



# Quality Tools: The Evidence

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# Objectives

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Outline a structured approach to identify and examine current evidence related to quality improvement activities.

Describe the impact of evidence in select quality projects.



# Question:

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How do you determine the interventions for your **quality** improvement project?

- Has the possible intervention been used by someone else?
- Was it successful in improving **quality**?



# One Definition of *Quality*

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The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are **consistent with current professional knowledge**

KN Lohr, N Engl J Med, 1990



# Evidence Translating Into Quality

Article

## Reducing Central Venous Catheter-Related Bloodstream Infections in Children With Cancer

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 MaryAnn Gregorich, PhD, MPH, and Marilyn Hockenbery, PhD, RN, FAAN

**C**hildren with cancer who have a central venous catheter (CVC) are at increased risk for bloodstream infections. Nursing strategies when using and caring for a CVC can decrease the burden of contamination in the patient population. Staff education on adherence to aseptic technique and other CVC care guidelines are essential to decreasing bloodstream infections.

### Background

#### Central Venous Catheters and Children With Cancer

CVCs are essential to the treatment and supportive care of children with cancer. The devices have greatly improved the quality of life of children with cancer and increased family satisfaction by minimizing the need for transportation and the associated emotional trauma. In addition, CVCs facilitate the long-term delivery of chemotherapy, parenteral fluids and nutrition, blood products, antibiotics, and analgesics. However, the insertion and maintenance of CVCs are not without associated complications. Potential complications associated with catheter insertion include pneumothorax, air embolism, nerve injury and catheter malposition. Infection and occlusion remain the two most common complications associated with use and maintenance of central lines (Hugdal, Reeb & Perry, 2002; O'Neil, 2005).

#### Incidence of Central Venous Catheter Infections

Catheter-related bloodstream infection rates vary widely among patient populations. Differences occur within the pediatric population by catheter type. In the pediatric population, the National Nosocomial Infection Surveillance System (NNIS) reported that hospital pediatric intensive care units experience the highest rates of infections at 44 per 1,000 catheter-days. The neonatal intensive care units have slightly lower rates of catheter infections at 4.7 per 1,000 catheter-days (Mulliken, De Chers, Lomasato, Ivers, & De Maeyer, 2001). Infection rates for CVCs placed in children with cancer range from 1.1-4.56 per 1,000 catheter-days (Haugenier,

**Purpose/Objective:** To determine whether a comprehensive educational program influenced the incidence of both colonization of central venous catheters (CVC) and bloodstream infection rates in children with cancer, to identify risk factors related to infection rates, and to determine the impact of an educational program on nurses' knowledge of CVC care for children with cancer.

**Design:** Prospective, longitudinal.

**Setting:** Pediatric cancer center in a large children's hospital in the southeastern United States.

**Sample:** 11 children with cancer were obtained from 27 children with cancer, and 127 nurses participated in the educational intervention.

**Methods:** CVC hub cultures were obtained prior to and three months after an educational intervention. A written pre- and postintervention assessment was used to evaluate the nurses' training.

**Main Research Variables:** Hub colonization and bloodstream infection rates.


**Findings:** Post-test mean score of 87% was significantly higher than the pre-test mean score of 73%. Post-test infection program, 3% of the hub-catheter culture systems, and after the educational program, the proportion of culture-positive hubs was reduced to 36%.

**Conclusions:** A comprehensive educational program increased nurses' knowledge of CVC care and reduced CVC hub colonization and catheter-related bloodstream infections in children with cancer.

**Implications for Nursing:** Patient and family participation in practice change is very important because often nursing is the first to gain. Additional research is clarifying the relationship between hub colonization and subsequent bloodstream infection in a larger sample is warranted.

222 Vol. 38, No. 3, March 2009 • Oncology Nursing Forum

## STANDARDS, RECOMMENDED PRACTICES, AND GUIDELINES



2006 Edition  
 With Official AORN Statements

AORN

# Clinical Practice Guidelines

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Systematically developed statements or recommendations to assist the practitioner about appropriate health care for specific clinical circumstances.

