Exploring the Evidence Pyramid

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Objectives

• Describe the levels of evidence in the Evidence Pyramid, a hierarchy of research evidence

• Identify web resources to use for nursing research and evidence-based practice to improve patient care

• Locate resources on HEALWA, the health evidence website for WA state nurses and other professional groups

• Identify a method of managing research with a citation manager
Exploring the Evidence Pyramid List of eResources

Exploring the Evidence Pyramid

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Key
S=Fee required (or contact your local hospital or clinic library)
M=Mobile (includes mobile applications and interfaces optimized for mobile access)
O=Online
H=HEAL-WA (Online access to evidence-based health information resources for Washington State nurses and other health professionals; registration required) [heatwa.org/]

- Each level of the pyramid draws on research evidence from the lower layers.
- Best to begin searching for evidence at the top of the pyramid.
  - More synthesized evidence is found at the higher levels
  - However, fewer studies are available at the top of the pyramid.
- If you don’t find the best level of evidence to answer the question, move down the pyramid to other types of studies.

Evidence Pyramid

[Diagram showing the Evidence Pyramid with layers from bottom to top: Background Information, Expert Opinion, Randomized Controlled Trials (RCTs), Cohort Studies, Qualitative Studies, Evidence Summaries, Evidence Guidelines, Systematic Reviews, Meta-Analyses, Metasearch Engine: TRIP, ACCESSSSS, ex. Cochrane, ex. DynaMed, NGC, Nursing Reference Center, ex. PubMed/Medline, CINAHL, ex. Textbooks, UpToDate]
What is evidence-based practice?

• Evidence based medicine is the **conscientious, explicit, and judicious use of current best evidence in making decisions** about the care of individual patients.

• The practice of evidence based medicine means **integrating individual clinical expertise with the best available external clinical evidence from systematic research**.

Evidence-Based Practice

The EBM Triad

- Individual Clinical Expertise
- Best External Evidence
- Patient Values & Expectations
Steps for EBN Practice

0. Cultivate a spirit of inquiry.
1. Convert your information into an answerable question (PICO)
2. Search the literature for the best available evidence
3. Critically appraise the evidence for validity and usefulness
4. Apply the findings to your clinical practice along with clinical expertise and patient’s perspective to plan care
5. Evaluate the outcomes of your practice decisions or changes based on evidence
6. Disseminate EBP results

What makes good evidence?

**Good**
- Based on scientific research
- RCT
- Systematic review
- Meta-analysis
- Clinical guidelines

**Shoddy**
- Opinion
- Consensus
- Because it’s been done this way for 100 years
What is an Evidence Pyramid?

• Guideline to the hierarchy of evidence available.
• Guide for finding the best evidence quickly and efficiently.
• Each level of the pyramid draws on research evidence from the lower layers.
• Best to begin searching for evidence at the top of the pyramid.
  – More synthesized evidence is found at the higher levels.
  – Fewer studies are available at the top of the pyramid.
• If you don’t find the best level of evidence to answer the question, move down the pyramid to other types of studies.
Chocolate Decadence Pyramid

Slide adapted from Edward G. Miner Library, University of Rochester School of Medicine and Dentistry
6S Pyramid

- Systems
  - Ex. DynaMed, Nursing Reference Center, NGC
  - Ex. Cochrane
  - Ex. MEDLINE/PubMed, CINAHL

Background Information: Ex. Textbooks, UptoDate
Evidence Pyramid

- **Systematic Reviews, Meta-Analyses**
  - ex. Cochrane

- **Evidence Summaries, Evidence Guidelines**
  - ex. DynaMed, NGC, Nursing Reference Center
  - ex. PubMed/Medline, CINAHL

- **Randomized Controlled Trials (RCTs), Cohort Studies, Qualitative Studies**
  - ex. Textbooks, UpToDate

- **Background Information, Expert Opinion**

Metasearch Engine: TRIP, ACCESSSSS
#1 Question:

Does bar coding reduce medication errors in hospitals?
#2 Clinical Question:

What is the effect of wound cleansing solutions and wound cleansing techniques on the rate of healing of pressure ulcers?
Where to look for evidence-based information? Where to begin?
Clarify your Question with PICO

- Patient, population or problem?
- Intervention?
- Comparison?
- Outcome?
PICO #1

• P: medication errors in hospitals
• I: bar coding of medicines
• C: no bar codes
• O: reduction of medication errors
PICO #2

• P: Pressure ulcers [for hospitalized patients]
• I: cleansing techniques
• C: comparing wound cleansing with no wound cleansing, or different wound cleansing solutions, or different cleansing techniques
• O: improved healing of pressure ulcers
Background Information: Textbooks

- UptoDate *uptodate.com* $MO
  Concise comprehensive up-to-date reviews of clinical topics
  in multiple specialties
- eBooks
- HEAL-WA eBooks
Prevention of adverse drug events in hospitals

Bar coding — Bar codes can be affixed to medications and patient wristbands in order to ensure matching between patients and their medications at the time of drug administration. Additional interfaces with computerized physician order entry (CPOE) and electronic medication administration record (eMAR) allow for a closed-loop system that confirms a match between medication orders, medication preparation (including dispensing), and patients receiving medications. Most importantly, bar coding provides the final opportunity to intercept medication errors before drug administration.

One study found that use of bar coding reduced the administration error rate by 41 percent and potential ADEs by 51 percent. Another study demonstrated that 73 administration errors were intercepted through bar coding for every 100,000 doses charted. 

Smart pumps — Smart pumps are used to reduce errors associated with intravenous medication administration through their built-in safety features, such as safety alerts, clinical calculators, dose limits, and drug libraries. However, smart pumps have not been consistently found to prevent ADEs. While one study in a pediatric hospital found that the combination of smart pumps, standard drug concentrations, and improved labeling led to a 73 percent reduction in reported medication-infusion errors, most other studies reported no significant impact of smart pumps on serious medication errors and ADEs.

Several barriers undermine the effective implementation of smart pumps, such as inconsistencies in the smart pump drug libraries and bypassing of safety alerts during administration. A study of 100 hospitals using smart pumps from the same manufacturer suggested substantial variability in drug names, dosing units, dose limits, and concentrations within the same library, which raise the risk of errors and ADEs. Another study found high medication discrepancy rates for
eBooks on HEALWA

healwa.org

- Patient Safety and Quality: An Evidence-Based Handbook for Nurses
- Harrison’s Online
- Lippincott Manual of Nursing Practice
- Medical-Surgical Nursing Care
Search Databases Efficiently to Find Research Journal Articles

- **PubMed/MEDLINE**  
  - PubMed includes MEDLINE and citations to biomedical journal articles, 1940’s+
  - Indexes 5,200 biomedical journals

- **CINAHL**  
  - Cumulative Index to Nursing and Allied Health Literature
  - Indexes the literature of nursing, biomedicine, alternative/complementary medicine, consumer health and 17 allied health disciplines.
2 PubMed/MEDLINE Strategies for Finding Evidence-Based Citations

1. Use Filters: Article/Publication Types
   - Randomized Controlled Trial
   - Clinical Trial
   - Research Support, US Government
   - Meta-Analysis
   - Systematic Reviews
   - Practice Guideline

2. Use Clinical Queries section of PubMed
medication errors/pc [majr] AND (automatic data processing [mesh] OR "bar code" OR "bar codes" OR "bar coding" OR "bar coded")
medication errors/pc [majr] AND (automatic data processing [mesh] OR "bar code" OR "bar codes" OR "bar coding" OR "bar coded")

PubMed Strategy #1: Limit to desired Article Types, e.g., RCTs, Clinical Trial....

