Using Evidence to Plan Quality Improvement (QI): The Good, The Bad, and The Ugly
Presenters

Kaiser Permanente Care Management Institute

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No conflicts of interest to declare
Objectives

- Develop an understanding of how peer-reviewed research fits into the Plan phase of PDSA
- Implement rapid review methods to identify and select high-quality studies and systematic reviews
- Identify common pitfalls in how research studies are used to plan QI
- Build a strong evidence-based foundation for your QI work
Agenda

- 12:30-1:00 – Overview
  - Introductions
  - About Kaiser Permanente
  - Intro to Evidence-Based Care

- 1:00-1:30 – Applying evidence in the Model for Improvement / PDSA
  - Define the PICO
  - Review the literature

- 1:30-2:15 – Applying evidence (cont.)
  - Appraise evidence quality
  - Adapt for QI
  - Discuss pre-course assignment

- 2:15-2:45 – Small group exercise: systematic review

- 2:45-3:00 – Break

- 3:00-3:50 – Small group exercise: antibiotic over-use
  - Define the PICO
  - Review the literature
  - Appraise evidence quality
  - Adapt for QI

- 3:50-4:00 – Report-out and wrap-up
Kaiser Permanente (KP):
Largest U.S. Integrated Delivery System

Membership by region
(As of January 2017)

Washington
651,000

Northwest
552,651

Northern California
3,992,501

Southern California
4,264,119

Hawaii
249,687

Colorado
663,240

Georgia
284,213

Mid-Atlantic States
665,402
Our Integrated Care and Coverage Model

**Kaiser Foundation Health Plan / Regional Health Plans**
- Nonprofit, tax-exempt 501(c)(3) organization(s)
- Contracts with employer groups and individual members
- Arranges medical and hospital care services

**The Permanente Medical Groups**
- Taxable, independent; self-governing
- Deliver quality medical care
- Shareholder / employed physicians
- Contracts with community physicians as appropriate

**Kaiser Foundation Hospitals**
- Nonprofit, tax-exempt 501(c)(3) organization
- Own / operate hospitals and outpatient facilities
- Care delivery integration between Permanente and hospitals
Our Quality Vision and Goals

- To be recognized by our members, patients, customers, and employees as the safest, most affordable, effective high-quality health care delivery system in the country.
- We are working to deliver the highest quality care and service through a customized and fully integrated care delivery system.
  - Best prevention and promotion of healthy behaviors
  - Best care for chronic conditions
  - Best hospitals
  - Best care experience
Care Management Institute (CMI):
*Making the right things easy to do*

Center for Clinical Information Services

Clinical Library

Evidence Services:
*What are the right things?*

Evidence-based methodologies

KP inter-regional stakeholder input and vetting
What is Evidence-based Practice?

- The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individuals

- Evidence-based care is not:
  - Anecdotal
  - “Because that’s what is done here”
  - Expert opinion
  - Cherry-picking from published articles
  - “Cookbook” or “cookie cutter” medicine
  - Performance measures
Fundamentals of the Evidence-Based Approach

Evidence-based Principles
- Systematic methods
  - *A priori* criteria, objective process
  - Transparent, reproducible
  - Validated methods to distinguish high vs. low quality evidence
  - Conclusions based on the body of evidence and its limitations

Other Strategies
- Non-systematic methods
  - Inconsistent study selection
  - Not reproducible
  - Allows biases to drive results
  - Individual studies may not be weighted appropriately within the body of evidence
  - May overstate confidence in “evidence-based” foundation
Recommendation strength is based on all concepts, not evidence alone.

Balance of desirable and undesirable effects

Quality of evidence

Values and preferences

Resource implications

Basis for recommendation
## Research, Evidence-based Practice, and Quality Improvement: What’s the Difference?

