



Communicating Effectively with Physicians to Influence Practice: A Rapid Review of the Evidence

Melanie Gillespie,
Physician Outreach Specialist
Region of Peel Public Health

December 8, 2010

Table of Contents

<i>Key Take Home Messages</i>	1
<i>Executive Summary</i>	2
1 Problem Statement	5
1.1 Effective Physician Communications	5
2 Context	6
2.1 Interface between Physicians and Public Health	6
2.2 Physicians in Peel Region	7
3 Using Evidence to Inform Physician Communication Strategies: A Case Study	9
4 Literature Review	10
5 Search Strategy	13
6 Critical Appraisal Strategy	16
7 Results	17
7.1 Summary of Analyses	17
7.2 Summary of Findings	17
7.3 Print Educational Materials (PEMS)	18
7.4 Local Opinion Leaders	19
7.5 Educational Meetings/CME Events	20
7.6 Audit and Feedback	21
7.7 Reminder Systems	22
7.8 Educational Outreach Visits (EOVs)	22
7.9 Multiple Interventions	23
7.10 The Relative Effectiveness of Interventions	23
8 Applicability and Transferability	25
8.1 Discussion Summary	25
8.2 Recommendations	27
<i>References</i>	30
<i>Appendices</i>	32
<i>Appendix 1: Conceptual Model of Physician Communication Strategies to Influence Practice</i>	33
<i>Appendix 2: Literature Search Flowchart</i>	34
<i>Appendix 3: Data Extraction Table for Systematic Reviews</i>	35

Key Take Home Messages

- On the whole, Peel Public Health continues to use strategies of low effectiveness when communicating with physicians. Such strategies are unlikely to have significant impact on physician practices and/or patient outcomes.
- Print materials and didactic meetings, mainstays of our current communication strategies, are found to have a smaller beneficial effect on physician practices as compared to other interventions.
- Interventions with larger effects include audit and feedback, continuing education with both didactic and interactive components, and educational outreach visits. These must be evaluated within a public health setting.
- More effective interventions are more intensive and have significant implications for both physicians' time and public health staff resources. Successful interventions will require prioritized planning, collaborative efforts, feasibility assessments and cost-benefit analyses.
- An internal change management strategy for physician outreach focusing on more effective physician communication strategies is recommended.

Executive Summary

Peel Public Health requires optimal strategies for communicating with the 1400 + physicians in Peel to influence the public health components of their practices. Program experience indicates that staff has limited knowledge of practice environments and how to effectively reach physicians with key public health messages. In the absence of clear alternatives, staff continue to use strategies of low effectiveness.

The purpose of this review is to identify effective strategies for communicating with physicians to influence behaviours related to public health practice. The interventions in this review include various communication strategies most likely to be used within public health for translating knowledge to physicians, specifically; print materials, presentations, outreach visits, audit and feedback, local opinion leaders and reminder systems. Outcomes of interest include a range of professional behaviours and practices, and patient outcomes. Through a process of hand-searching and electronically searching MEDLINE for systematic reviews, 11 articles were included in this rapid review.

Main findings are summarized as follows:

Strong Evidence

- There is a small favourable effect of print educational materials on professional practices but no effect on patient outcomes.
- Print materials and didactic meetings are found to have smaller beneficial effect as compared to other interventions.

-
- There is a small to moderate effect of Educational Outreach Visits (EOVs) (alone or in combination with other interventions) on professional practice, particularly on prescribing behaviour.

. Moderate Evidence

- There is a small effect associated with the use of local opinion leaders to impact professional practice, however results were inconclusive.
- There is a small to moderate effect of audit and feedback on professional practice, however effects are highly variable.
- There is a small to moderate effect of educational meetings (didactic and interactive elements) on professional practice and a smaller effect on patient outcomes.
- Continuing medical education meetings, (those with interactive and didactic elements), audit and feedback, local opinion leaders and educational outreach visits are noted to have similar effects.
- The effectiveness of multifaceted interventions appears to depend on the combination of interventions. Some combinations are effective, while others are not.
- Reminders systems produce inconclusive results, warranting further exploration.

Based on the evidence of this review and the feasibility and transferability of results, the following recommendations are outlined for Peel Public Health staff that are planning physician communications:

1. Work collaboratively to prioritize and carefully design and position physician-based interventions.

2. Increase the use of physician outreach strategies that are more effective including Educational Outreach Visits (EOVs) and continuing education (presentations) that contain both didactic and interactive components.
3. Develop an internal physician outreach strategy that supports the shift towards more effective physician communication strategies.

Peel Public Health has the organizational capacity to shift towards more effective physician communication strategies and by doing so can strengthen the impact of ongoing programs and strategic priorities that require physician communications. A successful shift will depend on a number of important factors including a physician outreach change management strategy for internal staff, use of a targeted approach, collaborative planning, and development of feasible models, appropriate training and a commitment to evaluating new approaches.

1 Problem Statement

1.1 Effective Physician Communications

Success in public health depends in large part on the ability to communicate effectively with key audiences for the purpose of influencing behaviours, practices and policies at the individual, organizational and community levels. Physicians represent one such key audience. Peel Public Health requires optimal strategies for communicating with physicians to influence public health practice. Many groups compete to communicate with the same target audience and physicians receive large volumes of print and emailed communications from their regulatory bodies, hospitals, pharmaceutical companies, laboratories and others.

The challenge for Peel Public Health is to gain the attention of physicians, and subsequently influence their practice. Our program experience at Peel Public Health indicates that staff has limited knowledge of practice environments and how to effectively reach physicians with key public health messages.

2 Context

2.1 Interface between Physicians and Public Health

The interface between physicians and public health is significant. Family doctors and other specialists are important partners in reaching the public and share a complimentary role in ensuring improvements and maintenance of the health of patients within the population.