Implementing a safe and reliable process for medication administration.
Richardson B, Bromirski B, Hayden A.
PMID: 22504475 [PubMed - indexed for MEDLINE]

Effect of bar-code technology on the safety of medication administration.

Medication dispensing errors and potential adverse drug events before and after implementing bar code technology in the pharmacy.
Poon EG, Cina JL, Churchill W, Patel N, Featherstone E, Rothschild JM, Keohane CA, Whittemore AD, Bates DW, Gandhi TK.
PMID: 16983130 [PubMed - indexed for MEDLINE] Related citations
Effect of bar-code technology on the safety of medication administration.


Abstract

BACKGROUND: Serious medication errors are common in hospitals and often occur during order transcription or administration of medication. To help prevent such errors, technology has been developed to verify medications by incorporating bar-code verification technology within an electronic medication-administration system (bar-code eMAR).

METHODS: We conducted a before-and-after, quasi-experimental study in an academic medical center that was implementing the bar-code eMAR. We assessed rates of errors in order transcription and medication administration on units before and after implementation of the bar-code eMAR. Errors that involved early or late administration of medications were classified as timing errors and all others as nontiming errors. Two clinicians reviewed the errors to determine their potential to harm patients and classified those that could be harmful as potential adverse drug events.

RESULTS: We observed 14,041 medication administrations and reviewed 3082 order transcriptions. Observers noted 776 nontiming errors in medication administration on units that did not use the bar-code eMAR (an 11.5% error rate) versus 495 such errors on units that did use it (a 6.8% error rate)—a 41.4% relative reduction in errors (P<0.001). The rate of potential adverse drug events (other than those associated with timing errors) fell from 3.1% without the use of the bar-code eMAR to 1.6% with its use, representing a 50.8% relative reduction (P<0.001). The rate of timing errors in medication administration fell by 27.3% (P<0.001), but the rate of potential adverse drug events associated with timing errors did not change significantly. Transcription errors occurred at a rate of 6.1% on units that did not use the bar-code eMAR but were completely eliminated on units that did use it.

CONCLUSIONS: Use of the bar-code eMAR substantially reduced the rate of errors in order transcription and in medication administration as well as potential adverse drug events, although it did not eliminate such errors. Our data show that the bar-code eMAR is an important intervention to improve medication safety. (ClinicalTrials.gov number, NCT00243373.)
Effect of Bar-Code Technology on the Safety of Medication Administration


ABSTRACT

Background

Serious medication errors are common in hospitals and often occur during order transcription or administration of medication. To help prevent such errors, technology has been developed to verify medications by incorporating bar-code verification technology within an electronic medication-administration system (bar-code eMAR).

Methods

We conducted a before-and-after, quasi-experimental study in an academic medical center that was implementing the bar-code eMAR. We assessed rates of errors in order transcription and medication administration on units before and after implementation of the bar-code eMAR. Errors that involved early or late administration of medications were classified as timing errors and all others as nontiming errors. Two clinicians reviewed the errors to determine their potential to harm patients and classified those that could be harmful as potential adverse drug events.

Results

We observed 14,641 medication administrations and reviewed 3,082 order transcriptions. Observers noted 776 nontiming errors in medication administration on units that did not use the bar-code eMAR (11.5% error rate) versus 495 such errors on units that did use it (6.8% error rate)—a 41.4% relative reduction in errors (P < 0.001). The rate of potential adverse drug events (other than those associated with timing errors) fell from 3.3% without the use of the bar-code eMAR to 3.6% with its use, representing a 50.8% relative reduction (P = 0.003). The rate of timing errors in medication administration fell by 27.9% (P < 0.001), but the rate of potential adverse drug events associated with timing errors did not change significantly. Transcription errors occurred at a rate of 6.1% on units that did not use the bar-code eMAR but were completely eliminated on units that did use it.

Conclusions

Use of the bar-code eMAR substantially reduced the rate of errors in order transcription and in medication administration as well as potential adverse drug events, although it did not eliminate such errors. Our data show that the bar-code eMAR is an important intervention to improve medication safety. (ClinicalTrials.gov number, NCT002043371.)
MeSH: Medical Subject Headings

Construct a Search using MeSH Headings

- MeSH=Medical Subject Headings
- They are assigned to all indexed articles in PubMed
- MeSH terms describe what the article is about
- *They are key in constructing targeting searches.*
Minimizing human error in radiopharmaceutical preparation and administration via a bar code-enhanced nuclear pharmacy management system.
Finding Qualitative Research

• Use appropriate Medical Subject Headings (MeSH) terms in your search, such as:
  – *Qualitative Research*
  – *Focus Groups*
  – *Interviews as Topic*
  – *Nursing Methodology Research*, and more
Search PubMed for Qualitative Research

Qualitative research AND medication errors/pc AND (automatic data processing [mesh] OR "bar code" OR "bar codes" OR "bar coding" OR "bar coded")

1. Pharmacy workers' perceptions and acceptance of bar-coded medication technology in a pediatric hospital.
   Holden RJ, Brown RL, Scanlon MC, Karsh BT.
   Related citations

2. Smart medical environment at the point of care: auto-tracking clinical interventions at the bed side using RFID technology.
   Ohashi K, Ota S, Ohno-Machado L, Tanaka H.
   PMID: 20471637 [PubMed - indexed for MEDLINE] Related citations
# PubMed Basic Tips

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<th>Try this...</th>
<th>Tell PubMed...</th>
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<td>Enter keywords (and synonyms for these terms) you would expect to find in an <em>article title or abstract</em> [PubMed does not search the full text of articles.]</td>
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<td>Search by phrase (“ ”)</td>
<td>Add quotations around words to tell PubMed to find an <em>exact phrase</em></td>
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| Search for words in the title [ti] | PubMed to search for words in article titles [Do not use this for comprehensive searches.]  
Ex: “pressure ulcer”[ti] AND mattress[ti]. |
| Use Limits               | Limit your results by *type of article, date range, age group, journal sets*, and more.                                                  |
| Search by Author [au]    | Search PubMed for a particular author  
Ex: Rivara FP[au]                                                                 |
| Find Related Citations   | In the *abstract view*, take a look at *the related citations* generated for a particular article (right hand side of page) |
### PubMed Tips (cont.)

**Try This...**

**Construct a search using MeSH terms**

MeSH terms are Medical Subject Headings and are assigned to all indexed articles in PubMed

MeSH terms describe what the article is about and *are a key in constructing targeted searches.*

**Tell PubMed...**

Once you’ve identified an article that looks relevant, take a look at the article’s MeSH terms.