<table>
<thead>
<tr>
<th>Research</th>
<th>Evidence-based Practice</th>
<th>Quality Improvement</th>
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<tbody>
<tr>
<td>Propose a hypothesis</td>
<td>Identify a problem</td>
<td>Identify an issue</td>
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<tr>
<td>Design study</td>
<td>Search literature</td>
<td>Set a benchmark</td>
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<tr>
<td>Select sample</td>
<td>Collect evidence</td>
<td>Plan process</td>
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<tr>
<td>Collect data</td>
<td>Appraise evidence</td>
<td>Collect data</td>
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<tr>
<td>Analyze data</td>
<td>Develop conclusions or recommendations</td>
<td>Identify improvement areas</td>
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<tr>
<td>Share findings</td>
<td>Apply evidence to practice</td>
<td>Share findings</td>
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<tr>
<td>Apply findings to practice</td>
<td>Evaluate outcome</td>
<td>Act on findings</td>
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Rapid Reviews Are Streamlined
Systematic Reviews

Systematic Review
- Comprehensive, formal research approach
- Multiple databases
- Broad search terms
- Primary studies
- Multiple reviewers
- Formal synthesis, bias appraisal
- Slow, resource intensive: 6 months to 1+ years

Rapid Review
- Narrow/focused, informal
- More limitations
- Limited databases
- Narrow search terms
- Focus on SRs, RCTs
- One reviewer
- Narrative summary
- Quicker: a few weeks to a few months

Evidence Scan
When you need the answer even sooner

Tradeoffs: Time/resources and comprehensiveness/limitations
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Evidence Review as Part of the Model for Improvement & PDSA Cycle

**Evidence Review Steps**

- **Define the PICO**
- **Review the evidence:** Search, screen, and select
- **Appraise evidence quality**
- **Adapt for QI**

**What are we trying to achieve?**

- How do we know that a change is an improvement?
- What change can we make that will result in improvement?

**Plan**

**Do**

**Act**

**Study**
The Benefit of Evidence Review: Less “Pilot-itis”

1. Cycle 1 - Test
   - A: Ask
   - P: Plan
   - S: Study
   - D: Do

2. Cycle 2 - Revise
   - A: Ask
   - P: Plan
   - S: Study
   - D: Do

3. Cycle 3 - Refine
   - D: Do
   - S: Study
   - P: Plan
   - A: Ask

4. Cycle 4 - Formalize
   - A: Ask
   - P: Plan
   - S: Study
   - D: Do

Changes that result in improvement

Data

Theories ideas
What Change Can We Make That Will Result in Improvement?

Model for Improvement / PDSA Approach

- Brainstorm with a multidisciplinary team of relevant stakeholders
- Identify desired change concept, generate change ideas and plans based on theories and predictions
- Pilot, use PDSA
- Consider local context

Evidence Review

- Learn from others’ experiences
- Theory is backed by evidence
- Evaluation ("pilot") is already done for you
- Needs to be adapted to local context
Case Example: Surgical Patient Safety

“We want to provide the best care possible to all our patients. We can do better to prevent surgical errors, complications, and deaths.

Many hospitals are implementing the surgical safety checklist developed by the World Health Organization. Should we do that here? Is it evidence-based?”
## WHO Surgical Safety Checklist (1st ed.)

### Before induction of anaesthesia

<table>
<thead>
<tr>
<th>SIGN IN</th>
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</table>
| - Patient has confirmed
  - Identity
  - Site
  - Procedure
  - Consent |
| - Site marked/not applicable |
| - Anaesthesia safety check completed |
| - Pulse oximeter on patient and functioning |

<table>
<thead>
<tr>
<th>DOES PATIENT HAVE A:</th>
</tr>
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<tbody>
<tr>
<td>- Known allergy?</td>
</tr>
<tr>
<td>- Difficult airway/aspiration risk?</td>
</tr>
<tr>
<td>- Risk of &gt;500mL blood loss (7mL/kg in children)?</td>
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</tbody>
</table>

### Before skin incision

<table>
<thead>
<tr>
<th>TIME OUT</th>
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<tr>
<td>- Confirm all team members have introduced themselves by name and role</td>
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</table>
| - Surgeon, anaesthesia professional and nurse verbally confirm
  - Patient
  - Site
  - Procedure |

### Anticipated critical events

- Surgeon reviews: What are the critical or unexpected steps, operative duration, anticipated blood loss?
- Anaesthesia team reviews: Are there any patient-specific concerns?
- Nursing team reviews: Has sterility (including indicator results) been confirmed? Are there equipment issues or any concerns?