Some of the links between public health and physicians are established through the Ministry of Health and Long-term Care, for example, the distribution of publicly funded vaccine and TB and STI medications for at-risk populations. Other relationships are determined by specific physician responsibilities outlined within the Health Protection and Promotion Act (e.g. fridge inspections in premises where provincially funded vaccine is stored, reporting of adverse events following immunization and diseases designated within the Act as reportable.)

As stated in a previous investigative report: "In this partnership role with physicians, Peel Public Health educates, informs and engages participation, support, co-operation and, when appropriate, compliance."¹²

Public health programs also support physicians by:

- collaborating to provide case and contact management
- engaging physicians in health promotion activities such as universal screening programs (e.g. Routine Universal Comprehensive Screening of female patients for partner abuse, Nipissing Developmental Screen), and

- providing resources for patient education (e.g. distribution of public health materials to patients) and referrals to public health programs.

2.2 Physicians in Peel Region

There are over 1400 physicians in Peel Region, of which approximately 840 are family physicians. Peel Public Health also links closely with other specialists such as infectious disease specialists, respirologists, paediatricians, obstetricians, and emergency specialists.

Peel Public Health uses a variety of approaches to communicate regularly with physicians, including the *Health Professionals' Update*, a brief communication that is regularly distributed to physicians, and public health presentations provided at Family Medicine Business meetings at each of the three hospitals within Peel region. As well, public health programs such as *TB, Vaccine Management and Physician Information, Surveillance, and Communicable Diseases Case Management* communicate regularly with physicians via mailed or faxed correspondence or phone and face-to-face meetings.

In addition, staff members develop a variety of print materials that either target physicians (e.g. guideline documents, decision-aids, screening tools, and referral brochures) or rely on them to distribute patient materials (e.g. health specific pamphlets, posters, public health referral information, and promotional items).

In 2006, a literature review was commissioned to determine effective approaches for communicating with physicians. This review was extensive, including 64 research articles

(surveys, randomized controlled trials, time series, meta-analyses and systematic reviews)

published between 1994 and 2005. Findings reported strategies in one of three categories i) non-existent to low effectiveness, ii) low to moderate effectiveness and iii) moderate to high effectiveness.

The findings of this review were disseminated to staff via presentations and individual consultations as requested. While the information was well-received, and staff expressed interest in using strategies identified as moderate to high effectiveness, staff continue to plan strategies of low effectiveness when disseminating information to physicians. For example, the concept of unsolicited mail-outs continues to be popular among staff.

3 Using Evidence to Inform Physician Communication Strategies: A Case Study

The following scenario illustrates the challenges that have arisen in the development and distribution of physician communications:

The Chronic Diseases and Injury Prevention team partnered with Family Health to plan a health professional strategy within a broader childhood injury prevention initiative. The physician package included: i) a questionnaire to be completed by the parent and discussed with the physician, ii) a referral pad for referrals to the Family Health and Chronic Diseases call centres, iii) and a brochure listing referrals to community obesity prevention and treatment centres. The packages were focus-tested by physicians, then revised. Approximately 10 physician offices also piloted the use of the packages. The project team offered outreach visits to the pilot sites. A follow-up evaluation with the ten pilot sites yielded a low response rate to a faxed survey. Therefore the team could draw no definitive conclusions about program success. As well, call centre tracking could not decipher referral sources when parents called in for more information related to preventing childhood obesity. The intent of the project team was to use the results of the pilot to determine next steps. The team decision was to shift the broader project focus to the general public. In order to bring closure to the health professional strategy, the decision was to distribute the remaining resources through a mass mail-out. There was no evidence to support further uptake or use of these resources by physicians as a result of the mail-out.

This case study illustrates that in the absence of clear alternatives, staff continue to consider strategies of low effectiveness when disseminating information to physicians. When strategies of moderate to high effectiveness are attempted, the results have been mixed or as in the previous case, unknown. Barriers to using more effective strategies may include lack of awareness about low, moderate and highly effective strategies, limited resources to plan effectively, or less experience with alternative strategies.

4 Literature Review

The purpose of this rapid review is to update findings from the previous literature review conducted in 2006. The previous review, while extensive, pre-dated the current standard for conducting literature reviews at Peel Public Health. The review did not use the current systematic approach of critical appraisal and incorporated many single studies of varying quality. As well, it only included articles up to 2005.

The research question addressed in this review is: *What are effective strategies for communicating with physicians to influence behaviours related to public health practice?*

The following PICO table outlines the relevant criteria for study selection:

P (Population)	Health Care Professionals
I (Intervention)	Print materials, presentations (CME meetings), outreach visits, audit and feedback, local opinion leaders, reminder systems
C (Comparison)	Control, standard care, another intervention (s)
O (Outcome)	Professional practice outcomes, patient outcomes

Participants:

While the results of this rapid review are likely to be most often applied by Peel Public Health staff to physicians in primary care settings, the reviews included in this study represented a range of health care professionals including physicians, nurses, pharmacists, and multi-disciplinary care teams.

Intervention:

The intervention included various communication strategies and tools for translating knowledge to physicians. While interventions include inter-professional education and technology-assisted strategies, this review focused on strategies that are most likely to be used within public health:

- Print materials: includes monographs, clinical guidelines, publications, newsletters and other materials⁴.
- Presentations: Continuing Medical Education - workshops and meetings:
- Outreach visits (i.e., academic detailing): a personal visit by a trained individual to health professionals in their own settings¹¹.
- Audit and feedback: providing any summary of clinical performance over a specified period of time; may include recommendations for clinical action⁹.
- Local opinion leaders: individuals who are identified as influential and trustworthy who may provide informal or formal education to their peers³.
- Reminder systems: Physician reminders at the point-of care¹.