Institute of Medicine (1992). *Guidelines for clinical practice: from development to use.*



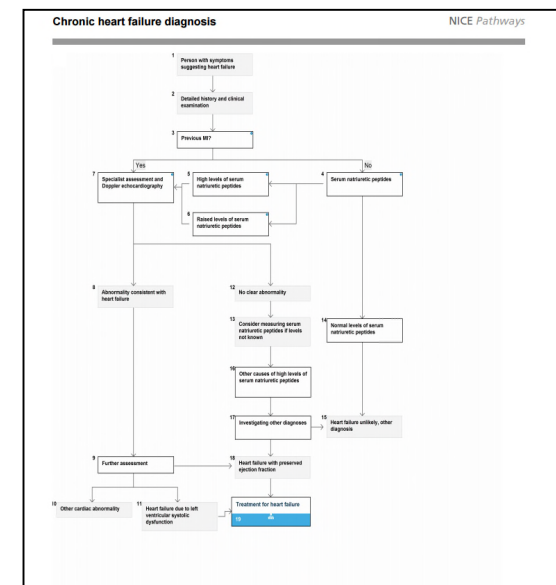
# Evidence-Based Pathways (Algorithms)

Structured multidisciplinary care plans which detail essential steps in the care of patients with a specific clinical problem based on evidence.

They support the translation of clinical guidelines into local protocols and clinical practice

Clinical pathways detail the local structure, systems and time-frames to address recommendations of guidelines.

Rotter T, et al. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. *Cochrane Database of Systematic Reviews* 2010, Issue 3. Art.No.:CD006632



# Clinical Protocols

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Plot a comprehensive, time-sensitive, multidisciplinary plan encompassing pre-hospital, hospital, and post-hospital domains.

Create a timeline protocol specifying both services and personnel.


Require continuous review and update since they become a method of evaluating compliance with quality improvement initiatives.

Hammond, J. (2001). Protocols and guidelines in critical care: development and implementation. *Current Opinion in Critical Care*, 7(6), 464-468.



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1

2

3

>>

Pause

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- ▶ **Human Resources**  
 Benefits  
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- ▶ **Employee Resources**  
 API Timeclock  
 Connect Forms  
▶ **Electronic Medical Record**  
 Daily Census  
 Event Reporting  
 IS Service Desk  
 People Directory  
 Policies and Procedures
- ▶ **Clinical Resources**  
 Clinical Guidelines  
 Culture Vision  
 Drug info & formulary  
 Medical Staff Privileges  
 Pathology online catalog  
 Patient education materials  
 Scope of Practice
- ▶ **Physician Resources**
- ▶ **Departments**  
 Pavilion for Women  
 Texas Children's Pediatrics  
 Texas Children's Health Centers  
 Texas Children's Health Plan
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- ▶ **Nursing Resources**

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Tex...

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**I AM TEXAS CHILDREN'S**  
XiaoYu Chen  
**NUTRITION AND GI**



"I love working at Texas Children's because of the high quality of patient care. I am proud to be

Connect Departments Connect Sites and Services Resources Tools Help

**Evidence Based Outcomes Center**  
 Libraries  
 Lists

## Clinical Guidelines and Order Sets

[Evidence-Based Medicine Course](#)

[Pedi 101](#)

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**Evidence-Based Guidelines**

Evidence-Based Guidelines	Updated
<a href="#">Acute Asthma Exacerbations</a>	01/2014
<a href="#">Acute Gastroenteritis</a>	07/2009
<a href="#">Acute Heart Failure</a>	08/2009
<a href="#">Acute Hematogenous Osteomyelitis</a>	09/2011
<a href="#">Acute Ischemic Stroke</a>	01/2011
<a href="#">Acute Otitis Media</a>	07/2013
<a href="#">Appendicitis/Appendectomy **</a>	07/2011
<a href="#">Arterial Thrombosis</a>	01/2011
<a href="#">Attention Deficit Hyperactivity Disorder (ADHD) ***</a>	06/2014
<a href="#">Autism ***</a>	04/2013
<a href="#">Bronchiolitis **</a>	05/2010
<a href="#">C Spine Assessment ***</a>	11/2013
<a href="#">Cancer Center Procedural Management</a>	11/2009
<a href="#">Cardiac Thrombosis</a>	08/2009
<a href="#">Central Line-Associated Bloodstream Infections</a>	01/2013
<a href="#">Community-Acquired Pneumonia</a>	02/2013
<a href="#">Cystic Fibrosis in Adolescents (GI/Nutrition)</a>	02/2013
<a href="#">Deep Vein Thrombosis</a>	03/2009
<a href="#">DKA</a>	11/2009
<a href="#">Fever and Neutropenia in Children With Cancer</a>	05/2010
<a href="#">Fever Without Localizing Signs 0-60 Days</a>	08/2013
<a href="#">Fever Without Localizing Signs 2-36 Months</a>	09/2013
<a href="#">Hyperbilirubinemia</a>	02/2010
<a href="#">Neonatal Thrombosis</a>	10/2009
<a href="#">Nutrition/Feeding in the Infant Post-Cardiac Surgery</a>	02/2010
<a href="#">Postpartum Hemorrhage</a>	09/2013
<a href="#">Procedural Sedation **</a>	10/2011
<a href="#">Rapid Sequence Intubation</a>	07/2010



# Creating Evidence-Based Clinical Standards



1) Ask the question



2) Find the best evidence



3) Evaluate the evidence



4) Apply the information



5) Evaluate outcomes

What is evidence?  
Where can I find it?



