E-SCOPE: A New Model to Identify & Accelerate Implementation of Evidence-Based Best Practices

Southern California Permanente Medical Group
Evidence-Based Medicine Services

Michael H. Kanter, MD | Joel Whittaker, MPH | Yasmina Mohan, MPH
Nothing to disclose

- Michael H. Kanter, MD, Joel Whittaker, MPH, and Yasmina Mohan, MPH today have no relevant financial or nonfinancial relationship(s) within the services described, reviewed, evaluated, or compared in this presentation.
Session Learning Objectives

1) Describe an implementation process model designed to reduce the time from publication of a best practice to implementation of that practice.

2) Identify determinants that act as facilitators and barriers in the planning and execution of implementation endeavors within a healthcare system.

3) Apply described process model for operation within comparable healthcare systems.
E-SCOPE: Evidence Scanning for Clinical, Operational, Practice Efficiencies

The E-SCOPE program works to put newly published, pre-screened, high-quality evidence in the hands of clinical decision makers who can make better, faster decisions about the implementation of best practices to improve the effectiveness, safety, timeliness and/or efficiency of care.
Why E-SCOPE?
Knowledge-to-Action Gap

- 251,135 registered clinical studies worldwide (2017)¹
- ~50,000 randomized controlled trials expected to be published annually by 2018-19²
- ~8,000 systematic evidence reviews published annually³
- Challenging for Chiefs of Service groups, frontline clinicians, health plan and hospital administrators, QI staff to keep pace with new evidence and identify effective healthcare practices that warrant implementation
- Estimated 17-year time lag between publication of new research evidence and implementation into practice⁴,⁵

⁵http://www.ihi.org/resources/Pages/Publications/Managingclinicalknowledgeforhealthcareimprovement.aspx
### Addressing the Knowledge-to-Action Gap

<table>
<thead>
<tr>
<th>Common Sources of Proposed Changes in Front-line Care</th>
<th>Evaluating Merit of Proposed Changes in Front-Line Care</th>
</tr>
</thead>
</table>
| ▪ “Suggestion” from senior management/front-line clinicians  
  - *Often wrong* | ▪ Conduct a (duplicate) clinical trial  
  - *Costly, time consuming and inconsistent with KP affordability mission* |
| ▪ Internal “expert” opinion  
  - *Not infrequently wrong* | ▪ Focused evidence review  
  - *Often not available, of poor quality, not generalizable to KP* |
| ▪ Idea provided at conference  
  - *No comment* | ▪ Pilot Studies  
  - *Vulnerable to poor design and less-than-rigorous evaluation* |
| ▪ Recently published article  
  - *Accuracy depends on study* | |
Need to change a practice – try a “pilot”

What is a “pilot”?  

- A practice that is normally prohibited but someone wants to do anyway? These often last a long time.
- A practice that the creator is certain will improve care such that data collection and testing are not necessary.
- Once the pilot is running, there is urgency to spread the best practice.
- An innovative practice that uses lots of new technology and gadgets created by innovative start-up companies in the Silicon Valley so it must be good. Data collection and testing will merely slow the innovative process.
Can traditional research help decide if a practice should be changed?

- Find a qualified researcher interested in the subject
- Apply for external grants
- Get external grants after some rejections
- Get IRB approval
- Get clinical sites to change practice and then observe results
- Analyze results and submit to journal
- Manage initial manuscript rejections and revisions
- Convince clinicians to change practice
Preoperative Autologous Blood Donations Before Elective Hysterectomy

Michael H. Kanter, MD; Darlene van Maanen, MT(ASCP); Karl H. Anders, MD; Fernando Castro, MT(ASCP); Win Win Mya, MD; Kathy Clark

Objective.—To determine whether preoperative autologous blood donation is justified for patients undergoing elective abdominal or vaginal hysterectomy.

Design.—Retrospective cohort study.