Comparison Group:

- The comparison groups were varied and included the following combinations:

Health professionals exposed to:

- No intervention (Control)
- Another single comparative intervention (e.g. Audit and Feedback)
- Standard care
- Single intervention
- Another multi-intervention without the intervention being studied

Outcome:

Outcomes of the included studies encompassed a range of professional practices. The focus of this review is on the application of these results to public health. Appendix 1 provides a conceptual model of physician outreach within this context; physician outreach interventions are linked to key outcomes as they relate to public health.

Outcomes included the following professional practices and behaviours: referrals, interviewing behaviours, screening, prescribing behaviour, compliance, clinical practice, primary prevention, self-efficacy and improved knowledge and skills. Positive patient outcomes were also considered in 8 of the 9 systematic reviews. Mansouri et al also included studies that measured changes in physician knowledge¹⁰.

5 Search Strategy

Two main search strategies were used to conduct this review: i) hand search of reviews conducted by the Cochrane Effective Practice and Organization of Care Group (EPOC) and ii) an electronic search of MEDLINE for systematic reviews conducted after 2004.

Strategy #1- Hand Search of EPOC Reviews: The Cochrane EPOC registry was hand searched for relevant systematic reviews. Eleven articles were initially identified using this strategy¹.

Strategy #2- Electronic Search of MEDLINE: In order to identify other systematic reviews conducted since 2005, a modified version of the EPOC MEDLINE search strategy was used:

Keywords:

- 1 Education, medical, continuing/ (17818)
- 2 continuing medical education of CME.tw. (648)
- 3 Teaching Rounds/ (24)
- 4 ((grand or teaching or morning) adj rounds).tw. (1177)
- 5 workshop*.tw. (18825)
- 6 or/1-5 (37413)
- 7 limit 6 to yr=2006-2010 (7102)
- 8 meta-analysis.pt. (24104)
- 9 7 and 8 (16)
- 10 "Referral and Consultation"/ (43159)
- 11 academic detailing.tw. (227)
- 12 outreach.tw. (5305)
- 13 (audit adj feedback).tw. (50)
- 14 *Feedback/ (3904)
- 15 or/10-14 (52331)
- 16 limit 15 to yr=2006-2010 (10431)
- 17 meta-analysis.pt. (24104)
- 18 16 and 17 (27)
- 19 Health Education/ or Teaching Materials/ or Pamphlets/ (52698)
- 20 ((education\$ or teach\$) adj (material\$ or book\$ or monograph\$ or pamphlet\$ or guidelines\$ or publication\$ or serial\$ or papers\$ or information)).tw. (3883)
- 21 education\$ intervention\$.tw. (4260)
- 22 exp education/mt (57089)
- 23 print\$.tw. (13077)
- 24 or/19-23 (117846)
- 25 limit 24 to yr=2006-2010 (24854)
- 26 meta-analysis.pt. (24104)
- 27 25 and 26 (127)

The previous Peel Public Health review of physician outreach strategies included studies from 1994-2005, therefore this review was based on articles retrieved from January 2006 to April 2010².

Included studies were systematic reviews only (English), and had to clearly focus on one of the following interventions: continuing medical education/presentations, audit and feedback, outreach visits, reminder systems (non-technology-based), web-based information and local opinion leaders. Outcomes had to include some aspect of professional behaviour or practice and could additionally include patient outcomes.

Studies that were excluded from this review were patient-mediated interventions, technology assisted strategies (Internet-based learning was the exception), inter-professional education or organizational interventions. Interventions that focused on one specific professional group that did not include physicians (e.g. dentists) were also not included in this review.

Search Results

In total, of 181 papers considered for this review, 11 papers were included (Refer to Appendix 2). Seven (7) systematic reviews were included from the hand searched Cochrane EPOC reviews. The MEDLINE search resulted in the inclusion of two additional systematic reviews and one systematic meta-review (i.e. synopses of systematic reviews). The Bloom study² was

² A review of systematic reviews that was completed in 2005 was included in this review (Bloom). This article, which was retrieved from the reference list of the previous investigative report, was included because of its summative value.

added as the final meta-review. The break-down of intervention types included in this review is as follows:

- Print materials: 2 (includes 1 meta-review)
- Continuing Education/Presentations: 1
- Outreach visits:1
- Audit and feedback:2
- Local opinion leaders: 1
- Comparison of multi-interventions: 4 (includes 1 meta-review)

6 Critical Appraisal Strategy

The primary tool used to critically appraise the studies included in this review was the Health Evidence Quality Assessment Tool (health-evidence, 2010).³ . An additional two articles were previously assessed by Health Evidence. As well, two synopses of systematic reviews were also reviewed by two reviewers. These synopses were assessed qualitatively, as an appropriate rating tool was not available.

Interpretation of the analysis and results was challenging because of the following factors:

- Inclusion of a large number of primary studies resulting in many comparisons
- Narrative synthesis versus meta-analysis
- Unfamiliarity with the statistical methods used
- Understanding the meta-regression analyses for moderating variables

Therefore, another step was added to include the critical appraisal by a professor and knowledge broker from the McMaster University Health Evidence program. The group met to review questions, discuss concerns and resolve any discrepancies in ratings.

³ As author of this literature review, the Physician Outreach Specialist was the primary reviewer for each review article. As well, 7 articles were reviewed and scored by a second reviewer Two Public Health staff in specialist roles and one Community Medicine Specialist served as second reviewers. In 2 cases, the Health Evidence ratings provided for 2 of the review articles. Discrepancies in ratings more than one point apart were discussed until agreement was reached.

