Locating Evidence

A sample database search for the clinical question:

*Does handwashing among healthcare workers reduce hospital acquired infection?*

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STEP 1: Write out your clinical question:

Does handwashing among healthcare workers reduce hospital acquired infection?

For questions of therapy/intervention, use the PICO (T) formula to identify the following elements in your question:

- **Patient** (or Problem or Population):
- **Intervention**:
- **Comparison**:
- **Outcome**:
- *(T)ime factor/(T)ype of study* (optional)
Does handwashing among healthcare workers reduce hospital acquired infection?

- **Patient (or Problem or Population):**
  - Hospital acquired infection

- **Intervention:**
  - Handwashing

- **Comparison:**
  - Standard hand washing; other solution; no hand washing

- **Outcome:**
  - Reduced infection rate

- (T) (not relevant for this question)
Does hand washing among healthcare workers reduce hospital acquired infection?

- **Patient (or Problem or Population):** Hospital acquired infection
- **Intervention:** handwashing
- **Comparison:** Standard handwashing; other solution; no handwashing
- **Outcome:** Reduced infection rate

**TIP:** Consider **Patient/Problem** and **Intervention** first when planning your search strategy and selecting database search terms.

[look for the **Comparison** and **Outcome** when you browse abstracts and review full text of articles]
STEP 2: Select a specialized database

From the libraries home page, [http://library.nyu.edu/](http://library.nyu.edu/) select **Articles via Databases**, then choose a database from the A to Z list.
• **Medline/PubMed**: the premier biomedical database; 1950 to present with some older refs; more than 20 million records

• **Web of Science** (*Social Science Citation Index, Science Citation Index, Arts and Humanities Citation Index*)

• **CINAHLPlus** (Cumulative Index to Nursing and Allied Health Literature); indexes nursing and allied health literature for more than 3200 journals back to 1937.

• **PsycINFO**: International coverage of the professional and academic literature in psychology, medicine, psychiatry, nursing, sociology, education, pharmacology, physiology, linguistics, and other areas.

• **Proquest** multidisciplinary resource for research on contemporary topics or for the beginning stages of a research project. Includes Joanna Briggs evidence summaries.

• **COCHRANE Database of Systematic Reviews**: Provides access to the Cochrane Collaboration’s systematic reviews in addition to other sources of reliable information, from other systematic review abstracts, technology assessments, economic evaluations and individual clinical trials. Includes Cochrane Database of Systematic Reviews (CDSR), Database of Abstracts of Reviews of Effects (DARE), Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Methodology Register (CMR), NHS Economic Evaluation Database (NHSEED), and Health Technology Assessment Database (HTA)
From the A-Z list, select: PubMed

**PubMed (Medline)**

Widely recognized as the premier source for bibliographic and abstract coverage of biomedical literature. Encompasses information from Index Medicus, Index to Dental Literature, and International Nursing Index, as well as other sources in the areas of allied health, physical therapy, health education, biological and physical sciences, humanities and information science as they relate to medicine and health care, communication disorders, population biology, and reproductive biology. More than 16 million records from more than 5200 journals are indexed. PubMed is the freely available version of MEDLINE.
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A simple search on one term: handwashing

Notice the Search details box in the lower right corner, the Search details translate to the MeSH term: hand disinfection

MeSH (Medical Subject Headings) is NLM's controlled vocabulary thesaurus used for indexing MEDLINE articles.
Or use the MeSH browser to locate terms and scope notes:
A search on “hospital acquired infection” in the MeSH browser directs us to the term: Cross Infection
Search steps schematically...

- Hospital acquired infection
- Handwashing

Handwashing → MeSH term: hand disinfection

AND

Hospital-acquired infection → MeSH term: cross infection
Search steps schematically…

Cross infection

AND

Hand disinfection
Search steps schematically...

The **AND** connector narrows a search.

**BOTH** search terms must be in the retrieved records.
Search steps schematically...

Use the **OR** connector to link synonyms... expand a search, (OR retrieves MORE...)

- hand disinfection
- hand hygiene
- hand scrubbing
- handwashing
Search steps schematically...

You may wish to expand a search, using synonyms...
Search steps schematically…

AND

You may wish to expand one or both search sets using synonyms...
Effect of a multifaceted intervention on adherence to hand hygiene among healthcare workers: a cluster-randomized trial.
Mertz D, Dafoe N, Walter SD, Brazil K, Loeb M.
Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada.

Abstract
OBJECTIVES: Adherence to hand hygiene among healthcare workers (HCWs) is widely believed to be a key factor in reducing the spread of health-care-associated infection. The objective of this study was to evaluate the impact of a multifaceted intervention to increase rates of hand hygiene among HCWs and to assess the effect on the incidence of hospital-acquired methicillin-resistant Staphylococcus aureus colonization.