# Guideline Search

The screenshot shows the National Guideline Clearinghouse (NGC) website interface. The browser window title is "NGC - Browse - Mozilla Firefox" and the address bar shows "http://www.guidelines.gov/browse/browsemode.aspx?node=3851&type=1". The page header includes the NGC logo, the text "National Guideline Clearinghouse www.guideline.gov", and the AHRQ logo. A navigation menu contains links for "Expert Resources", "Guideline Syntheses", "Submit Guidelines", "What's New", "Contact Us", "About", "Site Map", "Help", and "Subscribe".

The main content area is titled "NGC Browse - Disease/Condition Results". It features a search box with "Results per page 20" and a "Search" button. Below the search box are links for "Search Help", "Detailed Search", and "Frequent Searches". A "Browse" section lists categories: "Disease / Condition", "Treatment / Intervention", "Measures", "Organization", "Guideline Index", "Guidelines In Progress", and "Guideline Archive". A "Compare" section includes "View My Collection" and "Guideline Syntheses".

The search results display "Display results 1 to 4 of 4". The results are:

- [Bronchiolitis in children. A national clinical guideline.](#) Scottish Intercollegiate Guidelines Network - National Government Agency [Non-U.S.]. 2006 Nov. 41 pages. NGC:005387
- [Chronic cough due to nonbronchiectatic suppurative airway disease \(bronchiolitis\): ACCP evidence-based clinical practice guidelines.](#) American College of Chest Physicians - Medical Specialty Society. 2006 Jan. 6 pages. NGC:004826
- [Diagnosis and management of bronchiolitis.](#) American Academy of Pediatrics - Medical Specialty Society. 2006 Oct. 20 pages. NGC:005271
- [Evidence-based clinical practice guideline for medical management of bronchiolitis in infants less than 1 year of age presenting with a first time episode.](#) Cincinnati Children's Hospital Medical Center - Hospital/Medical Center. 1996 (revised 2005 Oct 15; reviewed 2006 May). 13 pages. NGC:005078

At the bottom of the results list are buttons for "Select All" and "Add to My Collection". Below the results is a banner for "Find out more about NGC's new features" with an image of glasses. The footer contains links for "About", "Accessibility", "Contact Us", "Disclaimer", "Feedback", "Help", "Home", "Privacy Policy Notice", "Resources", "Site Map", "What's New", "USA.gov", and "Adobe Reader". It also includes "Copyright/Permission Requests" and "Date Modified: 3/29/2010".

# Guideline Appraisal

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The **A**ppraisal of **G**uidelines for **RE**search & **E**valuation (AGREE II)

23-item checklist

6 quality domains

- Scope and purpose
- Stakeholder involvement
- Rigor of development
- Clarity of presentation
- Applicability
- Editorial independence

# Sources of Evidence

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- **Cochrane Collaboration**
  - Systematic reviews of randomized controlled trials
- **Joanna Briggs Institute**
  - Systematic reviews of randomized controlled trials, non-controlled trials, and qualitative research
- **HAM-Texas Medical Center Library**
  - PubMed, CINAHL, PsycInfo, Scopus
- **EBSCO-Host**
  - A portal into CINAHL, Medline, and Health Business Elite



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*informationforlife*  
The Methodist Academy of Medicine - Texas Medical Center Library

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# PubMed

The screenshot shows the PubMed website interface. At the top, there is a navigation bar with "NCBI Resources" and "How To" menus. Below this is the "PubMed.gov" logo and the text "U.S. National Library of Medicine National Institutes of Health". A search bar contains the text "PubMed" and has "Advanced search", "Help", and "Feedback" links. A "Search" button and a "Clear" button are also present. Below the search bar is a large banner with the text "Welcome to PubMed" and "The PubMed database comprises more than 19 million citations for biomedical articles from MEDLINE and life science journals. Citations may include links to full-text articles from PubMed Central or publisher web sites." To the right of the banner is a logo for "Introducing Rapid Research Notes" with the text "Immediate access to preliminary research reports". Below the banner are three columns of links: "Using PubMed" (PubMed Quick Start, Search by Author, Search by Journal, Full Text Articles, PubMed FAQs), "PubMed Tools" (Single Citation Matcher, Batch Citation Matcher, Clinical Queries, Topic-Specific Queries, E-Utilities), and "More Resources" (New and Noteworthy, PubMed Tutorials, MeSH Database, Journals Database, Clinical Trials).

