Appendix C. Literature Searches and Topic-Specific Methods


SECTION A. Literature Search

SEARCH METHODOLOGY

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY #1:
Heparin
AND
intravenous OR infusion
AND
“adverse events” OR “iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” OR “medication errors/prevention and control” OR “Medical Errors/adverse effects” OR “Safety Management” OR “Cross Infection/prevention and control” OR “infection control” OR error*[tiab] OR safe*[tiab] OR overdos* OR adverse*[tiab] OR ((infection OR infections OR iatrogenic) AND (prevent OR prevention OR preventive OR preventing)) OR protocol* OR nomogram* OR “inpatient coagulation service” OR “inpatient coagulation services” OR “human factors” OR “decision support”

NUMBER OF RESULTS: 908

SEARCH STRATEGY #2:
AND
intravenous OR infusion*
NOT
Results of Search #1

NUMBER OF RESULTS: 432

DATABASE SEARCHED & TIME PERIOD COVERED:
LANGUAGE:
English

SEARCH STRATEGY:
‘intravenous heparin’ OR heparin NEAR/5 infus*
AND
error* OR ‘cross infection’ OR ‘infection control’ OR safe* OR overdos* OR adverse OR (infection OR infections OR iatrogenic AND (prevent OR prevention OR preventive OR preventing)) OR protocol* OR nomogram* OR ‘inpatient coagulation service’ OR ‘inpatient coagulation services’ OR ‘human factors’ OR ‘decision support’
AND
‘article’/it OR ‘article in press’/it OR ‘conference abstract’/it OR ‘conference paper’/it OR ‘review’/it

NUMBER OF RESULTS: 791

====================================================================

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY:
“heparin AND (intravenous OR infusion) in Title, Abstract or Keywords
AND
adverse OR Error* OR Safe* OR overdos* OR ((infection OR infections OR iatrogenic) AND (prevent OR prevention OR preventive OR preventing)) OR protocol* OR nomogram* OR “inpatient coagulation service” OR “inpatient coagulation services” OR “human factors” OR “decision support” in Title, Abstract or Keywords

NUMBER OF RESULTS: 803 (Cochrane Reviews [11], Other Reviews [4], Clinical Trials [781], Methods Studies [1], Economic Evaluations [6]

====================================================================

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY:
heparin AND (intravenous OR infusion)
AND
adverse OR Error* OR Safe* OR overdos* OR ((infection OR infections OR iatrogenic) AND (prevent OR prevention OR preventive OR preventing)) OR protocol* OR nomogram* OR “inpatient coagulation service” OR “inpatient coagulation services” OR “human factors” OR “decision support”

NUMBER OF RESULTS: 269

SECTION B. Methods

PICOTS

<table>
<thead>
<tr>
<th>Elements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Patients in inpatient healthcare settings (adult and pediatric)</td>
</tr>
<tr>
<td>Intervention</td>
<td>Any intervention with a goal to improve safety of intravenous heparin administration</td>
</tr>
<tr>
<td>Comparator</td>
<td>Usual practice</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Effectiveness of the intervention</td>
</tr>
<tr>
<td>Timing</td>
<td>Before and after the intervention</td>
</tr>
<tr>
<td>Settings</td>
<td>Any inpatient setting</td>
</tr>
</tbody>
</table>

Inclusion/exclusion criteria:
No restrictions were made by language, country of study, or indication for use of heparin.

Chapter 4. Clinical Pharmacist’s Role in Preventing Adverse Drug Events: Brief Update Review

SECTION A. Literature Search

SEARCH METHODOLOGY

DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed – 2000-10/19/2011

LANGUAGE:
English

SEARCH STRATEGY:
clinical pharmacist*
AND
adverse OR harm* OR side effect* OR safe* OR reaction*

NUMBER OF RESULTS: 320

DATABASE SEARCHED & TIME PERIOD COVERED:
Cochrane Databases – 2000-10/24/2011
SEARCH STRATEGY:
clinical pharmacist*
AND
adverse OR harm* OR side effect* OR safe* OR reaction*

NUMBER OF RESULTS: 84

SECTION B. Methods

Titles and abstracts were reviewed by a physician health services researcher with experience in both systematic reviews and clinical pharmacist services. Included studies were those most relevant to clinical pharmacist interventions on medication errors and adverse drug events in various health care settings. The focus was on studies that addressed the possible association between clinical pharmacist activities and improved prescribing practices and/or assessed whether such activities might lead to reduced medication errors and adverse drug events. Included studies were narratively summarized by the author.

Chapter 5. The Joint Commission’s “Do Not Use” List: Brief Review (NEW)

SECTION A. Literature Search

SEARCH METHODOLOGY

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY:
abbreviation*
AND
safe* OR unsafe* OR adverse OR harm*

NUMBER OF RESULTS: 142

NUMBER OF RESULTS AFTER FILTERING FOR HUMAN ONLY AND REMOVING OTHER NON-RELEVANT REFERENCES: 71

SECTION B. Methods

Titles and abstracts were reviewed by a physician health services researcher with experience in both systematic reviews and in prescribing errors. The search was expanded by using Google to search for possibly pertinent articles and links; additional articles were identified by reference mining. The focus was on United States-based studies, since the “Do Not Use” list is a US regulatory issue. Clinical trials, observational studies, reviews, and anecdotal reports on
implementation were the primary resources and given priority in the order above. The synthesis was narrative.

Chapter 6. Smart Pumps and Other Protocols for Infusion Pumps: Brief Review (NEW)

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date limits</th>
<th>Platform/provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cochrane Library</td>
<td>2000- November 9, 2011</td>
<td>Wiley</td>
</tr>
<tr>
<td>ECRI Institute website</td>
<td>2000- November 8, 2011</td>
<td>ECRI Institute</td>
</tr>
<tr>
<td>Health Devices</td>
<td>2000- November 9, 2011</td>
<td>ECRI Institute</td>
</tr>
</tbody>
</table>

Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Nonjournal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.)

The search strategies employed combinations of fretext keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in PubMed syntax. A parallel strategy was used to search the databases comprising the Cochrane Library.

Medical Subject Headings (MeSH), and Keywords
**Conventions:**
PubMed

[**mh**] = MeSH heading
[**majr**] = MeSH heading designated as major topic
[**pt**] = publication type
[**sb**] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)
[**sh**] = MeSH subheading (qualifiers used in conjunction with MeSH headings)
[**tiab**] = keyword in title or abstract
[**ti**] = keyword in title

**Topic-Specific Search Terms**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infusion pumps</td>
<td>Infusion pumps[majr]</td>
<td>“infusion pump” “smart pump” “IV pump” “drug delivery system” “drug infusion system” (infusion OR medication OR intravenous) OR “IV” OR drug OR smart) AND (pump OR pumps)</td>
</tr>
<tr>
<td>Safety</td>
<td>medication errors[mh] safety[mh] safety management[mh] risk management[mh])</td>
<td>error* mistake* safe safety risk* malfunction* overdos* wrong</td>
</tr>
</tbody>
</table>


SECTION B. Methods

Titles and abstracts were reviewed by a health services research methodologist with experience in both systematic reviews and medical devices. Included studies were those most relevant to evaluation of smart pumps and related protocols for reduction of medication errors and adverse drug events in various health care settings. The focus was on studies that compared medication
error rates and adverse drug events following implementation of these technologies in hospitals compared to a control period when the technologies were not active or in place. Potential barriers to implementation (e.g. user compliance) were also assessed. Included studies were narratively summarized by the author.


SECTION A. Literature Search

A structured search of the PubMed database and review of the bibliographies of relevant articles identified 158 articles published from 2001 to 2011 that assessed barrier precautions for the prevention of health care-associated pathogen transmission. Search terms included “active surveillance,” “active detection,” and ”contact precautions.” Few of these studies utilized the cluster randomized trial design and most were quasi-experimental studies. Low quality studies that did not include a control group were excluded from this review.

SECTION B. Methods

Titles and abstracts were reviewed by an epidemiologist with special expertise in health care-associated infections. An evidence table was constructed that included study design, population, setting, and the principal outcomes. The synthesis was narrative.

Chapter 8. Interventions To Improve Hand Hygiene Compliance: Brief Update Review

SECTION A. Literature Search

For this topic we did not do a formal literature search, as the principal reviews and trials were already known to the authors as part of their work on recent a recent report, where previous comprehensive searches had been performed to identify the most pertinent and up to date literature.

SECTION B. Methods

These reviews and studies were reviewed by a health services researcher and epidemiologist with expertise in hand hygiene quality improvement. The synthesis was narrative.


SECTION A. Literature Search

The 14 studies for the previously published systematic review and meta-analysis (Meddings et al, Clin Infect Dis, 2010) were obtained from a comprehensive search of the world’s literature for
interventions from 1950 to 2008 to decrease catheter-associated urinary tract infections by means of the MEDLINE and Cochrane databases (using Ovid), the PubMed Journals and Medical Subject Heading (MeSH) datasets, the ISI knowledge databases (Web of Science and Biosis Previews) and the CINAHL and EMBASE databases. The MEDLINE and Cochrane database searches were conducted by exploding and combining the following Medical Subject Heading (MeSH) terms: urinary tract infection, urinary catheterization, indwelling catheter, inpatient, reminder system, device removal, intervention studies. The MeSH reminder system was also searched separately. We included the following terms in a keyword search (with wildcard indicated with *): urinary tract infection; ((urin* or uret*) and cath*)) or catheter*; nosocomial or inpatient or hospital*; reminder, removal, and intervention. We used similar strategies with the other databases. A research librarian provided guidance to improve search completeness. This search yielded 6679 citations, including many duplicate citations. As our initial search was broad and yielded many guidelines and reviews published regarding prevention of catheter-associated urinary tract infection, we also evaluated these articles’ reference lists for additional studies; 1 additional reference was located in this manner. More detailed review was required for 118 articles to determine whether they met inclusion criteria. After applying inclusion and exclusion criteria to focus on human studies of adults admitted to acute care hospitals reporting at least one outcome involving catheter use or CAUTI events as a result of the intervention, and with a comparison group (either pre- versus post-intervention or a separate control group); this yielded 16 studies for further review. Two authors of the systematic review (J.M. and M.M.) independently reviewed and abstracted data from the 16 articles that appeared to meet inclusion criteria, including setting, study population, inclusion/exclusion criteria, definitions used, health outcomes, and quality issues. A third investigator (S.S.) resolved any differences in abstraction and reviewed the joint decisions made to exclude 2 of the 16 articles that no longer met inclusion criteria after further review. As a result, this systematic search in 2008 yielded the 14 articles reviewed in the previously published meta-analysis.

To update the prior literature search for Chapter 9, a search was performed of MEDLINE and Cochrane databases (using Ovid) and PubMed for intervention studies (published from August 2008 to February 2012) to reduce use of unnecessary urinary catheters in the acute care of adults, using the same detailed search strategy as employed in the 2008 search. Yet, unlike the 2008 search which was focused on removal of recently placed indwelling catheters (which excluded emergency environments), the patient population for the 2012 search was expanded to include emergency department patients because use of interventions to restrict initial placement was an additional topic of interest for Chapter 9. The 2012 search results were also supplemented with prior lists of articles excluded from the prior 2008 search that were focused on emergency department interventions. A secondary evaluation of the CINAHL database was also performed for interventions developed and implemented by nurses related to urinary catheter use. In light of the somewhat different terminology on the topic found in the nursing literature, we searched CINAHL using variations of the following terms: reminder, removal, urinary catheter, nurse empowered, nurse directed, nurse protocol. No date limits were employed in the CINAHL search, which retrieved 5 records. Overall, the MEDLINE and CINAHL searches yielded 479 citations, including 353 from MEDLINE through Ovid, 9 additional from PubMed, 117 from the Cochrane EBM databases, and 7 duplicates. Studies were included if at least one outcome involving catheter use or CAUTI events (Table 1 in Chapter 9) was reported as a result of the intervention with a comparison group. A review of reference lists for additional studies was also
performed, yielding one additional study. After applying inclusion and exclusion criteria to focus on human studies of adult patients with at least one outcome involving catheter use or CAUTI events reported as a result of the intervention, and with a comparison group, this updated search yielded 12 intervention studies published since the prior meta-analysis.

SECTION B. Methods

As summarized in the previously published meta-analysis for the 14 selected studies from 2008 or earlier, a systematic review process was performed. Correspondence with 24 authors was initiated to clarify details regarding the interventions and outcomes with responses received from 11 authors, and 4 authors provided unpublished numeric data necessary for statistical pooling. Two physician reviewers performed a detailed abstraction of the 14 studies. Details of the statistical analyses for obtaining the pooled effects are detailed in the prior published analyses, and were not replicated or expanded for writing Chapter 9.

A similar review and abstraction process was performed by one physician (J.M.) for the 12 recent articles in the updated search. No contact was initiated with authors, and theses articles were analyzed and compared in a narrative process rather than a meta-analysis.

Details of the 14 prior and 12 recent studies are summarized in the Appendix Table for Chapter 9, regarding study design, patient population size and care environment, and details of the interventions used to either avoid inappropriate placement or to prompt removal of unnecessary catheters. Other important interventions that could possibly influence the outcomes of the studies were also summarized in this table. Important outcomes of the 14 prior studies as previously published in the meta-analyses were summarized in Figure 2; similar outcomes for the 12 recent studies were summarized in Figure 3.


SECTION A. Literature Search

DATABASES SEARCHED:
Medline Via Ovid
Cochrane Central Register of Controlled Trials Databases
Cochrane Database of Systematic Reviews
Cochrane Database of Abstracts of Reviews of Effects
Cochrane Methodology Register
Health Technology Assessment
NHS Economic Evaluation Database
ACP Journal Club

TIME PERIOD COVERED:
January 1, 2000 – January 1, 2012

LANGUAGE:
English language articles only
SEARCH STRATEGY:
Medical Subject Headings (MeSH) “Bacteremia” and “Catheterization, Central Venous,” and the MeSH subheadings “Prevention & control” and “Adverse effects,” as well as the keywords “central line-associated bloodstream infection,” “central line,” and “central venous catheter.” Search terms included variations of the keywords “bacteremia,” “bloodstream infection,” “central line,” “central venous catheter,” “prophylaxis,” and “prevention,” using wildcards and truncation to capture alternate spellings and endings.

NUMBER OF RESULTS:
1,087 unique manuscripts were retrieved by the search of which 337 articles were relevant for this report.

SECTION B. Methods
All relevant titles and abstracts were reviewed by a physician health services researcher (VC) with experience in both systematic reviews and in the topic of central line associated bloodstream infections (CLABSI). Studies included were those most relevant to prevention of CLABSI; in addition, studies that reported on local and national policies, economic impact and interventions associated with CLABSI reduction were included in this report.

Chapter 11. Ventilator-Associated Pneumonia: Brief Update Review

SECTION A. Literature Search
For this topic we did not do a formal literature search, as the principal reviews and trials were already known to the authors as part of their quality improvement work where previous comprehensive searches had been performed to identify the most pertinent and up to date literature.

SECTION B. Methods
These reviews and studies were reviewed by an intensive care unit physician health services researcher with clinical and quality improvement experience with ventilator-acquired pneumonia. The synthesis was narrative.
**Chapter 12. Interventions To Allow the Reuse of Single-Use Devices: Brief Review (NEW)**

**SECTION A. Literature Search**

**Electronic Database Searches**

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date limits</th>
<th>Platform/provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI Institute members website</td>
<td>2001-November 3, 2011</td>
<td>ECRI Institute</td>
</tr>
<tr>
<td>Institute for Healthcare Improvement</td>
<td>2001-November 3, 2011</td>
<td>Institute for Healthcare Improvement</td>
</tr>
<tr>
<td>PSNet</td>
<td>2001-November 3, 2011</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>PubMed</td>
<td>2001-November 2, 2011</td>
<td>National Library of Medicine</td>
</tr>
<tr>
<td>FDA</td>
<td>2001-November 8, 2011</td>
<td>The Food and Drug Administration</td>
</tr>
<tr>
<td>JCAHO</td>
<td>2001-November 3, 2011</td>
<td>Joint Commission (JCAHO)</td>
</tr>
<tr>
<td>NCQA</td>
<td>2001-November 3, 2011</td>
<td>National Committee for Quality Assurance (NCQA)</td>
</tr>
</tbody>
</table>

**Hand Searches of Journal and Nonjournal Literature**

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Non-journal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature as well as related citation searches using the Scopus database. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.) A number of organization websites were searched for relevant information, including: ECRI Institute members website, the Institute for Healthcare Improvement (ISI), and the Agency for Healthcare Research and Quality’s Patient Safety Network (PSNet).

The search strategies employed combinations of free text keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in PubMed syntax.

**Medical Subject Headings (MeSH) and Keywords**

**Conventions:**

- PubMed
- \[mh\] = MeSH heading
- \[majr\] = MeSH heading designated as major topic
[pt] = publication type
[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)
[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)
[tiab] = keyword in title or abstract

## Topic Specific Search Terms

<table>
<thead>
<tr>
<th>Concept</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>surgical instruments equipment and supplies disposable equipment</td>
<td>surgical medical cutting instrument* tool* equipment* device* trocar* scalpel* shaver* raz* drill* catheter* syringe* needle* mask* gown glove* endoscop* instrumentation</td>
</tr>
<tr>
<td>Reprocessing</td>
<td>equipment reuse</td>
<td>reuse reusing reus* reprocess reprocessing reprocessed reprocess* recycled recycling recycle* repurposed repurposed repurpose*</td>
</tr>
<tr>
<td>Single-Use</td>
<td></td>
<td>“single use” “single-use” disposable “one-time” “one time”</td>
</tr>
</tbody>
</table>
PubMed

English language, human, date limit: January 1, 2001-November 2, 2011

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search statement</th>
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<tbody>
<tr>
<td>3</td>
<td>Single Use</td>
<td>“single use*[tiab] OR &quot;single-use*[tiab] OR disposable[tiab] OR &quot;one-time*[tiab] OR &quot;one time*[tiab]</td>
</tr>
<tr>
<td>4</td>
<td>Combine</td>
<td>S1 AND S2 AND S3</td>
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</table>

<table>
<thead>
<tr>
<th>Total Downloaded</th>
<th>Total Retrieved</th>
<th>Total Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>11</td>
<td>15</td>
</tr>
</tbody>
</table>

SECTION B. Methods

Titles and abstracts were reviewed by a health services research methodologist with experience in both systematic reviews and medical devices. Included studies consisted of systematic reviews and clinical studies that compared patient outcomes following use of new versus reprocessed single-use devices as well as laboratory studies that tested an array of reprocessed single-use devices for microbiological contamination. Data regarding potential cost-savings of reprocessed single-use devices was also presented. Included studies were narratively summarized by the author.