- In the abstract view, click on the + next to Publication Types, MeSH terms.
- Click on a term to send it to the PubMed search box.
- You may combine terms, but you may receive better results by starting with two or three terms.
- You may add keywords to your search to narrow your results.
CINAHL: Search for Research Articles

- Provides coverage from 1982+ of nursing and 17 allied health disciplines literature
- 1700+ journals indexed
- Can easily search for Research articles

![CINAHL search interface](image)
Limit your Results

Publication Type
- Randomized Controlled Trial

Gender
- Female
- Male

Clinical Queries
- Therapy - High Sensitivity
- Therapy - High Specificity
- Therapy - Best Balance

Language
- Afrikaans
- Chinese
- Danish

Pregnancy
- Inpatients
- Outpatients

Publication Year from
- to

Author

Publication

Evidence-Based Practice

Journal Subset
- All
- Alternative/Complementary Therapies
- African
- Allied Health
1. Effect of bar-code-assisted medication administration on medication administration errors.
   M. Hassink, Jeroen J.; Duijens-Van Essenbergh, Marjolijn; Roukema, Jan A.; American Journal of Health-System Pharmacy, 2013 Apr 1; 70 (7): 572-3. (journal article - letter, research) ISSN: 1079-2082 PMID: 23515508
   Subjects: Medication Errors Classification; Bar Coding Utilization; Medication Systems Statistics and Numerical Data

2. Challenges implementing bar-coded medication administration in the emergency room in comparison to medical surgical units.
   (includes abstract) Glover, Nancy; CIN: Computers, Informatics, Nursing, 2013 Mar; 31 (3): 133-41. (journal article - research, tables/charts) ISSN: 1538-2931 PMID: 23321481
   Bar-coded medication administration has been successfully implemented and utilized to decrease medication errors at a number of hospitals in recent years. The purpose of this article was to discu...
   Subjects: Bar Coding; Emergency Service; Hospital Units; Medication Errors Prevention and Control; Medication Systems Utilization

   (includes abstract) Strykowski, Jill; Hadsall, Ron; Sawchyn, Bethany; VanSickie, Stacey; Niznick, Dan; American Journal of Health-System Pharmacy, 2013 Jan 15; 70 (2): 154-62. (journal article - research, tables/charts) ISSN: 1079-2082 PMID: 23292270
   Purpose. Results of a study at two hospitals to validate and test systems for bar-code-assisted medication administration (BCMA) are reported, including data on bar-code scanning failures and BCM...
   Subjects: Bar Coding Methods; Medication Systems Utilization; Medication Errors Prevention and Control; Pharmacy Service Administration

4. Optimizing the use of a bar code medication administration system for newborn patients using a lean methodological framework.
   Bar code medication administration (BCMA) systems are being implemented in hospitals as a way to prevent medication errors at the bedside. Although these systems can have a significant impact on ...
   Subjects: Bar Coding; Medication Errors Prevention and Control; Medication Systems In Infancy and Childhood; Infant, Newborn: birth-1 month

   Henneman, Philip L.; Marquard, Jenna L.; Fisher, Donald L.; Belle, Justin; Walsh, Brendan; Henneman, Justin P.; Blank, Fidela S.; Higgins, Ann Marie; Nathanson, Brian H.; Henneman, Elizabeth A.; Journal of Nursing Administration, 2012 Dec; 42 (12): 562-6. (journal article - research, tables/charts) ISSN: 0002-0443 PMID: 23151928
   Subjects: Medication Errors Prevention and Control; Bar Coding; Medication Systems

Effect of bar-code-assisted medication administration on medication error rates in an adult medical intensive care unit.
   (includes abstract) DeYoung JL; Vanderkooi ME; Barletta J; American Journal of Health-System Pharmacy, 2009 Jun 15; 66 (12): 1110-5. (journal article - glossary, research, tables/charts) ISSN: 1079-2082 PMID: 19498127
   PURPOSE: The effect of bar-code-assisted medication administration (BCMA) on the rate of medication errors in adult patients in a medical intensive care unit (ICU) was studied. METHODS:
Finding Qualitative Research in CINAHL

• Use appropriate CINAHL Subject Headings
  – Qualitative Studies
  – Focus Groups
  – Interviews
  – Grounded Theory
  – Phenomenological Research, etc.

• Choose Qualitative under Clinical Queries Limits
## CINAHL Basic Tips

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<tr>
<th>Try This…</th>
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<td><strong>Search by CINAHL Heading</strong></td>
<td>Select a citation of interest and click the title to see the Detailed Display. Inspect the <em>Major Subjects and Minor Subjects</em> fields in the citation record. Click on an individual term to run a search on that subject heading or copy desired terms into individual search boxes to create a new search.</td>
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## CINAHL vs. MEDLINE

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<th>CINAHL</th>
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<td>• Coverage: 1982+</td>
<td>• Coverage: early 1940’s+</td>
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<td>• Indexes 1700 journals</td>
<td>• Indexes 5200 journals</td>
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<td>• Focuses on nursing and allied health literature</td>
<td>• Focuses on biomedical literature</td>
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<td>• CINAHL Thesaurus</td>
<td>• Uses MeSH as its controlled vocabulary</td>
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<td>• Has peer-reviewed limit</td>
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<tr>
<td>• Includes cited references at end of many refs</td>
<td>• No cited references</td>
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Email Alerts

• What are email alert services?
  – Deliver current citations/abstracts into your email
  – Based on a search strategy you create
  – May provide links to PubMed and full-text articles

• Why use email alerts?
  – Keep abreast of new research in your field
  – Receive automatic updates

• Examples: MyNCBI for PubMed, Alerts for EBSCO
Accessing full-text eJournals and other eResources

- Use full-text links in PubMed/MEDLINE and CINAHL
- Check with your hospital or library or clinic
- For UW Affiliates: use the Proxy service to access full-text eJournals from off-campus
  www.lib.washington.edu/help/connect.html
- Use HEAL-WA healwa.org
Authoritative, current, evidence-based information for health care providers in Washington State.

VisualDx Mobile - New Download Instructions
Apr 08, 2013

VisualDx now includes patient handouts
Feb 26, 2013

Suspension of Washington State Mercury Limits on Certain Flu Vaccine
Jan 30, 2013

New Pregnancy & Lactation Checker in Natural Standard
Jan 25, 2013

Natural Standard en Français
Aug 17, 2012

More news...

Getting Started

Certain resources in HEAL-WA (indicated by a lock icon) require a HEAL-WA access code (UW NetID) and password for access.

Once you have set up your HEAL-WA access code and password, LOG IN to HEAL-WA by clicking on the "Log In" button at the top of this column.

LOG OUT from HEAL-WA by simply closing your browser.

Set up your HEAL-WA access - to set up a HEAL-WA access code and password, see the instructions on the Getting Started page.