Patients and Setting.—A total of 263 consecutive patients admitted for elective abdominal or vaginal hysterectomy to a community health maintenance organization hospital during 1993 and 1994.

Main Outcome Measures.—Evaluation of transfusion rates for patients who did and did not donate autologous blood; determination of any risk factors that would predict the need for transfusion; and evaluation of the need for transfusion based on chart review.

Results.—Of 263 patients, 26 received a blood transfusion. The major risk factor identified for transfusion was the donation of autologous blood. Of 140 patients who donated autologous blood, 25 were transfused, whereas just 1 patient of 123 authors have included hysterectomy in general, or specifically abdominal hysterectomy, as a procedure requiring the PAD of 2 U. Others have maintained that PAD is unnecessary for hysterectomy, but they do not provide supportive data. At our institution, we became concerned about the perceived wastage of autologous blood donated for hysterectomy. We therefore began a retrospective study of autologous blood donations and transfusion practices for our hysterectomy patients.
A study of an educational intervention to decrease inappropriate preoperative autologous blood donation: its effectiveness and the effect on subsequent transfusion rates in elective hysterectomy


BACKGROUND: Decreasing the overcollection of preoperative autologous blood is difficult to achieve. The purpose of this study was to determine whether an educational intervention designed to outline the risks of preoperative autologous collection can decrease such donation.

Preoperative autologous blood donation (PABD) has been advocated as being able to supply the safest type of blood (i.e., autologous) for transfusion. Enthusiasm for PABD increased greatly after the discovery that AIDS could be a transfusion-transmitted disease. More recently, however, PABD has been shown not to be cost-effective, especially in low-transfusion-risk...
Why the delays in implementation?

- No vendor was marketing the change
- Public pressure to not change was intense
- Regulators made it hard to change (Gann Act)
- Compliance/peer review made it hard to change
- The change did not involve any new “innovative” gadget or device or technology
- Change required more than just 1 physician/department
How can we bridge the knowledge-to-action gap?

How can healthcare systems proactively identify and deploy effective medical practices using high-quality, published evidence?

Through its E-SCOPE Program, Kaiser Permanente Southern California designed and instituted a generalizable process model aimed to find an accelerated, more effective, more systematic way to break the logjam of implementing evidence-based best practices.
**E-SCOPE**

- Started in 2014
- Collaboration between key groups to overcome barriers to identification and implementation of effective practices
- **30 projects** in various stages of implementation
## E-SCOPE: Evidence-Based Interventions Launched

<table>
<thead>
<tr>
<th>De-Implementation</th>
<th>Newly Deployed</th>
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<tbody>
<tr>
<td>• Elimination of continuous passive motion after total knee arthroplasty</td>
<td>• Music therapy (Preop, Infusion Center, various settings)</td>
</tr>
<tr>
<td>• Reduce non-beneficial vertebroplasty for osteoporotic compression fractures</td>
<td>• Internet/home-based exercise for stroke</td>
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<tr>
<td>• Antibiotic stewardship for simple hand surgery procedures</td>
<td>• Short-course antimicrobial therapy for intra-abdominal infections</td>
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<tr>
<td>• Switching off hospital steam sterilizers during non-use hours</td>
<td>• Proactive enrollment of CAD patients in weight management classes</td>
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<tr>
<td>• Foregoing perioperative bridging anticoagulation for atrial fibrillation</td>
<td>• Weight management for psoriasis</td>
</tr>
</tbody>
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### Underutilized/Scale Up Implementation

| • Vaginal iodine cleansing pre-Cesarean section | • Virtual exercise-based cardiac rehabilitation for CAD |
| • Kangaroo mother care in low-birthweight infants | • Internet-based cognitive behavioral therapy for insomnia |
| • Double gloving during surgery | • Balloon autoinflation for Glue Ear in Children |
| • Probiotics for preterm infants | • Text Messaging for Smoking Cessation |
| • Epley maneuver for benign positional vertigo | • Text Messaging for Weight Management |
| • Atraumatic Needles to reduce Post-dural (Lumbar) Puncture Headache | • Video Visits for Parkinson’s Patients |
| • Apneic Oxygenation for Intubation in ED | • Exercise-based cardiac rehabilitation for CHF |
Mean Time from Study Publication to Implementation: 16 months (range 4-36 months)
E-SCOPE Process, Part I: **Identify Evidence-Based Best Practices**

