

What does it take to implement change when the evidence is good?

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Quality Improvement's Basic Goal

“Implementation Science”

“Knowledge Translation”

Evidence



Practice

“Quality improvement strategies close the gap between health care processes or outcomes observed in practice and those obtainable on the basis of current professional knowledge.”

Shojania KG, McDonald KM, Wachter RM, Owens DK. Closing The Quality Gap: A Critical Analysis of Quality Improvement Strategies. AHRQ Publication No. 04-0051-1. August 2004.



SPECIAL ARTICLE

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The Quality of Health Care Delivered to Adults in the United States

Elizabeth A. McGlynn, Ph.D., Steven M. Asch, M.D., M.P.H., John Adams, Ph.D., Joan Keeseey, B.A., Jennifer Hicks, M.P.H., Ph.D., Alison DeCristofaro, M.P.H., and Eve A. Kerr, M.D., M.P.H.

ABSTRACT

Background We have little systematic information about the quality of care — a key element of quality of care.

Methods We telephoned a random sample of 1000 adults and asked them about selected health conditions.

We asked about the most recent two-year period and used this information to assess the quality of care for 30 acute and chronic conditions as well as preventive care.

Results Participants received 54.9 percent (95 percent confidence interval, 54.3 to 55.5) of recommended care. We found little difference among the proportion of recommended preventive care provided (54.9 percent), the proportion of recommended acute care provided (53.5 percent), and the proportion of recommended care provided for chronic conditions (56.1 percent). Among different medical functions, adherence to the processes involved in care ranged from 52.2 percent for screening to 58.5 percent for follow-up care. Quality varied substantially according to the particular medical condition, ranging from 78.7 percent of recommended care (95 percent confidence interval, 73.3 to 84.2) for senile cataract to 10.5 percent of recommended care (95 percent confidence interval, 6.8 to 14.6) for

Across 30 acute and chronic conditions, patients in 12 US cities received an average of 50% of recommended processes of care

performance on 439 indicators of quality of care. We then constructed aggregate scores.

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The Quality of Ambulatory Care Delivered to Children in the United States

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The Quality of Ambulatory Care Delivered to Children in the United States

Rita Mangione-Smith, M.D., M.P.H., Alison H. DeCristofaro, M.P.H., Claude M. Setodji, Ph.D., Joan Keesey, B.A., David J. Klein, M.S., John L. Adams, Ph.D., Mark A. Schuster, M.D., Ph.D., and Elizabeth A. McGlynn, Ph.D.

ABSTRACT

On average...children in the study received 46% (95% CI: 44% to 48%) of the indicated care. They received 67% (95% CI: 63% to 71%) of the indicated care for acute medical problems, 53% (95% CI: 50% to 56%) of the indicated care for chronic medical conditions, and 40% (95% CI: 38% to 43%) of the indicated preventive care.

Background Little comprehensive

Methods We assessed quality indicators for children who were

identified in medical records from all providers during the 2-year period before the date of study recruitment. Trained nurses abstracted medical records. Composite quality scores were calculated by dividing the number of times indicated care was documented as having been ordered or delivered by the number of times a care process was indicated.

Results On average, according to data in the medical records, children in the study received 46.5% (95% confidence interval [CI], 44.5 to 48.4) of the indicated care. They received 67.6% (95% CI, 63.9 to 71.3) of the indicated care for acute medical problems, 53.4% (95% CI, 50.0 to 56.8) of the indicated care for chronic medical conditions, and 40.7% (95% CI, 38.1 to 43.4) of the indicated preventive care. Quality varied according to the

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Quality Improvement's Basic Goal

"Implementation Science"

"Knowledge Translation"

Evidence

Practice

- Inhaled steroids for asthma
- Optimal diabetes care
- Preventive care guidelines

- Educational interventions
- Reminder systems
- Audit & feedback
- Report cards, benchmarking
- Case management
- Continuous Quality Improvement

Unfortunately, none of these work that well

No magic bullets: a systematic review of 102 trials of interventions to improve professional practice. *CMAJ* 1995

JOURNAL ARTICLE

No magic bullets: a systematic review of 102 trials of interventions to improve professional practice

A. D. Oxman, M. A. Thomson, D. A. Davis and R. B. Haynes

Health Services Research Unit, National Institute of Public Health, Oslo, Norway.