PLEASE NOTE that once you have set up your access code, it can take up to a day for your access code to be recognized so you can log in to HEAL-WA.
HEAL-WA Journals A-Z

5,000+ full-text health-related journals

AAACN viewpoint

CINAHL with Full Text (EBSCO Publishing) 2004 to present
Publisher: American Academy of Ambulatory Care Nursing
Subject: Medicine and Health Sciences -- Nursing

AACN advanced critical care

LWW Nursing and Health Professions Premier Collection 2006 to present
Publisher: Lippincott, Williams & Wilkins
Subject: Medicine and Health Sciences -- Nursing, Medicine and Health Sciences -- Critical Care

AACN Bold Voices

CINAHL with Full Text (EBSCO Publishing) 2009 to present
Search
Practice Guideline Resources

- National Guideline Clearinghouse guideline.gov HMO
- Nursing Reference Center $HMO ebscohost.com/nursing/products/nursing-reference-center
- PubMed pubmed.gov HMO
- CINAHL $HMO
   Institute for Clinical Systems Improvement - Nonprofit Organization. View all guidelines by the developer(s)

   European Pressure Ulcer Advisory Panel - Independent Expert Panel; National Pressure Ulcer Advisory Panel - Independent Expert Panel. View all guidelines by the developer(s)

3. Association for the Advancement of Wound Care guideline of pressure ulcer guidelines. 2010 Oct 1.
   NGC:008120
   Association for the Advancement of Wound Care - Nonprofit Organization. View all guidelines by the developer(s)

   Wound, Ostomy, and Continence Nurses Society - Professional Association. View all guidelines by the developer(s)

   American Medical Directors Association - Professional Association. View all guidelines by the developer(s)

6. Association for the Advancement of Wound Care (AAWC) venous ulcer guideline. 2005 (revised 2010 Dec).
   NGC:008984
   Association for the Advancement of Wound Care - Nonprofit Organization. View all guidelines by the developer(s)

   Wound, Ostomy, and Continence Nurses Society - Professional Association. View all guidelines by the developer(s)
Wound Cleansing

Wound healing is optimized and risk of infection is reduced when surface bacteria, necrotic tissue, exudates, metabolic wastes, and residue of wound care products are removed from the wound. Routine wound cleansing is used for both necrotic and clean wounds. Routine wound cleansing should be accomplished with minimal chemical or mechanical trauma to the tissue [M]. Traumatized wounds have a greater risk of infection and slower healing rate. The process of cleansing a wound involves selection of both a wound cleansing solution and a mechanical means of delivering that solution to the wound.

Goals of Cleansing

- Remove non-viable tissue, bacteria, bacterial toxins from the wound surface
- Protect healing wound
- Facilitate wound assessment by optimizing visualization of wound

General Points of Cleansing

- Cleanse the wound initially and at each dressing change
- Use universal precautions to minimize risk of cross-contamination
- Minimize mechanical force when cleansing ulcer with gauze, cloth, or sponges

Mechanical Cleansing Procedure

Work in a circular pattern, starting at the center of the wound to gently cleanse the wound with the moistened gauze. Work toward the edge of the wound and surrounding skin. Remove loose tissue with the gauze pad. Do not press hard or scrub a clean wound because this will damage the tissue and slow healing. Do not return to the wound center after cleansing, to avoid recontamination of the wound.

Antimicrobials and Cleansers

Normal saline is a safe and effective cleanser for all wounds. Normal saline is physiologic and will not harm tissue. It will adequately cleanse most wounds if a sufficient amount is used to thoroughly flush the wound. Although normal saline is the cleanser of choice in the hospital, it does not contain a preservative, so bacteria starts to colonize once the sealed bottle is open. Therefore, hospital protocols often advise discarding any unused saline after 24 hours.

Drinkable tap water is as effective as saline to cleanse a wound. Cleansing can be done under running water in a sink or preferably in the shower. Immunocompromised patients should not use tap water [M].

For the clean granulating wound, cytotoxic cleaning agents are not indicated. However, when a wound is suspected to have critical colonization or infection, topical antimicrobials are indicated (e.g., povidone-iodine, sodium hypochlorite solution, hydrogen peroxide or acetic acid) for a time-limited period (usually two weeks) [R]. For wounds with evidence of a heavy bioburden, use agents and dilutions that...
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<td>Pressure ulcer prevention and treatment protocol. Health care protocol.</td>
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<td>Association for the Advancement of Wound Care guideline of pressure ulcer guidelines.</td>
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<td>2008 Jan (revised 2012 Jan)</td>
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<td>2010 Oct 1</td>
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<td>Association for the Advancement of Wound Care - Nonprofit Organization</td>
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<td><strong>Methods Used to Collect/Select the Evidence</strong></td>
</tr>
<tr>
<td>Searches of Electronic Databases</td>
</tr>
<tr>
<td>Hand-searches of Published Literature (Primary Sources)</td>
</tr>
<tr>
<td>Hand-searches of Published Literature (Secondary Sources)</td>
</tr>
<tr>
<td>Searches of Electronic Databases</td>
</tr>
<tr>
<td>Searches of Unpublished Data</td>
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<tr>
<td><strong>Major Recommendations</strong></td>
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<tr>
<td>View Major Recommendations</td>
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<tr>
<td>View Major Recommendations</td>
</tr>
<tr>
<td><strong>Availability of Original Guideline</strong></td>
</tr>
<tr>
<td>View original (full-text) guideline</td>
</tr>
<tr>
<td>View original (full-text) guideline</td>
</tr>
</tbody>
</table>
Searching **CINAHL** for Pressure ulcer cleansing
Limit: Practice Guidelines

Searching **PubMed** for Pressure ulcer cleansing
Filter: Practice Guideline under Article Types
Search for Evidence Summaries

• DynaMed  ebscohost.com/dynamed  $HMO
  – Evidence-based clinical resource providing summaries of 3500+ diseases and conditions

• Nursing Reference Center  $HMO
  ebscohost.com/nursing/products/nursing-reference-center
  Includes Evidence-based Care Sheets and Quick Lessons

• Natural Standard  naturalstandard.com  $HMO
  – Evidence-based information for complementary and alternative medicine
DynaMed $HMO

- Provides summaries of the best evidence for over 3,500 clinical topics
- Can quickly browse and find key recommendations
- Updated daily
- Monitors content of over 500 journals and systematic review databases
- **M**: Available on mobile devices
Pressure ulcer

- Updated 2014 Jan 06 06:48:00 PM: topical atorvastatin may reduce size of stage I or II pressure ulcers (Pharmacotherapy 2014) view update

Related Summaries:
- Diabetic foot ulcer
- Venous ulcer
- Osteomyelitis
- Cellulitis
- Peripheral arterial disease (PAD) of lower extremities
Pressure ulcer

Wound cleansing:
- cleanse wound initially and with each dressing change, normal saline preferred agent[1]
- ulcer wounds should not be cleaned with skin cleansers or antiseptic agents (such as povidone-iodine hydrogen peroxide, acetic acid) because they destroy granulation tissue (grade B recommendation [inconsistent or limited evidence])[1]
- insufficient evidence to support or refute use of wound cleansing for pressure ulcers
  - based on Cochrane review
  - systematic review of 3 randomized trials evaluating wound cleansing solutions or wound cleansing techniques in 169 patients with pressure ulcers
  - no trials compared wound cleansing vs. no cleansing
  - saline spray containing aloe vera, silver chloride, and decyl glucoside (Vulnopur) significantly improved Pressure Sore Status Tool scores vs. isotonic saline in 1 trial with 126 patients
  - data were insufficient to compare tap water vs. saline in 1 trial with 8 patients