Chapter 13. Preoperative Checklists and Anesthesia Checklists

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date limits</th>
<th>Platform/provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMBASE (Excerpta Medica)</td>
<td>1996 – August 23, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>1996 – August 23, 2011</td>
<td>OVID SP</td>
</tr>
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<td>PreMEDLINE</td>
<td>1990 – August 23, 2011</td>
<td>OVID SP</td>
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</tbody>
</table>
Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Non-journal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature as well as related citation searches using the Scopus database. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.) The search strategies employed combinations of free text keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in OVID syntax; the search was simultaneously conducted across EMBASE and MEDLINE. A parallel strategy was used to search the databases comprising the Cochrane Library.

Medical Subject Headings (MeSH), Emtree and Keywords

Conventions:
OVID
$ = truncation character (wildcard)
exp = “explodes” controlled vocabulary term (e.g., expands search to all more specific related terms in the vocabulary’s hierarchy)
.de. or / = limit controlled vocabulary heading
.fs. = floating subheading
.hw. = limit to heading word
.md. = type of methodology (PsycINFO)
.mp. = combined search fields (default if no fields are specified)
.pt. = publication type
.ti. = limit to title
.tw. = limit to title and abstract fields
PubMed
[mh] = MeSH heading
[majr] = MeSH heading designated as major topic
[pt] = publication type
[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)
[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)
### Topic-Specific Search Terms

<table>
<thead>
<tr>
<th>Concept</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesia</td>
<td>Anesthesia/</td>
<td>Analges$</td>
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<td></td>
<td>Anesthesiology/</td>
<td>Anaesthesia$</td>
</tr>
<tr>
<td></td>
<td>Exp perioperative care/in, ae, mt, st</td>
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<td>Sedat$</td>
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<td>Checklist/</td>
<td>Checklist$</td>
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<td>World Health Organization/</td>
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<tr>
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<tr>
<td></td>
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<td>&quot;WHO&quot;</td>
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<td></td>
<td></td>
<td>&quot;world health organization&quot;</td>
</tr>
<tr>
<td>Context/Setting</td>
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<td>Intraoperat$</td>
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<td></td>
<td>Exp perioperative care/</td>
<td>Operat$</td>
</tr>
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<td></td>
<td>Exp surgical procedures, operative/</td>
<td>Patient$</td>
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<td>operating room$</td>
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<tr>
<td></td>
<td>Operating rooms/</td>
<td>intraoperat$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Penoperat$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Preoperat$ or pre-operat$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perioperat$ or peri-operat$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Postoperat$ or post-operat$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surg$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Surgical suite$</td>
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<td>Equipment</td>
<td>Electronics, medical/</td>
<td>Alarm$</td>
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<td>Equipment failure/</td>
<td>Apparatus</td>
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<tr>
<td></td>
<td>Equipment failure analysis/is.fs.</td>
<td>Check-out or checkout</td>
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<td>Electronic checklist$</td>
</tr>
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<td>Equipment</td>
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<tr>
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<td></td>
<td>System$</td>
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<td>Hospital Procedures/Administration/Protocol</td>
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<td>Surgery Department, Hospital/og, st</td>
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<td>Patient care</td>
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<tr>
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<td>su.fs.</td>
<td>Surgical suite$</td>
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**Embase/Medline/Premedline**

English language, human, remove overlap

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<th>Set Number</th>
<th>Concept</th>
<th>Search statement</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Anesthesia</td>
<td>(anesthesia/ OR anesthesiology/ OR (anaesthes$ OR anesthet$).ti,ab.) OR anesthesia department, hospital/og, st OR exp patient care/og, st</td>
</tr>
<tr>
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<td>Context/Setting</td>
<td>operating rooms/ OR operating room/ OR exp perioperative care/in, ae, mt, st, og OR exp surgical procedures, operative/ OR exp general surgery/ OR su.fs. OR surgery department, hospital/og, st OR operating rooms/og, st OR exp patient care/og, st</td>
</tr>
<tr>
<td>3</td>
<td>((“OR” OR operating room$ OR operat$ OR surg$ OR surgical suite$).ti,ab.) OR ((pre?operative OR pre?op OR peri?operative OR pre?surgical OR intra?op$).ti,ab.)</td>
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</tr>
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<td>Combine sets for Anesthesia and Context/Setting</td>
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<td>Patient Safety</td>
<td>patient safety/ OR (patient adj safety).ti,ab.</td>
</tr>
<tr>
<td>6</td>
<td>(safe$ AND ((policy OR policies OR protocol$ OR standard$ OR administration OR organization) AND (anesthes$ OR anaesthet$)).ti,ab.</td>
<td></td>
</tr>
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<td>7</td>
<td>(safe$ AND ((policy OR policies OR protocol$ OR standard$ OR administration OR organization) AND (surg$ OR operate OR operating OR operative$)).ti,ab.</td>
<td></td>
</tr>
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<td>8</td>
<td>Combine sets for Patient Safety</td>
<td>5 OR 6 OR 7</td>
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<tr>
<td>Set Number</td>
<td>Concept</td>
<td>Search statement</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>-----------------</td>
</tr>
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<td>9</td>
<td>Equipment</td>
<td>((exp equipment failure/ OR electronics, medical/ OR is.fs.) AND check$/ti,ab.) OR ((equipment or machine$ OR apparatus OR system$ OR monitor$) AND (check$ OR checklist OR check-out OR checkout)).ti,ab.</td>
</tr>
<tr>
<td>10</td>
<td>Combine sets for Equipment</td>
<td>9 OR 10</td>
</tr>
<tr>
<td>12</td>
<td>Incidence</td>
<td>exp incidence/ OR (decrease$ OR incidence OR prevalence OR reduc$ OR number$).ti,ab. OR ((before and after) OR (preintervention OR preintervention OR pretest OR pre-test OR postintervention OR postintervention OR posttest OR post-test)).ti,ab.</td>
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<tr>
<td>13</td>
<td>Medical errors</td>
<td>medical errors/pc OR postoperative complications/pc OR ((error$ OR complication$ OR adverse event$ OR “intraoperative awareness” OR wrong$) AND (prevent$ OR control)).ti,ab.</td>
</tr>
<tr>
<td>14</td>
<td>Staff</td>
<td>exp medical staff, hospital/ OR nursing staff hospital/log, st, ut OR attitude of health personnel/ OR attitude/ OR ((nurse$ OR anesthetist$ OR anesthesiologist$ OR resident$ OR surgeon$) AND (knowledge OR attitude$ OR competen$ OR train$ OR educat$)).ti.</td>
</tr>
<tr>
<td>15</td>
<td>Safety checklists</td>
<td>(“safety checklist$” OR ((anesthesia OR surg$) adj2 check$) OR ((surg$ OR pre?surg$ OR pre?op$ OR peri?op$ OR intra?op$) AND (checkout$ OR checkout$))).ti,ab.</td>
</tr>
<tr>
<td>16</td>
<td>Checklist/</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Combine for Checklists</td>
<td>15 OR 16</td>
</tr>
<tr>
<td>18</td>
<td>Safety management</td>
<td>safety/ OR safety management/ OR safety.ti,ab. OR ((preop$ OR pre-op$ OR periop$ OR peri-op$ OR pre?surg$) AND (safety OR precaution$)).ti,ab.</td>
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<tr>
<td>19</td>
<td>Combine sets for Safety Management and Patient Safety</td>
<td>8 OR 18</td>
</tr>
<tr>
<td>20</td>
<td>Total Quality Management</td>
<td>total quality management/ OR health care quality/ OR ((health$ OR healthcare OR hospital$) AND (quality OR “TQM” OR “total quality management”)).ti,ab.</td>
</tr>
<tr>
<td>21</td>
<td>Organizational culture</td>
<td>health care delivery/ OR organizational culture/ OR ((organization$ OR hospital$ OR unit$ OR team$ OR staff) AND (culture$ OR change$ OR manage$ OR direct$ OR context$)).ti,ab.</td>
</tr>
<tr>
<td>22</td>
<td>Combine sets for TQM and Staff attitudes and Organizational Culture</td>
<td>14 OR 20 OR 21</td>
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<tr>
<td>23</td>
<td>World Health Organization checklist</td>
<td>(&quot;world health organization/ OR &quot;World Health Organization”.ti,ab. OR &quot;world health&quot;.ti,ab.) AND checklist$.mp.)</td>
</tr>
<tr>
<td>24</td>
<td>Combine Context/setting and Checklists</td>
<td>4 AND 17</td>
</tr>
<tr>
<td>25</td>
<td>Combine Context/setting and Checklists with Medical Errors/pc</td>
<td>24 AND 13</td>
</tr>
<tr>
<td>26</td>
<td>Combine Context/setting and Checklists with Incidence</td>
<td>24 AND 12</td>
</tr>
<tr>
<td>27</td>
<td>Combine Context/setting and Checklists with Incidence</td>
<td>24 AND 18</td>
</tr>
<tr>
<td>28</td>
<td>Combine</td>
<td>25 OR 26 OR 27</td>
</tr>
<tr>
<td>29</td>
<td>Combine Checklists and Equipment</td>
<td>11 AND 15</td>
</tr>
<tr>
<td>30</td>
<td>Combine with medical errors/pc and safety</td>
<td>29 AND (13 OR 19)</td>
</tr>
<tr>
<td>31</td>
<td>Combine Context/setting and Checklists with TQM</td>
<td>24 AND 22</td>
</tr>
<tr>
<td>32</td>
<td>Combine concepts for Checklists</td>
<td>28 OR 30 OR 31</td>
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</table>
Set Number | Concept                   | Search statement                          
-----------|---------------------------|-------------------------------------------
33         | Combine with WHO checklist| 32 OR 23                                  
34         | Combine for final set     | 32 OR 33                                  
35         | Apply limits              | Limit 34 to yr="2000-2011"                
36         |                           | Limit 35 to English language              
37         | Remove duplicates         | Remove duplicates from 36                 

Total Downloaded | Total Retrieved | Total Included
-----------------|----------------|----------------- 
459

SECTION B. Methods

**Patient safety problem:** Preoperative checklists can help prevent errors and complications related to surgery. Checklists are often implemented within a multifactorial strategy of interventions, therefore they cannot be judged alone as a patient safety practice. The World Health Organization Surgical Safety Checklist is a prominent example of a preoperative checklist intended to ensure safe surgery and minimize complications; it has been translated into at least six languages.¹ One family of errors involves wrong site surgery (such as wrong procedure, wrong site, wrong person), and in 2004, the Joint Commission created the Universal Protocol for Preventing Wrong Site, Wrong Procedure, Wrong Person Surgery.² It comprises three sets of steps: pre-operative verification process, marking the operative site, and a “time out” immediately before the operation. A checklist can be used to clarify the details of these three steps. For anesthesia checklists, in 2008 the American Society of Anesthesiologists provided general guidelines that should be checked before surgery, and institutions can implement the guidelines to tailor the checklist to their specific equipment and clinical setting.³

Proposed key questions
1. What is the evidence on the context and implementation of preoperative checklists in healthcare facilities?
2. What is the evidence on the adoption and diffusion of preoperative checklists in healthcare facilities?
3. What is the evidence on the effectiveness of preoperative anesthesia checklists in healthcare facilities?
4. What is the evidence on the context and implementation of preoperative anesthesia checklists in healthcare facilities?
5. What is the evidence on the adoption and diffusion of preoperative anesthesia checklists in healthcare facilities?
<table>
<thead>
<tr>
<th>PICOTS Elements</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>KQ1 and KQ2: Patients undergoing any surgery. KQ3, KQ4, and KQ5: Patients undergoing any surgery involving general anesthesia.</td>
</tr>
<tr>
<td>Intervention</td>
<td>Preoperative checklist, either electronic or hard-copy. KQ1 and KQ2: For a preoperative checklist addressing surgical safety in general, we examined in detail the World Health Organization Surgical Safety Checklist. For preoperative checklist specifically designed to implement the Universal Protocol and prevent wrong-site surgery, any checklist. KQ3, KQ4, and KQ5: For anesthesia, it must have been an equipment checklist prior to administering general anesthesia before surgery.</td>
</tr>
<tr>
<td>Comparison</td>
<td>KQ1 and KQ2: No comparison required to be reported, but we extracted information on comparisons that were made. KQ3, KQ4, and KQ5: Not using a checklist, or a different checklist.</td>
</tr>
<tr>
<td>Outcomes</td>
<td>KQ1 and KQ2: No health outcomes necessary to be reported (because these questions do not involve effectiveness), but we extracted information on outcomes that were reported. KQ3, KQ4, and KQ5: Rates of intraoperative awareness, any equipment complications, intraoperative patient complications, postoperative patient complications.</td>
</tr>
<tr>
<td>Timing</td>
<td>Only examined postoperative events within one month of surgery, because later events are less likely to have been caused by the surgery itself.</td>
</tr>
<tr>
<td>Settings</td>
<td>Hospitals and surgical centers</td>
</tr>
</tbody>
</table>

**Inclusion criteria:**

General inclusion criteria: Full article published in a peer-reviewed journal, Abstracts will be excluded, English language publications only, published in 2000 or later, preoperative checklist (either electronic or hard-copy), surgery at either a hospital or a surgical center.

Inclusion criteria for Key Questions 1 and 2:
- Patients undergoing any surgery
- For preoperative checklists primarily designed to implement the Universal Protocol and prevent wrong-site surgery: At least 20,000 procedures. This number may change depending on the size of the literature that meets the inclusion criteria.
- For a preoperative checklist addressing surgical safety in general, we examined in detail the World Health Organization Surgical Safety Checklist.
- For preoperative checklist specifically designed to implement the Universal Protocol and prevent wrong-site surgery, any checklist.
- Any study design included, because these questions involve issues of implementation and adoption, which do not require a comparison set of procedures.

Inclusion criteria for Key Questions 3, 4, and 5:
- Patients undergoing any surgery involving general anesthesia
- At least 100 procedures. This number may change depending on the size of the literature that meets the inclusion criteria.
- Equipment checklist prior to administering general anesthesia before surgery
- Study must either compare the use of a checklist to not using a checklist, or study must compare checklists. We included any design that made such as comparison (e.g., before-after, interrupted time series, or time series with concurrent control group, etc).
• Reported at least one of the outcomes of interest (rates of intraoperative awareness, equipment complications, intraoperative patient complications, postoperative patient complications) within one month of the operation

References


Chapter 14. Use of Report Cards and Outcome Measurements To Improve the Safety of Surgical Care: American College of Surgeons National Quality Improvement Program (NEW)

SECTION A. Literature Search

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY:
American College Surgeon* AND National Surgical Improvement Program

NUMBER OF RESULTS: 169
In addition to searching the published literature, this topic relied on evidence available on the American College of Surgeons NSQIP website at http://www.acsnsqip.org/. Interviews with leadership and administrators in ACS NSQIP were performed. Surgeon champions were questioned.

In addition to searching the published literature, this topic relied on evidence available on the American College of Surgeons NSQIP website at http://www.acsnsqip.org/.
SECTION B. Methods

Evidence from the literature and the ACS NSQIP website was reviewed by a general surgeon health services researcher with experience in systematic reviews. The synthesis was narrative.

Chapter 15. Prevention of Surgical Items Being Left Inside a Patient: Brief Update Review

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

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<th>Date limits</th>
<th>Platform/provider</th>
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<tr>
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<td>Searched November 3, 2011</td>
<td>Wiley</td>
</tr>
<tr>
<td>ECR Institute members website</td>
<td>Searched October 26, 2011</td>
<td>ECRI Institute</td>
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<td>Institute for Healthcare Improvement</td>
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<tr>
<td>PSNet</td>
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<td>Agency for Healthcare Research and Quality</td>
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Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Non-journal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature as well as related citation searches using the Scopus database. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.) A number of organization websites were searched for relevant information, including: ECRI Institute members website, the Institute for Healthcare Improvement (ISI), and the Agency for Healthcare Research and Quality’s Patient Safety Network (PSNet).

The search strategies employed combinations of free text keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in PubMed syntax. A parallel strategy was used to search the databases comprising the Cochrane Library.

Medical Subject Headings (MeSH), Emtree and Keywords

Conventions:

OVID

$ = truncation character (wildcard)
exp = “explodes” controlled vocabulary term (e.g., expands search to all more specific related terms in the vocabulary’s hierarchy)

.de. or /
.fsf. = floating subheading
.hw. = limit to heading word
.md. = type of methodology (PsycINFO)
.mp. = combined search fields (default if no fields are specified)
.pt. = publication type
.ti. = limit to title
.tw. = limit to title and abstract fields

PubMed
[mh] = MeSH heading
[majr] = MeSH heading designated as major topic
[pt] = publication type
[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)
[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)
[tiab] = keyword in title or abstract

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<td>Gossypiboma</td>
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<td>Sponge*</td>
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<td>Error*</td>
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Embase/Medline/Premedline

English language, human, remove overlap

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<th>Search statement</th>
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</tr>
<tr>
<td>2</td>
<td>Surgery</td>
<td>Surgical[tiab] OR surgery[tiab]</td>
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</tbody>
</table>
SECTION B. Methods

Titles and abstracts were reviewed by a health services research methodologist with experience in both systematic reviews and medical devices. Included studies were those most relevant to the risk and prevention of retained foreign objects as a result of surgery. We examined studies on manual counting, as well as those using various forms of radiofrequency identification. Potential barriers to implementation (e.g. user compliance) and the costs of various technologies were also assessed. Included studies were narratively summarized by the author.

