituals and traditions as opposed to a scientific foundation.

Definitions

Various definitions associated with wound care have been proposed, published, and debated.¹ Terms have been used interchangeably, all subject to the individual’s interpretation. The following definitions are an attempt to provide a point of reference for the terms used in this document.

Sterile Technique involves strategies used in patient care to reduce and maintain objects and areas as free from microorganisms as possible. Sterile technique involves meticulous handwashing, use of a sterile field, sterile gloves for application of a sterile dressing and sterile instruments. “Sterile to sterile” involves the use of only sterile instruments and materials in dressing change procedures; contact between sterile instruments or materials and any nonsterile surface or product must be avoided.²⁻³

Clean Technique involves strategies used in patient care to reduce the overall number of microorganisms or to prevent or reduce the risk of transmission of microorganisms from one person to another or from one place to another. Clean technique involves meticulous handwashing, maintaining a clean environment by preparing a clean field, using clean gloves, sterile instruments, and prevention of direct contamination of materials and supplies. No “sterile to sterile” rules apply.³⁻⁴ This technique may also be termed “non-sterile.”

Aseptic Technique is the purposeful prevention of the transfer of organisms from one person to another by keeping the microbe count to an irreducible minimum.⁵ Some authors have made a distinction between surgical asepsis or “sterile technique” and medical asepsis or “clean technique.”³

No Touch Technique is a method of changing surface dressings without directly touching the wound or any surface that might come in contact with the wound.⁶

Colonization is the presence of microorganisms without signs and/or symptoms of infection. All chronic wounds are colonized to varying degrees.⁶

Infection is the presence of microorganisms with signs and symptoms of disease. Signs and symptoms which may be indicative of infection include erythema, edema, changes in character/increase in drainage, and increased odor, fever, altered mental status, and/or increased white blood cell count.⁷

Wound is a “disruption of normal anatomic structure and function.”⁸

Acute Wound is a wound that either heals by regeneration or in a timely and orderly process.⁸

Chronic Wound is a wound that has “failed to proceed through an orderly and timely process to produce anatomic and functional integrity.”⁸

Surgical Wound is a wound in which primary healing occurs when the wound edges have been drawn together to achieve closure.⁹ A surgical wound may be considered an acute wound.

Discussion

A survey developed by the Nursing Consortium for Research Practice concluded that a great variation exists “with regard to sterile technique in wound care practices...”¹⁰ In the survey, technique choices among staff nurses were based on the education level of the caregiver, “how I was taught in school” and perception of infection risk to the patient.¹ Again, the element

of a scientific foundation for wound care practice was not evident.

In 1993, Stotts et al. employed a descriptive, exploratory research survey to obtain information regarding wound care practices in the United States.¹¹ Two hundred and forty-two (242) members of WOCN responded to the survey. Of the respondents, 51.4% reported use of sterile technique and 43% reported use of non-sterile technique. The percentages varied when the type of wound and care settings were taken into consideration. It was also shown that, in preparation for discharge from the hospital, 90% of patients with open wounds were taught to perform nonsterile technique at home regardless of whether clean or sterile technique was used during hospitalization.

A review of the literature revealed no specific scientific research studies to support the use of either “clean” or “sterile” technique in any given patient care setting. However, there is a study comparing the use of sterile saline or tap water for cleaning acute traumatic soft tissue wounds.¹² Analyses of strike-through contamination associated with saturated sterile dressings have also been published.^{13,14} Clinical Practice Guidelines published by the Agency for Health Care Policy and Research, recommends the “use of clean dressings, rather than sterile ones” be used in the treatment of pressure ulcers “as long as dressing procedures comply with institutional infection-control guidelines.”⁶ However, these recommendations are based on expert opinion and not on evidence-based research. It must be reiterated: there is *no* consensus of expert opinion on the controversy of “clean vs sterile” in the management of chronic wounds. Expert opinions are based on current practice and anecdotal notes, not on evidence-based practice. Additionally, it should be noted that current prac-

Continued on page 20

tices have not been shown to be either beneficial *or* harmful.

Wound care is now occurring in a variety of patient care settings including acute care, subacute care, long-term care, outpatient clinics, and in the home. The question arises: Should a different technique be utilized in the delivery of wound care based on the health care setting? Decisions made on the type of technique to be used may be more reasonably based on what will be *done* to the wound, rather than *where* or to *whom* it is to be delivered. Other factors that may influence the technique are the status/acuity of the patient, healthcare setting itself, and/or encounters with and type of caregiver.¹⁰ For instance a frail, elderly patient who is on immunosuppressant drugs with a large, full thickness skin loss sternal wound and who is to receive daily dressing changes to the wound might benefit from “sterile” technique. A middle-aged patient in an automobile accident, subsequently developing a non-infected Stage III pressure ulcer and who is to receive hydrocolloid dressing changes to the wound every 3–4 days, might be adequately managed using “clean” technique. However, there is no scientific evidence or consensus that any one of these conditions is more or less important in selecting the appropriate method of care for the wound.