Nonsurgical debridement methods:
- mechanical debridement (may be painful, viable tissue may be removed with necrotic tissue) - methods include[1, 2]
  - wet-to-dry dressings
  - hydrotherapy via whirlpool bath
  - wound irrigation
- addition of pulsatile lavage treatment to standard dressing care may improve healing of pressure ulcers in adults with spinal cord injury (level 2 [mid-level] evidence)
  - based on small randomized trial
  - 28 adults (mean age 56 years) with spinal cord injury and stage III-IV pelvic pressure ulcers randomized to 1 of 2 groups for 3 weeks
    - daily low pressure pulsatile lavage (normal saline 1 L at 11 pound-force/inch²) plus standard dressing changes
    - sham treatment plus standard dressing changes
  - pulsatile lavage associated with improvements over 3 weeks in depth, width, length, and volume of pressure ulcer (p < 0.001 for all)
- Reference - Phys Ther 2012 Jan;92(1):38

- enzymatic - preparations available in United States include collagenase and papain/urea with or without chlorophyll[1, 2]
  - slower than other methods, may be painful
  - useful for patients who cannot tolerate sharp debridement
  - should not be used if infection present
- collagenase ointment may be better than placebo for nonsurgical debridement of ulcers (level 2 [mid-level] evidence) but insufficient evidence for comparison with other debridement agents
  - based on systematic review of mostly low-quality trials
  - systematic review of 10 randomized trials and 2 prospective cohort studies evaluating collagenase ointment for debridement of pressure ulcers, leg ulcers, or burn wounds
  - most trials small with multiple methodologic flaws, including lack of blinding, baseline differences, subjective assessment measures, inadequate report of outcomes
  - collagenase associated with
    - more rapid removal of necrotic tissue from pressure ulcer wounds vs. sham ointment in 3 trials with 81 patients
    - slower removal of necrotic tissue from pressure ulcer wounds vs. papain-urea ointment in 1 trial with 26 patients
Guidelines:

Guideline comparison:

- synthesis of 2 guidelines (RNAO 2007, WOCN 2010) on management of pressure ulcers can be found at National Guideline Clearinghouse 2011 Jan 24:16417
- synthesis of 2 guidelines ([HIGN 2008, WOCN 2010) on prevention of pressure ulcers can be found at National Guideline Clearinghouse 2011 Jan 24:25078

International guidelines:

- international expert evidence-based recommendations for negative pressure wound therapy: treatment variables (pressure levels, wound filler and contact layer) can be found in J Plast Reconstr Aesthet Surg 2011 Sep;64 Suppl:S1
- European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel international guidelines
  - prevention of pressure ulcers can be found at National Pressure Ulcer Advisory Panel 2009 PDF or in Spanish PDF or in Japanese PDF
  - treatment of pressure ulcers can be found at European Pressure Ulcer Advisory Panel 2009 PDF or in Japanese PDF
- Italian Society of Infectious Tropical Diseases (Societa Italiana di Malattie Infettive e Tropicali)/International Society of Chemotherapy (SIMIT/ISC) guideline on diagnosis and management of skin and soft-tissue infections can be found in J Chemother 2011 Oct;23(5):251

United States guidelines:

- Institute for Clinical Systems Improvement (ICSI) pressure ulcer prevention and treatment protocol can be found at ICSI 2012 Jan PDF or at National Guideline Clearinghouse 2012 Jul 30:36059
- Agency for Healthcare Research and Quality, formerly Agency for Health Care Policy and Research (AHCPR), guidelines on
  - treatment of pressure ulcers can be found at AHCPR 1994 Dec
  - prevention of pressure ulcers can be found at AHCPR 1992
- Association for the Advancement of Wound Care (AAWC) guideline on pressure ulcer guidelines can be found at AAWC 2010 Oct 1 PDF or at National Guideline Clearinghouse 2011 Aug 1:24361
- Wound Healing Society guideline on treatment of pressure ulcers can be found in Wound Repair Regen 2006 Nov-Dec;14(6):663
- EBSCOhost Full Text full-text
- HIGN protocols for best practice of preventing pressure ulcers and skin tears can be found at National Guideline Clearinghouse 2008 Jan 10:12262
# Levels of Evidence and Grades of Recommendations

<table>
<thead>
<tr>
<th>Grade of recommendation</th>
<th>Level of evidence</th>
<th>Interventions</th>
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<tbody>
<tr>
<td>A</td>
<td>1a</td>
<td>Systematic review of randomized controlled trials</td>
</tr>
<tr>
<td></td>
<td>1b</td>
<td>Individual randomized controlled trial</td>
</tr>
<tr>
<td>B</td>
<td>2a</td>
<td>Systematic review of cohort studies</td>
</tr>
<tr>
<td></td>
<td>2b</td>
<td>Individual cohort study</td>
</tr>
<tr>
<td></td>
<td>3a</td>
<td>Systematic review of case-control studies</td>
</tr>
<tr>
<td></td>
<td>3b</td>
<td>Individual case-control study</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>Case series</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
<td>Expert opinion without explicit critical appraisal or based on physiology or bench research</td>
</tr>
</tbody>
</table>

REPROLINE, Johns Hopkins University  www.reproline.jhu.edu
Nursing Reference Center

- Evidence-based Care Sheets
  - Evidence-based summaries on key topics incorporating the best available evidence through vigorous systematic surveillance
- Diseases & Conditions
- Quick Lessons
- Drug information
- Skills & Procedures
- Practice Guidelines
- Patient Education materials
- CE modules
Pressure Ulcers

- Pressure Ulcers: Therapy - Wound Bed Preparation
- Pressure Ulcers: Therapy -- an Overview
- Pressure Ulcers: Therapy -- Dressings
- Pressure Ulcers: Therapy -- Electrical Stimulation
- Pressure Ulcers: Therapy -- Growth Factors
- Pressure Ulcers: Therapy -- Negative Pressure
- Pressure Ulcers: Treatment
- Pressure Ulcers: Use of Pressure-Redistributing Devices

Quick Lessons
Clinically-organized nursing overviews that are designed to map the nursing work flow

Evidence-Based Care Sheets
Evidence-based summaries on key topics incorporating the best available evidence through rigorous systematic surveillance
Pressure Ulcers: Treatment

What We Know
- Pressure ulcers (PUs), also called decubitus ulcers, pressure sores, and bedsores, are localized areas of skin and soft tissue breakdown, caused mainly by prolonged pressure, friction, and shear forces, that can result in ischemia, cell death, and tissue necrosis.(5) (For more information, see Quick Look About...Pressure Ulcers as an Entry.)
- Symptoms range from nonhealing erythemas with intact skin, wounds, and induration to partial or full-thickness skin loss(6)8.
- Preventive complications include infection, osteomyelitis, abscess, cellulitis, and sepsis(9).
- Treatment depends on accurate assessment of tissue damage. The National Pressure Ulcer Advisory Panel staging system includes stages 1-IV and 2 advanced categories.(1)5,16-20 (For more information, see Quick Look About...Pressure Ulcers as a Stage.)
- Stage 1: Observable pressure-related alteration of intact skin in comparison to the adjacent uninvolved skin; changes may occur in skin color or temperature, tissue consistency, or sensation; color changes vary depending on skin pigmentation.
- Stage II: Partial-thickness skin loss involving the dermis.
- Stage III: Full-thickness skin loss and subcutaneous tissue loss, but not into the fascia.
- Stage IV: Full-thickness skin loss, necrosis, destruction of muscle and bone.
- Toxins, such as diabetes, may also affect the skin and underlying tissues that may precipitate a progression to stage III or IV.
- Concomitant full-thickness skin loss with tissue or bone in the wound bed, making it impossible to accurately assess the wound base.