### Step 1. Strategic Algorithm-Based Evidence Search
- Custom search terms and filters applied to find high-quality, relevant studies in high-impact journals, evidence databases & repositories
- *(500-1,000 abstracts per quarter)*

### Step 2. Initial Screening/Selection of Relevant Abstracts
- Focus on systematic reviews and RCTs
- Results demonstrate moderate-to-high impact on outcomes
- Generalizable to our health care setting
- *(100-150 studies selected)*

### Step 3. Quality/Relevance Screen by Clinical Leaders
- Intervention already in practice?
- Improve quality, safety, efficiency, reduce costs?
- Implementation feasible in our system?
- *(50-70 studies get full-text review)*

### Step 4. Final Review and Selection of Studies
- Full-text review of studies
- Critical appraisal
- *(35-40 studies selected)*
E-SCOPE Process, Part II: Implement Selected Practices

Step 5. Engage Clinical Quality/Operations Leaders
- Selected studies sent to quality/operations leaders
- Follow-up meetings with interested stakeholders to discuss expected benefits of implementing practices

Step 6. Form Multidisciplinary Implementation Team
- Project Manager assembles a multidisciplinary stakeholder team
- Implementation plan tailored to intervention, setting, patient population, available resources

Step 7. Support Implementation of Selected Practices
- Stakeholder team assumes ownership of implementation efforts
- E-SCOPE team provides oversight, facilitates regular meetings, trouble-shoots problems

Step 8. Monitor Progress
- E-SCOPE team regularly monitors implementation progress
- Initiative-specific metrics tracked over time to determine whether aspects of the implementation plan have been met

(1-3 interventions approved)
Program Team

Michael H. Kanter, M.D.
- Regional Medical Director of Quality & Clinical Analysis, Southern California Permanente Medical Group
- Executive Vice President and Chief Quality Officer, The Permanente Federation
- Chair of Clinical Science Department, Kaiser Permanente School of Medicine

Joanne Schottinger, M.D.
- Associate Medical Director for Quality and Clinical Analysis
**Weight & Psoriasis – Evidence Sources**

**REVIEW**

Effect of lifestyle weight loss intervention on disease severity in patients with psoriasis: a systematic review and meta-analysis

S Upala1,2,3 and A Sanguanikoon1,2,3

**BACKGROUND:** Psoriasis is a chronic inflammatory disease of the skin with joint manifestations. Greater psoriasis severity and lower response to treatment have been linked to obesity. However, the effect of weight reduction by non-pharmacologic intervention on disease severity is still questionable. This is a systematic review and meta-analysis of randomized controlled trials (RCTs) on the effect of dietary and lifestyle weight loss interventions on psoriasis severity.

**METHODS:** We comprehensively searched PubMed/MEDLINE, EMBASE, and CENTRAL from their inception to August 2014. Inclusion criteria were RCTs that examined lifestyle intervention by diet or exercise in overweight or obese patients with psoriasis and measured the severity of psoriasis as an outcome compared with controls. Two authors independently assessed article quality and extracted the data.

**RESULTS:** Out of 12 full-text articles, 7 RCTs involving 878 patients were included in the meta-analysis, which was based on the random-effects model. The pooled odds ratio of improvement in the PASI score in patients receiving weight loss intervention compared with controls was 2.0 (95% confidence interval CI: 1.39 to 2.90; P = 0.004). More participants in the intervention group had a reduction in the PASI score, with a pooled odds ratio of 2.6 (95% CI: 1.0 to 7.0; P = 0.055).