7 Results

Eight of the nine systematic reviews included in this literature review were rated as “strong” quality, while one was rated as “moderate to strong”. The two meta-reviews that were included were qualitatively assessed as moderate^{2,7}. In the meta-review conducted by Francke et al, the authors performed methodological assessments on the 12 systematic reviews included in their article using the *Quality Assessment Checklist for Reviews*.⁷ Two of the 12 reviews scored high on the checklist while the other ten reviews scored in the lowest of the middle ranges, indicating extensive or major flaws. The other meta-review or synopsis did not indicate that a quality assessment of reviews was performed².

7.1 Summary of Analyses

Meta-analyses were performed in four of the 11 studies included in this review. Results from the two meta-reviews were summarized and discussed qualitatively. The remaining five systematic reviews reported the statistics from primary studies separately as ranges, and narrative syntheses were provided. In three studies, meta-regression analyses were performed to identify moderating variables that influenced over-all effectiveness.

7.2 Summary of Findings

The following table provides a summary of the relative effectiveness of each intervention, organized from least effective to most effective.

Intervention	Strength of Evidence	Magnitude of Effect ⁴	Summary
Print Materials	Strong	Small, variable for professional outcomes Mean ARD ⁵ 4.3% (-8.0% - 9.6%) *No effect for patient outcomes	When used alone, print materials may have effect on professional outcomes but have no effect on patient outcomes.
Physician Reminder Systems	Moderate	*Insufficient evidence to provide effect statistic	Mixed results. Needs to be explored further.
Local Opinion Leaders	Moderate	Small, Variable for professional outcomes Mean ARD 10% (-6% - 25%)	In hospital settings, use of opinion leaders can have a small effect on professional practice.
Audit and Feedback	Moderate	Small to moderate for professional outcomes Mean ARD 5% (3 - 11%)	Audit and feedback can have a small effect on improving professional practice, particularly when baseline practice is low and feedback is more intensive.
Continuing Education	Moderate	Small to moderate for professional outcomes Mean ARD 6% (2.9 - 15.9%)	Mixed (didactic & interactive) educational mtgs. are beneficial.
Multi-faceted Interventions	Moderate to Strong	Small, variable for professional outcomes.	Benefit of multi-faceted interventions depends on the combination of interventions
Educational Outreach Visits	Strong	Small to moderate for professional outcomes (particularly for prescribing behaviour. Mean ARD 5.6%(3 – 9%)	EOVs have small but consistent effects on prescribing behaviour. Effects are more variable for other professional outcomes.

7.3 Print Educational Materials (PEMS)

There is strong evidence to support a small favourable effect of PEMS on professional practices (e.g. prescribing, smoking cessation activities and medication change), but no effect on patient outcomes (e.g. screening, quit smoking and smoking cessation attempts)⁴. These findings were more optimistic than those of a previous cochrane review which described the effect of print materials as small and of uncertain clinical significance.⁴ Arnold et al concluded from a review exploring interventions to increase appropriate prescribing, that the use of printed educational

⁴ Represents main effect for dichotomous outcomes.

⁵ ARD=Adjusted risk difference: which is the difference in adherence after the intervention minus the difference before the intervention. A positive ARD indicates adherence improved more in the intervention group than in the control group. ARD is one of the standard statistical calculations used by the Cochrane EPOC group for dichotomous variables.

materials alone resulted in no or only small changes in prescribing¹. When compared to other interventions, the effect of PEMS on professional practice was removed⁴.

PEMs in the Farmer et al study included clinical guidelines, newsletters or bulletins, articles in peer-reviewed journals and monographs⁴. The purpose of the Franke et al study was to gain a better understanding of which factors affect the implementation of clinical guidelines⁷. Clinical guidelines of low complexity and guidelines that were easy to use promoted implementation. Young professionals with less experience were more likely to use guidelines, while limited familiarity and lack of agreement with guidelines were the main professional characteristics identified as barriers to guideline adoption. Limited resources, work pressures and patient resistance were also identified as reducing the likelihood of implementation⁷. While this study provides a useful context for considering the implementation of guidelines, 10 of the included reviews were identified as having extensive or major flaws.

7.4 Local Opinion Leaders

There is modest evidence to support small effects for the use of local opinion leaders to impact professional practice³. However results were inconclusive, as also found in the previous review³. This systematic review examined a range of health professional behaviours related to the general management of clinical problems. The included studies were primarily in hospital settings. Among the 12 included RCTs, several were studies of high and moderate risk of bias.

As outlined in Appendix 3, when comparing use of local opinion leaders to no intervention, a single intervention (alternative), single intervention plus(local opinion leader plus single

intervention or intervention alone) or local opinion leaders as part of a multiple intervention, the reported ARDs all indicated small effects, with a large degree of variability. This variability of effect may be explained, in part by the varied roles of the opinion leaders included in the primary studies. A meta-regression analysis was performed to determine the effect of the method used to identify opinion leaders. There are four defined methods used to identify opinion leaders: the socio-metric method (e.g. self-reported questionnaire in which individuals are rated as professionals), informant method, self-designating method, and observation method. In the Doumit review, studies using the informant method of identifying opinion leaders showed larger effects than the sociometric method.³

7.5 Educational Meetings/CME Events

Consistent with findings from an earlier review by the same authors, there is moderate evidence to support small to moderate effects of educational meetings/CME events on professional practice and a smaller effect on patient outcomes^{6, 10}. Effects are likely to be small even with educational meetings that vary on a number of dimensions, including format⁶. (Refer to Appendix 3). The Foresetlund review included 81 RCTs, involving more than 11,000 health professionals, the majority of whom were physicians. Educational meetings targeted a range of professional behaviours including preventive care, test-ordering behaviour, screening behaviours, improving communication skills and the general management of health problems.