Basic considerations for technique selection

The following factors should be considered when planning chronic wound care. *Also see Table 1.*

What is clean, what is sterile, what is contaminated—Keep items apart by using “no touch technique.” The healthcare provider must have a thorough understanding of these entities to accomplish the goal of separation.

Type and extent of wound care procedure—How invasive is the procedure? Is debridement to be performed? Does the procedure involve simply changing a transparent film dressing or hydrocolloid or extensive packing of the wound? Consideration should also be given to the location and depth of the wound.

Type of supplies/instruments to be used

Solutions for cleansing/treatment—Use and maintenance may be based on likelihood of exposure to organisms in the care setting. Initially, solutions such as commercially prepared wound cleansers and normal saline are sterile. The life of these solutions is based on manufacturer’s recommendations and the policy of the healthcare institution providing the care. Unfortunately, no scientific evidence exists to guide the policies of the healthcare institution.

Care setting—Who will be doing the wound care? What is the environment in which the care will be delivered?

Conclusions

There is no agreement on the definitions of “clean” or “sterile” technique.

The definitions of “clean” and “sterile” are not as important as choosing the appropriate intervention for the procedure when managing chronic wounds.

Evidence-based research is needed to support either “clean” or “sterile” management of chronic wounds. This would best be accomplished by formal scientific studies in multi-site locations that would include *all* healthcare settings.

Critical examination of evidence-based research could well lead to increased cost effectiveness and improved patient outcomes.

Such research could also impact reimbursement regulations resulting in considerable savings in healthcare dollars without compromising patient safety.

References

1. Faller NA (1999). Clean vs Sterile: A Review of the Literature. *Ostomy/Wound Management*, 45(5), 56-68.

Continued on page 22

TABLE 1. Suggested Technique for the Management of Chronic Wounds

Intervention	Handwashing	Gloves	Supplies (Includes solutions and dressing supplies)	Instruments
Wound cleansing	Yes	Clean*	Normal saline or commercially prepared wound cleanser—sterile; maintain as clean per care setting policy**	Irrigation with sterile device; maintain as clean per care setting policy
Routine dressing change without debridement	Yes	Clean*	Sterile; maintain as clean per care setting policy**	Sterile; maintain as clean per care setting policy
Dressing change with mechanical, chemical, or enzymatic debridement	Yes	Clean*	Sterile; maintain as clean per care setting policy**	Sterile; maintain as clean per care setting policy
Dressing change with sharp, conservative bedside debridement	Yes	Sterile*	Sterile	Sterile

*It must be remembered that reimbursement of wound care delivered in the outpatient and home care setting is governed by regulations mandated by the Healthcare Financing Administration (HCFA). HCFA requires use of sterile supplies and equipment, including gloves. Deviations from HCFA regulations in the delivery of wound care could result in the submission of fraudulent claims for reimbursement.

** “Maintain clean as per care setting policy” means each care setting must address the parameters for maintenance, such as expiration dates for supplies, consideration of cost, and correct interpretation of the manufacturer’s recommendations.