What We Can Do
- Learn more about PUs, including risk factors, symptoms, staging, assessment, and prevention of treatment interventions—so you are not severely tension patients' personal care needs on health education cases, with knowledge you can offer colleagues.
- On admission, assess all of your patients for existing PUs and for potential disuse ulcers.
- Use a risk assessment tool (e.g., Braden, Norton) and ask the patient's family if there is any history of PUs.
- Changing the important patient may require touching or turning the patient. For patients, changing the patient's skin, turning, hitting, islands, and information.
- If applicable, note color, size, location, and stage of PU, and if it is induration, to prevent.
- To determine the extent and condition of existing PUs using an accepted staging and assessment tool (e.g., the Pressure Ulcer Scale for Healing [PUSH]).
- Use a risk assessment tool and use appropriate staging and assessment tools (e.g., the Pressure Ulcer Scale for Healing [PUSH]).
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- Use a risk assessment tool and use appropriate staging and assessment tools (e.g., the Pressure Ulcer Scale for Healing [PUSH]).

Coding Matrix

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0106</td>
<td>0002</td>
<td>Pus, decubitus ulcer, stage 1, superficial</td>
</tr>
<tr>
<td>0106</td>
<td>0009</td>
<td>Pus, decubitus ulcer, stage 2, partial thickness</td>
</tr>
<tr>
<td>0106</td>
<td>0017</td>
<td>Pus, decubitus ulcer, stage 3, full thickness</td>
</tr>
<tr>
<td>0106</td>
<td>0025</td>
<td>Pus, decubitus ulcer, stage 4, full thickness and bone</td>
</tr>
</tbody>
</table>

References
**Quick Lesson**

**Pressure Ulcers: Therapy – Dressings**

- **Description/Etiology**: A pressure ulcer (PU) is a localized injury to the skin and underlying tissue caused by pressure and/or shear. It is usually associated with local tissue ischemia. PUs can occur in any body area, but are most common on the sacrum, heels, and elbows.

- **Risk Factors**: Risk factors for PUs include immobility, smoking, diabetes, obesity, corticosteroids, and use of sedatives.

- **Assessment**: Assessment includes the size, depth, and extent of the ulcer, as well as the patient’s medical history and current medications.

- **Treatment Goals**: To maintain optimal physiological status and reduce the risk of complications.

- **Red Flags**: Avoid dressing the patient if they have an infection, any signs of depth, or if the ulcer is bleeding.

- **Provide Emotional Support and Educate**: Education is important to prevent PUs in the future.

---

**References**

- | Author | Title |
  |--------|-------|

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November 9, 2012
# Nursing Reference Center:
## Skill Competency Checklist

**Wound Dressings: Pressure**

<table>
<thead>
<tr>
<th>Standard Men/Initials</th>
<th>Competency Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Prerequisite Skills</strong></td>
</tr>
<tr>
<td></td>
<td>Knowledge of the mechanism whereby a pressure dressing prevents clothing and personnel from being in a bleeding wound</td>
</tr>
<tr>
<td></td>
<td>Recognition of excessive bleeding as a medical emergency; demonstrated ability to prioritize nursing actions based on source of bleeding (e.g., arterial versus venous), extent of blood loss, and presence or absence of other injuries</td>
</tr>
<tr>
<td></td>
<td>Knowledge of facility protocol concerning procedure; if applicable, participation in specialized training for treatment of patients with traumatic injuries</td>
</tr>
<tr>
<td></td>
<td>Understanding of standard precautions for infection control</td>
</tr>
<tr>
<td></td>
<td><strong>Preparation</strong></td>
</tr>
<tr>
<td></td>
<td>Reviews the treating clinician's orders for wound care, if available</td>
</tr>
<tr>
<td></td>
<td>Reviews facility protocol regarding emergency care</td>
</tr>
<tr>
<td></td>
<td>Identifies patient using facility protocol</td>
</tr>
<tr>
<td></td>
<td>Verifies whether the patient is allergic to latex or other procedure materials or medications. If so, uses alternative materials</td>
</tr>
</tbody>
</table>
|                       | Gathers supplies:  
|                       | - Personal protective equipment (PPE), e.g., gown, mask, eye protection, as appropriate  
|                       | - Sterile gauze pads and/or gauze bandage roll  
|                       | - Telfa bandages  
|                       | - Adhesive bandage tape  
|                       | - Sterile/non-sterile gloves and other personal protective equipment (PPE), e.g., gown, mask, eye protection, as appropriate  
|                       | - Telephone for assessing vital signs and for performing basic life support (BLS) procedures, as needed  
|                       | - Written information, if available, to reinforce verbal education |
|                       | **Procedure** |
|                       | Performs hand hygiene |
|                       | Dones PPE as appropriate to avoid transfer of microorganisms |
|                       | Closes the door to the patient's room and/or draws the curtain around the bed to provide privacy |
|                       | - As appropriate for the situation, introduces self to the patient and family members, if present, and explains clinical role in the provision of pressure dressing application |
|                       | - Evaluates whether the patient/family requires special considerations regarding communication (e.g., due to illiteracy, language barriers, or deafness); makes arrangements to meet these needs, if present |
|                       | - As appropriate, assesses the patient/family for knowledge deficits and anxiety regarding pressure dressing application; provides additional information and emotional support, as needed |
|                       | Checks the A-B-C's (Airway, Breathing, Circulation) of emergency patient assessment; conducts a brief assessment of vital signs, tissue perfusion, and level of consciousness; if the patient is conscious and communicative, provides comfort and explains how help will be provided |
|                       | - Follows facility protocol for cardiopulmonary resuscitation (CPR) and for notification of facility critical care or rapid response team, if indicated |
|                       | Quickly observes the area of the bleeding to identify the site and degree of blood loss, as well as the type of wound |
|                       | Applies sterile gloves (if resealable), covers the wound with sterile gauze, and applies firm pressure over the gauze to temporarily stop the bleeding |
|                       | Elevates the extremity or area of blood loss above the patient's heart to decrease blood loss |
|                       | Covers the bleeding area with thick sterile gauze pads |
Pressure Sores

(Pressure Ulcers; Bed Sores; Decubitus Ulcers)

**Definition**
A pressure sore is a lesion that develops on the skin and underlying tissues due to unrelieved pressure. The skin and tissues need enough blood supply for oxygen and nutrients. When tissues are compressed for an extended period from hours to days, blood supply can be cut off, leading to a sore.