### Before patient leaves operating room

<table>
<thead>
<tr>
<th>SIGN OUT</th>
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<tr>
<td>- Nurse verbally confirms with the team:</td>
</tr>
<tr>
<td>- The name of the procedure recorded</td>
</tr>
<tr>
<td>- That instrument, sponge and needle counts are correct (or not applicable)</td>
</tr>
<tr>
<td>- How the specimen is labelled (including patient name)</td>
</tr>
<tr>
<td>- Whether there are any equipment problems to be addressed</td>
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</tbody>
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- Surgeon, anaesthesia professional and nurse review the key concerns for recovery and management of this patient

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This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.
Define the PICO

Population
Who are the groups of individuals?

Intervention
What change can we make that will result in an improvement? What will you do differently?

Comparators
What is the alternative to the intervention?

Outcome
How do we know that a change is an improvement? What are the relevant outcomes?
Agree on the PICO: Questions to Consider

   Patients undergoing surgery

I: All 19 components, or certain ones?
   WHO Surgical Safety Checklist

C: Is variability across studies in the comparator – the “usual” standard – acceptable?
   Usual care, any comparator

O: What measurable outcomes could the intervention affect?
   Postoperative mortality, surgical complications
Additional Inclusion / Exclusion Criteria for Narrowing Results

- **Timeframe for intervention**
  - Is ___ days/weeks/months too short to see the desired effect?

- **Setting**
  - U.S. only? Similar developed countries?

- **Publication date**
  - Does it affect credibility to use a 10-year-old study?

- **Language**
  - Limiting to English only introduces bias, but is practical

- **Study type**
  - Systematic review only? Any “review”?

- **Journal filters**
  - Only the most reputable journals, or any?
Review the Literature: Top Sources to Search

- PubMed ([www.pubmed.gov](http://www.pubmed.gov))
  - Premier database, 27 million records
  - Free to search, full-text article availability based on your institution’s subscriptions
  - Covers medicine, nursing, dentistry, veterinary medicine, health care systems, public health, preclinical sciences
  - MEDLINE – generally the same content with better search precision, but requires a subscription (via Ovid)

- Cochrane ([www.cochranelibrary.com](http://www.cochranelibrary.com))
  - High-quality systematic reviews
  - Subscription database, some report available via open access
  - Limited number of records (10,000) compared to PubMed
  - Indexed in PubMed and MEDLINE, but worth a separate search
Additional Sources

- Other disciplines
  - CINAHL – nursing and allied health
  - EMBASE – MEDLINE + pharmaceutical journals
  - Multidisciplinary + grey literature
    - Web of Science – basic & social sciences, humanities, etc.
    - Google Scholar – exploratory, not replicable

- Synthesized evidence
  - PubMed Health – subset of PubMed; quick answers for consumers and front-line clinicians; not comprehensive
  - McMaster University Health Systems Evidence – curated database about health systems improvement, with study appraisal
  - UpToDate, DynaMed, Clinical Key – Clinical point-of-care resources, not necessarily evidence-based
Review the Literature: Develop a Search Strategy

- Tutorial on PubMed search techniques
  - Ask your librarian for help!

- Use components of the PICO question as keywords
  - Develop a list of similar terms or phrases (e.g., surgical, surgery, operative, operation)
  - Target search using specificity (e.g., World Health Organization)
  - Need to manually check for some PICO elements, especially if search results are too narrow

- Use filters, as defined in inclusion / exclusion criteria (e.g., article types, publication dates, language)
Tips for Effective Searching: Boolean Operators

- **AND**
  - Default operator, added automatically in PubMed
  - salmonella AND hamburger = salmonella hamburger

- **OR, NOT**

- **Nesting (using parentheses)**
  - salmonella AND hamburger OR eggs vs. salmonella AND (hamburger OR eggs)
  - 110,000+ results
  - 2,241 results