**CONCLUSION:** Non-pharmacologic, nonsurgical weight loss intervention led to improved weight loss in overweight or obese patients. However, more RCTs with larger sample sizes and longer follow-up are needed to confirm these findings.


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**The Relationship of Obesity With the Severity of Psoriasis: A Systematic Review**


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**Review**

**The Relationship of Obesity With the Severity of Psoriasis: A Systematic Review**

**Patrick Fleming**, **John Kraft**, **Wayne P. Gulliver**, and **Charles Lynde**

**Abstract**

**Background:** Psoriasis is a chronic inflammatory disease associated with obesity. The increased production of adipocytokines in central adiposity contributes to the systemic inflammation of obesity and perhaps to psoriasis.

**Objective:** The objective of this systematic review is to determine the association of obesity with psoriasis severity.

**Methods:** We searched PubMed, EMBASE, and Cochrane Database for English-language papers involving human subjects for all years. We extracted data on age, sex, body mass index (BMI), proportion obese, and psoriasis severity index score (PASI).

**Results:** We identified 254 articles in our search and included 9. The sample size was 134,823 psoriasis patients. Seven of the 9 studies found a statistically significant association of increased psoriasis severity with higher BMI.

**Conclusion:** Increased severity of psoriasis appears to be associated with increased BMI. Most studies were cross-sectional or case-control, making it difficult to determine temporality. Dermatologists should consider recording BMI for psoriasis patients and offering them lifestyle counseling.
Weight & Psoriasis - Evidence

Evidence Summary

• Increased adiposity and weight gain strong risk factors for developing psoriasis, strong association between obesity and severity of psoriasis.

• Increased body mass index affects the response of psoriasis to pharmacologic therapy and phototherapy by reducing the ability to achieve the full therapeutic effect.

• Weight management interventions that achieve 3-14% weight loss can reduce psoriasis severity up to 75% for patients with BMI ≥ 30.
## Weight & Psoriasis - Implementation

<table>
<thead>
<tr>
<th><strong>Target Population</strong></th>
<th>Members ≥ 18 years of age with a body mass index ≥ 30 and a diagnosis of psoriasis.</th>
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</thead>
<tbody>
<tr>
<td><strong>Intervention Overview</strong></td>
<td>Promote weight loss to reduce psoriasis severity and potential consequent need for pharmacologic therapy. Raise awareness and inspire action through delivery of constant and consistent messaging at multiple patient touch points through distinct platforms.</td>
</tr>
<tr>
<td><strong>Measurement</strong></td>
<td>Dermatology Chiefs’ Goal: By the end of June 2018, each Medical Center will refer ≥ 50% of target population members who have had an appointment in Dermatology to weight management classes.</td>
</tr>
</tbody>
</table>

Figure 1. Office Visit Intervention Workflow

- POE alert: vital sign intake
- Office staff initiate Healthy Balance referral
- Provider engages patient in weight loss conversation
- Provider confirms Healthy Balance referral
- Office staff books patient for Healthy Balance Overview Class
- Office Staff finalize by including respective smartphrases in AVS

Figure 2. Supplemental Intervention Components

- Regional Outreach Letter/Email
- Targeted Outreach
- Online Personal Action Plan
- Patient Testimonial Video
- Health Education Materials
Text Messaging for Smoking Cessation – Evidence Sources
Text Messaging for Smoking Cessation - Evidence

**Evidence Summary**

- High quality evidence supports text messaging interventions to reduce smoking behavior.
  - 3 high quality systematic reviews (>20 RCTs, >15,000 participants)
- Smoking quit rates for text messaging intervention groups were higher compared to control group quit rates.
- Wide reach and low cost of text message interventions.
## Text Messaging for Smoking Cessation - Implementation