In their systematic review of 31 studies, Mansouri et al reported that the mean effect size between CME and physician knowledge was close to moderate, while the mean effect for both physician performance and patient outcomes was small¹⁰. The results of the Mansouri et al

study, should be used cautiously given the moderate quality of the review, however findings are consistent with the results of other reviews that noted when compared to standard care, educational interventions can marginally reduce the average weight for patients after 1 year^{5,6}.

The effect of CME interventions appears to be larger for higher attendance and mixed didactic/interactive content^{1,6}. This represents an important difference from a finding from the previous review, in which interactive education alone was more effective than didactic education⁶. Educational meetings were not found to be effective for impacting complex behaviours and less serious outcomes⁶. In the Mansouri review, CME effectiveness favoured active and mixed methods, multifaceted educational workshops, repeated workshops, interactive small groups and case discussion interventions. Lowest effect sizes were associated with conferences, lectures and mail-out strategies¹⁰.

7.6 Audit and Feedback

There is strong evidence to support small to moderate effects of audit and feedback on professional practice⁸. However effects are highly variable⁹. For example, the Arnold et al review reported no effect or small changes in prescribing¹. Few studies reported patient outcomes as a primary outcome⁹.

The relative effects of audit and feedback appear to be larger when baseline adherence to recommended practice is low,⁹ when feedback is provided more intensely or frequently⁹, when feedback is written and when it provides the correct information⁸. In the comprehensive review conducted by Jamtvedt et al (118 RCTS), the effects of audit and feedback varied widely from

negative effect, to small to moderate effect, whether audit and feedback was offered alone or as a component within a multi-intervention⁹ (See Appendix 3).

Conclusions from the Hysong review which had a smaller number of included studies (19), suggest that audit and feedback has a modest but significant effect on health care provider performance⁸.

7.7 Reminder Systems

While none of the systematic reviews include in this literature review looked exclusively at reminder systems, when compared to or included with other interventions, reminders produced mixed (but potentially positive) results, warranting further exploration of this strategy for a wide range of interventions including prescribing and professional practices to facilitate patient weight management^{1, 5}.

7.8 Educational Outreach Visits (EOVs)

There is strong evidence to support small to moderate effects of EOVs (alone or in combination with other interventions) on professional practice, particularly on prescribing behaviour. Based on a comprehensive review conducted by O'Brien et al, including 69 RCTs, involving more than 15,000 health professionals (predominantly primary care physicians), the impact of EOVs varies widely for other professional practices such as preventive services and the general management of problems encountered in a general practice¹¹. When compared to audit and feedback alone, EOVs appeared to have a slightly greater effect. In a review of a range of interventions to

increase the rate of appropriate prescribing, Arnold et al noted that EOVs produced mixed results¹.

7.9 Multiple Interventions

The evidence on the relative effectiveness of multifaceted interventions appears to be contextual. In the O'Brien review for example, when EOVs were part of a multi-faceted intervention, the median effect size was larger than EOVs alone¹¹. By contrast, Forsetlund et al did not find a significant difference in the effects of multifaceted interventions versus CME meetings alone⁶. Similarly, Jamtvedt et al did not find significant difference in the relative effectiveness of audit and feedback when combined with CME meetings or multifaceted interventions⁹.

7.10 The Relative Effectiveness of Interventions

In describing the relative effectiveness of audit and feedback, local opinion leaders and educational outreach visits, authors from one review state that practitioners should expect absolute improvements in practice of five to ten¹¹. Continuing medical education meetings, particularly those mixed with interactive and didactic elements are noted to have similar effectiveness to audit and feedback, local opinion leaders and educational outreach visits⁶. Print materials and didactic meetings were found to have smaller beneficial effect as compared to other interventions^{4, 6}. In a meta-review (of weaker quality) that examine eight different educational methods, didactic programs and provision of printed materials alone appeared to cluster in the range of no-to-low effects, while opinion leaders, interactive education, audit and feedback, academic outreach and reminders appeared to cluster to moderate-to-high beneficial effects². The direction of the findings is similar to results from the previous review (2006). Print

materials and didactic meetings when used as a single strategy, were identified in the 2006 report as non-existent to low effectiveness. Similarly to this report, audit and feedback and opinion leaders were identified as having low to moderate effectiveness. While the 2006 report was more optimistic about the effectiveness of reminders, outreach visits and multi-faceted strategies (identified as moderate to high effectiveness), this report identified these strategies as having small to moderate effects.

8 Applicability and Transferability

8.1 Discussion Summary

A cross-section of supervisors, managers and Associate Medical Officers of Health whose program mandates include physician communications were invited to test the applicability and transferability of review findings to Peel Public Health. The consensus of the group was that each of the physician interventions has been or could be applied to the public health context. Based on the evidence, the group also supported a shift away from interventions of low effectiveness, like print-only communications, and a move towards initiatives that engage more effective strategies, like EOVs. Staff agreed that using evidence-based approaches would be viewed as favourable by key stakeholders, including Regional Council who would view such approaches as innovative, relationship-building and fiscally responsible. However use of more effective strategies such as EOVs and A&F were not viewed as without challenges. By design, EOVs require more physician time and public health resources, including staff time and extensive training. EOVs would have to be viewed by physicians as having a large benefit to be valuable. As one staff put it: “time is experienced as billable time; every minute is precious, every intervention assessed as ‘what’s in it for me’”. From a public health perspective, the potential benefits of EOVs would have to be balanced against potential reach. Questions raised included: “Would it be practical to use this strategy with 1400+ physicians?” “If a more targeted approach was used, on what basis would participants be chosen?” (E.g. those who volunteer? The non-compliant? Specialists?) “Are outcomes of “5 to 10%” improvement enough to warrant use of more effective interventions?” “How many public health programs would be able to take advantage of this approach at any given time?”