Additional Search Tips

- Generally not recommended in PubMed due to its automated term mapping (ATM) and explosion method
  - Wildcard operators / truncation: *
    - surg* will return surgeon, surgery, surgeries, surgical, etc.
  - Exact phrase searching: “__”
    - “surgical safety checklist” = 206 results
    - surgical safety checklist = 607 results
  - MeSH terms
    - Standardized taxonomy

- Optimal search technique differs for each source
  - Start broad, refine to improve relevance of results
  - Larger databases require more search limitations
  - Tradeoff between comprehensiveness and efficiency
Keywords: surgical safety checklist, postoperative mortality
Review the Literature: Screen and Select Studies

- Initial search
  - Better to start with too many results than too few
  - Optimal number of results depends on the topic

- Title-level review
  - Probably meets all PICO elements, include if uncertain

- Abstract-level review
  - More detail available to determine if PICO elements met

- Full-text review and final study selection
  - In a systematic review / rapid review, would summarize all that meet PICO at this stage
  - For a QI project evidence scan, may want to limit further, but be careful not to introduce bias here
The higher up the triangle, the better the quality of the evidence.
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3:50-4:00 – Report-out and wrap-up
Appraise Evidence Quality and Adapt for QI

- Are the results valid – i.e., how well does the study measure what it purports to measure?
  - Were patients randomized?
  - If not, did the study design attempt to minimize bias?

- What were the results?
  - How large are the effects? Is this worth doing?
  - How precise are the effects – are confidence intervals narrow? Consistent across studies? Sensitive to small/random changes?

- How can I apply the results?
  - How do the study’s context, implementation, follow-up, and outcomes compare to yours?

Source: Adapted from Fan et al. (2010). How to use an article about quality improvement. *JAMA*, 304(20):2279-89.
Evidence Used in QI: The Good, The Bad, and the Ugly

- High levels of evidence (i.e., synthesized) are not always available in QI
  - Expert opinion/consensus
  - Case reports or examples
  - Lower quality non-randomized studies
  - Too few randomized studies and synthesized literature

Adapted from Fan et al., 2010
Expert Opinion: When There is No Evidence

- Benefits
  - Based on clinical experience or perspective
  - Viewpoint of target audience for QI intervention

- Drawbacks
  - May be a single perspective
  - Conflicts of interest or bias

Adapted from Fan et al., 2010
Case Example:
Editorial (No author, 2008)


WHO's patient-safety checklist for surgery.

[No authors listed]

Comment in

WHO's checklist for surgery: don't confine it to the operating room.
Case Example: Editorial (No author, 2008)

Summary
- Checklists are needed to ensure basic repeated elements (e.g., confirming patient identity) are followed
- WHO SSC is tangible and promotes safety
- Still need to have an understanding of the circumstances under which unsafe practice occur

Quality Considerations
- Anonymous author and conflicts of interest not reported
- No supporting data or evidence to back up conclusions

Case Report

- **Benefits**
  - Describe an unusual or novel event / clinical case
  - Address safety concerns and adverse events

- **Drawbacks**
  - Does not establish causality
  - n=1

Adapted from Fan et al., 2010
Gastrojejunostomy: a potential hazard to the surgeon.

Birdi R¹, John SK, French JJ.

Abstract

This case report highlights the potential hazard of emergency operating of an obstructed hollow viscus in the era of World Health Organization checklists.
Case Example: Case Report (Birdi, 2012)

- **Summary**
  - Checklists failed to identify burn risk to the surgeon during open gastrojejunostomy
  - Checklists should include operation-specific procedures or considerations

- **Quality Considerations**
  - Single event
  - Applicability (harm occurred in a specific setting during a specific type of operation)

Non-Randomized Studies

- **Benefits**
  - Represents real life situations in large diverse samples
  - Able to capture rare events

- **Drawbacks**
  - Multiple sources of bias and confounders

- **Common designs in QI**
  - Stepped wedge
  - Times series
  - Controlled/uncontrolled before-after studies

Based on evidence hierarchy from Fan et al., 2010
Case Example:
Stepped Wedge Design (Haugen, 2015)


Haugen AS\textsuperscript{1}, Softeland E, Almeland SK, Sevdalis N, Vonen B, Eide GE, Nortvedt MW, Harthug S.