Chapter 16. Operating Room Integration and Display Systems: Brief Review (NEW)

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Limits</th>
<th>Platform/Provider</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2000-November 29, 2011</td>
<td>EBSCOhost</td>
</tr>
<tr>
<td>ECR Institute website</td>
<td>2000-November 29, 2011</td>
<td>ECR Institute</td>
</tr>
<tr>
<td>Health Devices</td>
<td>2000-November 29, 2011</td>
<td>ECR Institute</td>
</tr>
<tr>
<td>Name</td>
<td>Date Limits</td>
<td>Platform/Provider</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>

**Hand Searches of Journal and Nonjournal Literature**

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Nonjournal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.)

The search strategies employed combinations of freetext keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in PubMed syntax. A parallel strategy was used to search the databases comprising the Cochrane Library.

**Medical Subject Headings (MeSH), and Keywords**

**Conventions:**

PubMed

* = truncation character (wildcard)

[mh] = MeSH heading

[majr] = MeSH heading designated as major topic

[pt] = publication type

[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)

[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)

[tiab] = keyword in title or abstract

[ti] = keyword in title
<table>
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<th>Concept</th>
<th>Controlled Vocabulary*</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
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<td>Operating rooms</td>
<td>operating rooms[majr]</td>
<td>operating room/s&lt;br&gt;surgery suite/s&lt;br&gt;surgical suite/s&lt;br&gt;OR/s&lt;br&gt;C-suite/s&lt;br&gt;hybrid operating suite/s&lt;br&gt;supersuite/s&lt;br&gt;super suite/s&lt;br&gt;VIOR/s (visually integrated operating room)&lt;br&gt;surgical field/s</td>
</tr>
<tr>
<td>Integration</td>
<td>operating room information systems[mh]&lt;br&gt;systems integration[mh]&lt;br&gt;video-assisted surgery[majr]</td>
<td>integration&lt;br&gt;central control&lt;br&gt;centralized control&lt;br&gt;centralised control&lt;br&gt;common location&lt;br&gt;single location&lt;br&gt;plug and play&lt;br&gt;router&lt;br&gt;routing</td>
</tr>
<tr>
<td>Information itself</td>
<td></td>
<td>audio&lt;br&gt;AV&lt;br&gt;camera&lt;br&gt;data&lt;br&gt;EMR&lt;br&gt;image/s&lt;br&gt;imaging&lt;br&gt;PACS&lt;br&gt;picture archiving&lt;br&gt;video</td>
</tr>
<tr>
<td>Transmission of information</td>
<td>computer communication networks[majr]&lt;br&gt;monitoring, intraoperative/instrumentation[majr]&lt;br&gt;videorecording[majr]</td>
<td>communication/s&lt;br&gt;digital</td>
</tr>
</tbody>
</table>
### Concept | Controlled Vocabulary* | Keywords
--- | --- | ---
Display of information | data display[mj] | boom
 |  | cart-mounted
dashboard/s
display/s
flat panel
high definition
HD
LCD/s
monitor/s
television/s
touch screen/s
touchscreen/s
TV/s
screen/s
surgical display/s
streaming
video
VCR
wall-mounted
workstation/s

*Note: none of the MeSH terms were specific enough to retrieve results relevant to the topic and were not incorporated into the main search strategy.

### PubMed – main search

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Main concept</td>
<td>“integrated operating room”[tiab] OR “integrated operating rooms”[tiab]</td>
</tr>
<tr>
<td>3</td>
<td>Descriptive concept</td>
<td>integrat*[ti]</td>
</tr>
<tr>
<td>5</td>
<td>Combine sets</td>
<td>2 AND (3 OR 4)</td>
</tr>
<tr>
<td>6</td>
<td>Combine sets</td>
<td>1 OR 5*</td>
</tr>
</tbody>
</table>

*Note: no publication limits or safety concepts were applied to the final set of search results because there were few results.
**PUBMED – ADDITIONAL TERMS THAT WERE BROWSED**

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting</td>
<td>C-suite OR C-suites OR hybrid operating OR supersuite OR super suite OR ORs “operating room” AND future VIOR*</td>
</tr>
</tbody>
</table>

*Note: The terms in this table mainly yielded no results, irrelevant results, or large sets of results with few relevant. Some references were identified and kept during searches with these terms, but the terms were not useful enough to include in the main search strategy above.

**CINAHL**

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting</td>
<td>“operating room” OR “operating room”</td>
</tr>
<tr>
<td>2</td>
<td>Main concept</td>
<td>integrat*</td>
</tr>
<tr>
<td>3</td>
<td>Combine</td>
<td>1 AND 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Downloaded</th>
<th>Total Retrieved</th>
<th>Total Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>140</td>
<td>44 instructions</td>
<td>18</td>
</tr>
</tbody>
</table>

**SECTION B. Methods**

Titles and abstracts were reviewed by a physician health services researcher with experience in systematic review. Only full published studies were considered for review (meeting abstracts were excluded). Only English-language publications were eligible for inclusion. For the effectiveness and harms of the PSP, we considered including studies of any design (e.g.,
randomized controlled trials, non-randomized controlled trials, prospective and retrospective observational studies, surveys) that may provide relevant data. For the implementation of the PSP, we considered including any qualitative or quantitative research that addressed the implementation issues. Included studies were narratively summarized by the author. As this PSP project team has agreed, we did not assess risk of bias of included individual studies or the overall strength of evidence for this brief PSP review.

Chapter 17. Use of Beta Blockers To Prevent Perioperative Cardiac Events: Brief Update Review

SECTION A. Literature Search

For this topic we did not do a formal literature search. Rather the principal meta-analyses and trials were already known to the authors as part of their clinical work. A “related articles” search was done on these to look for any additional relevant publications.

SECTION B. Methods

The meta-analyses, trials, and related articles search were reviewed by a physician health services researcher with experience in cardiovascular systematic reviews. The synthesis was narrative.

Chapter 18. Use of Real-Time Ultrasound Guidance During Central Line Insertion: Brief Update Review

SECTION A. Literature Search

DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH #1:
ultrasound OR ultrasonograph*
AND
guided OR guidance OR ultrasound-guided OR doppler-guided OR ultrasound-assisted
AND
catheter* OR cannulat*
AND
vein OR veins OR venous OR vascular

MANUALLY FILTERED IN ENDNOTE FOR THE FOLLOWING JOURNALS:
JAMA
New England Journal of Medicine
British Medical Journal
Lancet
Annals of Internal Medicine
Critical Care Medicine
Journal of Clinical Monitoring
Anaesthesia
Circulation
Chest
Anesthesia & Analgesia
Annals of Emergency Medicine
Anesthesiology
Archives of Surgery

NUMBER OF RESULTS AFTER FILTERING: 92

====================================================================

SEARCH #2 (RCT’S OR META-ANALYSES):
DATABASE SEARCHED & TIME PERIOD COVERED:
PubMed – 2000-12/16/2011

LANGUAGE:
English

SEARCH STRATEGY:
ultrasound OR ultrasonograph*
AND
guided OR guidance OR ultrasound-guided OR doppler-guided OR ultrasound-assisted
AND
catheter* OR cannulat*
AND
vein OR veins OR venous OR vascular
AND
randomized controlled trial* OR randomized controlled trial[pt] OR rct* OR double-blind* OR single-blind* OR “double blind” OR “single blind” OR “systematic review” OR meta-analy* OR metaanaly* OR Meta-Analysis[pt]

NUMBER OF RESULTS: 93
NUMBER AFTER REMOVING REFERENCES FROM “SPECIFIED JOURNALS” LIST: 74

====================================================================

SEARCH #3
DATABASE SEARCHED & TIME PERIOD COVERED:
SCOPUS – 2000-12/16/2011

LANGUAGE:
English

SEARCH STRATEGY:
B. Methods

Titles and abstracts were reviewed by a general internist with experience in systematic reviews (Figure 1). Relevant articles were narratively summarized. This summary was reviewed by the second author, a general internist experienced in the implementation and use of ultrasound for central-line placement, who suggested several additional references and described program implementation at one health care site.
Chapter 19. Preventing In-Facility Falls

SECTION A. Literature Search

DATABASE SEARCHED AND TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY:

NUMBER OF RESULTS: 1841

DATABASE SEARCHED AND TIME PERIOD COVERED:
CINAHL: 2005-8/2/2011
SEARCH STRATEGY:
“Accidental Falls” OR “fallers” OR “falls per” OR “falls rate” OR “falls incidence” OR “falls prevention” OR “fall prevention” OR “prevention of falls” OR “prevent falls” OR “prevents falls” OR “prevent patient falls” OR “prevents patient falls” OR “preventing fall” OR “preventing falls” OR “falls reduction” OR “fall reduction” OR “reduction of falls” OR “reduce falls” OR “reduces falls” OR “reducing fall” OR “reducing falls” OR “improve fall” OR “improve falls” OR “improves fall” OR “improves falls” OR “improving fall” OR “improving falls” AND hospital OR hospitals OR hospitali*

NUMBER OF RESULTS: 876
NUMBER AFTER REMOVAL OF DUPLICATES: 524

DATABASE SEARCHED AND TIME PERIOD COVERED:
WEB OF SCIENCE – Science Citation Index, Social Science Citation Index, Arts & Humanities Index, Conference Proceedings Science Index, Conference Proceedings Social Science Index: 2005-8/5/2011
SEARCH STRATEGY:
Topic=(“Accidental Falls” OR “fallers” OR “falls per” OR “falls rate” OR “falls incidence” OR “falls prevention” OR “fall prevention” OR “prevention of falls” OR “prevent falls” OR “prevents falls” OR “prevent patient falls” OR “prevents patient falls” OR “preventing fall” OR “preventing falls” OR “falls reduction” OR “fall reduction” OR “reduction of falls” OR “reduce falls” OR “reduces falls” OR “reducing fall” OR “reducing falls” OR “improve fall” OR “improve falls” OR “improves fall” OR “improves falls” OR “improving fall” OR “improving falls”) AND Topic=(hospital OR hospitals OR hospitali*)

NUMBER OF RESULTS: 420
SECTION B. Methods

Articles identified by Hempel and colleagues using the above process were then reviewed by us using the following criteria:

- Acute care hospitals
- With large sample sizes (at least N=1,000)
- General population or older adult population

From the Prevention of Falls Newtok Europe (ProFANE) “Manual for the fall prevention classification system:” Domain 3: Components (Combination sub-section)¹

<table>
<thead>
<tr>
<th>Combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most interventions fall under the following sub-domains (detailed under Domain 4: Descriptors of the intervention).</td>
</tr>
<tr>
<td>Exercises (supervised and/or unsupervised)</td>
</tr>
<tr>
<td>Medication (drug target)</td>
</tr>
<tr>
<td>Surgery</td>
</tr>
<tr>
<td>Management of urinary incontinence</td>
</tr>
<tr>
<td>Fluid or nutrition therapy</td>
</tr>
<tr>
<td>Psychological</td>
</tr>
<tr>
<td>Environment/Assistive technology</td>
</tr>
<tr>
<td>Social environment</td>
</tr>
<tr>
<td>Knowledge/education interventions</td>
</tr>
<tr>
<td>Other interventions/procedures</td>
</tr>
</tbody>
</table>

Combination refers to how many sub-domains are delivered to the participants of an intervention, and importantly, the manner in which these sub-domains are combined.


Chapter 20. Preventing In-Facility Delirium

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Limits</th>
<th>Platform/Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL (Cumulative Index to Nursing and Allied Health Literature)</td>
<td>Searched June 10, 2011</td>
<td>EBSCOHost</td>
</tr>
<tr>
<td>Cochrane Library</td>
<td>Searched June 14, 2011</td>
<td>Wiley</td>
</tr>
<tr>
<td>EMBASE (Excerpta Medica)</td>
<td>1996 – August 23, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>1996 – August 23, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>PreMEDLINE</td>
<td>1990 – August 23, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>PubMed</td>
<td>Searched August 17, 2011</td>
<td>National Library of Medicine</td>
</tr>
</tbody>
</table>
Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Nonjournal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.)

The search strategies employed combinations of free text keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in OVID syntax; the search was simultaneously conducted across Embase and Medline. A parallel strategy was used to search the databases comprising the Cochrane Library.

Medical Subject Headings (MeSH), EMTREE and Keywords

Conventions:
OVID
$ = truncation character (wildcard)
exp = “explodes” controlled vocabulary term (e.g., expands search to all more specific related terms in the vocabulary’s hierarchy)
.de. or
/ = limit controlled vocabulary heading
.fs. = floating subheading
.hw. = limit to heading word
.md. = type of methodology (PsycINFO)
.mp. = combined search fields (default if no fields are specified)
.pt. = publication type
.ti. = limit to title
.tw. = limit to title and abstract fields
PubMed
[mh] = MeSH heading
[majr] = MeSH heading designated as major topic
[pt] = publication type
[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)
[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)
[tiab] = keyword in title or abstract
## Topic-Specific Search Terms

<table>
<thead>
<tr>
<th>Concept</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anesthesia</strong>&lt;br&gt; Pre/Peri/Intra/Postoperative period&lt;br&gt; Surgery</td>
<td>Analgesic agent/adverse drug reaction, drug interaction, drug toxicity, pharmacokinetics, pharmacology Analgesics, opioid/ae Exp analgesics/adverse effects, pharmacokinetics, poisoning, toxicity Exp perioperative care/ Exp Postoperative complication/ Postoperative care/</td>
<td>Anaesthe$&lt;br&gt; Analgesic$&lt;br&gt; Aneste$&lt;br&gt; Complicat$&lt;br&gt; Opioid$&lt;br&gt; Postop$&lt;br&gt; Sedat$</td>
</tr>
<tr>
<td><strong>Disease/Condition</strong>&lt;br&gt; Delirium/ Delirium/et Delirium/pc</td>
<td>Delirium/ prevention and control Dt.fs. Tu.fs.</td>
<td>Acute confusional state Cause$&lt;br&gt; Complicat$&lt;br&gt; Control$&lt;br&gt; Delirium Develop$&lt;br&gt; Effect$ etiology Event$ Outcome$ Prevent$ Result$ Sundown syndrome</td>
</tr>
<tr>
<td><strong>Intervention program</strong>&lt;br&gt; Dh.fs. Dh.fs.</td>
<td>Delirium/prevention and control Dt.fs. Tu.fs.</td>
<td>Approach$&lt;br&gt; Barrier$ barrier* Checklist$ Collaborat$ control Delirium Exercise$ Families Family “hospital elder life” Implement$ Initiative$ Intervention$ Monitor$ movement non-pharma$ non-pharmacolog$ obstacle$ occupational therapy Pharma Pharmacologic$ Physical therap$ plan Prevention Program$ Project$ prophylactic$ protocol reduc$ screen$ sleep strateg$ volunteer$ walk$</td>
</tr>
<tr>
<td>Concept</td>
<td>Controlled Vocabulary</td>
<td>Keywords</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>Risk/Screening</td>
<td>Delirium/et</td>
<td>Assess, Assessment, Checklist, Examination, Examine, History, Interview, Predict, Prediction, Predictor, Risk, Survey</td>
</tr>
<tr>
<td></td>
<td>Exp Risk/ or Risk Assessment/</td>
<td></td>
</tr>
<tr>
<td>Setting</td>
<td>Intensive care units/</td>
<td>admission, Hospital$, Hospital-acquired, Iatrogenic, Inpatient, Intensive care, &quot;ICU&quot;, nosocomial patient</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Embase/Medline/Premedline**

English language, human, remove overlap

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disease/Condition</td>
<td><em>Delirium/</em> (delirium or “sundown syndrome” or “acute confusional state”),ti,ab.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>(epidemiology or etiology or prevention),fs. or (avoid$ or caus$ or risk$ or predict$ or prevent$).ti,ab.</td>
</tr>
<tr>
<td>3</td>
<td>Combine sets</td>
<td>1 or 2</td>
</tr>
<tr>
<td>4</td>
<td>Risk</td>
<td>exp risk/ or risk assessment/ or (epidemiology or etiology or prevention).fs. or (avoid$ or caus$ or risk$ or predict$ or prevent$).ti,ab.</td>
</tr>
<tr>
<td>5</td>
<td>Risk of developing delirium</td>
<td>(delirium/et or (delirium and (cause$ or result$ or outcome$ or complicat$ or etiology or develop$ or effect$ or event$)),ti,ab.)</td>
</tr>
<tr>
<td>6</td>
<td>Combine sets for risk of developing delirium</td>
<td>(3 AND 4) OR 5</td>
</tr>
<tr>
<td>7</td>
<td>Setting/Context</td>
<td>(hospital or hospitals or hospitaliz* or hospitalis* or inpatient$ or iatrogenic or admission or admitted or “ICU” or “intensive care” or “post anesthesia” or “post anaesthesia” or “post surgery” or “post surgical” or postoperative or “post operative”).ti.</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>exp hospitalization/ or exp intensive care units/</td>
</tr>
<tr>
<td>9</td>
<td>Combine sets for Setting</td>
<td>7 OR 8</td>
</tr>
<tr>
<td>10</td>
<td>Combine for final set of risk of developing delirium in hospital settings</td>
<td>6 AND 9</td>
</tr>
<tr>
<td>11</td>
<td>Postoperative complications</td>
<td>exp postoperative complication/ or (postop$ adj2 complication$),ti,ab.</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>exp perioperative care/ or (sedat$ or analgesic$ or anesthe$ or anaesthe$ or opioid$),ti,ab.</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>exp surgical procedures, operative/ae or (surgery or surgical or intraoperative or intra-operative),ti,ab.</td>
</tr>
<tr>
<td>14</td>
<td>Combine sets for Postoperative complications</td>
<td>11 OR 12 OR 13</td>
</tr>
<tr>
<td>15</td>
<td>Sedation</td>
<td>analgesics, opioid/ae</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>analgesic agent/ae, it, to, pk, pd [Adverse Drug Reaction, Drug Interaction, Drug Toxicity, Pharmacokinetics, Pharmacology]</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>exp Analgesics/ae, pk, po, to [Adverse Effects, Pharmacokinetics, Poisoning, Toxicity]</td>
</tr>
</tbody>
</table>