2. Rhinehart E, MM Friedman. (1999). Infection Control in Homecare. Gaithersburg, MD: Aspen Publishers.
3. Sussman C, B Bates-Jensen. (1998). Wound Care: A Collaborative Practice Manual for Physical Therapists and Nurses. Gaithersburg, MD: Aspen Publishers, Inc.
4. DeCastro MD, L Fauerbach, L Masters (1996). Aseptic Techniques. Infection Control and Applied Epidemiology: Principles and Practice; Association for Professionals in Infection Control and Epidemiology, Inc. St. Louis: Mosby YearBook.
5. Crow S (1997). Infection Control Perspectives. In Krasner, D, Kane, D. (Eds.), Chronic Wound Care: A Source Book for Healthcare Professionals, 2nd ed., pp. 990-96. Wayne, PA: Health Management Publications, Inc.
6. Bergstrom N, MA Bennett, C Carlson, et al. (1994) Treatment of Pressure Ulcers: Clinical Practice Guideline number 15:59-60. AHCPR Publication 95-0652. Rockville, MD: Agency for Health Care Policy and Research, Public Health Service, U.S. Department of Health and Human Services.
7. Doughty DB. (1992). Principles of Wound Healing and Wound Management. In RA Bryant (Ed.), Acute and Chronic Wounds: Nursing Management, p. 44. St. Louis: Mosby YearBook.
8. Lazarus G, D Cooper, D Knighton, et al. (1994). Definitions and Guidelines for Assessment of Wounds and Evaluation of Healing. Archives of Dermatology, 130(4), 489-493.
9. Stotts N., S Barbour, K Griggs, et al. (1997). Sterile versus Clean Technique in Postoperative Wound Care of Patients with Open Surgical Wounds: A Pilot Study. J. Wound, Ostomy, and Continence Nurs. 24(1), 10-18.
10. Wise LC, J Hoffman, L Grant, J Bostrom. (1997). Nursing Wound Care Survey: Sterile and Nonsterile Glove Choice. J. Wound, Ostomy, and Continence Nurs. 24(3), 144-50.
11. Stotts NA, S Barbour, R Slaughter, D Wipke-Tevis. (1993). Wound Care Practices in the United States. Ostomy/Wound Management, 39(3), 59-62.
12. Angeras MH, A Brandberg, A Falk, T Seeman. (1992). Comparison between Sterile Saline and Tap Water for the Cleaning of Acute Traumatic Soft Tissue Wounds. European Journal of Surgery, 158(6-7):347-350.
13. Alexander D, D Gammage, A Nichols, D Gaskins. (1992) Analysis of Strike-through Contamination in Saturated Ster-

Continued on page 31

HICPAC: History and Guidelines

Bob Sharbaugh, PhD, CIC, APIC/HICPAC liaison

In 1990, Dr. William Martone of the Hospital Infections Program at the CDC, expressed the desire to have an advisory committee that could provide advice and guidance to the CDC regarding the practice of infection control and strategies for surveillance, prevention, and control of healthcare associated infections, antimicrobial resistance, and related events in settings where healthcare is provided. Subsequently, the Hospital Infection Control Practices Advisory Committee (HICPAC) was established in 1991.

HICPAC's first meeting was held in 1992 at the CDC in Atlanta with members being selected by the Secretary of DHHS. Today, HICPAC consists of 14 members who are selected from authorities knowledgeable in the fields of infectious diseases, healthcare-associated infections and healthcare-related conditions, epidemiology, health policy, health services research, public health and related fields. The membership is according to geographic distribution and must include female and minority representation. Members serve overlapping four-year terms. Over the years, infection control personnel have been well represented on HICPAC and APIC currently has an official liaison to the Committee.

HICPAC recently held its semiannual meeting in Atlanta last November. Of particular interest to ICPs was the discussion surrounding several documents which are in development and which are scheduled for publication in late 2001 or early-mid 2002. These documents will all appear in the MMWR and on the APIC Web site as well. However, due to their length and financial restrictions, the text of some documents will not be published in AJIC. A brief summary of these documents is as follows:

Guideline for Environmental Infection Control in Healthcare Facilities

At the time of this writing, Draft 6 of this guideline was awaiting CDC clearance for publication in the Federal Register. The document is very long and detailed with chapters addressing Air, Water, Housekeeping, Environmental Sampling, Laundry and Bedding, Animals in Healthcare Facilities

and Regulated Waste. Anticipated publication will be in late 2001.

Guideline for Prevention of Healthcare-Associated Pneumonia

This document will be a revision of the original guideline published in 1997. The focus is being expanded beyond acute care to include patients in home care and long term care and those who are not intubated. The primary sections covered by this guideline will include bacterial pneumonia, aspergillosis, viral pneumonia, Legionnaire's disease, influenza and mycoplasma pneumonia. The guideline is scheduled for publication in the Federal Register by this summer with possible publication of the final document in the fall of 2001.

Guideline for Prevention of Intravascular Catheter-Related Infections

This document will be a revision of the original guideline published in 1995. Like other guideline revisions, the focus of this document will also be expanded to include patients in home care and hemodialysis. APIC is fortunate to have one of our own, Rita McCormick, representing the Association as a member of the working group developing this guideline. In addition, the APIC Practice Guidance

Program Team (formerly the Guidelines Committee) has had the opportunity to offer comment on Draft 1 on this document. Publication is anticipated late in 2001 or early 2002.

Guideline for Hand Hygiene

Neither APIC nor the CDC will be developing individual guidelines on this topic. Rather, a Memorandum of Understanding (MOU) was signed last year that allows for a collaborative agreement for the joint preparation, dissemination, and evaluation of the Hand Hygiene Guideline. Specific organizations included in the MOU are HICPAC, CDC, APIC, SHEA, and IDSA.

Continued on page 29

ile Dressings. Clinical Nursing Research, 1(1):28-34.