Abstract

OBJECTIVES: We hypothesized reduction of 30 days’ in-hospital morbidity, mortality, and length of stay postimplementation of the World Health Organization’s Surgical Safety Checklist (SSC).

BACKGROUND: Reductions of morbidity and mortality have been reported after SSC implementation in pre-/postdesigned studies without controls. Here, we report a randomized controlled trial of the SSC.

METHODS: A stepped wedge cluster randomized controlled trial was conducted in 2 hospitals. We examined effects on in-hospital complications registered by International Classification of Diseases, Tenth Revision codes, length of stay, and mortality. The SSC intervention was sequentially rolled out in a random order until all 5 clusters-cardiothoracic, neurosurgery, orthopedic, general, and urologic surgery had received the Checklist. Data were prospectively recorded in control and intervention stages during a 10-month period in 2009-2010.
Case Example: Stepped Wedge Design (Haugen, 2015)

Summary

- WHO SSC sequentially implemented in random order across five surgical specialties (2,221 controls and 2,263 WHO SSC)
- Complications significantly reduced with implementation of WHO SCC (19.9% vs. 11.5%, p<0.001)
- Reduction in mortality not significant (1.6% vs. 1.0%)

Quality Considerations

- Study groups not similar; different surgeries performed
- Lack of blinding (performance bias); possibility of contamination
- Long-term follow-up of patients not evaluated
- Random order increases study quality

Case Example:
Time Series Design (Morgan, 2015)


A combined teamwork training and work standardisation intervention in operating theatres: controlled interrupted time series study.

Morgan L1, Pickering SP2, Hadi M2, Robertson E1, New S3, Griffin D2, Collins G4, Rivero-Arias O5, Catchpole K6, McCulloch P1.

Author information

Abstract
BACKGROUND: Teamwork training and system standardisation have both been proposed to reduce error and harm in surgery. Since the approaches differ markedly, there is potential for synergy between them.

METHODS: DESIGN: Controlled interrupted time series with a 3 month intervention and observation phases before and after.

SETTING: Operating theatres conducting elective orthopaedic surgery in a single hospital system (UK Hospital Trust).

INTERVENTION: Teamwork training based on crew resource management plus training and follow-up support in developing standardised operating procedures. Focus of subsequent standardisation efforts decided by theatre staff.
Case Example: Time Series Design (Morgan, 2015)

Summary
- Teamwork training and work standardization, including WHO SSC
- No significant effect on complications, LOS, and readmissions

Quality Considerations
- WHO SSC used as part of a comprehensive QI intervention
- No control for possible concurrent extraneous events that may have influenced clinical outcomes
- Lack of allocation concealment (selection bias)
- Use of a parallel control group increases study quality

A surgical safety checklist to reduce morbidity and mortality in a global population.


Abstract

BACKGROUND: Surgery has become an integral part of global health care, with an estimated 234 million operations performed yearly. Surgical complications are common and often preventable. We hypothesized that a program to implement a 19-item surgical safety checklist designed to improve team communication and consistency of care would reduce complications and deaths associated with surgery.

METHODS: Between October 2007 and September 2008, eight hospitals in eight cities (Toronto, Canada; New Delhi, India; Amman, Jordan; Auckland, New Zealand; Manila, Philippines; Ifakara, Tanzania; London, England; and Seattle, WA) representing a variety of economic circumstances and diverse populations of patients participated in the World Health Organization's Safe Surgery Saves Lives program. We prospectively collected data on clinical processes and outcomes from 3733 consecutively enrolled patients 16 years of age or older who were undergoing noncardiac surgery. We subsequently collected data on 3955 consecutively enrolled patients after the introduction of the Surgical Safety Checklist. The primary end point was the rate of complications, including death, during hospitalization within the first 30 days after the operation.
Case Example – Assignment: Uncontrolled Before-After (Haynes, 2009)

- Summary
  - Before-after study showed reduced surgical complications and death with introduction of WHO Surgical Safety Checklist

- Quality Considerations
  - Based on this article, what are some considerations when assessing the claims about the effects of the WHO Surgical Safety Checklist?