<table>
<thead>
<tr>
<th><strong>Target Population</strong></th>
<th>Members $\geq$ 18 years of age with a current smoker status who are <strong>prepared to “take action” to quit smoking</strong>, have a cell phone with text messaging capabilities, and are English speakers.</th>
</tr>
</thead>
</table>
| **Intervention Design** | Duration: 90 days  
Start: Monthly  
Frequency (decreasing schedule):  
Days 1-30: 3 daily texts  
Days 31-60: 2 daily texts  
Days 61-90: 1 daily text  
Message Types: Motivational & Strategy Building |
| **Measurement** | 1. Member enrollment in program  
2. Member completion of program  
3. Self-reported QUIT status at the end of 3-month intervention  
4. Self-reported QUIT status at 3-month follow-up post intervention  
5. Qualitative assessment of member experience regarding program participation |
De-Implementation Projects
Elimination of Continuous Passive Motion (CPM) After Total Knee Arthroplasty (TKA) – Evidence Source
Elimination of Continuous Passive Motion (CPM) After Total Knee Arthroplasty (TKA)

- Reduce inappropriate use following TKA in patients with arthritis
- Baseline data showed that CPM was still being used post-TKA in KPSC
- SCPMG Chiefs of Orthopedics agreed to reduce CPM use
- Implementation Team:
  - SCPMG Chiefs of Orthopedics
  - SCPMG Clinical Analysis
  - E-SCOPE

Elimination of Continuous Passive Motion (CPM) After Total Knee Arthroplasty (TKA)

- Implementation Highlights:
  - Physician education
  - Provider usage report generated to identify high-utilizers

- Measurement:
  - CPM orders post TKA: decreased by 60% (2014-2017)
  - Possible reduction in expenditures on CPM machines
  - Improve efficiency by reducing staff time spent administering treatment

Underutilization & Standardization Projects
Atraumatic Needles for Preventing Post-Dural Puncture Headaches – Evidence Sources

Atraumatic versus conventional lumbar puncture needles: a systematic review and meta-analysis

Andres Rodriguez, Marita L, Godoy-Castañeras N, Claparols A, Arevalo JJ, Boingga S, Rosal I, Segal M

Summary

Background Atraumatic needles have been proposed to lower complications after lumbar puncture. However, several surveys indicate that clinical adoption of these needles remains poor. We did a systematic review and meta-analysis to compare patient outcomes after lumbar puncture with atraumatic needles and conventional needles.

Methods In this systematic review and meta-analysis, we independently searched 13 databases with no language restrictions from inception to Aug 15, 2017, for randomised controlled trials comparing the use of atraumatic and conventional needles in which no dural punctures were done (epidural injections) or without a conventional needle control group were excluded. We collected data on clinical and outcome data from included studies. We present the data as and describe the outcomes in this report.

Primary outcomes of post-lumbar-puncture headache incidence and additional safety and efficacy outcomes were extracted from each study and used in a meta-analysis. This study is registered with the International Prospective Register of Systematic Reviews, number CRD42016012948.

Findings We identified 16434 reports, after exclusions, 119 trials done between 1993 and 2017 from 29 countries, including a total of 8493 participants, were eligible for analysis. The incidence of post-dural puncture headache was significantly reduced from 11.0% (95% CI 9.9–12.3) in the conventional needle group to 2.8% (2.3–3.2) in the atraumatic needle group (relative risk 0.36, 95% CI 0.28–0.47; p<0.00001; I²=0%). Atraumatic needles were also associated with significantly less pain in the lumbar puncture fluid or control arm (0.44, 95% CI 0.39–0.50; p<0.00001), need for epidural local anaesthetic (0.50, 95% CI 0.38–0.67; p=0.0003), and need for headache medication (0.54, 95% CI 0.41–0.71; p=0.0004). Need for repositioning (0.49, 95% CI 0.34–0.68; p=0.0002) and lumbar circumference (0.51, 95% CI 0.37–0.70; p=0.0004), however, did not differ significantly between the two needle groups. Subgroup analysis of post-lumbar-puncture headache revealed no differences between needle type and patient age, sex, use of prophylactic intravenous fluids, and patient position in the lumbar puncture, but not after puncture; or a clinician specialty. These results were und ships of evidence as we measured the risk of non-traditional assessment, development, and evaluation.