OBJECTIVE: To determine the effectiveness of different types of interventions in improving health professional performance and health outcomes. **DATA SOURCES:** MEDLINE, SCISEARCH, CINAHL and the Research and Development Resource Base in CME were searched for trials of educational interventions in the health care professions published between 1970 and 1993 inclusive. **STUDY SELECTION:** Studies were selected if they provided objective measurements of health professional performance or health outcomes and employed random or quasi-random allocation methods in their study designs to assign individual subjects or groups. Interventions included such activities as conferences, outreach visits, the use of local opinion leaders, audit and feedback, and reminder systems. **DATA EXTRACTION:** Details extracted from the studies included the study design; the unit of allocation (e.g., patient, provider, practice, hospital); the characteristics of the targeted health care professionals, educational interventions and patients (when appropriate); and the main outcome measure. **DATA SYNTHESIS:** The inclusion criteria were met by 102 trials. Areas of behaviour change included general patient management, preventive services, prescribing practices, treatment of specific conditions such as hypertension or diabetes, and diagnostic service or hospital utilization. Dissemination-only strategies, such as conferences or the mailing of unsolicited materials, demonstrated little or no changes in health professional behaviour or health outcome when used alone. More complex interventions, such as the use of outreach visits or local opinion leaders, ranged from ineffective to highly effective but were most often moderately effective (resulting in reductions of 20% to 50% in the incidence of inappropriate performance). **CONCLUSION:** There are no "magic bullets" for improving the quality of health care, but there are a wide range of interventions available that, if used appropriately, could lead to important improvements in professional practice and patient outcomes.

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Effects of Quality Improvement Strategies for Type 2 Diabetes on Glycemic Control

A Meta-

Kaveh G
Vandana

JAMA. 2006

[ABSTRACT](#)

Context
effectiveness

Objecti
type 2 d

- Across 66 trials (50 RCTs) interventions reduced HbA_{1c} by 0.42% (95% CI: 0.29% to 0.54)
 - *Doubtful clinical significance even at population level*
- Most QI strategies had small to modest (at best) impacts
 - *Many trials reported large process improvements, but these did not translate into clinical improvements*

Data Sources and Study Selection MEDLINE (1966–April 2006) and the Cochrane Collaboration's Effective Practice and Organisation of Care Group database, which covers multiple bibliographic databases. Eligible studies included randomized or quasi-randomized controlled trials and controlled before-after studies that evaluated a QI intervention targeting some aspect of clinician behavior or organizational change and reported changes in glycosylated hemoglobin (HbA_{1c}) values.

Data Extraction Postintervention difference in HbA_{1c} values were estimated using a meta-regression model that included baseline glycemic control and other key intervention and study features as predictors.

Data Synthesis Fifty randomized controlled trials, 3 quasi-randomized trials, and 13 controlled before-after trials met all inclusion criteria. A

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A report card on quality improvement for children's health care. *Pediatrics* 2001

Reportedly successful QI initiatives more commonly described improvement in administrative measures such

[B]arriers to QI for children were similar to those for adults, but were compounded by difficulties in measuring child health outcomes, limited resources among public organizations and small provider groups, and relative lack of competition for pediatric tertiary care providers.

reminder systems for office-based preventive services and inpatient pathways. Reported successful QI initiatives more commonly described improvement in administrative measures such as rate of admission or length of stay rather than functional status or quality of life. Interviews found that barriers to QI for children were similar to those for adults, but were compounded by difficulties in measuring child health outcomes, limited resources among public organizations and small provider groups, and relative lack of competition for pediatric tertiary care providers. Research and dissemination of QI for children were seen as less well developed than for adults. CONCLUSIONS: Attempts to improve the quality of child health services have been increasing, and the evidence we reviewed suggests that it is possible to improve the quality of care for children. Nonetheless, numerous gaps remain in the understanding of QI for children, and widespread improvement in the quality of health services for children faces significant barriers.