**>23 million citations for biomedical articles from the 1948; abstracts & full-text**





# CINAHL

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## *Cumulative Index to Nursing and Allied Health Literature*

- Nursing and 17 allied health disciplines
- 1982 to the present
  - >1300 journals regularly indexed and abstracted with >135,000 citations
  - Relatively few abstracts or full-text articles
  - Includes competencies for all jobs in hospitals, summaries of malpractice court cases, and research instruments, access to healthcare books, nursing dissertations, selected conference proceedings, standards of professional practice, educational software, and AV materials

# EBSCO Host



## Choose Databases | [Select another EBSCO service](#)

To search within a single database, click the database name listed below. To select more than one database to search, check the boxes next to the databases and click *Continue*.



### Continue

Select / deselect all

#### CINAHL Complete

*CINAHL@Complete* is the world's most comprehensive source of full-text for nursing & allied health journals, providing full text for more than 1,300 journals indexed in *CINAHL*. This authoritative file contains full text for many of the most used journals in the *CINAHL* index, with no embargo. *CINAHL@Complete* is the definitive research tool for all areas of nursing & allied health literature.

[Title List](#) [More Information](#)

#### Health Business Elite

*Health Business Elite* provides comprehensive journal content detailing all aspects of health care administration and other non-clinical aspects of health care institution management. Topics covered include hospital management, hospital administration, marketing, human resources, computer technology, facilities management and insurance. *Health Business Elite* contains full text content for more than 570 journals such as *H&HN: Hospitals & Health Networks*, *Harvard Business Review* (available back to 1922), *Health Facilities Management*, *Health Management Technology*, *Healthcare Financial Management*, *Marketing Health Services*, *Modern Healthcare*, and many more.