Audit and feedback was identified as most likely to result in controversy, due to the potential for negative publicity and lower acceptability associated with measuring performance. However as one staff pointed out, A&F does not always refer to individual feedback but can include group feedback as well. The recently released report identifying hospital formula supplementation rates was offered as an example of how A&F was used successfully to create dialogue with hospital partners and generate an action plan. In this case, naming the hospitals was viewed as a catalyst for subsequent action.

In terms of organizational capacity, the largest barriers to successful implementation of more effective strategies included staff reluctance to abandon familiar strategies and the capacity to deliver more intensive interventions with current resources. However, interventions of greater effectiveness could potentially support strategic priorities (e.g. smoking cessation, nurturing the next generation) and ongoing CD programs (e.g. TB outreach and vaccine management).

This review was not without its limitations. The study populations also included other health settings including hospitals; and outcome measures often included prescribing behaviours, diagnostic and treatment procedures and the general management of health problems. These outcomes were not differentiated from counselling (e.g. smoking cessation, breastfeeding) or preventative care (e.g. screening, vaccinations). There was a high degree of variability among studies and study results even when effects were reported. After reviewing this report, staff emphasized the need to understand and tailor interventions for a public health context.

Evaluating such efforts would add to the body of knowledge regarding which physician communication strategies work specifically in the context of public health.

8.2 Recommendations

Based on the evidence of this review and the feasibility and transferability of results, the following recommendations are outlined for Peel Public Health staffs that are planning physician communications:

1. Work collaboratively to prioritize and carefully design and position physician-based interventions. Teams should work closely to:
 - Consider a range of interventions that appropriately target physicians as one of many potential audiences
 - Avoid targeting physicians for too many initiatives
 - Shift away from using strategies that are less effective, namely print-only and didactic presentations. Staff should be encouraged to:
 - Use print sparingly and in conjunction with more effective strategies
 - Consider other strategies (than health professional strategies) when patient outcomes are the primary goal
 - Continue to use Health Professional Updates and Rounds opportunities when the primary goal is to increase physician awareness of relevant issues. When the goal is to influence physician behaviour and/or patient outcomes, staff should be encouraged to use other strategies in conjunction with or instead of these standard communications.
2. Increase the use of physician outreach strategies that are more effective including EOVs and continuing education (presentations) that contain both didactic and interactive components. Given the implications for staff resources and physician time, these strategies should be:

-
- Used strategically considering magnitude of the health issue relative to other issues, potential reach and physician acceptability
 - Carefully researched, planned and based on coherent intervention models
 - Analyzed for effectiveness, efficiency and cost-benefit
 - Implemented with extensive staff training and full consideration of required skill-sets
 - Explore the targeted use of physician outreach strategies that are moderately effective including A&F, multi-faceted interventions, local opinion leaders and reminder systems.
 - In particular, when using audit and feedback, staff should:
 - Consider if adherence to recommended practice is low
 - Design a feedback strategy that is adequate in intensity and frequency, written and includes improvement
 - Conduct a risk assessment, considering the potential impact of identifying poor performance or conveying negative feedback priorities (e.g. smoking cessation, nurturing the next generation) and ongoing CD programs (e.g. TB outreach and vaccine management)
 - Implement intervention models that make sense from a public health perspective
 - Include an evaluation plan
3. Develop an internal physician outreach strategy that supports the shift towards more effective physician communication strategies. The initiative should include:
- Broad distribution of this report for staff review
 - Interactive presentations for divisional and team meetings based on report findings
 - Increased involvement of the physician outreach specialist and communications associates in development of physician-based initiatives engaging in a physician strategy

- Development of an approval process and clearinghouse for managing multiple physician strategies across divisions
- Audit and feedback to internal staff
- Evaluation of physician-based interventions
- Cost-benefit analysis

Peel Public Health has the organizational capacity to shift towards more effective physician communication strategies and by so doing, can strengthen the impact of ongoing programs and strategic priorities that require physician communications. A successful shift will depend on a number of important factors including a physician outreach change management strategy for internal staff, use of a targeted approach, collaborative planning, development of feasible models, appropriate training and a commitment to evaluating new approaches.

References

1. Arnold S. R, Straus S. E. Interventions to improve antibiotic prescribing practices in ambulatory care. The Cochrane database of systematic reviews. 2005 (4):CD003539.DOI: 10.1002/14651858.CD003539.pub2.
2. Bloom B. Effects of continuing medical education on improving physician clinical care and patient health: A review of systematic reviews. *Int J Technol Assess Health Care*. 2005;21(3):380.
3. Doumit G, Gattellari M, Grimshaw J, O'Brien MA. Local opinion leaders: Effects on professional practice and health care outcomes (review). The Cochrane database of systematic reviews. 2007(1):CD00125.DOI:10.1002/14.
4. Farmer AP, Legare F, Turcot L, Grimshaw J, Harvey E, McGowan JL, et al. Printed educational materials: Effects on professional practice and health care outcomes. The Cochrane database of systematic reviews. 2008(3):CD004398.DOI:10.1002/14651858.CD004398.pub2.
5. Flodgren G, Deane K, Dickinson HO, Kirk S, Alberti H, Beyer FR, et al. Interventions to change the behaviour of health professionals and the organisation of care to promote weight reduction in overweight and obese people (review). The Cochrane database of systematic reviews. 2010(3):CD000984.DOI:10.1002/14651858.CD000984.pub2.
6. Forsetlund L, Bjorndal A, Rashidian A, Jamtvedt G, O'Brien MA, Wolf F, et al. Continuing education meetings and workshops: Effects on professional practice and health care outcomes (review). The Cochrane database of systematic reviews. 2009(2). CD003030.DOI:10.1002/14651858.Cd003030.pub2.
7. Francke AL, Smit MC, de Veer A. J.E., Mistiaen P. Factors influencing the implementation of clinical guidelines for health care professionals. *BMC medical informatics and decision making*. 2008;8(38).
8. Hysong S. Audit and feedback features impact effectiveness on care quality. *Med Care*. 2009;47(3):356.
9. Jamtvedt G, Young JM, Kristoffersen DT, O'Brien MA, Oxman AD. Audit and feedback: Effects on professional practice and health care outcomes. The Cochrane database of systematic reviews. 2006 (2): CD000259.DOI:10.1002/14651858.CD000259.pub2.
10. Mansouri M, Lockyer J. A meta-analysis of continuing medical education effectiveness. *J Contin Educ Health Prof*. 2007;27(1):6.
11. O'Brien MA, Rogers S, Jamtvedt G, Oxman A, D., Odgaard-Jensen J, Kristoffersen DT, et al. Educational outreach visits: Effects on professional practice and health care outcomes (review).