- Adapting for Local QI
  - If this was your only evidence basis for the intervention, what would your approach be for implementation / pilot testing?

Randomized Studies

- **Benefits**
  - RCT is “gold standard”
  - Minimizes bias

- **Drawbacks**
  - Short, small, and not representative of real life
  - RCT design often not feasible

Adapted from Fan et al., 2010
Case Example:
Randomized Controlled Trial (Chaudhary, 2015)

Implementation of a surgical safety checklist and postoperative outcomes: a prospective randomized controlled study.

Chaudhary N, Varma V, Kapoor S, Mehta N, Kumaran V, Nundy S.

Abstract

The implementation of a surgical safety checklist is said to minimize postoperative surgical complications. However, to our knowledge, no randomized controlled study has been done on the influence of checklists on postoperative outcomes in a developing country. We conducted a prospective randomized controlled study with parallel group study design of the implementation of WHO surgical safety checklist involving 700 consecutive patients undergoing operations in our hospital between February 2012 and April 2013. In 350 patients, the checklist was implemented with modifications-the Rc arm. The control group of 350 patients was termed the Rn arm. The checklist was filled in by a surgery resident, and only the participants in the study were blinded. Postoperative wound-related (p = 0.04), abdominal (p = 0.01), and bleeding (p = 0.03) complications were significantly lower in the Rc compared to the Rn group. The number of overall and higher-grade complications (Clavien-Dindo grades 3 and 4) per patient reduced from 0.97 and 0.33 in the Rn arm to 0.80 and 0.23 in the Rc arm, respectively. A significant reduction in mortality was noted in the Rc arm as compared to the Rn arm (p = 0.04). In a subgroup analysis, the number of overall and higher-grade complications per patient with incomplete checklists was higher than that with fully completed checklist group. Implementation of WHO surgical safety checklist results in a reduction in mortality as well as improved postoperative outcomes in a tertiary care hospital in a developing country.
Case Example:
Randomized Controlled Trial (Chaudhary, 2015)

- **Summary**
  - 350 patients where WHO SSC implemented compared to 350 patients where the checklist not implemented
  - Some post-operative complications, including mortality, significantly reduced with use of WHO SSC

- **Quality Considerations**
  - Lack of allocation concealment (selection bias) and blinding (performance bias); possibility of contamination
  - Small sample size and lack of long-term follow-up
  - Inconsistent effects on clinical outcomes
  - Applicability (conducted in India) and lack of replication

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3:00-3:50 – Small group exercise: antibiotic over-use
   ▪ Define the PICO
   ▪ Review the literature
   ▪ Appraise evidence quality
   ▪ Adapt for QI

3:50-4:00 – Report-out and wrap-up
Synthesized Evidence

- **Benefits**
  - Comprehensive syntheses of all available studies
  - Increases precision and statistical power
  - Minimizes bias
  - Subgroup analyses

- **Drawbacks**
  - Time consuming
  - Need a large body of evidence

Adapted from Fan et al., 2010
Systematic review and meta-analysis of the effect of the World Health Organization surgical safety checklist on postoperative complications.


Abstract

BACKGROUND: The World Health Organization (WHO) surgical safety checklist (SSC) was introduced to improve the safety of surgical procedures. This systematic review evaluated current evidence regarding the effectiveness of this checklist in reducing postoperative complications.

METHODS: The Cochrane Library, MEDLINE, Embase and CINAHL were searched using predefined inclusion criteria. The systematic review included all original articles reporting a quantitative measure of the effect of the WHO SSC on postoperative complications. Data were extracted for postoperative complications reported in at least two studies. A meta-analysis was conducted to quantify the effect of the WHO SSC on any complication, surgical-site infection (SSI) and mortality. Yule’s Q contingency coefficient was used as a measure of the association between effectiveness and adherence with the checklist.