14. Popovich DM, D Alexander, M Rittman, et.al. (1995); Strike-through Contamination in Saturated Sterile Dressings: A Clinical Analysis; Clin. Nursing Research, 4(2), 195-207.

Suggested Reading

Centers for Disease Control and Prevention. Guideline for Prevention of Surgical Site Infection, 1999.

APIC Text of Infection Control and Epidemiology; Vol. 1, Chapter 89, Skin and Soft Tissue.

Sterile vs Nonsterile Wound Care, An Interactive Monograph for Healthcare Professionals; 1998 Dumex Medical Surgical Products, Ltd. in Contemporary Concepts in Wound Health, No. 1 in a series.

Jones M, J Davey, A Champion. Dressing Wounds; Nursing Standard, June 17 Number 39, 1998.

APIC News (ISSN 1070-8561), Volume 20, Number 1, is published bimonthly by the Association for Professionals in Infection Control and Epidemiology, Inc., (APIC) at 1275 K Street NW, Suite 1000, Washington, DC 20005-4006. *APIC News* is a membership benefit, paid by membership dues. Additional subscriptions are available at \$30 domestic and \$35 foreign. Periodical postage rate Paid at Washington DC, and additional mailing offices. POSTMASTER: Send address changes to *APIC News*, 1275 K Street NW, Suite 1000, Washington, DC 20005-4006.

© Copyright 2001 APIC

Publisher—Christopher E. Laxton, Executive Director
202/789-1890, ext. 2601 or e-mail claxton@apic.org

Managing Editor—Sharada Gilkey
202/789-1890, ext. 2612 or e-mail sgilkey@apic.org

All submissions to *APIC News* should be sent to the attention of Sharada Gilkey, Managing Editor, APIC National Office, 1275 K Street NW, Suite 1000, Washington, DC 20005-4006. Submissions must be provided on disk labeled with name of file and format used, along with a paper copy, and daytime phone and fax numbers. Note: Short announcements (less than 50 words) need not be provided on disk, but must be submitted in writing by mail, fax, or e-mail.

Deadlines for future issues:

July/August—May 14, 2001

September/October—July 16, 2001

APIC National Office
1275 K Street NW, Suite 1000
Washington, DC 20005-4006

Phone: 202/789-1890

Fax: 202/789-1899

Internet: www.apic.org

E-mail: APICinfo@apic.org

APIC NATIONAL OFFICE STAFF

EXECUTIVE OFFICE	EXTENSION
Executive Director Christopher E. Laxton (claxton@apic.org)	2601
Deputy Executive Director Ann C. Kenworthy, CAE (akenworthy@apic.org)	2616
Executive Assistant Janel Bland (jbland@apic.org)	2614
EDUCATION	
Director Valerie Restifo, RN, MA, MS (vrestifo@apic.org)	2627
Associate Directors Jerene Maune, RN, MSN (jmaune@apic.org) Karen Harvey, RN, MSN (kh Harvey@apic.org)	2623 N/A
Education Assistants Eugene Reed (ereed@apic.org) Stephanie Sylver (ssylver@apic.org)	2628 2611
Meeting Coordinator Niiyo Madison (nmadison@apic.org)	2614
FINANCE AND ADMINISTRATION	
Director David C. Zinner (dzinner@apic.org)	2602
Assistant Director of Finance Pam Ngorskul, CPA (pngorskul@apic.org)	2605
Accounting Assistants Kim White (kwhite@apic.org) Andrea Richardson (arichardson@apic.org) Linda Johnson (lljohnson@apic.org)	2621 2603 2622
GOVERNMENT AND PUBLIC AFFAIRS	
Director Jennifer Thomas (jthomas@apic.org)	2604
INFORMATION TECHNOLOGY	
Director Catherine Dodi (cdodi@apic.org)	2620
Database Manager (vacant)	
Information Technology Specialist Jacob Leshner (jleshner@apic.org)	2626
MEMBERSHIP SERVICES	
Director Deborah R. Timmons (dtimmons@apic.org)	2615
Chapter Services Coordinator Tamra Griffith (tgriffith@apic.org)	2631
Member Services Representatives Gwendolyn Jasper (gjasper@apic.org) Traci Satcher (tsatcher@apic.org)	2610 2608
Receptionist DaKeia Williamson (dwilliamson@apic.org)	2609
PUBLICATIONS	
Director Sharada Gilkey (sgilkey@apic.org)	2612
Publications Assistant Kris Carey (kcarey@apic.org)	2629
RESEARCH FOUNDATION	
Director Nila Vehar (nvehar@apic.org)	2624
Assistant Paula Gray (pgray@apic.org)	2625

Phone 202/789-1890