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#### MEDLINE Complete

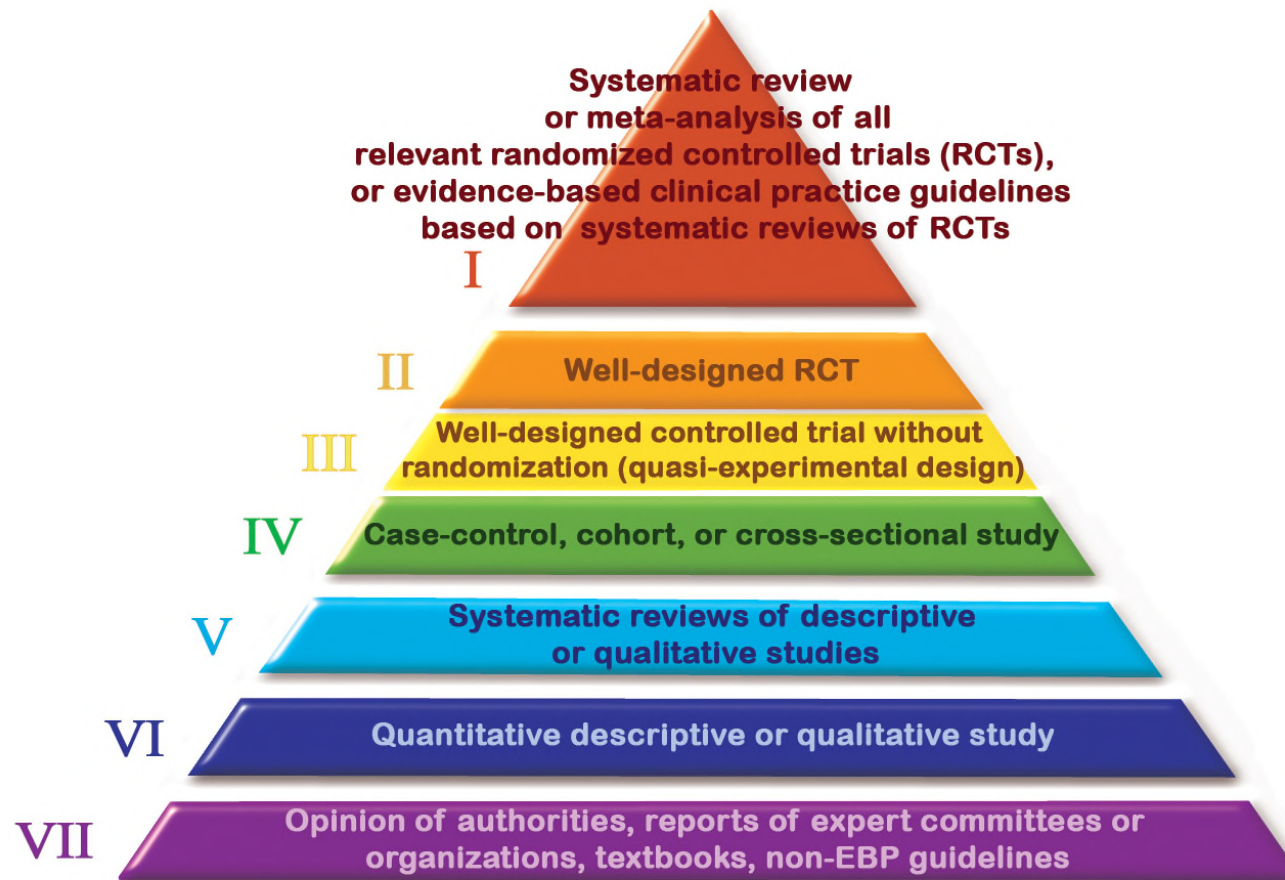
*MEDLINE Complete* provides authoritative medical information on medicine, nursing, dentistry, veterinary medicine, the health care system, pre-clinical sciences, and much more. *MEDLINE Complete* uses MeSH (Medical Subject Headings) indexing with tree, tree hierarchy, subheadings and explosion capabilities to search citations from over 5,400 current biomedical journals. *MEDLINE Complete* is also the world's most comprehensive source of full text for medical journals, providing full text for over 1,800 journals indexed in MEDLINE. Of those, more than 1,700 have cover-to-cover indexing in *MEDLINE*, and of those, over 900 are not found with full text in any version of *Academic Search*, *Health Source* or *Biomedical Reference Collection*. This wide-ranging file contains full text for many of the most used journals in the MEDLINE index - with no embargo. With coverage dating back to 1857 and full-text back to 1865, *MEDLINE Complete* is the definitive research tool for medical literature.

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# Organization Website Examples

- American Academy of Pediatrics
- American Association of Critical Care Nurses
- American College of Emergency Physicians
- American Society of Anesthesiologists
- Centers for Disease Control and Prevention
- Infusion Nurses Society
- National Association of Children's Hospitals
- Society for Pediatric Nurses

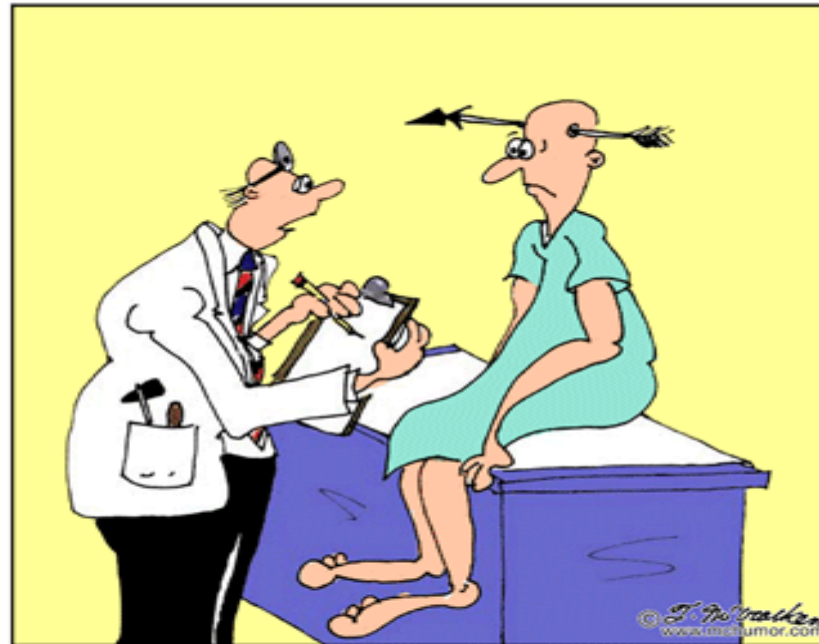
# Hierarchy of Evidence



Adapted from Melnyk & Fineout-Overholt, 2005



# Putting It Into Practice



"Off hand, I'd say you're suffering from an arrow through your head, but just to play it safe, I'm ordering a bunch of tests."