C-38
<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Combine sets for Sedation</td>
<td>15 or 16 OR 17</td>
</tr>
<tr>
<td>19</td>
<td>Combine sets for Postoperative or Sedation Complications</td>
<td>14 OR 18</td>
</tr>
<tr>
<td>20</td>
<td>Combine sets for Postoperative or Sedation Complications and Risk of Delirium</td>
<td>19 AND 6</td>
</tr>
<tr>
<td>21</td>
<td>Disease/Condition prevention and control</td>
<td>*Delirium/pc or (delirium and (prevent$ or control$)).ti,ab.</td>
</tr>
<tr>
<td>22</td>
<td>Interventions</td>
<td>(interven$ or initiative$ or program$ or project$ or plan$ or protocol$ or monitor$ or checklist$ or collabor$ or approach$ or screen$ or strateg$).ti,ab.</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>(exercise$ or walk or family or families or movement or non-pharma$ or occupational therap$ or physical therap$ or sleep or hydrat$ or volunteer$).ti,ab. OR “hospital elder life”.mp.</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>(pharma$ or drug$ or medication$ or prophylactic$ or therap$).ti,ab. or dt.fs. or tu.fs.</td>
</tr>
<tr>
<td>25</td>
<td></td>
<td>program evaluation/ or program development/ or safety management/methods or models, organizational/ or clinical effectiveness/evaluation or quality assurance, health care/ or ((clinical or medical) adj (protocol* or checklist* or documentation*)).ti,ab.</td>
</tr>
<tr>
<td>26</td>
<td>Combine sets for Interventions</td>
<td>22 OR 23 OR 24 OR 25</td>
</tr>
<tr>
<td>27</td>
<td>Combine sets for Disease control and prevention and Interventions</td>
<td>21 AND 26</td>
</tr>
<tr>
<td>28</td>
<td>Incidence</td>
<td>exp incidence/ or (incidence or prevalence or rate or increase or decrease or reduc$ or number).mp.</td>
</tr>
<tr>
<td>29</td>
<td>Barriers</td>
<td>(barrier$ or obstacle$ or resource$ or cost$ or time).ti,ab.</td>
</tr>
<tr>
<td>30</td>
<td>Combine sets for Barriers to Disease control and prevention and Interventions and Incidence of delirium</td>
<td>27 AND 28 AND 29</td>
</tr>
<tr>
<td>31</td>
<td>Combine Disease/Condition and Disease prevention and control</td>
<td>3 OR 21</td>
</tr>
<tr>
<td>32</td>
<td>Quality improvement hedge</td>
<td>(quality and improv$ and intervention$).mp.</td>
</tr>
<tr>
<td>33</td>
<td>Combine Disease and Quality Improvement hedge</td>
<td>31 AND 32</td>
</tr>
<tr>
<td>34</td>
<td>Combine final sets for review</td>
<td>10 OR 20 OR 30 OR 33</td>
</tr>
<tr>
<td>35</td>
<td>Limit</td>
<td>Limit 34 to yr=&quot;2000-2011&quot;</td>
</tr>
<tr>
<td>36</td>
<td>Limit</td>
<td>Limit 35 to English language</td>
</tr>
<tr>
<td>37</td>
<td>Apply Systematic Review narrow hedge</td>
<td>36 AND ((research synthesis or pooled).mp. or systematic review/ or meta analysis/ or meta-analysis/ or ((evidence base$ or methodol$ or systematic or quantitative$ or studies or search$).mp. and (review/ or review.pt.)))</td>
</tr>
<tr>
<td>38</td>
<td>Remove duplicates</td>
<td>Remove duplicates from 37</td>
</tr>
</tbody>
</table>

### SECTION B. Methods

#### Inclusion/Exclusion Criteria

General criteria: Only full published studies were considered for review (meeting abstracts were excluded). Only English-language publications were eligible for inclusion.
Risk factors:
- Included RCTs comparing groups with different risk factors; also prospective and retrospective cohort studies that perform multivariate analyses of factors associated with incidence of delirium.
- Comparative studies must have at least 20 patients in each arm, while cohort studies must have at least 20 patients overall.

Effectiveness and harms:
- Included RCTs, controlled clinical trials (CCTs), interrupted time series, and controlled before-after studies (CBAs) where at least the after-intervention portion is prospective; CBAs are necessary to look at implementation (KQ6).
- Studies must have at least 20 patients in each arm.

Implementation and Context:
- Abstracted information on implementation and context from effectiveness studies, and descriptive studies of implementation with an associated effectiveness study
- Qualitative research studies addressing implementation of delirium prevention interventions
- Quantitative research studies on implementation of delirium prevention interventions

Chapter 21. Preventing In-Facility Pressure Ulcers
SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Limits</th>
<th>Platform/Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL (Cumulative Index to Nursing and Allied Health Literature)</td>
<td>1981 – June 9, 2011</td>
<td>EBSCOHost</td>
</tr>
<tr>
<td>Cochrane Library</td>
<td>Sought June 22, 2011</td>
<td>Wiley</td>
</tr>
<tr>
<td>EMBASE (Excerpta Medica)</td>
<td>1996 – September 15, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>1996 – September 15, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>PreMEDLINE</td>
<td>Sought August 16, 2011</td>
<td>OVID SP</td>
</tr>
</tbody>
</table>

Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Nonjournal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.)
The search strategies employed combinations of freetext keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in OVID syntax; the search was simultaneously conducted across EMBASE and MEDLINE. A parallel strategy was used to search the databases comprising the Cochrane Library.

Medical Subject Headings (MeSH), Emtree and Keywords

Conventions:

OVID

$ = truncation character (wildcard)
exp = “explodes” controlled vocabulary term (e.g., expands search to all more specific related terms in the vocabulary’s hierarchy)
.de. or /
.fs. = floating subheading
.hw. = limit to heading word
.md. = type of methodology (PsycINFO)
.mp. = combined search fields (default if no fields are specified)
.pt. = publication type
.ti. = limit to title
.tw. = limit to title and abstract fields

PubMed

[mh] = MeSH heading
[majr] = MeSH heading designated as major topic
[pt] = publication type
[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)
[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)
[tiab] = keyword in title or abstract

<table>
<thead>
<tr>
<th>Topic-Specific Search Terms</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure ulcers</td>
<td>Pressure ulcer/</td>
<td>bed sore$</td>
</tr>
<tr>
<td></td>
<td>Skin ulcer/ or skin ulcers/</td>
<td>bedsore$</td>
</tr>
<tr>
<td></td>
<td>Decubitus/ or decubitus ulcer/</td>
<td>decubitus adj ulcer$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pressure sore$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure ulcer$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pressure ulcer$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pressure wound$</td>
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<td></td>
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<td>Skin ulcer$</td>
</tr>
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<td></td>
<td>wound</td>
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<td>Concept</td>
<td>Controlled Vocabulary</td>
<td>Keywords</td>
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<td>---------------------------------------------------------------------------------------</td>
<td>---------------------------------------</td>
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<tr>
<td>Intervention program</td>
<td>clinical effectiveness/evaluation exp health care quality/ models, organizational/ program development/ program evaluation/ quality assurance, health care/ quality of health care or quality assurance, health care or quality indicators, health care or health plan implementation safety management/methods</td>
<td>Checklist checklist* Clinical checklist Clinical documentation clinical protocol Implement* implement* Initiative initiative* Intervention intervention Medical checklist* Medical documentation* Medical protocol* Program program* Protocol protocol quality and improvement and intervention$ Standard standard* train* Training</td>
</tr>
<tr>
<td>Barriers</td>
<td>attitude of health personnel/ clinical competence/ education, medical/ health knowledge, attitudes, practice/ physician practice patterns/ staff, hospital/education</td>
<td>barrier$ Barriers Compliance compliance$ imped$ (nurse$ or physician$ or staff or employee) and (educat$ or train$ or knowledge or attitude$ or competen$ or time) obstacle$ outcome$ Outcomes</td>
</tr>
<tr>
<td>Setting</td>
<td>exp health care organization/ exp health planning organizations/</td>
<td>alliance$ coalition$ collaborat$ health care or healthcare medical health system$ hospital$ network$</td>
</tr>
<tr>
<td>Effectiveness/Measure</td>
<td>Exp incidence/ Exp prevalence/ Exp vital statistics/</td>
<td>decrease incidence increase number prevalence rate</td>
</tr>
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<td>Concept</td>
<td>Search Statement</td>
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<tr>
<td>1</td>
<td>Disease/Condition</td>
<td>&quot;pressure ulcer/ or pressure ulcer*.ti,ab. or ((skin ulcers/ or skin ulcer/) and pressure,t.i,ab.)</td>
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<tr>
<td>2</td>
<td>(exp decubitus/ or exp decubitus ulcer/) and skin.mp.</td>
<td></td>
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<tr>
<td>3</td>
<td>(pressure adj2 (sore$ or ulcer$ or wound$)).ti,ab.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(bedsore$ or (bed adj2 sore$)).ti,ab.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>(decubitus adj ulcer$).ti,ab.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Combine sets for Disease</td>
<td>1 or 2 or 3 or 4 or 5</td>
</tr>
<tr>
<td>7</td>
<td>Intervention/Program Implementation/Quality improvement</td>
<td>program evaluation/ or program development/ or safety management/methods or models, organizational/ or clinical effectiveness/evaluation or quality assurance, health care/ or ((clinical or medical) adj (protocol* or checklist* or documentation*)).ti,ab.</td>
</tr>
<tr>
<td>8</td>
<td>(quality and improv$ and intervention$).mp.</td>
<td></td>
</tr>
<tr>
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<td>(implement* or initiative* or program* or intervention or train* or checklist* or standard* or protocol).mp.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>exp health care quality/ or (quality of health care or quality assurance, health care or quality indicators, health care or health plan implementation).sh.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Combine sets for Intervention/Program Implementation/Quality improvement</td>
<td>7 or 8 or 9 or 10</td>
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<tr>
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<td>Obstacles/Barriers</td>
<td>attitude of health personnel/ or education, medical/ or staff, hospital/education or clinical competence/ or health knowledge, attitudes, practice/ or physician practice patterns/</td>
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<td>13</td>
<td>(imped$ or obstacle$ or barrier$ or outcome$ or compliance$ or ((nurse$ or physician$ or staff or employee) and (educat$ or train$ or knowledge or attitude$ or competen$ or time))).mp.</td>
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</tr>
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<td>14</td>
<td>Combine sets for Obstacles</td>
<td>12 or 13</td>
</tr>
<tr>
<td>15</td>
<td>Context/Setting</td>
<td>(hospital$ or hospital-acquired or inpatient$ or patient$ or acute care or long term care or long-term care).ti,ab.</td>
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<tr>
<td>16</td>
<td>exp health care organization/ or exp health planning organizations/ or ((hospital$ or health system$ or health care or healthcare or medical) and (collaborat$ or alliance$ or coalition$ or network$)).mp.</td>
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<td>Combine sets for Setting</td>
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<td>Combine Disease and Intervention/Program Implementation/Quality improvement</td>
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<tr>
<td>20</td>
<td>Combine Obstacles and Disease and Intervention/Program Implementation/Quality improvement and Setting</td>
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<td>Remove duplicates</td>
<td>Remove duplicates from 20</td>
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<td>Limit by date</td>
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<tr>
<td>23</td>
<td>Incidence or prevalence</td>
<td>exp incidence/ or exp prevalence/ or (incidence or prevalence or rate or increase or decrease or number).mp.</td>
</tr>
<tr>
<td>24</td>
<td>exp Demography/sn [Statistics &amp; Numerical Data]</td>
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</tr>
<tr>
<td>25</td>
<td>Combine for Incidence or prevalence</td>
<td>23 or 24</td>
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<td>Set Number</td>
<td>Concept</td>
<td>Search Statement</td>
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<td>------------</td>
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<td>26</td>
<td>Combine Obstacles and Disease and Intervention/Program Implementation/Quality improvement and Setting and Incidence</td>
<td>22 and 25</td>
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<td>Limit</td>
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<td>Combine Disease and Quality Improvement</td>
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</table>

**CINAHL**

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</thead>
<tbody>
<tr>
<td>S1</td>
<td>Disease/Condition</td>
<td>(MM &quot;Pressure Ulcer&quot;) OR (MH &quot;Pressure Ulcer Care (Saba CCC)&quot;) OR (MH &quot;Pressure Ulcer Stage 1 Care (Saba CCC)&quot;) OR (MH &quot;Pressure Ulcer Stage 2 Care (Saba CCC)&quot;) OR (MH &quot;Pressure Ulcer Stage 3 Care (Saba CCC)&quot;) OR (MH &quot;Pressure Ulcer Stage 4 Care (Saba CCC)&quot;) OR (MH &quot;Pressure Ulcer Care (Iowa NIC)&quot;) OR (MH &quot;Pressure Ulcer Prevention (Iowa NIC)&quot;) OR TI pressure ulcers</td>
</tr>
<tr>
<td>S2</td>
<td>Program</td>
<td>implement* OR program* OR initiative* OR protocol* OR checklist* OR train* OR standard*</td>
</tr>
<tr>
<td>S3</td>
<td>Obstacles</td>
<td>Barrier* OR outcome* OR compliance*</td>
</tr>
<tr>
<td>S5</td>
<td>Combine Programs and Protocols</td>
<td>S2 OR S4</td>
</tr>
<tr>
<td>S6</td>
<td>Combine Condition and Obstacles AND Programs or Protocols</td>
<td>S1 AND S3 AND S5</td>
</tr>
<tr>
<td>S7</td>
<td>Limit</td>
<td>Limit S6 to 2000-2011</td>
</tr>
</tbody>
</table>

From S7 keep 64
SECTION B. Methods

Inclusion criteria:
• Experimental research studies including randomized controlled trials, non-randomized controlled trials, pre-post studies (or before and after studies), and cohort studies that evaluated the implementation of a multicomponent pressure ulcer (PU) prevention programs
• Published post-2000 and conducted in the U.S.
• Study must report on PU rate (incidence/prevalence)
• Studies must report PU rate for at least 6 months post- implementation of prevention program

Exclusion criteria:
• Studies that did not report a baseline (pre-prevention program implementation) PU rate
• Studies with less than 50% of patient population at study end
• Studies focused on PU risk assessment or singular interventions that prevent PUs (e.g., special mattresses, skin care items, etc.). These topics are currently covered in a separate comparative effectiveness review.
Chapter 22. Inpatient Intensive Glucose Control Strategies To Reduce Death and Infection (NEW)

SECTION A. Literature Search

Search for studies about cost

Database: Ovid MEDLINE(R) and Ovid OLDMEDLINE(R) <1948 to January Week 2 2010>
Search Strategy: yield through January 2010, updated October 2011
--------------------------------------------------------------------------------
1 exp insulin/ (135826)
2 exp hypoglycemic agents/ (159801)
3 exp Blood Glucose/ (105380)
4 (insulin or hypoglycemic agent$ or hypoglycaemic agent$ or glycemic control or glycaemic control).mp. {mp=title, original title, abstract, name of substance word, subject heading word, unique identifier} (264080)
5 1 or 2 or 3 or 4 (316621)
6 Critical Illness/ (10449)
7 critical care/ or intensive care/ (31575)
8 exp Perioperative Care/ (65391)
9 exp Postoperative Period/ (30372)
10 ((critical$ adj6 ill$) or critical care or icu or intensive care or burn unit$ or coronary care).mp. {mp=title, original title, abstract, name of substance word, subject heading word, unique identifier} (118455)

C-46
11 intensive care units/ or burn units/ or coronary care units/ or recovery room/ (31083)
12 postoperative complications/ or prosthesis-related infections/ or surgical wound dehiscence/ or surgical wound infection/ (269644)
13 (postoperative$ or post operative$).mp. {mp=title, original title, abstract, name of substance word, subject heading word, unique identifier} (501444)
14 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 (643228)
15 5 and 14 (6711)
16 randomized controlled trial.pt. (278973)
17 controlled clinical trial.pt. (79853)
18 randomized controlled trials.sh. (0)
19 random allocation.sh. (66268)
20 double blind method.sh. (103038)
21 single blind method.sh. (13368)
22 16 or 17 or 18 or 19 or 20 or 21 (416935)
23 (animals not human).sh. (4467853)
24 22 not 23 (374747)
25 clinical trial.pt. (452229)
26 exp clinical trials/ (0)
27 (clin$ adj25 trial$).ti,ab. (166370)
28 ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. (103187)
29 placebos.sh. (28486)
30 placebo$.ti,ab. (118661)
31 random$.ti,ab. (460194)
32 research design.sh. (57708)
33 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 (924508)
34 33 not 23 (807020)
35 34 or 24 (836845)
36 15 and 35 (1138)
37 exp Myocardial Infarction/ (124416)
38 exp Hospitalization/ (120073)
39 exp Inpatients/ (8203)
40 exp Cerebrovascular Accident/ (55676)
41 cerebrovascular disorders/ or brain ischemia/ or exp “intracranial embolism and thrombosis”/ or exp intracranial hemorrhages/ (120133)
42 exp myocardial revascularization/ or exp coronary artery bypass/ (64411)
43 37 or 40 or 41 or 42 (330035)
44 5 and 43 (4681)
45 35 and 44 (689)
46 45 not 36 (556)
47 38 or 39 (126877)
48 5 and 47 (1329)
49 35 and 48 (243)
50 49 not (36 or 46) (130)
51 exp Hypoglycemia/ci, ep, et {Chemically Induced, Epidemiology, Etiology} (9091)
52 1 or 2 or 4 (271238)
53 51 and 52 (5827)
54 14 and 53 (251)
55 43 and 53 (52)
56 47 and 53 (89)
57 54 or 55 or 56 (362)
58 57 not (36 or 46 or 49) (312)
59 exp Hypoglycemia/ (18273)
60 52 and 59 (10136)
61 14 and 60 (400)
62 43 and 60 (101)
63 47 and 60 (126)
64 61 or 62 or 63 (580)
65 64 not 57 (218)
66 65 not (36 or 46 or 49) (193)
67 exp “Costs and Cost Analysis”/ (145993)
68 15 and 67 (51)
69 exp Economics/ (413412)
70 ec.fs. (261917)
71 69 or 70 (488778)
72 15 and 71 (82)
73 72 not 68 (31)
74 from 73 keep 1-31 (31)