RESULTS: Seven of 723 studies identified met the inclusion criteria. There was marked methodological heterogeneity among studies. The impact on six clinical outcomes was reported in at least two studies. A meta-analysis was performed for three main outcomes (any complication, mortality and SSI). Risk ratios for any complication, mortality and SSI were 0.59
Summary

- A systematic review of 25 low-quality studies (2 RCTs, 13 cohorts) evaluating effects of implementing the WHO SSC on postoperative complications and mortality
- Comprehensive literature search with dual study selection, data extraction, and quality assessment
- Inconsistent results on postoperative mortality with use of WHO checklist compared to usual care
  - Only significantly reduced in studies conducted in developing countries

Quality Considerations

- Discuss in small groups

Are the results valid? *In the included studies*
- Were patients randomized? Did the study design minimize bias?

What were the results? *Across all studies*
- How large are the effects? Is this worth doing?
- How precise are the effects – are confidence intervals narrow? Consistent across studies? Sensitive to small/random changes?

How can I apply the results? *Of the review*
- How do the included studies’ contexts, implementation, follow-up, and outcomes compare to yours?

Overall, would you implement the WHO checklist, based on the de Jager et al. review?
- How does this differ from your decision after reviewing only the Haynes et al. study?
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Case Example: Antibiotic Overuse

“Our primary care doctors are prescribing too many antibiotics. Patients ask for them, even though they usually aren’t helpful for acute respiratory infections, and they are potentially harmful; antibiotic resistance is on the rise.

What should we do? An in-service for the doctors? Handouts in the waiting rooms to educate patients?”
Evidence Review Steps

Define the PICO

Review the evidence

Appraise evidence quality

Adapt for QI

Evidence Review as Part of the Model for Improvement & PDSA Cycle

What are we trying to achieve?
How do we know that a change is an improvement?
What change can we make that will result in improvement?

Plan

Do

Act

Study
Define the PICO

- Population
- Intervention
- Comparator
- Outcome
- Other criteria to narrow search results
  - Publication date
  - Study type
  - Language
  - Timeframe for data collection
  - Setting
Review the Literature: Search PubMed

- Include key PICO elements to build the search
  - Population – Respiratory infection; any age
  - Intervention – Any to reduce inappropriate antibiotic prescribing, including but not limited to clinician or patient education
  - Comparator – Any
  - Outcome – Prescribing patterns
  - Other inclusion criteria – U.S. setting/developed country; within 5 years; systematic review of multiple interventions; English

- Search: antibiotic prescribing AND primary care AND respiratory
  - Filters: Systematic Reviews; 5 years; English
Review the Literature: Screen Results

- Initial search
  - Better to start with too many results, than too few
  - Refine in accordance with PICO
  - Test various search strategies while finalizing PICO

- Title-level review
  - Probably meets all PICO elements, include if uncertain

- Abstract-level review
  - More detail available to determine if PICO elements met

- Full-text review
  - In a systematic review / rapid review, would synthesize all
  - For a QI project evidence scan, may want to limit further; be careful not to introduce bias here
Review the Literature: Select the Evidence


Appraise Evidence Quality / Adapt for QI

- Are the results valid? **In the included studies**
  - Were patients randomized? Did the study design minimize bias?

- What were the results? **Across all studies**
  - How large are the effects? Is this worth doing?
  - How precise are the effects – are confidence intervals narrow? Consistent across studies? Sensitive to small/random changes?

- How can I apply the results? **Of the review**
  - How do the study’s context, implementation, follow-up, and outcomes compare to yours?

- What would you do next, informed by the evidence?
## Small Group Report-Out

<table>
<thead>
<tr>
<th>Study</th>
<th>Are the results valid?</th>
<th>What were the results?</th>
<th>How can I apply the results?</th>
<th>What would you do next, informed by this evidence?</th>
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Evidence Review as Part of the Model for Improvement & PDSA Cycle

Evidence Review Steps

- Define the PICO
- Review the evidence
- Appraise evidence quality
- Adapt for QI

What are we trying to achieve?
How do we know that a change is an improvement?
What change can we make that will result in improvement?
Figuring Out the Right Thing to Do

- What you’re doing now
- What you should be doing
- What others want you to do
- What you can get people to do