The Cochrane database of systematic reviews. 2007(2).
CD000409.DOI:10.1002/14651858.CD000409.pub2.

12. Peel Public Health. Physician outreach, education and communication strategies. An Investigative report. 2006.

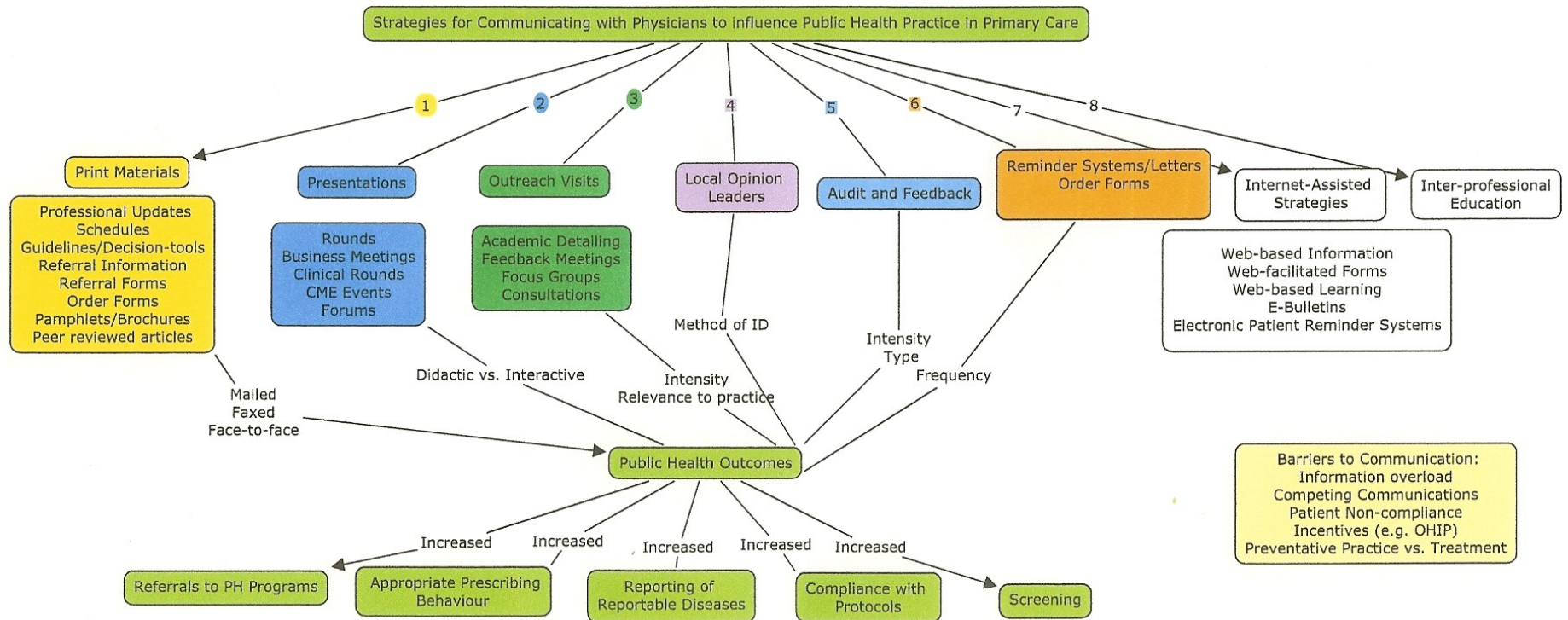
Appendices

**Appendix 1:
Conceptual Model of Physician Communication Strategies to Influence Practice**

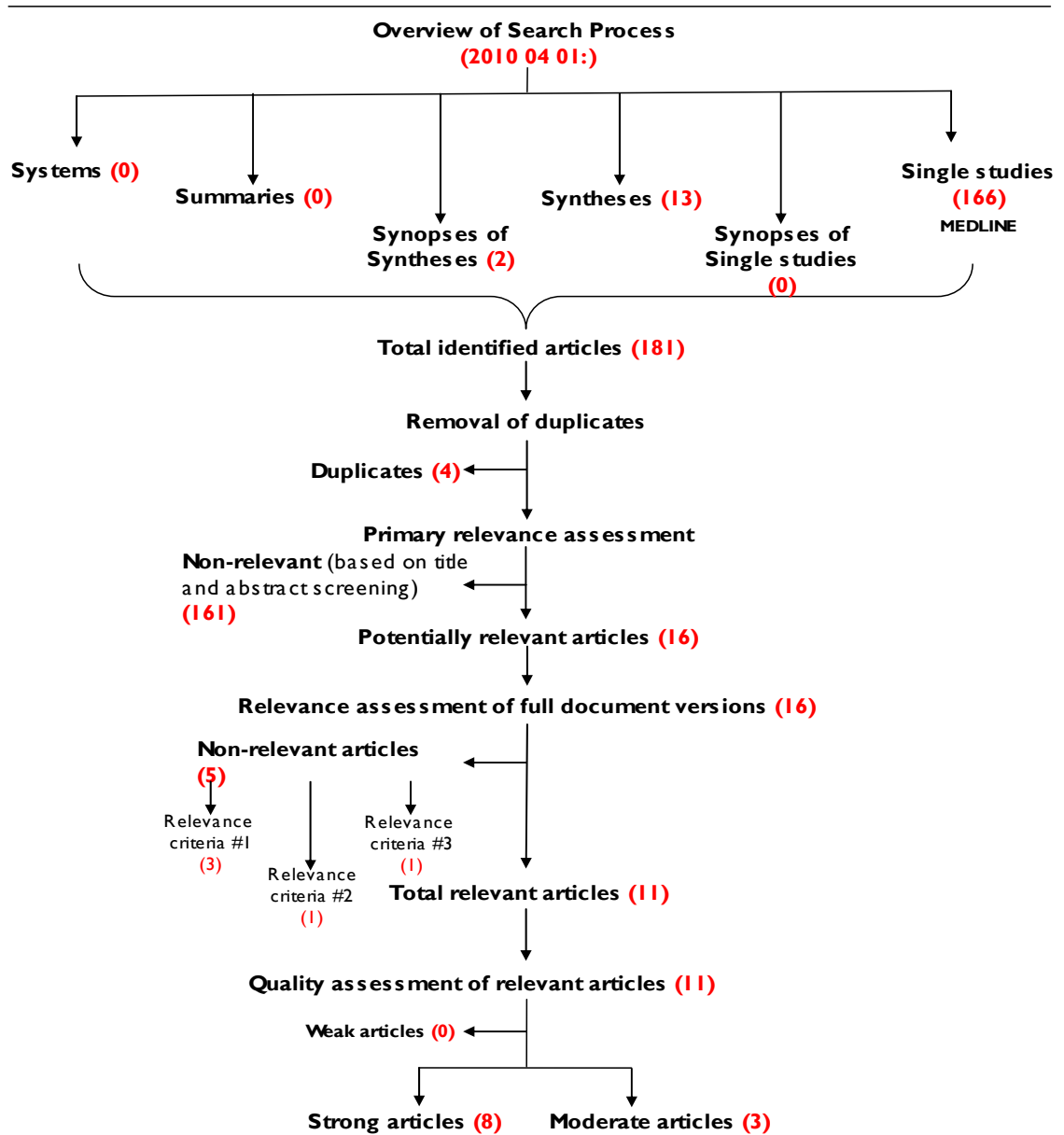
Appendix 2: Literature Search Flowchart

Appendix 3: Data Extraction Table for Systematic Reviews

Appendix 1: Conceptual Model of Physician Communication Strategies to Influence Practice



Appendix 2: Literature Search Flowchart



How to cite this tool: Health-evidence.ca. (2009, November 25). *Keeping Track of Search Results: A Flowchart*. Retrieved April 8, 2010, http://www.health-evidence.ca/public/tools/10/Keeping_Track_of_Search_Results_-_A_Flowchart.ppt.

Appendix 3: Data Extraction Table for Systematic Reviews

1.

Year, Author, Title: Arnold, et al., 2005. Interventions to improve antibiotic prescribing practices in ambulatory care

Quality Rating: Strong (R1⁵= 9, HE= 9)

Objectives of the Review: To systematically review the literature to estimate the effectiveness of professional interventions, alone or in combination, in improving the selection, dose and treatment duration of antibiotics prescribed by healthcare providers in the outpatient setting; (both for adults and children) and to evaluate the impact of these interventions on patient outcomes that were related to antibiotic use.

Number of Primary Studies Included: 39 total: 25 RCTs, 1 quasi-randomized control trial (QRCT), 11 Controlled Before and After studies (CBA), 2 interrupted time series (ITS)

Types of Studies: RCTs, QRCT, CBA, ITS

Databases Searched/Years Searched: MEDLINE (1966 - 2000), EMBASE (1980 -2000), EPOC specialized register searched to the end of 2002.

Inclusion & Exclusion Criteria: Inclusion: physicians, physician extenders (who prescribe antibiotics) who provide primary care in community or academic ambulatory settings. Exclusion: medical trainees only.