Publication Types:

- [Research Support, Non-U.S. Gov't](#)
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PMID: 11134448 [PubMed - indexed for MEDLINE]



Common Failings in QI Efforts

- Evidence for target not always that good
- Change strategy to implement evidence picked “off the shelf”
- Inattention to attitudes/needs of front line workers
- Little appreciation of barriers to implementation

Principles to Keep in Mind

- Determine basis of a given quality or safety problem
 - *Don't assume you know the answer*
- Match proposed solution to the problem
- Anticipate barriers to implementation
- Pilot test
- More formal evaluation

Principles I Won't Be Discussing

- Engage senior administrators
 - *Make sure this is real, not just lip service*
- Change the culture of your organization
 - *Good luck with that*
- No new meetings: hijack existing ones

Principles to Keep in Mind

- Determine basis of a given quality or safety problem
 - *Don't assume you know the answer*
- Match proposed solution to the problem
- Anticipate barriers to implementation
- Pilot test
- More formal evaluation

Example Problem: Overuse of Urinary Catheters → Nosocomial UTIs

- Organisational – inadequate staffing
- Professional
 - Knowledge/skills
 - Attitudes, peer opinions
 - Memory, time factors
- Patient --e.g. knowledge, expectations

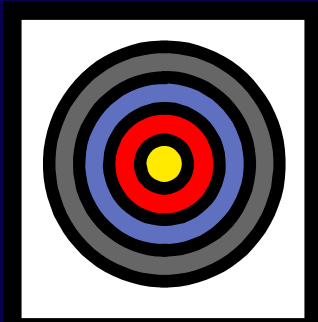
Probably contributes, but hard to fix

Likely not a major factor in this case

How much catheters bother

Probably a major factor: MDs often unaware of catheters factor in this case

Successful Application of Matching Solution to Problem : reduction of nosocomial UTIs



Target: decreased use of Foley catheters

- Insertion not indicated 25% of the time
- *But*, often placed in Emerg before MDs see patients
- Continued use not indicated 50% of time
- MDs unaware of catheter 30-50% of time

Interventions directed at decreased insertion likely to be ineffective; *decreasing duration seems more promising*

Automatic Stop Orders for Urinary Catheters

	Control Ward	Study Ward	Difference
Catheter Duration	8 ± 5 days	5 ± 3 days	3 days (p = 0.03)

Importance of Example

- Educational initiatives – almost certainly would have had no effect
- Local champions, opinion leaders - ditto
- Audit & feedback – possibly could have had an effect, but likely weak but would still rely on sustained vigilance by clinicians

In this case, a reminder that targeted decreased duration of catheterization was more appropriate than other potential strategies, but each problem will be different.

Principles to Keep in Mind

- Determine basis of a given safety problem
 - *Don't assume you know the answer*
- Match proposed solution to the problem
- **Anticipate barriers to implementation**
- Pilot test
- More formal evaluation

Computerized Provider Order Entry

- Reports of major implementation problems
 - Cedars-Sinai in LA (2004), CHEO in Ottawa
- More insidious implementation failures
- Among 100 hospitals with CPOE
 - 50% reported participation by <50% of physicians
 - 30% reported >90% of all orders remain handwritten

JAMA

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Vol. 293 No. 10, March 9, 2005

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Original Contribution

Role of Computerized Physician Order Entry Systems in Facilitating Medication Errors

Ross Koppel, PhD; Joshua P. Metlay, MD, PhD; Abigail Cohen, PhD; Brian Abaluck, BS; A. Russell Localio, JD, MPH, MS; Stephen E. Kimmel, MD, MSCE; Brian L. Strom, MD, MPH

JAMA. 2005;293:1197-1203.

ABSTRACT

Context Hospital computerized physician order entry (CPOE) systems are widely regarded as the technical solution to medication ordering errors, the largest identified source of preventable hospital medical error. Published studies report that CPOE reduces medication errors up to 81%. Few researchers, however, have focused on the existence or types of medication errors facilitated by CPOE.

Objective To identify and quantify the role of CPOE in facilitating prescription error risks.

Design, Setting, and Participants We performed a qualitative and quantitative study of house staff interaction with a CPOE system at a tertiary-care teaching hospital (2002-2004). We surveyed house staff (N = 261; 88% of CPOE users); conducted 5 focus groups and 32 intensive one-on-one interviews with house staff, information technology leaders, pharmacy leaders, attending physicians, and nurses; shadowed house staff and nurses; and observed them using CPOE. Participants included house staff, nurses, and hospital leaders.