# Identify Problem Areas

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## METHODS TO IDENTIFY PROBLEM AREAS

- Hunches, intuition, bright ideas
- Complaints
- Variations in practice
- QI data, some patients or areas fare better than others
- Benchmarks, standards
- Recently published research
- Best practices

## COMMON PHRASES THAT IDENTIFY PROBLEM AREAS

- There ought to be a better way.
- If only so-and-so were here...
- We did it differently where I used to work.
- I HATE doing \_\_\_\_\_.
- There are too many steps in this process.

# What is the question?

## *PICO format*

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P – population

- “In **ED patients** with bronchiolitis...”

I – intervention

- “...does nebulized hypertonic saline...”

C – comparison

- “when compared to placebo...”

O – outcome of interest

- “...**prevent admission, shorten ED stay, etc.**”



# Components of PICO Questions: What is 'searchable'?

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PICO	Do you need to search for this component?
Population	Almost always
Intervention	Always
Comparison	Sometimes
Outcomes	Usually
Time	Sometimes



# Keywords from PICO Question

In pediatric populations, which intervention (postcards, letters, telephone calls) most increases compliance rates for pediatric well care visits?

*P*opulation – Pediatrics

*I*ntervention – Postcards

*C*omparison – Letters AND Telephone Calls

*O*utcome – Well care visit compliance



# The Search

(bronchiolitis and hypertonic saline) AND systematic[sb] - PubMed result - Mozilla Firefox

http://www.ncbi.nlm.nih.gov/pubmed?termClinical=bronchiolitis+and+hypertonic+saline&term=(bronchiolitis+and+hypertonic+saline)+AND+systematic[sb]&p%24a=&p%24l=PubMedStaticPages&p%24el=&p%24st

Search: PubMed  
(bronchiolitis and hypertonic saline) AND systematic[sb] Search Clear

Display Settings:  Summary, Sorted by Recently Added

**Results: 4**

- [Towards evidence based emergency medicine: Best BETs from the Manchester Royal Infirmary. Bet 1. Nebulised hypertonic saline significantly decreases length of hospital stay and reduces symptoms in children with bronchiolitis.](#)  
Horner D.  
Emerg Med J. 2009 Jul;26(7):518-9. Review.  
PMID: 19546275 [PubMed - indexed for MEDLINE]  
[Related articles](#)
- [Bronchiolitis: from empiricism to scientific evidence.](#)  
Carraro S, Zanconato S, Baraldi E.  
Minerva Pediatr. 2009 Apr;61(2):217-25. Review.  
PMID: 19322125 [PubMed - indexed for MEDLINE]  
[Related articles](#)
- [Nebulized hypertonic saline solution for acute bronchiolitis in infants.](#)  
Zhang L, Mendoza-Sassi RA, Wainwright C, Klassen TP.  
Cochrane Database Syst Rev. 2008 Oct 8;(4):CD006458. Review.  
PMID: 18843717 [PubMed - indexed for MEDLINE]  
[Related articles](#)
- [Current treatment for acute viral bronchiolitis in infants.](#)  
Martínón-Torres F.  
Expert Opin Pharmacother. 2003 Aug;4(8):1355-71. Review.  
PMID: 12877643 [PubMed - indexed for MEDLINE]  
[Related articles](#)

Display Settings:  Summary, Sorted by Recently Added

**Filter your results:**  
All (4)  
[Review \(4\)](#)  
Free Full Text (0)  
[Manage Filters](#)

**Titles with your search terms**  
► Evidence-based emergency medicine/systemat [Ann Emerg Med. 2010]  
» See more...

**Find related data**  
Database: Select  
[Find items](#)

**Search details**  
Turn Off  
{ ("bronchiolitis"[MeSH Terms] OR "bronchiolitis"[All Fields]) AND ("saline solution, hypertonic"[MeSH Terms] OR "saline"[All Fields]) AND "solution"[All Fields] }  
[Search](#) » See more...

**Recent activity**  
Turn Off Clear  
Q (bronchiolitis and hypert... (4) PubMed  
» See more...

# Search the Evidence

---

Using Boolean to put your key words together

- AND
- OR
- NOT

# Stand up if...

---

You were born in Texas

AND

You graduated from UT

AND

You have worked at TCH for <5 years



# Stand up if...

---

You graduated from UT

OR

From any university in Texas

OR

From a university in the Southern U.S.