Interpretation Among patients who had further atraumatic needles were associated with a decrease in the incidence of post-dural puncture headache and in the need for patients to return to hospital for additional therapy, and had similar efficacy to conventional needles. These findings offer clinicians and stakeholders a comprehensive assessment and high-quality evidence for the safety and efficacy of atraumatic needles as a superior option for patients who require lumbar puncture.
Atraumatic Needles for Preventing Post-Dural Puncture Headaches

- Evidence indicating post-dural puncture headaches can be prevented if atraumatic needles are used for lumbar punctures
- Internal assessment found variations (inconsistent with evidence) in available lumbar puncture needle trays across specialties
- Shared evidence with key stakeholders, including Kaiser National Product Council
- Obtained buy-in to make necessary changes
- Ordering changes made (contracts amended) to make atraumatic needle trays the standard product available for lumbar punctures

Kangaroo Care (KC) in the NICU – Evidence Sources

Systematic reviews

Kangaroo mother care: a systematic review of barriers and enablers
Grace J Chan, Amy S Lai, Stephen Wall & Rifat Atun

Objective
To investigate factors influencing the adoption of kangaroo mother care in different contexts.

Methods
We searched PubMed, Embase, Scopus, Web of Science, and the World Health Organization’s regional databases, for studies on “kangaroo mother care” or “kangaroo care” or “skin-to-skin care” from January 1960 to August 2015, without language restrictions. We included pragmatic, reporting, and hand-searched references of published reviews and articles. Two independent reviewers screened articles and extracted data on barriers, health system characteristics, and contextual factors. We developed a conceptual model to analyze the integration of kangaroo mother care in health systems.

Findings
We screened 2,875 studies and included 112 studies that contained qualitative data on implementation. Kangaroo mother care was applied in different ways in different contexts. The studies show that there are several barriers to implementing kangaroo mother care, including the need for time, social support, medical care and family acceptance. Barriers within health systems included organizational, financing, and service delivery. In the broad context, cultural norms influenced perceptions and the success of adoption.

Conclusion
Kangaroo mother care is a complex intervention that is behavior driven and includes multiple elements. Success of implementation requires high user engagement and stakeholder involvement. Future research includes designing and testing models of specific interventions to improve uptake.

Kangaroo Mother Care and Neonatal Outcomes: A Meta-analysis

Ellen G. Bourdon, MD, ScD, Roya Dastjerdi, MPH, ML; Donna J. Ojukwu, ScD, MPH, Walala M. Fawzi, BBM, PhD, Elise A. Mwonee, PhD, Elizabeth Lobstein, MD, PhD, PhD, PhD

Abstract
Kangaroo mother care (KMC) is an intervention aimed at improving outcomes among preterm and low birthweight newborns.

Objectives
Conduct a systematic review and meta-analysis estimating the association between KMC and neonatal outcomes.

Data Sources
PubMed, Embase, Web of Science, Scopus, African Index Medicus (AIM), Latin American and Caribbean Health Sciences Information System (LILACS), Index Medicus for the Eastern Mediterranean Region (EMEMR), Index Medicus for the South-East Asian Region (IMSEAR), and Western Pacific Region Index Medicus (WPRIM).

Study Selection
We included randomized trials and observational studies through April 2014 examining the relationship between KMC and neonatal outcomes among infants of any birth weight or gestational age. Studies with <10 participants, lack of a comparison group without KMC, and those not reporting a quantitative association were excluded.

Data Extraction
Two reviewers extracted data on study design, risk of bias, KMC intervention, neonatal outcomes, relative risk (RR) or mean difference measures.