Main Outcome Measure Examples of medication errors caused or exacerbated by the CPOE system.

Results We found that a widely used CPOE system facilitated 22 types of medication error risks. Examples include fragmented CPOE displays that prevent a coherent view of patients' medications, pharmacy inventory displays mistaken for dosage guidelines, ignored antibiotic renewal notices placed on paper charts rather than in the CPOE system, separation of functions that facilitate double dosing and incompatible orders, and

“Role of computerized physician order entry systems in facilitating medication errors”

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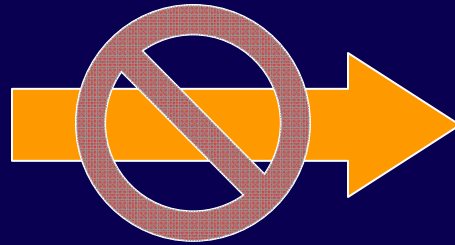
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Potassium Chloride Safety

Concentrated KCl resembles other iv solutions



Lethal errors involving injections of concentrated KCl

Sobering example of hospital where delays in receiving KCl from Pharmacy resulted in surreptitious hoarding of KCl on wards

→ Increase, rather than decrease in hazard

Agency for Healthcare Research and Quality

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Case & Commentary

Laboratory Medicine | February 2004

Transfusion "Slip"

The Case

A married couple, Mr. and Mrs. M, was brought to the emergency department of a Level 1 trauma center after a half-ton truck that had struck their car. Mr. M appeared hemodynamically stable with multiple fractures. Mrs. M had been the driver. Her blood pressure was low, and she had wide-open crystalloid infusions, and she had signs of peritonitis on exam. Both patients were typed and crossed, although Mrs. M needed packed red blood cells urgently.

The husband and wife patients had been placed in a large room with several beds. In the commotion of stabilizing and assessing both patients, the typing tube for Mr. M was labeled with the sticker for Mrs. M. When the tube was labeled and sent to the lab, this error would normally be undetectable based on the standard protocols for handling blood samples. By coincidence, however, Mrs. M had previously undergone a cesarean section at the same hospital. She had been typed and crossed at that time. She and her husband did not share the same blood type (she was Type O and he Type A). The alert technologist in the blood bank noticed the change in blood type and inferred that a mistake must have been made. She called the ED immediately. They agreed to redraw her blood sample for re-typing, but also requested that O-negative blood be sent to the ED immediately in case the patient deteriorated. Mrs. M thus never received the wrong blood.

This case represents a very serious near miss. But for the coincidence of Mrs. M's blood type being on file at the same hospital, she would have received a potentially fatal incompatible **transfusion** matched for her husband's blood type (A) and not her own (O).

- Husband and wife brought to ED after MVA
- Cross-match samples sent for both patients
- Mr. M's cross match tube was labeled with sticker for Mrs. M
- *Fortunately, Mrs. M had undergone a C-section at same hospital and Lab Technologist noticed 'change' in her blood type from Type O to Type A*
- *→ called the ED immediately*

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“We had a similar incident...

The solution here has been that all blood needs two screens. Unfortunately, patients routinely have both samples taken at once (i.e., at the same draw), thus undermining the safety of double samples to avoid patient labeling confusion.”

Unfortunately, no matter how well-intentioned, any solution that requires extra effort on the part of front line people is very unlikely to succeed when the error is very uncommon and the but actions affected by the protocol are very common. In this case, the requirement for double screening requires providers to twice as much work as before each time they have to cross match someone in order to prevent a very uncommon type of error. No matter how serious that error may be, a "work around" or "routine rule violation" of some kind is bound to emerge.

Implementation Issues

- Expect to occur with any new technology
 - CPOE, barcoding, smart pumps
- Expect to occur with any intervention involving reorganization of care
- Expect with any intervention that requires additional work for frontline personnel
- Expect with any ‘add-on’ policy, especially when target problem is uncommon

What does it take to implement change when the evidence is good?

A change strategy that

- Makes work easier for front line providers (or at least not harder)
- Is based on an understanding of the target problem
- Has good evidence supporting its effectiveness

- Still don't be surprised if you fail!
- Even successes will usually be modest

But, that's OK - consistent, modest gains will eventually produce major improvements, just as with the rest of biomedicine