# Stand up if...

---

You have a smartphone

NOT

(an iPhone OR Blackberry)



# I Found It!

---



Now what do I do with it?

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# Analyze the Evidence

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Gold Mine



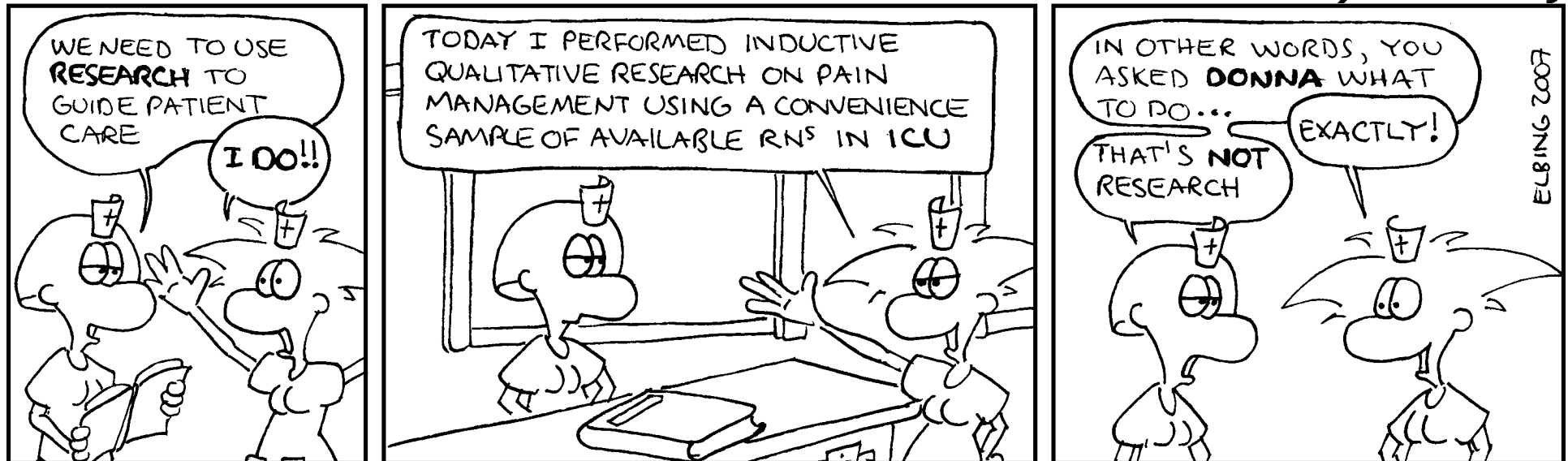
Bonfire



# Analyze the Evidence

## Nurstoons

by Carl Elbing



[www.nurstoons.com](http://www.nurstoons.com)

# Rating the quality of evidence:

Grading of Recommendations, Assessment, Development and Evaluation

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Developed by a widely representative group of international guideline developers

Clear separation between quality of evidence and strength of recommendations

- Quality (evidence)
  - How sure one is that the estimate of treatment effect is sufficient to support the recommendation
- Strength (recommendation)
  - How sure one is that adherence to recommendation will result in improved outcome

Explicit acknowledgment of values and preferences

Guyatt et al, BMJ 336;924

# When the Evidence is Lacking

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Standardize (goal of a guideline)

Revisit evidence frequently and rigorously



# Apply Evidence to Practice

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Make a Practice Recommendation considering extent to which intervention is

- Feasible, practical, affordable, available
- Appropriate ethically and justifiably
- Meaningful to the context in which care is given and the personal experience, opinions, values, beliefs and interpretations of patients
- Effective in achieving desired outcomes



# How Do EBGs Improve Quality?

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- Document Continuous Improvement
  - (process steps)
  
- Eliminate Inappropriate Variation
  - (outcomes)