Results
1,035 studies were screened; 124 met inclusion criteria. Among LBW newborns, KMC compared to conventional care was associated with 36% lower mortality (RR 0.64; 95% CI 0.46, 0.91). KMC decreased risk of neonatal sepsis (RR 0.53; 95% CI 0.34, 0.83), hypothermia (RR 0.22; 95% CI 0.12, 0.41), hypoglycemia (RR 0.12; 95% CI 0.05, 0.32), and hospital readmission (RR 0.42; 95% CI 0.25, 0.76) and increased exclusive breastfeeding (RR 1.50; 95% CI 1.26, 1.75). Newborns receiving KMC had lower mean respiratory rate and pain measures, and higher oxygen saturation, temperature, and head circumference growth.

Limitations
Lack of data on KMC limited the ability to assess dose-response.

Conclusions
Interventions to scale up KMC implementation are warranted.
Kangaroo Care (KC) in the NICU

- KC in the NICU reduces mortality, neonatal sepsis, hypothermia, hypoglycemia & hospital readmission; increases exclusive breastfeeding
- NICU Directors and RN Staff noted that KC was underutilized due to lack of appropriate training, wide variation in KC protocols and numerous false contraindications
- Agreement was reached by NICU Teams to scale up implementation and reduce barriers to KC.
- Implementation Team:
  - SCPMG NICU Directors
  - PICU-NICU Nursing Peer Group
  - KP Nursing Executives
  - SCPMG Clinical Analysis
  - E-SCOPE

Kangaroo Care (KC) in the NICU

Implementation Highlights

- Medical Center implementation toolkit:
  - Regional KC Protocol developed
  - RN training materials developed and disseminated
  - NICU Directors socialize MD staff to rollout at local provider meetings
  - Parent educational materials
  - KPHC flowsheets to improve documentation

- Measurement:
  - Developed metric for measuring KC
  - Adopted as PICU-NICU 2018 Goal (↑ KC by 15% at each medical center)

Operational Projects
Switching Off Hospital Steam Sterilizers During Hours of Non-Use – Evidence Source

Original Research

Hospital steam sterilizer usage: could we switch off to save electricity and water?

Forbes McGain¹, Graham Moore² and Jim Black³

Abstract

Objectives: Steam sterilization in hospitals is an energy and water intensive process. Our aim was to identify opportunities to improve electricity and water use. The objectives were to find: the time sterilizers spent active, idle and off; the variability in sterilizer use with the time of day and day of the week; and opportunities to switch off sterilizers instead of idling when no loads were waiting, and the resultant electricity and water savings.

Methods: Analyses of routine data for one year of the activity of the four steam sterilizers in one hospital in Melbourne, Australia. We examined active sterilizer cycles, routine sterilizer switch-offs, and when sterilizers were active, idle and off. Several switch-off strategies were examined to identify electricity and water savings: switch off idle sterilizers when no loads are waiting and switch off one sterilizer after 10:00 h and a second sterilizer after midnight on all days.

Results: Sterilizers were active for 13,430 (38%) sterilizer-hours, off for 4822 (14%) sterilizer-hours, and idle for 16,788 (48%) sterilizer-hours. All four sterilizers were simultaneously active 9% of the time, and two or more sterilizers were idle for 69% of the time. A sterilizer was idle for two hours or less 13% of the time and idle for more than 2 h 87% of the time. A strategy to switch off idle sterilizers would reduce electricity use by 66 MWh and water use by 1004 kl per year, saving 26% electricity use and 13% of water use, resulting in financial savings of AUD$13,867 (UK£6,517) and a reduction in 79 tonnes of CO₂ emissions per year. An alternative switch-off strategy of one sterilizer from 10:00 h onwards and a second from midnight would have saved 30 MWh and 456 kl of water.