**Pressure Sore (Skin Ulceration)**

---

**Causes**
Pressure sores result from lying or sitting in one position for too long a time. Prolonged pressure cuts off the blood supply to tissues that are compressed between a bony area and a mattress, chair, or other object. Without oxygen and nutrients, tissue starts to die.

Several factors contribute to the development of pressure sores including:
<table>
<thead>
<tr>
<th>Pneumonia in Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia In Older Adults</td>
</tr>
<tr>
<td>Pneumonia, Aspiration (Anaerobic)</td>
</tr>
<tr>
<td>Pneumonia, Bacterial</td>
</tr>
<tr>
<td>Pneumonia, Healthcare-Associated</td>
</tr>
<tr>
<td>Pneumonia, Hospital-Acquired</td>
</tr>
<tr>
<td>Pneumonia, Mycoplasma (Atypical)</td>
</tr>
<tr>
<td>Pneumonia, Nosocomial</td>
</tr>
<tr>
<td>Pneumonia, Primary (Atypical)</td>
</tr>
<tr>
<td>Pneumonia, Ventilator-Associated</td>
</tr>
<tr>
<td>Pneumonia, Ventilator-Associated, in Children</td>
</tr>
<tr>
<td>Pneumonitis in Children</td>
</tr>
</tbody>
</table>
Natural Standard naturalstandard.com $HMO

• Provides high-quality, evidence-based information about complementary and alternative medicine
• Includes dietary supplements and integrative therapies
• Grades reflect level of available scientific data + or - the use of therapy for a specific medical condition
• **M**: Available on mobile devices
• Merging with *Natural Medicines Comprehensive Database* in early 2014
Sunflower oil (*Helianthus annuus*)

*Natural Standard* Professional Monograph, Copyright © 2013 (www.naturalstandard.com).

### Synonyms/Common Names/Related Substances:

Clinical Bottom Line/Effectiveness

Brief Background:
- Sunflower oil is derived from the sunflower plant (*Helianthus annuus*). It was used by Native Americans for its healing properties, applied topically to reduce inflammation, pain, and itching. It was also used to treat poison ivy, snakebites, and rheumatism.
- Other traditional uses for sunflower seeds include constipation, chest pain, ulcers, and warts. In modern times, sunflower oil has aroused interest for such ailments as cardiovascular disease and hyperlipidemia, due to its high vitamin E and polyunsaturated fat content; however, studies published to date have found conflicting evidence regarding the efficacy of sunflower oil for these conditions.
- The anti-inflammatory properties of polyunsaturated fatty acids have also been evaluated, with inconclusive results. Similarly, inconclusive to negative findings have been reported for a number of other indications, including type 2 diabetes and hypertension.

Scientific Evidence for Common/Studied Uses:

<table>
<thead>
<tr>
<th>Indication</th>
<th>Evidence Grade</th>
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<tbody>
<tr>
<td>Tinea pedis (athlete’s foot)</td>
<td>B</td>
</tr>
<tr>
<td>Blood clotting disorders</td>
<td>C</td>
</tr>
<tr>
<td>Breast inflammation</td>
<td>C</td>
</tr>
<tr>
<td>Cardiovascular risk reduction</td>
<td>C</td>
</tr>
<tr>
<td>Chronic inflammatory rheumatic disease</td>
<td>C</td>
</tr>
<tr>
<td>Diabetes mellitus type 2</td>
<td>C</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>C</td>
</tr>
<tr>
<td>Atherosclerosis</td>
<td>D</td>
</tr>
<tr>
<td>Hypertension</td>
<td>D</td>
</tr>
<tr>
<td>Peripheral vascular disease</td>
<td>D</td>
</tr>
<tr>
<td>Vitamin A deficiency</td>
<td>D</td>
</tr>
</tbody>
</table>

Historical or Theoretical Uses That Lack Sufficient Evidence:
- Allergies, Alzheimer’s disease, antioxidant (1), arthritis, bed sores (2), constipation, cough, fever, gallstones (3), pain, poison ivy, skin infections, snake bites, ulcers, warts.
Interactions

Most herbs and supplements have not been thoroughly tested for interactions with other herbs, supplements, drugs, or other medical devices. Most of the information below is based on reports in scientific publications, laboratory experiments, or traditional use. You should always read medical condition, or are taking other drugs, herbs, or supplements, you should speak with a qualified healthcare provider.

Sunflower oil/Drug Interactions:

- **Anticoagulants and antiplatelets**: Based on clinical research, sunflower oil may affect platelet activation and alter coagulation (24;25;26;27;28;29). Theoretically, concomitant use of anticoagulant or antiplatelet agents and sunflower oil may increase bleeding risk.

- **Antidiabetic agents**: Based on clinical study, sunflower oil may decrease blood glucose (30;31;32;33) as well as in mentioned. Theoretically, concurrent use of sunflower oil with antidiabetic agents may have additive effects and increase the risk of hypoglycemia.

- **Antilipemic agents**: Based on clinical research, sunflower oil may lower cholesterol (8;13;17;24;24;33;40;42;43;49;50;51;52;61;62;63). Theoretically, concurrent use of sunflower oil with antilipemic agents may have additive cholesterol-lowering effects.

- **Antibiobesity agents**: Clinical studies have reported conflicting findings concerning sunflower oil's effect on body weight. Antiobesity agents are not well understood.

- **Hematologic agents**: In humans, sunflower oil has been observed to significantly decrease fibrinogen (p=0.04) and increase tissue plasminogen activator antigen (p=0.04), compared to baseline (40). Sunflower oil has also been shown to decrease chylomicron apoB48 and B100 (p<0.05) compared to olive oil (11).

- **Immunosuppressants**: Based on clinical research, sunflower oil may alter antibody levels, cytokine production, and 18;20;36;37;38;39). Theoretically, sunflower may alter or interfere with immunosuppressants.

Sunflower oil/Herb/Supplement Interactions:

- **Anticoagulants and antiplatelets**: Based on clinical research, sunflower oil may affect platelet activation and alter coagulation (24;25;26;27;28;29). Theoretically, concomitant use of anticoagulant or antiplatelet agents and sunflower oil may increase bleeding risk.

- **Antioxidants**: Sunflower oil has been found to increase serum alpha-tocopherol and oxidation lag time, and decrease lipid hydroperoxides, and triiodoburic acid reactive substances in clinical studies (1;5;48;64;65). Sunflower oil has less effective than olive oil or fish oil and more effective than palm oil in the prevention of lipid oxidation in humans, however, resulted in higher free F(2)-isoprostanes (p=0.003) and malondialdehyde (p=0.04) in one human study. Concurrent use of sunflower oil with antioxidants may have additive effects.