Search for trials

Database: Ovid MEDLINE(R) <1950 to November Week 2 2007>

1 exp insulin/ (130835)
2 exp hypoglycemic agents/ (151706)
3 exp Blood Glucose/ (98489)
4 (insulin or hypoglycemic agent$ or hypoglycaemic agent$ or glycemic control or glycaemic control).mp. {mp=title, original title, abstract, name of substance word, subject heading word} (243159)
5 1 or 2 or 3 or 4 (292506)
6 Critical Illness/ (8301)
7 critical care/ or intensive care/ (28092)
8 exp Perioperative Care/ (60582)
9 exp Postoperative Period/ (28181)
10 ((critical$ adj6 ill$) or critical care or icu or intensive care or burn unit$ or coronary care).mp. {mp=title, original title, abstract, name of substance word, subject heading word} (103498)
11 intensive care units/ or burn units/ or coronary care units/ or recovery room/ (27247)
12 postoperative complications/ or prosthesis-related infections/ or surgical wound dehiscence/ or surgical wound infection/ (252519)
13 (postoperative$ or post operative$).mp. {mp=title, original title, abstract, name of substance word, subject heading word} (457854)
14 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 (582795)
15 5 and 14 (5822)
16 randomized controlled trial.pt. (246761)
17 controlled clinical trial.pt. (77022)
18 randomized controlled trials.sh. (52472)
19 random allocation.sh. (59778)
20 double blind method.sh. (94781)
21 single blind method.sh. (11591)
22 16 or 17 or 18 or 19 or 20 or 21 (418296)
23 (animals not human).sh. (4261058)
24 22 not 23 (382274)
25 clinical trial.pt. (444490)
26 exp clinical trials/ (199910)
27 (clin$ adj25 trial$).ti,ab. (139332)
28 ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. (94254)
29 placebos.sh. (26956)
30 placebo$.ti,ab. (106977)
31 random$.ti,ab. (394441)
32 research design.sh. (50582)
33 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 (887876)
34 33 not 23 (887876)
35 34 or 24 (798240)
36 15 and 35 (979)
37 exp Myocardial Infarction/ (115916)
38 exp Hospitalization/ (107713)
39 exp Inpatients/ (6673)
40 exp Cerebrovascular Accident/ (44100)
41 cerebrovascular disorders/ or brain ischemia/ or exp “intracranial embolism and thrombosis”/ or exp intracranial hemorrhages/ (112871)
42 exp myocardial revascularization/ or exp coronary artery bypass/ (56866)
43 37 or 40 or 41 or 42 (300510)
44 5 and 43 (4061)
45 35 and 44 (657)
46 45 not 36 (544)
47 38 or 39 (113294)
48 5 and 47 (1078)
49 35 and 48 (202)
50 49 not (36 or 46) (114)
51 exp Hypoglycemia/ci, ep, et {Chemically Induced, Epidemiology, Etiology} (8651)
52 1 or 2 or 4 (250082)
53 51 and 52 (5520)
54 14 and 53 (180)
55 43 and 53 (41)
56 47 and 53 (65)
57 54 or 55 or 56 (276)
58 57 not (36 or 46 or 49) (254)
59 exp Hypoglycemia/ (17277)
An additional search for adverse effects used the above strategy through line 71, followed by:

72 (ae or po or to).fs. (1254721)
73 exp Drug Toxicity/ (15829)
74 medical errors/ or medication errors/ (13158)
75 exp Drug Interactions/ (116890)
76 72 or 73 or 74 or 75 (1359022)
77 1 or 3 (186918)
78 6 or 7 or 8 or 9 or 11 or 12 (379861)
79 77 and 78 (2545)
80 76 and 79 (364)
81 limit 80 to english language (296)
82 limit 81 to humans (276)
83 15 and 76 (871)
84 limit 83 to english language (725)
85 limit 84 to humans (668)
86 85 not 82 (392)
87 from 82 keep 1-276 (276)
88 from 86 keep 1-392 (392)

Database: EBM Reviews - Database of Abstracts of Reviews of Effects <3rd Quarter 2008>

1 (insulin or hypoglycemic agent$ or hypoglycaemic agent$ or glycemic control or glycaemic control).mp. {mp=title, full text, keywords} (163)
2 ((critical$ adj6 ill$) or critical care or icu or intensive care or burn unit$ or coronary care).mp. {mp=title, full text, keywords} (327)
3 (postoperative$ or post operative$).mp. {mp=title, full text, keywords} (705)
Database: EBM Reviews - Cochrane Central Register of Controlled Trials <3rd Quarter 2008>

1 (insulin or hypoglycemic agent$ or hypoglycaemic agent$ or glycemic control or glycaemic control).mp. {mp=title, original title, abstract, mesh headings, heading words, keyword} (14093)
2 ((critical$ adj6 ill$) or critical care or icu or intensive care or burn unit$ or coronary care).mp. {mp=title, original title, abstract, mesh headings, heading words, keyword} (6526)
3 (postoperative$ or post operative$).mp. {mp=title, original title, abstract, mesh headings, heading words, keyword} (36957)
4 2 or 3 (42208)
5 1 and 4 (541)
6 from 5 keep 1-541 (541)

SECTION B. Methods

Search strategy

We searched MEDLINE and the Cochrane Database of Systematic Reviews for literature published from database inception through January 2010 and obtained additional articles from consultation with experts and from reference lists of pertinent studies, reviews, and editorials. We updated this search for the purposes of this report in October 2011. Appendix Table 1 provides the search strategies in detail. We searched clinicaltrials.gov for information about unpublished studies. All citations were imported into an electronic database (EndNote X2, Thomson Reuters, New York, NY).

Study selection

Three investigators reviewed the abstracts of citations identified from literature searches. Full-text articles of potentially relevant abstracts were retrieved for further review. Eligible articles were published in English and provided primary data on the use of IIT in hospitalized patients. We excluded studies that evaluated fixed-dose insulin and glucose-insulin-potassium (GIK) infusions.

To evaluate the efficacy of and hypoglycemia risk associated with IIT in hospitalized patients, we considered randomized controlled trials that reported at least one of the following prespecified outcomes: mortality, cardiovascular events, congestive heart failure, disability, wound infection, sepsis, or renal failure requiring hemodialysis. We defined perioperative trials as those in which IIT was begun pre-, intra-, or immediately post-operatively and discontinued less than 24 hours post-operatively.
Because the safety of IIT may vary based on intervention and implementation characteristics, we evaluated hypoglycemia rates in controlled and uncontrolled studies of IIT protocols, even if they did not report other health outcomes (study selection details in Appendix Table 1).

To assess the risk of hypoglycemia associated with IIT, we included controlled and uncontrolled studies that evaluated IIT protocols in hospitalized patients, even if they did not report health outcomes. We excluded IIT studies that did not report rates of hypoglycemia [1-12]. In order to avoid studies with potential selection bias, we excluded prospective cohort studies in which patients were not consecutively enrolled or in which there was excessive loss to follow-up [12-21]. Because tight glycemic control strategies require personnel training and institutional acceptance, we excluded studies in which the intervention was evaluated over a short period of time (defined as 6 months or less) as we felt these studies were less likely to provide externally valid results [22-27].

**Data extraction and quality assessment**

From each study, we abstracted the following: study design, objectives, setting, demographics (sex, age, baseline morbidity), subject eligibility and exclusion criteria, number of subjects, years of enrollment, duration of follow-up, study and comparator interventions, method used to monitor blood glucose, target range for blood glucose control, outcomes measured, analytic method used, variables adjusted in the analysis, results of the study and mean blood glucose achieved in each group, information on concomitant therapy/nutrition, occurrence of hypoglycemia in each group, and any other adverse events.

The quality of each study was rated as good, fair, or poor based on U.S. Preventive Task Force Service criteria [28]. When reviewers disagreed about quality rating, consensus was reached through discussion with all authors.

**Meta-analysis**

We conducted meta-analyses using IIT studies identified in our original search through January 2010. Studies identified from the update search through October 2011 were described, but not included in these meta-analyses. The primary outcome of interest was short-term mortality, defined as mortality occurring within 28 days or during the ICU or hospital stay. If studies reported more than one of these outcomes, we preferentially used 28-day mortality for the analysis, followed by hospital- or ICU-mortality. We conducted a sensitivity analysis based on short-term mortality definition. Secondary outcomes included 90- or 180-day mortality, infection, length of stay, and hypoglycemia. For each outcome, we abstracted the number of events and total subjects from each treatment arm and obtained a pooled estimate of relative risk (RR) using a random effects model [29]. Statistical heterogeneity was assessed by Cochran’s Q test and I² statistic [30]. All analyses were performed using Stata 10.0 (StataCorp, College Station, TX, 2007).

We conducted prespecified subgroup analyses comparing ICU with non-ICU studies, and sensitivity analyses on the following aspects: 1) the proportion of diabetic patients included, using 25% as a cut-point based on a natural division in the included studies; 2) mean blood glucose.
glucose achieved in the intervention group, using 6.7 mmol/L (120 mg/dL) as the cut-point since a lower threshold (6.1 mmol/L, 110 mg/dL) would have yielded only one study; and 3) study quality.

**Study yield**

From our initial search through January 2010, we identified 3,055 titles and abstracts of which 461 articles selected for full-text review. We included 31 trials conducted among critically ill patients, patients with acute MI or stroke, or perioperative patients. We also found 29 insulin protocol studies not reporting health outcomes. Our update search through October 2011 identified an additional 331 titles and abstracts of which 40 articles were selected for full-text review. We included 2 trials conducted in neurologic intensive care units, 1 trial in gastrectomy patients, and 1 trial of a subcutaneous insulin regimen in general surgical ward patients. We also found 10 insulin protocol studies not reporting health outcomes. The yield is summarized in Figure 1.
Figure 1, Chapter 22. Management of inpatient hyperglycemia literature flow

Abstracts imported from MEDLINE (1950-January 2010) N = 2970

Abstracts imported from MEDLINE and Cochrane (Jan 2010-Oct 2011) N = 331

Reference lists, unpublished and recently published studies N = 84

Total citations identified for review N = 3,386

Total excluded articles = 424
Study design or article type out of scope = 151
Study population, outcome, intervention, or beyond scope = 114
Non-systematic or poor-quality systematic review = 76
Studies excluded from review of safety of insulin infusion = 30
Duplicate study data = 26
Systematic review containing 2 or fewer MICU/SICU trials = 2
Excluded from update search = 28

Total articles retrieved for full-text review N = 501

Safety of insulin infusions observational studies and trials not reporting health outcomes N = 39

31 included trials

MI/stroke/acute brain injury 13 RCTs

MICU/SICU 13 RCTs

Perioperative 8 RCTs

General surgical ward 1 RCT

C-54
References


Chapter 23. Interventions To Prevent Contrast-Induced Acute Kidney Injury

SECTION A. Literature Search

SEARCH METHODOLOGY

We conducted a structured search of PubMed using a search strategy developed by a medical librarian. The search strategy was last updated on December 6, 2011 and was as follows:
SECTION B. Methods

Based on the large number of systematic reviews identified by the above search, we opted to perform a systematic meta-review of the existing systematic reviews. We included only systematic reviews published since January 1, 2007. Two authors independently reviewed the 32 reviews identified through the PubMed search to identify systematic reviews and meta-analyses. All of the systematic reviews identified (N=20) were assessed for methodologic quality by two reviewers who independently completed the AMSTAR checklist. Disagreements in this process were resolved by consensus. The included systematic reviews were grouped according to the specific CI-AKI preventive intervention studied, and were summarized narratively.


SECTION A. Literature Search

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE:
English

SEARCH STRATEGY:
“Hospital Rapid Response Team”[Mesh] OR “rapid response team” OR “rapid response teams” OR “rapid response system” OR “rapid response systems” OR “medical emergency team” OR “medical emergency teams” OR “critical care outreach team” OR “critical care outreach teams” OR “patient at-risk team” OR “patient at-risk teams” OR “patient at risk team” OR “patient at risk teams” OR “emergency medical team” OR “emergency medical teams” AND effectiv* OR implement* OR success* OR fail* OR utiliz* OR adopt* OR “patient care” AND team* AND (emergency OR emergencies OR rapid OR “critical care”)

<table>
<thead>
<tr>
<th></th>
<th>Search string</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>(“contrast medium” OR “contrast media” OR “contrast dye” OR “radiographic contrast” OR “radiocontrast media” OR “radiocontrast medium” OR contrast agent*) AND (kidney diseases[ci] OR kidney[ae] OR kidney/de OR nephritis OR nephropath* OR nephrotox* OR renal insufficiencies[mh] OR renal insufficiency* OR diabetic nephropathies[mh] OR creatinine OR “kidney injury” OR “kidney dysfunction” OR “renal dysfunction”) OR (“contrast induced” OR “contrast associated” AND (renal OR kidney OR nephropath* OR nephrotox*)) OR (contrast media/ae AND (kidney diseases[majr] OR kidney[majr] OR diabetic nephropathy[majr])))</td>
<td>5217</td>
</tr>
<tr>
<td>#2</td>
<td>#1 limited to Randomized Controlled Trials, English language, publication date since 1/1/2001</td>
<td>193</td>
</tr>
<tr>
<td>#3</td>
<td>#1 limited to Systematic Reviews, English language, publication date since 1/1/2001</td>
<td>53</td>
</tr>
<tr>
<td>#4</td>
<td>#3 limited to publication date since 1/1/2007</td>
<td>32</td>
</tr>
</tbody>
</table>
AND
effectiv* OR implement* OR success* OR fail* OR utiliz* OR adopt*

NUMBER OF RESULTS: 1679

====================================================================

DATABASE SEARCHED & TIME PERIOD COVERED:
CINAHL: 2000-8/16/2011

SEARCH STRATEGY:
“rapid response team” OR “rapid response teams” OR “rapid response system” OR “rapid response systems” OR “medical emergency team” OR “medical emergency teams” OR “critical care outreach team” OR “critical care outreach teams” OR “patient at-risk team” OR “patient at-risk teams” OR “patient at risk team” OR “patient at risk teams” OR “emergency medical team” OR “emergency medical teams”
AND
effectiv* OR implement* OR success* OR fail* OR utiliz* OR adopt*

OR

“patient care” AND team* AND (emergency OR emergencies OR rapid OR “critical care”) 
AND
effectiv* OR implement* OR success* OR fail* OR utiliz* OR adopt*
Search modes - Phrase Searching (Boolean)

NUMBER OF RESULTS: 333

====================================================================

DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
‘rapid response team’/exp OR ‘rapid response team’ OR ‘rapid response teams’/exp OR ‘rapid response systems’/exp OR ‘rapid response system’ OR ‘rapid response systems’/exp OR ‘rapid response systems’ OR ‘medical emergency team’/exp OR ‘medical emergency team’ OR ‘medical emergency teams’/exp OR ‘medical emergency teams’ OR ‘critical care outreach team’ OR ‘critical care outreach teams’ OR ‘patient at-risk team’ OR ‘patient at-risk teams’ OR ‘patient at-risk teams’ OR ‘patient at-risk teams’ OR ‘patient at risk team’ OR ‘patient at risk teams’ OR ‘emergency medical team’ OR ‘emergency medical teams’ OR ((‘patient care’ NEAR/3 team*) AND (emergency OR emergencies OR rapid OR ‘critical care’))
AND
effectiv* OR implement* OR success* OR fail* OR utiliz* OR adopt*

NUMBER OF RESULTS: 594
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
“rapid response team” OR “rapid response teams” OR “rapid response system” OR “rapid response systems” OR “medical emergency team” OR “medical emergency teams” OR “critical care outreach team” OR “critical care outreach teams” OR “patient at-risk team” OR “patient at-risk teams” OR “patient at risk team” OR “patient at risk teams” OR “emergency medical team” OR “emergency medical teams”:ti,ab,kw or “patient care” AND team* AND (emergency OR emergencies OR rapid OR “critical care”):ti,ab,kw

NUMBER OF RESULTS: 72 (Syst Revs – 4, Other Revs – 7, Clin Trials – 55, Econ – 6)

SECTION B. Methods

PICOTS

<table>
<thead>
<tr>
<th>Elements</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Patients on general hospital wards - Adult and pediatric</td>
</tr>
<tr>
<td>Intervention</td>
<td>Rapid Response Systems</td>
</tr>
<tr>
<td>Comparator</td>
<td>Effectiveness: Usual practice</td>
</tr>
<tr>
<td>Implementation</td>
<td>- Technology/tools: criteria for activating team (extended vs restricted criteria), investment in human resources (team availability)</td>
</tr>
<tr>
<td></td>
<td>- Staff selection/ training: Physician on team (MET model) vs. Nurse –led (RRT model); investment in team; education/training of team and floor staff</td>
</tr>
<tr>
<td></td>
<td>- Identifying/addressing barriers/facilitators: Reluctance to call team, nursing workload, availability of team to respond</td>
</tr>
<tr>
<td>Outcomes</td>
<td>• Mortality (total or preventable)</td>
</tr>
<tr>
<td></td>
<td>• Incidence of cardio-respiratory arrest</td>
</tr>
<tr>
<td></td>
<td>• Unanticipated intensive care unit admission</td>
</tr>
<tr>
<td>Timing</td>
<td>Before and after intervention</td>
</tr>
<tr>
<td>Settings</td>
<td>Hospitals</td>
</tr>
</tbody>
</table>

Inclusion/exclusion criteria:
Studies from all countries and languages were included

Effectiveness: Included all studies with a comparison group and at least some component of an RRS. Critical Care Outreach Team studies were included if they also included a pre-intensive care unit RRS component (general response to all ward patients). Effectiveness studies were only included after November 2008, the end date for a high-quality systematic review and meta-analysis.

Implementation: Included qualitative and quantitative studies addressing implementation.

Studies were defined as qualitative research studies if they used a formal qualitative methodology such as interviews, focus groups, or ethnography
Studies were defined as quantitative implementation studies if they evaluated the impact of a change or difference in implementation strategy on utilization of the RRS and/or patient outcomes.