Conclusions: The methodology used of how hospital sterilizer use could be improved could be applied to all hospitals and more broadly to other equipment used in hospitals.
Switching Off Hospital Steam Sterilizers During Hours of Non-Use

- Evidence that switching off sterilizers reduces electricity, water use, resulting in a significant cost savings, along with reduced CO2 emissions.
- Shared evidence with Sterile Processing Directors & Facilities Service Directors.
- 10 of 13 facilities have reported successful shut down of sterilizers during hours of non-use.
- Estimated savings ~ $250,000 per year regionwide in water and energy costs, along with other environmental benefits (reduced carbon emissions, less water consumption).
- Significant benefit to KP Environmental Stewardship Goals—working to spread to other KP Regions.

Facilitators & Barriers to Implementation

Facilitators

- Organizational Imperative
- Program Design & Strategy

Barriers

- Stakeholder Engagement & Management
- Confirming Ownership for Sustainability
- Competing Priorities
### Key Facilitators for Effective Implementation

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<tr>
<th>Leadership</th>
<th>Key leader as an integral member of implementation team</th>
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<tbody>
<tr>
<td><strong>Barrier Identification</strong></td>
<td>Identifying barriers either prior to the implementation, in order to tailor the implementation process, or during the evaluation of the implementation</td>
</tr>
<tr>
<td><strong>Tailoring to the Context</strong></td>
<td>Tailoring to the specific needs of the facility setting</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>Formal communication throughout implementation process (e.g. through coordinated and structured platforms)</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>Educating healthcare providers and/or patients (e.g. oral, written online and/or paper)</td>
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<tr>
<td><strong>Supportive Supervision</strong></td>
<td>Provision of in-person or off-site support for staff responsible for implementation</td>
</tr>
<tr>
<td><strong>Provision of Resources</strong></td>
<td>Provision of resources as a formal part of implementation</td>
</tr>
<tr>
<td><strong>Audit &amp; Feedback</strong></td>
<td>Audit of the implementation process and/or its outcomes</td>
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Key Program Challenges

- Keeping up with “quarterly” pace of evidence searches
- Volume of potential initiatives vs. project management bandwidth vs. stakeholder bandwidth (initiative overload)
- Stakeholder engagement & management
- Identifying stakeholders/project owners for implementation sustainability
- Identifying/avoiding duplicate initiatives
- Monitoring/measurement of uptake (process outcomes vs. health outcomes)
Q&A

THANK YOU!
A staggering 36,000 randomized controlled trials (RCTs) are published each year, on average, and it typically takes about 17 years for findings to reach clinical practice. Proposed changes in frontline care often originate with suggestions from clinicians, but evaluating their merit can be time-consuming and expensive. Focused evidence reviews may yield inconclusive results that don’t lend themselves to clear-cut decisions; pilot studies are vulnerable to poor design, less-than-rigorous evaluation, scant evidence, and other limitations. The result: a logjam of epic proportions that slows the real-world implementation of evidence-based practices. At Kaiser Permanente Southern California (KPSC), we aimed to find a quicker, more effective, more systematic way to break that logjam in a manner that is consistent with the Triple Aim.

An Organizational Imperative

In 2013, KPSC set out to expedite implementation of clinical practices that have a rigorous evidence base, are not used or are underused by KPSC, improve the quality of care, and are likely to be sustainable and cost effective. KPSC’s medical group quality leader, Dr. Michael Kanter, initiated this effort after hundreds of pilot studies and performance improvement activities at KPSC, using PDSA cycles, yielded too few new practices that were implemented widely.

In January 2014, we assigned an analyst on our existing evidence-based medicine team to scan the literature for promising practices that were not in wide use at KPSC. The findings were forwarded to regional chiefs of service, who responded enthusiastically because they had long trusted the team’s evidence reviews to inform clinical decision support and guideline development in their specialty areas. Nevertheless, given that regional chiefs and other stakeholders had limited ability to implement new practices, by June 2014 it was clear that a one-person literature review would be insufficient. A project manager was then hired to help with the implementation effort.