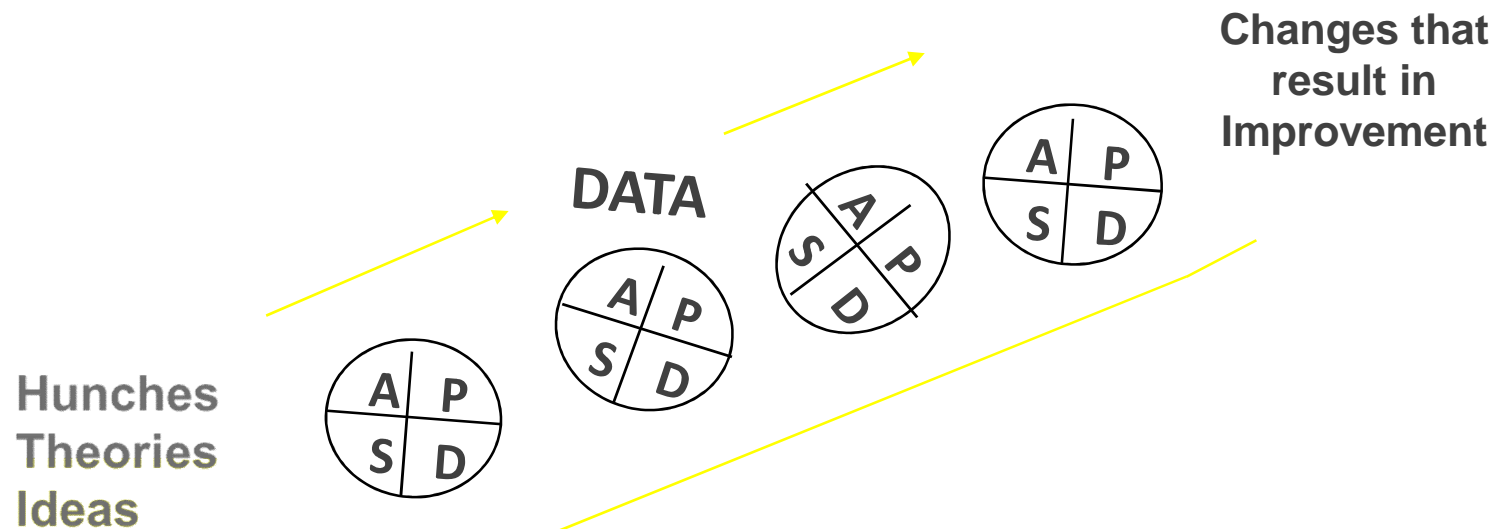


# Guidelines as the Basis for QI Projects

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## PDSA cycle

- Planning stage
- Use guideline recommendations as interventions for the your QI project



# Integration in Policy

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Recommendations should be integrated into policy

New policies should be created if needed.

**Medication Policy & Procedure**

Approved:	Approved by:	Policy No:
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**Policy**

This policy outlines the guidelines for of prescription medications for clients. The shelter has a responsibility to keep all prescription drugs locked cabinet. These medications should only be made available are prescribed. Clients are responsible to administer their own medications. The following is intended consistent approach to medication storage and distribution.

**Procedure**

Medications are the property of the client and therefore medication is the responsibility of the client.

- Medications will be in either a vial or dosette format, properly labelled with pharmacy, and physician.
- Each client's medication will be stored in an individual labelled bin within a drawer in the front office.
- There will be access to a refrigerator for storage of medications refrigeration.
- If staff or client notices errors to the dosette, return dosette to immediately.





**Outcomes**

**Quality**

WE HAVE TWO OPTIONS.  
EITHER AN EVIDENCE -  
BASED TREATMENT OR  
AN EXCITING, RISKY  
ALTERNATIVE.



Christine Almer

# Questions?

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# EBP Activity

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Four groups

1. Define the problem in a PICO question
2. Describe how you would search for the evidence
3. Determine your recommendation for care and implementation strategy
4. Detail how you would determine if you were successful

# For more information...

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[eboc@texaschildrens.org](mailto:eboc@texaschildrens.org)



# Credits

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Brouwers M, Kho ME, Browman GP, Burgers JS, Cluzeau F, for the AGREE Next Steps Consortium. AGREE II: Advancing guideline development, reporting and evaluation in healthcare. *Can Med Assoc J.* 2010. Available online July 5, 2010. doi:10.1503/cmaj.090449

Guidelines for Clinical Practice: From Development to Use. Institute of Medicine (US) Committee on Clinical Practice Guidelines; [Field MJ](#), [Lohr KN](#), editors. Washington (DC): National Academies Press (US); 1992

Guyatt, G., Oxman, A., Vist, G., Kunz, R., Falck-Ytter, Y., et al. (2008). GRADE: An emerging consensus on rating quality of evidence and strength of recommendations. *British Medical Journal*, 26, 924-926.

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Moyer V et al. Evidence Based Pediatrics and Child Health 2000 BMJ Books]

Rotter T, et al. Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. *Cochrane Database of Systematic Reviews* 2010, Issue 3. Art.No.:CD006632