Chapter 25. Medication Reconciliation Supported by Clinical Pharmacists (NEW)

SECTION A. Literature Search

A search strategy comprising multiple terms was developed by a library scientist with extensive experience in conducting systematic reviews in collaboration with a physician health services researcher also very experienced in literature searching and with content expertise in patient safety. As noted in the detailed description of the search, databases covered included MEDLINE, EMBASE, and the Cochrane library.

Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1946 to July 16, 2012>
1  ((reconcil* adj3 medicat*) or (med* reconcil* or medrec)).mp.
2  patient admission/ or patient discharge/ or patient readmission/ or patient transfer/ or Continuity of Patient Care/ or transition.ti.
3  Medication Errors/ or ((medication or discrepanc* or discontinuit* or reconciliation).ti. or (medication adj8 discrepance*).ti,ab.)
4  (2 and 3) or 1
5  limit 4 to english

Embase <1980 to 2011 Week 18>
1  ((reconcil* adj3 medicat*) or (med* reconcil* or medrec)).mp.
2  Medication Errors/ or ((medication or discrepanc* or discontinuit* or reconciliation).ti. or (medication adj8 discrepance*).ti,ab.)
3  hospital admission/ or hospital discharge/ or hospital readmission/ or patient transfer*.mp. or (continuity adj3 care).mp. or transition.ti.
4  1 or (3 and 2)
5  limit 4 to english

Cochrane CENTRAL (Central Register of Controlled Trials) <June 2009>
#1 (medication reconciliation):ti,ab,kw
#2 “medication reconciliation”:ti,ab,kw
#3 (reconcil* near/3 medicat*):ti,ab,kw
#4 (medrec):ti,ab,kw
#5 (#1 OR #2 OR #3 OR #4)

SECTION B. Methods

Titles and abstracts were independently reviewed by 2 of 3 individuals, including a library scientist who has conducted numerous systematic reviews, a master’s level research assistant with content experience in patient safety, a physician trainee with health services research
experience. Disagreements were resolved by discussion between reviewers as well as and consultation with a physician health services researcher with expertise in patient safety and extensive experience with systematic reviews.
Chapter 26. Identifying Patients at Risk for Suicide: Brief Review (NEW)

SECTION A. Literature Search

To conduct the review, we searched PubMed in October 2011 using major heading search terms Suicide, and Hospital or Inpatient or Safety Management, for English language articles published starting in the year 2000. We expanded the search using the PubMed “related citations” feature, and Google Scholar to search for citing articles of those retained for review; we identified additional relevant articles by reference mining. We also searched PSNet. Clinical trials, large observational studies, reviews, and reports on implementations were given priority. Systematic reviews were scored for methodologic quality using the 11-point AMSTAR scale; items rated Not Applicable were not counted towards either the score or the total.

SECTION B. Methods

Titles, abstracts and articles were reviewed by a psychiatrist health services researcher with extensive experience in systematic reviews, including a prior review of suicide prevention programs. The synthesis was narrative.

Chapter 27. Strategies To Prevent Stress-Related Gastrointestinal Bleeding (Stress Ulcer Prophylaxis): Brief Update Review

SECTION A. Literature Search

We searched PubMed for relevant articles using the search terms “stress ulcer” and “stress ulcer prophylaxis”, limited to systematic reviews published in the past 5 years. This search identified 19 articles

SECTION B. Methods

Articles identified using the above strategies were reviewed by two practicing hospitalists, one of whom has prior expertise in conducting and analyzing systematic reviews. The systematic reviews identified through this search form the basis of this review. These systematic reviews were summarized narratively, and their reference lists were reviewed by hand to identify other key articles on costs and implementation.

Chapter 28. Prevention of Venous Thromboembolism: Brief Update Review

SECTION A. Literature Search

For this topic we did not do a formal literature search, as the principal reviews and trials were already known to the authors as part of their quality improvement work where previous comprehensive searches had been performed to identify the most pertinent and up to date literature.
SECTION B. Methods

These reviews and studies were reviewed by a surgeon health services researcher with clinical and quality improvement experience with venous thromboembolism. The synthesis was narrative.

Chapter 29. Preventing Patient Death or Serious Injury Associated With Radiation Exposure from Fluoroscopy and Computed Tomography: Brief Review (NEW)

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date limits</th>
<th>Platform/provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECRI Institute members website</td>
<td>Searched November 8, 2011</td>
<td>ECRI Institute</td>
</tr>
<tr>
<td>Institute for Healthcare Improvement</td>
<td>Searched November 14, 2011</td>
<td>ECRI Institute</td>
</tr>
<tr>
<td>PSNet</td>
<td>Searched November 14, 2011</td>
<td>Agency for Healthcare Research and Quality</td>
</tr>
<tr>
<td>PubMed</td>
<td>Searched November 11, 2011</td>
<td>National Library of Medicine</td>
</tr>
</tbody>
</table>

Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Non-journal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature as well as related citation searches using the Scopus database. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.) A number of organization websites were searched for relevant information, including: ECRI Institute members website, the Institute for Healthcare Improvement (ISI), and the Agency for Healthcare Research and Quality’s Patient Safety Network (PSNet).

The search strategies employed combinations of free text keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in PubMed syntax. A parallel strategy was used to search the databases comprising the Cochrane Library.

Medical Subject Headings (MeSH)

Conventions:
PubMed
[mh]  =  MeSH heading
[majr] =  MeSH heading designated as major topic
**Topic-Specific Search Terms**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
</table>
| Adverse effects of radiation therapy | "radiation injuries/prevention and control"[majr]  
"radiation-protective agents"[majr]  
"radiation monitoring"[majr]  
"radiation dosage"[majr]  
"dose-response relationship, radiation"[majr]  
"radiation protection"[majr]  
"fluoroscopy/adverse effects"[majr]  
"radiography, interventional/adverse effects"[majr]  
"radiotherapy/adverse effects"[majr]  
"radiation"[majr]  
"death"[majr]  
"mortality"[majr]  
"wounds and injuries"[majr]  
"burns"[mesh]  
"skin transplantation"[mesh] | radiation  
fluoroscop*  
injur*  
injury*  
death  
mortality  
injur*  
harm  
burn*  
skin graft  
skin transplant  
grade 3  
grade 4 |
| Programs | "outcome and process assessment (health care)"[majr]  
"safety management"[majr]  
"risk assessment"[majr]  
"secondary prevention"[mesh]  
"program development"[mesh]  
"program evaluation"[mesh]  
"health plan implementation"[mesh] | prevent*  
reduc*  
initiative*  
program*  
implement* |
| Study design | randomized controlled trial[pt]  
controlled clinical trial[pt]  
risked controlled trials[mh]  
random allocation[mh]  
double-blind method[mh]  
single-blind method[mh]  
clinical trial[pt]  
clinical trials[mh]  
research design[mh:noexp]  
comparative study[pt]  
evaluation studies[pt]  
evaluation studies as topic[mh]  
follow-up studies[mh]  
prospective studies[mh]  
cross-over studies[mh]  
meta-analysis[mh]  
meta-analysis[pt]  
outcomes research[mh]  
multicenter study[pt] | clinical trial  
clinical trials  
comparative study  
comparative studies  
evaluation study  
evaluation studies |
## SECTION B. Methods

Titles and abstracts were reviewed by a health services research methodologist with experience in both systematic reviews and radiation therapy. Our research was limited to studies implementing practices (e.g., protocols, technical measures) to reduce radiation exposure to patients from fluoroscopy and computed tomography-guided diagnostic and interventional procedures. The focus was on studies published from 2005 to the present that compared outcomes (e.g., radiation dose, imaging time) following implementation of these practices compared to a control period when the technologies were not in place. Potential barriers to implementation, technical difficulty of practices and reported harms from patient safety practices were also assessed. Included studies were narratively summarized by the author.
Chapter 30. Ensuring Documentation of Patients’ Preferences for Life-Sustaining Treatment: Brief Update Review

SECTION A. Literature Search

For this topic, since we had just completed a 2011 Agency for Healthcare Research and Quality systematic review on the topic of interventions to improve end-of-life care, we used syntheses and articles identified in this search, and did not conduct any additional literature searches.

SECTION B. Methods

Relevant reviews and studies were reviewed by a palliative care physician health services researcher with clinical and quality improvement experience with end-of-life care. The synthesis was narrative.

Chapter 31. Human Factors and Ergonomics

SECTION A and B. Literature Search and Methods

For this topic we determined that a systematic review of “Human Factors and Ergonomics” would be too diffuse to be useful to readers. Therefore this topic uses exemplars to illustrate different ways that human factors and ergonomics can be useful in patient safety.

Chapter 32. Promoting Engagement by Patients and Families To Reduce Adverse Events

SECTION A. Literature Search

SEARCH METHODOLOGIES

SEARCH #1:  
DATABASE SEARCHED & TIME PERIOD COVERED:  

LANGUAGE:  
English

SEARCH STRATEGY:  
“Physician–Patient Relations” OR “Nurse–Patient Relations” OR “Patient Participation” OR “Patient Education as Topic” OR “Social Responsibility” OR “Patient-Centered Care” OR “informed consent” OR “chronic disease”  
AND  
“adverse events” OR “Iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” or “Medical Errors/adverse effects” or “Safety Management” or “Cross Infection/prevention and control”
NUMBER OF RESULTS: 1673

SEARCH #2:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
Patient participation OR patient role OR patients role OR patient complain* OR patients complain*
AND
“adverse events” OR “Iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” or “Medical Errors/adverse effects” or “Safety Management” or “Cross Infection/prevention and control” OR safe* OR “medical error” OR “medical errors” OR mistake* OR “medication error” OR “medication errors”
AND
“patient participation”[All Fields]

NUMBER OF RESULTS: 4434

SEARCH #3:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
AND
“adverse events” OR “Iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” or “Medical Errors/adverse effects” or “Safety Management” or “Cross Infection/prevention and control” OR safe* OR “medical error” OR “medical errors” OR mistake* OR “medication error” OR “medication errors” OR adverse OR dangerous
AND
systematic[sb]

NUMBER OF RESULTS: 593
SEARCH #4:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
patient participation[mh] OR “patient participation”[tiab] OR “patient role” OR “patients role” OR patient complaint* OR patients complain* OR “patient reporting”[tiab] OR “patient reports”[tiab] OR “patients reporting”[tiab] OR “patients reports”[tiab] AND “adverse events” OR “Iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” OR “Medical Errors/adverse effects” or “Safety Management” or “Cross Infection/prevention and control” OR safe* OR “medical error” OR “medical errors” OR mistake* OR “medication error” OR “medication errors”

NUMBER OF RESULTS: 514

SEARCH #5:
DATABASE SEARCHED & TIME PERIOD COVERED:
Cochrane Database of Systematic Reviews – 2006-9/15/2011

SEARCH STRATEGY:
“Physician–Patient Relations” OR “Nurse–Patient Relations” OR “Patient Participation” OR “Patient Education” OR “informed consent” OR “patient reporting” OR “patient reports” OR “patients reporting” OR “patients reports” OR complain* OR patient participa* OR patients participa* OR “patient education” OR “education of patients” OR “patient role” OR “patient’s role” OR patients’ role* OR “health literacy” in Title, Abstract or Keywords AND “adverse events” OR “Iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” OR “Medical Errors/adverse effects” or “Safety Management” or “Cross Infection/prevention and control” OR safe* OR “medical error” OR “medical errors” OR mistake* OR “medication error” OR “medication errors” OR adverse OR dangerous in Title, Abstract or Keywords

NUMBER OF RESULTS: 909

SEARCH #6:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
“Physician–Patient Relations” OR “Nurse–Patient Relations” OR “Patient Participation” OR “Patient Education as Topic” OR “Social Responsibility” OR “Patient-Centered Care” OR “informed consent” OR “chronic disease” AND “adverse events” OR “Iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” OR “Medical Errors/adverse effects” OR “Safety Management” OR “Cross Infection/prevention and control”

NUMBER OF RESULTS: 2660

=====================================================================  
SEARCH #7:  
DATABASE SEARCHED & TIME PERIOD COVERED:  
Medline on OVID – 2000-9/19/2011  
SEARCH STRATEGY:  
Physician Patient Relations/ OR Nurse Patient Relations/ OR Patient Participation/ OR Patient Education as Topic/ or Social Responsibility.mp. OR Patient Centered Care/ OR informed consent.mp. OR chronic disease$.mp. AND (adverse event$ OR iatrogenic disease OR medical adj error$ OR safety adj2 manag$ OR cross adj2 Infection$ adj2 prevent$ OR adverse effect$).mp. [mp=protocol supplementary concept, rare disease supplementary concept, title, original title, abstract, name of substance word, subject heading word, unique identifier]  
NUMBER OF RESULTS: 1776

=====================================================================  
SEARCH #8:  
DATABASE SEARCHED & TIME PERIOD COVERED:  
Medline on OVID – 2000-9/19/2011  
SEARCH STRATEGY:  
(Patient adj2 participa$ or patient$ adj5 role or patient adj5 complain4 or patient$ adj3 involv$ or patient$ adj3 engag$ or patient$ adj3 report$).mp. AND (adverse adj2 event$).mp. or iatrogenic Disease/pc or Medical Errors/pc or Medical Errors/ae or Cross Infection/pc or safe$.mp. or unsaf$.mp. or medical.mp. adj3 error$.mp. or mistake$.mp. or medication.mp. adj3 error$.mp.  
NUMBER OF RESULTS: 532

=====================================================================
SEARCH #9:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
“adverse events” OR “iatrogenic Disease/prevention and control” OR “Medical Errors/prevention and control” OR “medication errors/prevention and control” OR “Medical Errors/adverse effects” OR “Safety Management” OR “Cross Infection/prevention and control” OR “infection control”
AND
“Physician-Patient Relations” OR “Nurse-Patient Relations” OR “Patient Participation” OR “Patient Education as Topic” OR “Patient-Centered Care” OR “patient reporting” OR “patient-empowering” OR “patient empowerment” OR “patient partnership” OR “patient activation” or “patient self-effectiveness” or “patient involvement”

NUMBER OF RESULTS: 1499

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SEARCH #10:
DATABASE SEARCHED & TIME PERIOD COVERED:
CINAHL – 2000-10/24/2011

SEARCH STRATEGY:
(TI (Physician n3 Patient n3 relation*) OR (Nurse n3 Patient n3 relation*) OR Patient n3 Participat* OR Patient n3 Education OR “Patient-Centered Care” OR “patient reporting” OR patient n2 empower* OR patient n3 partner* OR “patient activation” OR “patient self-effectiveness” OR patient n3 involv*)
OR AB (Physician n3 Patient n3 relation*) OR (Nurse n3 Patient n3 relation*) OR Patient n3 Participat* OR Patient n3 Education OR “Patient-Centered Care” OR “patient reporting” OR patient n2 empower* OR patient n3 partner* OR “patient activation” OR “patient self-effectiveness” OR patient n3 involv*)
OR MW (Physician n3 Patient n3 relation*) OR (Nurse n3 Patient n3 relation*) OR Patient n3 Participat* OR Patient n3 Education OR “Patient-Centered Care” OR “patient reporting” OR patient n2 empower* OR patient n3 partner* OR “patient activation” OR “patient self-effectiveness” OR patient n3 involv*)
AND
‘adverse events’ OR ‘iatrogenic disease’ OR ‘medical errors’ OR ‘medication errors’ OR ‘medication error’ OR ‘medical error’ OR (‘cross infection’ AND prevent*) OR ‘safety management’ OR ‘infection control’

NUMBER OF RESULTS: 1283

====================================================================

SEARCH #11:
DATABASE SEARCHED & TIME PERIOD COVERED:
Embase – 2000-10/27/2011

SEARCH STRATEGY:
AND
‘adverse events’ OR ‘iatrogenic disease’ OR ‘medical errors’ OR ‘medication errors’ OR ‘medication error’ OR ‘medical error’ OR ‘cross infection’ AND prevent* OR ‘safety management’ OR ‘infection control’

NUMBER OF RESULTS: 2869

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SEARCH #12a:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
AND
adverse OR iatrogenic OR error* OR harm* OR safe* OR (infection* AND prevent*) OR (infection* AND control*) in Title, Abstract or Keywords


=====================================================================}

SEARCH #12b:
DATABASE SEARCHED & TIME PERIOD COVERED:

SEARCH STRATEGY:
MeSH descriptor Physician-Patient Relations, this term only OR MeSH descriptor Patient Education as Topic, this term only OR MeSH descriptor Patient Participation explode all trees
AND
SECTION B. Methods

PICOTS

<table>
<thead>
<tr>
<th>Elements</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Patients in inpatient healthcare settings (adult and pediatric) and their family members</td>
</tr>
<tr>
<td>Intervention</td>
<td>Any intervention to encourage patient involvement in safety, including reporting adverse outcomes or errors</td>
</tr>
<tr>
<td>Comparator</td>
<td>Usual practice</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Effectiveness of the intervention</td>
</tr>
<tr>
<td>Timing</td>
<td>Before and after the intervention</td>
</tr>
<tr>
<td>Settings</td>
<td>Hospitals</td>
</tr>
</tbody>
</table>

Inclusion/exclusion criteria:
- Only English-language studies from the US, UK, Canada, and Australia were included in the present review, due to potentially significantly different cultural issues in patient engagement in their health care outside of these countries, as well as potential differences in tools for promoting engagement.
- Included studies were required to focus on hospital care settings (e.g., intensive care units) – patient engagement in safety in the home setting would be difficult to differentiate from patient self-management of their medications and care, when providers are not present.
- Only systematic reviews focusing on effectiveness and prospective, controlled studies were included.