- **Antilipemics**: Based on clinical research, sunflower oil may lower cholesterol (8;13;17;24;24;33;40;42;43;49;50;51;61;62;63). Theoretically, concurrent use of sunflower oil with antilipemic agents may have additive cholesterol-lowering effects.
# Bed sores and related conditions

Levels of scientific evidence for specific therapies

<table>
<thead>
<tr>
<th>Grade: A (Strong Scientific Evidence)</th>
<th>Specific therapeutic Use(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light therapy</td>
<td>Wound healing</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Grade: B (Good Scientific Evidence)</th>
<th>Specific therapeutic Use(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colloidal silver</td>
<td>Wound healing</td>
</tr>
<tr>
<td>Comfrey</td>
<td>Wound healing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade: C (Unclear or Conflicting Scientific Evidence)</th>
<th>Specific therapeutic Use(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated charcoal</td>
<td>Wound healing</td>
</tr>
<tr>
<td>Aloe</td>
<td>Skin ulcers</td>
</tr>
<tr>
<td>Alpha-lipoic acid</td>
<td>Wound healing (patients undergoing hyperbaric oxygen therapy)</td>
</tr>
<tr>
<td>Arginine</td>
<td>Anal fissures</td>
</tr>
<tr>
<td>Aromatherapy</td>
<td>Wound care</td>
</tr>
<tr>
<td>Ayurveda</td>
<td>Anal fissure</td>
</tr>
<tr>
<td>Beta-glucan</td>
<td>Skin care</td>
</tr>
<tr>
<td>Betaine anhydrous</td>
<td>Wound care</td>
</tr>
<tr>
<td>Bovine cartilage</td>
<td>Skin care (laser resurfacing adjunct)</td>
</tr>
<tr>
<td>Calendula</td>
<td>Anal fissures</td>
</tr>
<tr>
<td>Calendula</td>
<td>Skin care</td>
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</tbody>
</table>
Use a Meta-Search Engine to find evidence sites

- Trip  *tripdatabase.com*  HO
- Accesssss Federated Search  
  *plus.mcmaster.ca/ACCESSSSS/*  O
1. Bar-code technology to reduce medication errors.
   NEJM 2010

2. Computerized bar code-based blood identification systems and near-miss transfusion episodes and transfusion errors.
   Mayo Clinic Proceedings 2013

3. Effect of bar-code technology on the safety of medication administration.
   NEJM 2010

4. Bar-code/eMAR combo reduces errors.
   Healthcare Benchmarks and Quality Improvement 2010

Accessss Federated Search

- **[http://plus.mcmaster.ca/ACCESSSSS/](http://plus.mcmaster.ca/ACCESSSSS/)
- Searches simultaneously several evidence-based resources (online evidence-based texts, and pre-appraised journal publications)
- Follows 6s Pyramid of evidence-based decision-making
- Provides email alerts to new published evidence in user’s area of interest
pressure ulcers AND cleans*
Search for Systematic Review and Meta-Analyses Resources

- Cochrane Database of Systematic Reviews  $HMO
- PubMed/MEDLINE: Systematic Reviews  HMO
- CINAHL  $HMO
Systematic review vs. Meta-analysis

• **Systematic review:**
  – a literature review of RCTs focused on a single question which tries to identify, appraise, select and synthesize all high quality research evidence relevant to that question.
  – Uses explicit methods to identify, select and critically evaluate relevant research.

• **Meta-analysis:**
  – a systematic review combining results of several studies using quantitative statistics.
Cochrane Database of Systematic Reviews

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Current Issue

Protocol
Cochrane Database Protocol

BACKGROUND

Description of the condition

An adverse drug event is an unwanted occurrence after exposure to a drug that is not necessarily caused by the drug. Adverse drug events (ADEs) include adverse drug reactions (ADRs) and preventable adverse drug events, which are adverse drug events associated with a medication error. An adverse drug reaction is defined as any response to a drug which is noxious and unintended. These reactions occur at doses normally used for prophylaxis, diagnosis or therapy of the disease.

Medication errors are broadly defined as any error in the prescribing, dispensing or administration of a drug, irrespective of whether such errors lead to adverse consequences or not (Williams 2007). The Council of Europe (Council of Europe 2005) and the UK Department of Health (Smith 2004) define medication errors as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient or consumer. However, a better definition may be 'the failure to complete a planned action as intended or the use of a wrong plan to achieve an aim'. Errors can include problems in practice, products, procedures, and systems. (Kohn 2000). The severity of ADEs has been classified as follows (ISMP 2011).

- Category 1: circumstances or processes that have the potential to cause an adverse drug event.
- Category 2: an event occurred but the patient was not harmed.
- Category 3: an event occurred that resulted in the need for increased patient assessments but no change in vital signs and no patient harm.
- Category 4: an event occurred that resulted in the need for treatment and/or intervention and caused temporary patient
Authors' conclusions

We identified three small studies addressing cleansing of pressure ulcers. One reported a statistically significant improvement in pressure ulcer healing for wounds cleansed with saline spray containing Aloe vera, silver chloride and decyl glucoside (Vulnopur) compared with isotonic saline solution, a further study reported no statistically significant change in healing was seen when wounds were cleaned with water was compared with saline. A final study compared pulsatile lavage with sham and found a significantly greater reduction in ulcer volume at the end of the study period in the lavage group compared with the sham group. The authors conclude that there is no good trial evidence to support use of any particular wound cleansing solution or technique for pressure ulcers.
Finding Systematic Reviews and Meta-Analyses in CINAHL

• Use Publication Type Limits:
  – Systematic Review
  – Meta-Analysis

• Search *Meta Analysis* as a Subject Heading
Finding Systematic Reviews and Meta-Analyses in PubMed

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Abstract
Medication administration error (MAE) remains a patient safety concern. Few studies have investigated the impact of bar-coded technology on medication error reduction during the medication administration process at the bedside in acute care settings. The purpose and focus of this systematic review is to determine whether implementation of the Bar Code Medication Administration System (BCMA) is associated with declines in MAE rate. Findings from this systematic review reveal varied findings between studies and among the 5 rights of medication administration (right drug, right time, right patient, right dose, and right route) in general. Although BCMA did not consistently decrease the overall incidence of MAE, the technology did identify categories of medication errors not previously detected with the traditional 5 rights approach. The opportunity to analyze the additional categories of MAE identified by BCMA has implications for patient safety and is perhaps the most significant contribution of this review.
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Evidence Pyramid

Systematic Reviews, Meta-Analyses
ex. Cochrane

Evidence Summaries, Evidence Guidelines
ex. DynaMed, NGC, Nursing Reference Center

Randomized Controlled Trials (RCTs), Cohort Studies, Qualitative Studies
ex. PubMed/Medline, CINAHL

Background Information, Expert Opinion
ex. Textbooks, UpToDate

Metasearch Engine: TRIP, ACCESSSSS
Closing Thoughts

• Refer to the handout “Exploring the Evidence Pyramid”
• Remember the Evidence Pyramid. Start at the top!
• Use Cochrane Database to find SRs.
• Use DynaMed, Nursing Reference Center, and Natural Standard to find summaries of evidence.
• Use CINAHL and PubMed to find research articles.
• To manage references, use EndNote Basic.
• Remember HEAL-WA for access to a wide selection of evidence-based eResources.
Exploring the Evidence Pyramid

Handout:

PowerPoint:

Questions?

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