DESIGN: Cluster-randomized controlled trial.

SETTING: Thirty hospital units in 3 tertiary care hospitals in Hamilton, Ontario, Canada.

INTERVENTION: After a 3-month baseline period of data collection, 15 units were randomly assigned to the intervention arm (with perforated feedback, small-group teaching seminars, and posters) and 15 units to usual practice. Hand hygiene was observed during randomly selected minute periods on each unit, and the incidence of MRSA colonization was measured using weekly surveillance specimens from June 20 May 2008.

RESULTS: We found that 3,812 (48.2%) of 7,901 opportunities for hand hygiene in the intervention group resulted in adherence, compared with 3,205 (42.6%) of 7,526 opportunities in the control group ($P < .001$; independent $t$ test). There was no reduction in the incidence of hospital MRSA colonization in the intervention group.

CONCLUSION: Among HCWs in Ontario tertiary care hospitals, the rate of adherence to hand hygiene had a statistically significant increase with a multifaceted intervention, but the incidence of MRSA colonization was not reduced.

PMID: 20923288 [PubMed - indexed for MEDLINE]

A sample citation meets the search criteria:

Hand disinfection

AND

Cross infection are MeSH terms
Does handwashing among healthcare workers reduce hospital acquired infections?

In all databases, look for the categorical Limits feature:

- for Age groups, e.g., aged, child, young adult (rather than keywords such as “pediatric” or “elderly”)

- for Article type: [http://nyu.libguides.com/filtering](http://nyu.libguides.com/filtering)

In the PubMed example let’s limit to Article type: “randomized controlled trial” to retrieve a higher level of evidence.
In this PubMed example a search on:
handwashing AND cross infection
retrieves 1694 results.

Use left menu to filter by Article type:
For example: using the filter for Article type: “randomized controlled trial” reduces search results and retrieves a higher level of evidence.
Search steps schematically...

Publication type: randomized controlled trial

(hospital acquired infection OR cross infection OR nosocomial infection)

(Hand disinfection OR hand hygiene OR hand scrubbing OR handwashing)

AND
Effect of a multifaceted intervention on adherence to hand hygiene among healthcare workers: a cluster-randomized trial.

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CONCLUSION: Among HCWs in Ontario tertiary care hospitals, the rate of adherence to hand hygiene with a multifaceted intervention, but the incidence of MRSA colonization was not reduced.

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Publication Types, MeSH Terms

Publication Types
Randomized Controlled Trial
Research Support, Non-U.S. Gov't

MeSH Terms
Cross Infection prevention & control
Guideline Adherence* Hand Disinfection standards*
Health Personnel*

A sample citation meets the search criteria:
Hand disinfection
AND
cross infection are MeSH terms
AND
Randomized controlled trial is the publication type
Effect of a multifaceted intervention on adherence to hand hygiene among healthcare workers: a cluster-randomized trial.

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RESULTS: We found that 3,812 (48.2%) of 7,901 opportunities for hand hygiene in the intervention group and 3,205 (42.6%) of 7,526 opportunities in the control group (P < .001; independent t test). There was no difference in MRSA colonization in the intervention group.

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Publication Types, MeSH Terms

Publication Types
Randomized Controlled Trial
Research Support, Non-U.S. Gov't

MeSH Terms
Cross Infection/prevention & control
Guideline Adherence*
Hand Disinfection/standards*
Health Personnel*
Hospital
Humans
Hygiene*
Infectious Disease Transmission, Professional-to-Patient/prevention & control
Article Title: Effect of a multifaceted intervention on adherence to hand hygiene among healthcare workers: a cluster-randomized trial.

Author: Mertz, Dominik

Journal Title: Infection control and hospital epidemiology

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1. **FRAME QUESTION**, including the **Problem** (or **Patient** or **Population**) **AND** **Intervention**

2. **FINDING**: **Select a SOURCE**, database (CINAHLPlus, PubMed/MEDLINE…)

3. **SEARCH**: Translate the terms of the question to the controlled vocabulary of the database, when possible; use keyword searching when necessary.

   Use **AND** to combine terms and **narrow** a search:
   
   cross infection **AND** hand disinfection

   Use **OR** to **expand** a search using synonyms

   (hand disinfection **OR** handwashing **OR** hand hygiene)

   (cross infection **OR** nosocomial infection* **OR** hospital acquired infection)

   **Apply Limits** for publication type, year, age groups, *For example*:
   
   - Limit to age group “Aged, 65 and over”
   - Limit to publication years 2005-2013
   - Limit to publication type “randomized controlled trial”

4. **ASSESSMENT**: critical appraisal, applicability, actionability, repeat from 1 if needed
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Evidence is hierarchical. Explore the resources linked at: [nyu.libguides.com/pyramid](nyu.libguides.com/pyramid)