Chapter 33. Promoting a Culture of Safety

SECTION A. Literature Search

Search Methodology

PubMed:
Limit from 2000
Final Search Strategy:
“patient safety culture” OR “safety culture survey” OR “safety attitude questionnaire” OR “safety attitudes questionnaire” OR “safety attitude” OR “patient safety practice” OR (“Hospital Survey” AND “patient safety culture”) OR “Manchester Patient Safety Framework” OR (“Patient Safety Culture” AND survey) OR “patient safety climate” OR ((“safety culture” OR “safety practice” OR “safety climate” OR “high reliability”) AND (rehabilitation OR snf OR “nursing home” OR “skilled nursing facility” OR hospital OR hospitals OR ICU OR intensive care unit OR “emergency room” OR attitude OR attitudes OR “assisted living” OR “long term care” OR resident OR residents OR “health center” OR...
healthcare OR “health care” OR patients OR patient OR intervention OR improvement OR scale OR “primary care”) OR “hospital patient climate safety scale” OR “culture of safety” OR “culture of trust” OR (culture[ti] reliability[ti])
Total Retrieved: 1637

Patient Safety Practices/Culture – PTN: HQ208-1000
search by J Larkin 9/19/2011

CINAHL:
Limit from 2000
Search Strategy:

“patient safety culture” OR “safety attitude questionnaire” OR “patient safety practice” OR “hospital survey on patient safety” OR “manchester patient safety framework” OR “hospital patient climate safety scale” OR “culture of safety” OR “culture of reliability” OR “culture of trust” OR (“safety culture” OR “safety practice” OR “safety climate” OR “high reliability” AND “skilled nursing facility” OR hospital OR hospitals OR ICU OR intensive care unit OR “emergency room” OR attitude OR attitudes OR “assisted living” OR “long term care” OR resident OR residents OR “health center” OR healthcare OR “health care” OR patients OR patient OR intervention OR improvement OR scale OR “primary care”)

802 results (NOT deduped with PubMed or any other database)
Results sent in .txt file (this is the generic bibliographic software file option) (unable to save to an .ris file from Ebsco)
PSC_Cinahl.txt

Patient Safety Practices/Culture – PTN: HQ208-1000
search by J Larkin 9/20/2011

Cochrane:
Limit from 2000
Search Strategy:

“patient safety culture” OR “safety attitude questionnaire” OR “patient safety practice” OR “hospital survey on patient safety” OR “manchester patient safety framework” OR “hospital patient climate safety scale” OR “culture of safety” OR “culture of reliability” OR “culture of trust” OR (“safety culture” OR “safety practice” OR “safety climate” OR “high reliability” AND “skilled nursing facility” OR hospital OR hospitals OR ICU OR intensive care unit OR “emergency room” OR attitude OR attitudes OR “assisted living” OR “long term care” OR

C-73
resident OR residents OR “health center” OR healthcare OR “health care” OR patients OR patient OR intervention OR improvement OR scale OR “primary care”

51 results (NOT deduped with PubMed or any other database)
PSC_cochrane.ATXT

Patient Safety Practices/Culture – PTN: HQ208-1000
search by J Larkin 9/20/2011

embase Search:
Limit from 2000
no mapping or exploding of terms and unchecked “medline”
Search Strategy:

“patient safety culture” OR “safety attitude questionnaire” OR “patient safety practice” OR “hospital survey on patient safety” OR “manchester patient safety framework” OR “hospital patient climate safety scale” OR “culture of safety” OR “culture of reliability” OR “culture of trust”
OR
(“safety culture” OR “safety practice” OR “safety climate” OR “high reliability”
AND
“skilled nursing facility” OR hospital OR hospitals OR ICU OR intensive care unit OR “emergency room” OR attitude OR attitudes OR “assisted living” OR “long term care” OR resident OR residents OR “health center” OR healthcare OR “health care” OR patients OR patient OR intervention OR improvement OR scale OR “primary care”)

1352 results (NOT deduped with PubMed or any other database)
In this instance, the combination of terms and this database in general tend to produce higher numbers of results. I do believe there will be a decent amount of overlap with the other databases though.
PSC_embase.ris

Patient Safety Practices/Culture – PTN: HQ208-1000
search by J Larkin 9/19/2011

PsycInfo Search:
Limit from 2000
Search Strategy:

“patient safety culture” OR “safety attitude questionnaire” OR “patient safety practice” OR “hospital survey on patient safety” OR “manchester patient safety framework” OR “hospital patient climate safety scale” OR “culture of safety” OR “culture of reliability” OR “culture of trust”
OR
(“safety culture” OR “safety practice” OR “safety climate” OR “high reliability”
AND
“skilled nursing facility” OR hospital OR hospitals OR ICU OR intensive care unit OR “emergency room” OR attitude OR attitudes OR “assisted living” OR “long term care” OR resident OR residents OR “health center” OR healthcare OR “health care” OR patients OR patient OR intervention OR improvement OR scale OR “primary care”)

727 results (NOT deduped with PubMed or any other database)
Results sent in .txt file(this is the generic bibliographic software file option) (unable to save to an .ris file from Ebsco)
PSC_Psycinfo.txt

SECTION B. Methods

PICOTS

<table>
<thead>
<tr>
<th>Elements</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Patients in inpatient healthcare settings Adult and pediatric</td>
</tr>
<tr>
<td>Intervention</td>
<td>Promoting a culture of safety</td>
</tr>
<tr>
<td>Comparator</td>
<td>Usual practice</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Overall - Change in patient safety culture/climate - Clinical indicators of safety/harm where available</td>
</tr>
<tr>
<td>Timing</td>
<td>Before and after the intervention</td>
</tr>
<tr>
<td>Settings</td>
<td>Hospitals</td>
</tr>
</tbody>
</table>

Inclusion/exclusion criteria:

- Only English-language studies from the US, UK, Canada, and Australia were included in the present review. While there are a growing number of studies that have translated English-language surveys of culture into other languages, there is still limited evidence that construct validity of such measures is comparable across samples.
- Included studies were required to focus on in-patient units within hospital care settings (e.g., intensive care units). Studies in the operating room, radiology, and other non-inpatient units were not included in this review.
- Included studies had to report on measures of culture over at least two points in time.
- Included studies were also required to use a psychometrically valid measure of safety culture that is present in the peer-reviewed literature. As a guideline, studies that utilized one of the following measures of patient safety culture were included: hospital survey on patient safety culture (HSOPSC) / HSOPS, Hospital Survey on Patient Safety Patient Safety Climate/ patient safety climate in health care organizations (PSCHO), Safety Climate Survey (SCS) Safety Attitudes Questionnaire (SAQ) Hospital safety climate scale (HSC) Operating Room Management Attitudes Questionnaire (ORMAQ) Hospital Survey on Patient Safety Stanford/PSCI Culture Survey Safety Climate Scale MSSA, Medication Safety Self Assessment HTSSCS, Hospital Transfusion Service Safety Culture Survey Manchester Patient Safety Framework.
- Interventions had to target practicing health care professionals or para-professionals. Studies examining PSPs aimed at medical or nursing students, or otherwise including only education outside of a clinical setting, were not included.
- The stated purpose of the PSP described had to specifically include aims “to improve culture”.
-Studies specifically targeting patient safety culture were included. Studies of other types of culture (e.g., general organizational culture) were not included.
-Only prospective studies were included.

Chapter 34. Effect of Nurse-to-Patient Staffing Ratios on Patient Morbidity and Mortality

SECTION A. Literature Search

DATABASE SEARCHED & TIME PERIOD COVERED:
Web of Science – 2007-9/12/2012

SEARCH STRATEGY:
“Forward searches” on the following 4 source publications:

Kane RL, Shamliyan T, Mueller C, Duval S, Wilt TJ.

NUMBER OF RESULTS: 78

Robert L. Kane, MD,* Tatyana A. Shamliyan, Christine Mueller, Sue Duval, and Timothy J. Wilt

NUMBER OF RESULTS: 149

Aiken LH, Clarke SP, Cheung RB, Sloane DM, Silber JH.
“Educational levels of hospital nurses and surgical patient mortality.”

NUMBER OF RESULTS: 337

Needleman J, Buerhaus P, Mattke S, Stewart M, Zelevinsky K.
“Nurse-staffing levels and the quality of care in hospitals.”

NUMBER OF RESULTS: 131

TOTAL NUMBER AFTER REMOVAL OF DUPLICATES: 546

SECTION B. Methods
The figure shows the flow of articles through the review process. With one exception we did not include any additional cross-sectional studies of association. The one exception is detailed in the text.

References


Chapter 35. Patient Safety Practices Targeted at Diagnostic Errors (NEW)

SECTION A. Literature Search

We designed a four-pronged literature search strategy to identify a broad range of interventional studies with implications for errors in clinical diagnosis. In the first mechanism of our overall strategy, we utilized the Agency for Healthcare Research and Quality’s Patient Safety Network (PSNet, see psnet.ahrq.gov). The PSNet website contains regularly-updated resources related to patient safety, and therefore, the PSNet online database was searched for articles classified under the safety target “diagnostic error.” We used articles from this search in the final review, and also to test search terms for the PubMed MEDLINE database search. In the second search mechanism, we hand-screened two previous systematic reviews related to diagnostic errors, and adapted their search strategies for our review. In the third mechanism, a structured search was built to identify published literature indexed to the PubMed MEDLINE database (see Table 1). In the fourth mechanism, we reviewed reference lists of articles flagged in the earlier search phases for the purpose of identifying further eligible studies.

During the first review phase, every article identified through the first three mechanisms (n = 1,389) was screened by two independent reviewers who recommended the study for inclusion or exclusion based upon title and abstract (if available). To make these recommendations, reviewers excluded those studies that: (1) did not contain an intervention component, (2) contained an intervention component unrelated to diagnostic errors, or (3) did not report patient-related outcomes. Discrepancies between reviewer’s recommendations in this phase were evaluated by the entire team until a consensus was achieved. Articles that met our inclusion criteria proceeded to the second review phase, a full text review (n = 269). During the full text review, our final inclusion criteria required that studies reported: (1) results from an intervention related to diagnostic errors, and (2) relevant patient outcomes, or proxy measures of patient outcomes, indicating that (3) the study was conducted with real patients. Again, two independent reviewers evaluated full-text articles and recommended them for inclusion in the final report. The fourth search mechanism—the references review—was conducted by one researcher who screened 2,332 article titles. For all relevant articles, the abstracts were reviewed (n = 115) using the same inclusion criteria as above. Once an abstract was considered relevant, it entered data abstraction review by two separate reviewers. Discrepancies between reviewer recommendations in the second full-text phase were again addressed by the team consensus method. Studies that met the all aforementioned requirements in the second phase were included within the chapter (n = 91). Data were then abstracted from the final set of articles by two independent abstractors, and discrepancies in the data abstraction phase were evaluated by the team consensus method.

Figure 2 summarizes details number of studies identified initially by the four search mechanisms, and the number of included and excluded studies from each review phase.

Search Limitation: Due to the variety of potential topics related to diagnostic errors, the search strategy was built to identify a broad base of literature addressing potential contributors to errors across clinical domains and care settings. However, the current strategy did not include additional searches to directly target interventional types with lower yields as might be expected
if focusing on a specific clinical specialty or care setting. For example, the major subheading search for “Delayed Diagnosis” in MEDLINE would likely capture studies with a primary focus related to the current review, but may not capture a study primarily focusing on particular clinical processes such as x-ray review for injuries. The extensive number of possible search terminology combinations using specific clinical domains (e.g., “radiology”), care settings (e.g., “critical care”), and intervention types (e.g., “double review”) where diagnostic errors may occur was beyond the scope of the current review. However, with our extensive reference review we expect that our included studies represent at a minimum a reasonable probe of the literature for certain clinical specialties, care settings, and intervention types likely to be of importance to reducing diagnostic errors (e.g., evaluations of an additional reviewer of radiology reports added to the diagnostic pathway; laboratory-focused interventions).

Table 1, Chapter 35. MEDLINE search strategy

<table>
<thead>
<tr>
<th>The final search was performed on October 10, 2011. The search was conducted using PubMed MEDLINE and was limited to English language publications.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following two search strategies were used in conjunction with one another to identify articles with diagnostic error reduction interventions published between 1980 and 2011.</td>
</tr>
</tbody>
</table>


Search Strategy B replicates that used by Singh et al”, though for a wider date range. Citations from their search dates (2000-2009) were removed from both Search A and B, so as not to duplicate their work.

**References**


SECTION B. Methods

Figure 2, Chapter 35. Diagnostic errors systematic review flow chart

Chapter 36. Monitoring Patient Safety Problems (NEW)

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

<table>
<thead>
<tr>
<th>Name</th>
<th>Date limits</th>
<th>Platform/provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMBASE (Excerpta Medica)</td>
<td>1996 – September 21, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>1996 – September 21, 2011</td>
<td>OVID SP</td>
</tr>
<tr>
<td>PreMEDLINE</td>
<td>Searched September 22, 2011</td>
<td>PubMed</td>
</tr>
<tr>
<td>PSNet</td>
<td>Searched September 13, 2011</td>
<td>AHRQ</td>
</tr>
</tbody>
</table>

Hand Searches of Journal and Nonjournal Literature

Journals and supplements maintained in ECRI Institute’s collections were routinely reviewed. Nonjournal publications and conference proceedings from professional organizations, private agencies, and government agencies were also screened. Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.)
The search strategies employed combinations of freetext keywords as well as controlled vocabulary terms including (but not limited to) the following concepts. The strategy below is presented in OVID syntax; the search was simultaneously conducted across EMBASE and MEDLINE.

**Medical Subject Headings (MeSH), Emtree and Keywords**

Conventions:

**OVID**

$ = truncation character (wildcard)

exp = “explodes” controlled vocabulary term (e.g., expands search to all more specific related terms in the vocabulary’s hierarchy)

.de. or

/ = limit controlled vocabulary heading

.fs. = floating subheading

.hw. = limit to heading word

.md. = type of methodology (PsycINFO)

.mp. = combined search fields (default if no fields are specified)

.pt. = publication type

.ti. = limit to title

.tw. = limit to title and abstract fields

**PubMed**

[mh] = MeSH heading

[majr] = MeSH heading designated as major topic

[pt] = publication type

[sb] = subset of PubMed database (PreMEDLINE, Systematic, OldMEDLINE)

[sh] = MeSH subheading (qualifiers used in conjunction with MeSH headings)

[tiab] = keyword in title or abstract

**Topic-Specific Search Terms**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Controlled Vocabulary</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse events</td>
<td>ae.fs. Adverse outcome/ exp Cross infection/ Hospital infection/ Iatrogenic disease/ exp Medical errors/</td>
<td>Administration Adverse events Diagnostic Error$ Iatrogenic Medical Medication Nosocomial</td>
</tr>
<tr>
<td>Chart review</td>
<td>Concurrent review/ Documentation/ Drug utilization review/ Medical audit/ Medical records/ Medical record review/</td>
<td>Chart review Case finding Computerized surveillance</td>
</tr>
<tr>
<td>Patient safety</td>
<td>Patient safety/ Safety/ Safety management</td>
<td>Patient safety Patient Safety Organization PSO</td>
</tr>
<tr>
<td>Concept</td>
<td>Controlled Vocabulary</td>
<td>Keywords</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Reporting Systems</td>
<td>Medline/Embase</td>
<td>Adverse drug reaction reporting systems/ Population surveillance/ exp Product surveillance, postmarketing/ exp Postmarketing surveillance/ Sentinel surveillance/</td>
</tr>
<tr>
<td></td>
<td>PSNet</td>
<td>Error reporting Government reporting Institutional reporting Reporting</td>
</tr>
<tr>
<td>Trigger tools</td>
<td>Medline/Embase</td>
<td>Automated Automatic Computer-based detection Data mining</td>
</tr>
<tr>
<td></td>
<td>PSNet</td>
<td>Electronic adj2 screen$ Surveillance Trigger tool$</td>
</tr>
<tr>
<td></td>
<td>PSNet</td>
<td>Computerized adverse event detection Electronic health records</td>
</tr>
</tbody>
</table>

**Embase/Medline/Premedline**  
English language, human, remove overlap

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adverse events</td>
<td>Ae.fs. or exp cross infection/ or iatrogenic disease/ or exp medical errors/ or adverse outcome/ or hospital infection/ or iatrogenic disease/</td>
</tr>
<tr>
<td>2</td>
<td>Iatrogenic or nosocomial or (hospital adj acquired) or ((medical or medication or diagnostic or administration) adj2 error$)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Combine sets</td>
<td>1 or 2</td>
</tr>
<tr>
<td>4</td>
<td>Direct observation</td>
<td>Direct observation or (executive adj walk$)</td>
</tr>
<tr>
<td>5</td>
<td>Chart review</td>
<td>Chart review or chart$.ti. or case finding</td>
</tr>
<tr>
<td>6</td>
<td>Concurrent review/ or documentation or drug utilization review/ or medical audit/ or medical records/ or medical record review/ or utilization review/</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Combine sets – chart review</td>
<td>5 or 6</td>
</tr>
<tr>
<td>8</td>
<td>Trigger tools</td>
<td>(electronic medical record/ or hospital information systems/ ) and (data mining or automated or automatic or surveillance)</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Electronic adj2 screen$</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Computer-based detection</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Trigger tool$</td>
</tr>
<tr>
<td>12</td>
<td>Combine sets</td>
<td>8 or 9 or 10 or 11</td>
</tr>
<tr>
<td>13</td>
<td>Combine sets – trigger tools</td>
<td>3 and (4 or 7 or 12)</td>
</tr>
</tbody>
</table>
**Patient Safety Net (PSNET)**

<table>
<thead>
<tr>
<th>Set Number</th>
<th>Concept</th>
<th>Search statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Browsed categories:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Computerized adverse event detection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Governmental reporting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Institutional reporting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-governmental reporting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patient safety indicators</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Downloaded</th>
<th>Total Retrieved</th>
<th>Total Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>176</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION B. Methods**

**Inclusion/Exclusion Criteria**

Healthcare organizations have been using a wide array of methods to detect patient safety problems. These methods include incident reporting, direct observation of patient care, chart review, analysis of malpractice claims, patient complaints and reports to risk management, executive walk rounds, trigger-tool use, patient interviews, morbidity and mortality conferences, autopsy, and clinical surveillance. Many of these methods (e.g., trigger tools) can be further categorized by the targeted problems (e.g., medication-related medical errors or iatrogenic infections), tools, algorithms, and data source used. Given the limited time frame for this review, we focus this chapter on general approaches to detecting patient safety problems that involve using multiple methods (e.g., incident reporting, executive walk rounds, clinical surveillance, chart review, and trigger tools) to collect data. We primarily reviewed studies that compared the utilities of different methods, because we believe that understanding the strengths and weaknesses of different methods is most relevant to decision makers who need to form an effective strategy for monitoring patient safety problems for their organizations. Comparison studies that used one method (e.g., chart review) as a gold standard to validate another method (e.g., incident reporting) were not included for this chapter, because, in essence, these studies still focused on one individual method (i.e., the method being validated).

Only full published studies were considered for review (meeting abstracts were excluded). Only English-language publications were eligible for inclusion. For the effectiveness and harms of the PSP, we considered including studies of any design (e.g., systematic reviews, randomized controlled trials, non-randomized controlled trials, prospective and retrospective observational studies, surveys) that may provide relevant data. For the implementation and context of the PSP, we primarily abstracted data from the effectiveness or safety studies being reviewed.

**Risk of Bias and Strength of Evidence**

We did not assess the risk of bias of the included studies or the overall strength of evidence. The body of evidence consists of one systematic review and several studies that compared the types and numbers of patient safety problems identified using different methods. No adequately
validated tool is available for assessing this type of comparison studies or for assessing the overall strength of evidence that mixes such comparison studies with a systematic review.

Chapter 37. Interventions To Improve Care Transitions at Hospital Discharge (NEW)

SECTION A. Literature Search

DATABASE SEARCHED & TIME PERIOD COVERED:

LANGUAGE: English

SEARCH #1:


NUMBER OF RESULTS: 3540

SEARCH #2:

NUMBER OF RESULTS: 5160

====================================================================
DATABASE SEARCHED & TIME PERIOD COVERED:
Cochrane Central Register of Controlled Trials – 1990-8/12/2011

LANGUAGE:
English

SEARCH STRATEGY:
(transitional care OR readmission OR readmit* OR patient discharg* ):ti,ab,kw or (length of stay OR “length-of-stay”) AND discharge plan*:ti,ab,kw or (emergency service,hospital OR emergency service* OR emergency room* ):ti,ab,kw
AND
(discharg* OR home visits OR home visit* OR house calls OR house call*:ti,ab,kw
AND
(interven* OR model* OR strateg* OR improv* OR practices OR random*:ti,ab,kw
AND
home OR house

NUMBER OF RESULTS: 1030
NUMBER AFTER REMOVAL OF DUPLICATES: 620

=====================================================================  
DATABASE SEARCHED & TIME PERIOD COVERED:
EconLit – 1990-8/15//2011

LANGUAGE:
English

SEARCH STRATEGY:
EconLit – 1990-8/15/2011

SEARCH STRATEGY:
transitional care OR readmission OR readmit* OR patient discharg* OR ( (length of stay OR “length-of-stay”) AND discharge plan* ) OR emergency service,hospital OR emergency service* OR emergency room*
AND
discharg* OR home visits OR home visit* OR house calls OR house call*

OR

readmit* OR readmission* OR rehospitali* OR re-hospitali*
AND
home OR house

NUMBER OF RESULTS: 48
NUMBER AFTER REMOVAL OF DUPLICATES: 38
DATABASE SEARCHED & TIME PERIOD COVERED:
PsycINFO – 1990-8/15/2011

SEARCH STRATEGY:
transitional care OR readmission OR readmit* OR patient discharg* OR ( (length of stay OR “length-of-stay”) AND discharge plan* ) OR emergency service,hospital OR emergency service* OR emergency room*
AND
discharg* OR home visits OR home visit* OR house calls OR house call*
AND
home OR house
Search modes - Phrase Searching (Boolean)

OR
“transitional care”

OR
readmit* OR readmission* OR rehospitali* OR re-hospitali*
AND
home OR house

NUMBER OF RESULTS: 617
NUMBER AFTER REMOVAL OF DUPLICATES: 407

DATABASE SEARCHED & TIME PERIOD COVERED:
Embase – 1990-9/12/2011

LANGUAGE:
English

SEARCH STRATEGIES:

SEARCH #1 (S. Rennke Strategy)
‘transitional care’ OR care NEAR/3 transition* OR discharge NEAR/3 plan* OR patient NEAR/3 discharg* AND [humans]/lim AND [english]/lim AND [1990-2012]/py 8,919 View | Edit
#1transitional AND care OR care AND transition* OR transition* AND in AND care OR transition* OR discharge AND plan* OR patient AND discharg* AND
readmi* OR rehospital* OR (avoid* OR reduc* AND admission*) OR medical NEAR/2 error* OR medical NEAR/2 mistake* OR medication NEAR/2 error* OR adverse NEAR/2 event* OR ‘continuity of patient care’ OR home NEAR/2 visit* OR house NEAR/2 call* OR aftercare OR team*
AND interven* OR model*:ti OR strateg* OR improv*:ti OR implement* OR practices OR random* OR ‘controlled clinical trial’ OR ‘controlled clinical trials’ OR program OR programs OR programme OR programmes OR (‘program evaluation’ AND outcome*) OR systematic NEAR/2 review*
AND human

SEARCH #2 (Revision 1):
‘transitional care’ OR rehospitali* OR discharge NEAR/2 plan* OR (emergency NEAR/2 service* OR emergency NEAR/2 room* AND ‘hospital readmission’) OR (medical NEAR/2 error* OR medical NEAR/2 mistake* OR medication NEAR/2 error* OR adverse NEAR/2 event* OR ‘patient care team’/exp OR ‘patient care team’ OR ‘patient care teams’ OR multidisciplinary NEAR/2 team* AND hospital NEAR/2 readmi*)
AND readmi* OR patient NEAR/2 discharg* OR (avoid* OR reduc* AND admission*) OR ‘continuity of care’ OR ‘continuity of patient care’ OR home NEAR/2 visit* OR house NEAR/2 call* OR aftercare
AND interven* OR model*:ti OR strateg* OR improv*:ti OR implement* OR practices OR random* OR clinical NEAR/2 trial* OR (program* NEAR/2 evaluation* AND treatment NEAR/2 outcome*) OR systematic NEAR/2 review*

SEARCH #3 (Revision 2):
‘transitional care’ OR rehospitali* OR (discharge NEAR/2 plan* OR emergency NEAR/2 service* OR emergency NEAR/2 room* OR medical NEAR/2 error* OR medical NEAR/2 mistake* OR medication NEAR/2 error* OR adverse NEAR/2 event* OR ‘patient care team’/exp OR ‘patient care team’ OR ‘patient care teams’ OR multidisciplinary NEAR/2 team* AND readmi*)
AND readmi* OR postdischarge OR ‘post-discharge’ OR patient NEAR/2 discharg* OR (avoid* OR reduc* AND (admission* OR admit*)) OR ‘continuity of care’ OR ‘continuity of patient care’ OR home NEAR/2 visit* OR house NEAR/2 call* OR aftercare
AND interven* OR model*:ti OR strateg* OR improv*:ti OR implement* OR practices OR random* OR clinical NEAR/2 trial* OR (program* NEAR/2 evaluation* AND treatment NEAR/2 outcome*) OR systematic NEAR/2 review*

ALL THREE SEARCHES WERE COMBINED (“OR’ED TOGETHER) & DUPLICATES WERE REMOVED

TOTAL NUMBER OF RESULTS: 1427
DATABASE SEARCHED & TIME PERIOD COVERED:
CINAHL – 1990-9/12/2011

LANGUAGE:
English

SEARCH STRATEGY:
transitional care OR care transition* OR rehospital* OR discharge plan* OR “patient care team” OR “multidisciplinary team” OR ( (emergency service, hospital OR emergency service* OR emergency room*) AND readmi* ) OR medical error OR medical errors OR medical mistake* OR medication errors OR adverse event* OR postdischarge OR “post-discharge” OR readmi* OR patient discharg* OR “continuity of patient care” OR “continuity of care” OR “home visits” OR “home visit” OR “house calls” OR “house call” OR aftercare OR ( (avoid* OR reduc*) AND (admit* OR admission ) ) OR interven* OR strateg* OR implement* OR practices OR random* OR “controlled clinical trial” OR “controlled clinical trials” OR program* OR systematic review* OR ( “program evaluation” AND outcome* ) OR TI ( model* OR improv* )

NUMBER OF RESULTS: 1235
NUMBER OF RESULTS AFTER REMOVING DUPLICATES: 588

SECTION B. Methods
Figure 1, Chapter 37. Theoretical model for the effectiveness of patient safety practices for transitional care

Health care system factors
- Country
- Integration of care
- Safety Culture
- Teamwork

Risk for Readmission or adverse event

Patient factors
- Socioeconomic status
- Acute Diagnoses
- Comorbidities
- Access to care
- Caregiver support
- Health literacy
- English proficiency

Transitional care PSP’s
- Pre-discharge
- Post-discharge
- Bridging

Implementation Context

Adverse Events

Readmission or Emergency Department visit
Figure 2, Chapter 37. Trial flow diagram

16,079 citations identified by literature search

174 duplicates Excluded

15,905 citations identified by literature search

15,451 Abstracts excluded
11,037 Did not report results of an intervention
4,414 Ineligible topics

454 Articles passed title and Abstract screening

411 Articles Excluded
65 Systematic/narrative reviews
114 Not a transition of care intervention
144 Studies conducted in disease-specific population
36 No pre-discharge intervention
26 No eligible outcome reported
26 Ineligible Study designs

43 articles included
Chapter 38. Use of Simulation Exercises in Patient Safety Efforts

SECTION A. Literature Search

Search Strategies and Citation Results

PubMed Search Strategies

The first PubMed search, run November 14, 2011, yielded 42 titles. Full-text copies of 31 articles (74%) were reviewed, of which none reported T2 or T3 outcomes. Six articles from this search were included in the chapter at the recommendation of experts or to provide supplemental information about simulation. The first strategy was:


The second PubMed search, run November 15, 2011, yielded 304 titles. Full-text copies of 64 articles (21%) were reviewed, of which 11 studies reported T2 or T3 outcomes that were included in the review. Three additional articles from this search were included in the chapter to provide supplemental information about simulation. The second strategy was:


The third PubMed search, run November 29, 2011, yielded 142 titles. Full-text copies of 12 articles (8%) were reviewed, of which 4 studies reported T2 or T3 outcomes and were included in the chapter. One additional article from this search was included to provide supplemental information about simulation. The third strategy was:

("Health Care Category"[Mesh])) AND (simulation[All Fields]) AND (Meta-Analysis[ptyp])

Cochrane Library Databases Search Strategies

The Cochrane Database of Systematic Reviews was searched November 16, 2011 for “simulat*” in title, abstract, or keyword fields. This search yielded 17 results, of which full-text copies of 6 articles (35%) were reviewed. Two of these studies reported T2 or T3 outcomes in combinations with T1 outcomes and were included in the review of empirical literature. A third study was included for an example of other uses of simulation that were not a focus of the current review.

The Cochrane Central Register of Clinical Trials was searched November 16, 2011 for “simulat*” and “safe*” across any field. This search yielded 328 results, of which full-text copies
of 66 articles (20%) were reviewed. Thirteen of these studies reported T2 or T3 outcomes and were included for review of empirical literature.

Other Literature Capture Methods

Secondary or “chain-method” literature prompted full-text review of an additional 15 empirical articles, 13 of which are presented in the empirical review. This search method also resulted in 16 articles that were used to provide supplemental information about simulation. Experts recommended an additional 22 articles, all of which are presented in the review. Many of these articles included important theoretical work or important resources for those looking to implement simulation. Experts also recommended important T1 studies for inclusion in the review (n = 9).

Literature Totals

The empirical literature search resulted in 833 titles, of which 174 (21%) were reviewed in full-text for inclusion in the review. The final reference list in Simulation and Patient Safety was ultimately comprised of 45% (n = 40) literature directly captured by database searches, 32% secondary literature (n = 27), and 25% literature recommended by practitioners with expertise in simulation (n = 25). Eight additional articles served an explanatory function (e.g., clinical rationale for placing a central venous catheter), and these articles were retrieved from free-text searches in PubMed and Google Scholar.

SECTION B. Methods

The methodology for identifying empirical literature in this review involved three primary mechanisms. In the first mechanism, structured search strategies for PubMed and the Cochrane Library Databases provided the initial capture of simulation references. These searches were limited to meta-analyses or systematic reviews, and to studies that were empirical in nature. Theoretical pieces and commentary publications were not excluded in these search strategies, but these publication types were not a focus of this mechanism to capture literature. The search strategies were limited to general terminology (e.g., “simulation”) rather than specific terms that might be required if one wished to perform a systematic review of simulation practices. Specific simulation search terms might include the clinical specialty under investigation (e.g., “anesthesiology”), the procedure under investigation (e.g., “laparoscopic cholecystectomy”), the purpose of the simulation (e.g., “curriculum”), or the fidelity and specific simulation exercise (e.g., “mannequin”). Due to the brief nature of the current review, and to the extensive possible combinations of these specific terms, this search mechanism identified literature through general terms rather than exhaust these combinations. In the second mechanism, practitioners with expertise in simulation were asked to provide recommendations on seminal work in simulation, current key articles, empirical research on simulation and patient safety, areas of focus most pertinent to implementing simulation, and guidance in terms of implementing simulation. Secondary or “chain-method” capture of references provided the third mechanism to inform this review. That is, reference lists in articles captured from the first two mechanisms provided additional literature. Specifics and resulting citations are provided below on each of these search mechanisms.
Empirical articles were held to a translational science paradigm for inclusion. Articles were given priority if they reported outcomes from care provided to actual patients, or from actual care system interventions. In terms of translational science, these are “T2” or “T3” simulation studies, respectively. Due to the nature of simulation, selected studies that did not report outcomes from care provided to actual patients (i.e., “T1” or “within the lab” studies) were included if experts recommended their inclusion to adequately represent the applications of simulation. All efforts were made to remain inclusive across clinical specialties, no preference was assigned to specific procedures or care practices. There is a section on central venous catheter placement that provided an “in-depth” look at simulation to improve patient safety. This literature was selected for in-depth presentation because (1) as a specific topic it had the greatest number of articles captured in our review with outcomes reported at both the T2 and T3 level, and (2) this particular line of research included analyses of costs for those looking to implement simulation.

Chapter 39. Obtaining Informed Consent From Patients: Brief Update Review

SECTION A. Literature Search

Pubmed was searched for review articles with the MeSH term of “Informed Consent” that were published since 2001. This was supplemented with a Google search for “informed consent and patient safety”, “informed consent and health literacy”, “simplified informed consent”; “written educational materials and informed consent”, “decision aids and informed consent” “informed consent and reading comprehension” “informed consent and Limited English Proficiency”, “informed consent and patient comprehension”, “informed consent and teach back”, “informed consent and structured interview”, “informed consent and computer” and “video informed consent”. Forward citation searches using Google Scholar were also done for included original studies. A search on PSNet was also performed.

SECTION B. Methods

Titles and abstracts were reviewed by a physician health services researcher with expertise in informed consent. Inclusion criteria were informed consent in a clinical setting; articles about informed consent in the research setting were excluded. The citations from relevant reviews were searched for original studies, and full text articles of potentially relevant original studies were reviewed. The synthesis of included studies was narrative.

Chapter 40. Team Training in Health Care: Brief Update Review

SECTION A. Literature Search

Given the presence of recent reports and systematic reviews in this area, we did not conduct a systematic literature search for this topic. Key information was compiled from previous reports and from articles identified by experts in this area.
SECTION B. Methods

Systematic reviews and articles were abstracted by health services researchers with expertise in the topic area, and the results were narratively synthesized.

Chapter 41. Computerized Provider Order Entry With Clinical Decision Support Systems: Brief Update Review

SECTION A. Literature Search

We searched the specialized database AHRQ Patient Safety Net (PSNet) using the search terms “computerized provider order entry”, “computerized physician order entry”, “clinician decision support systems”, “clinical decision support systems”, “electronic medical records”, and “health information technology”. We also manually reviewed the reference lists of the articles identified through this search.

SECTION B. Methods

We evaluated the effectiveness of this PSP by identifying and narratively summarizing the systematic reviews of this topic that have been published since 2007, as well as identifying and summarizing additional original research studies that were published in 2011 (and thus are too recent to have been included in systematic reviews). Data regarding cost, implementation issues, and potential for harm associated with this PSP were summarized narratively.

Chapter 42. Tubing Misconnections: Brief Review (NEW)

SECTION A. Literature Search

Electronic Database Searches

The following databases have been searched for relevant information:

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Other mechanisms used to retrieve additional relevant information included review of bibliographies/reference lists from peer-reviewed and gray literature. (Gray literature consists of reports, studies, articles, and monographs produced by federal and local government agencies, private organizations, educational facilities, consulting firms, and corporations. These documents do not appear in the peer-reviewed journal literature.)

Sites viewed for this topic include:
- Joint Commission – www.jointcommission.org
- U.S. Food and Drug Administration – www.fda.gov
- Pennsylvania Patient Safety Authority – www.patientsafetyauthority.org
- PSNet- www.psnet.ahrq.gov

**SECTION B. Methods**

Titles and abstracts were reviewed by a health services research methodologist with experience in both systematic reviews and medical devices. Included studies consisted of guidance documents and clinical studies that discussed engineering controls and work practice changes to prevent tubing misconnections. Potential barriers to implementation, and reported benefits and harms from the patient safety practices were also assessed. Included guidance documents and studies were narratively summarized by the author.
Chapter 43. Limiting Individual Provider’s Hours of Service: Brief Update Review

SECTION A. Literature Search

We searched the specialized database AHRQ Patient Safety Net (PSNet) using the search terms “work hours”, “duty hours”, “hours of service”, “fatigue”, “sleep deprivation”, and “burnout”, and manually reviewed the reference lists of the articles and reports identified through this search.

SECTION B. Methods

We evaluated the effectiveness of this PSP by identifying and narratively summarizing the systematic reviews and original research studies of this topic that have been published since 2004. Data regarding cost, implementation issues, and potential for harm of this PSP were also summarized narratively.