Description of Interventions, Settings & Study Sample:

Interventions: Distribution of educational materials, educational mtgs, local consensus process, educational outreach visits, local opinion leaders, patient mediated interventions, audit & feedback, reminders, marketing, mass media, financial interventions

Geographical Settings: Majority of studies (16) in U.S. or Canada. Remaining studies came from U.K., Australia, New Zealand, Norway, Spain and others including developing countries.

Intervention Settings: hospitals, health units, ambulatory settings, community-based settings

Sample: physicians, community health aides, community residents, children, primary healthcare nurses

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

Comparisons: Printed educational materials vs. other intervention or no intervention. A&F with or without other educational materials vs. other intervention or control. Educational mtgs. vs. other interventions or control. Academic detailing vs. other intervention or no intervention. Reminders vs. other intervention or no intervention. Multi-faceted intervention vs. other intervention or no intervention. Effect of any intervention vs. control on bacterial resistance.

Outcome measures:

rate of appropriate antibiotic prescribing

Incidence of colonization with, or infection due to antibiotic-resistant organisms, incidence of adverse events associated with reduced use or duration of treatment with antibiotics or use of narrow spectrum anti-biotics

No meta-analysis: Studies were analyzed qualitatively.

Main Findings of Review:

Printed ed. materials vs. other intervention or controls: 4 studies. None of the studies (3) using mailed materials demonstrated a stat. sig. change in prescribing behaviour. The ITS study demonstrated sig. reduction in antibiotic use following publication of recommendation.

A&F vs. other intervention or no intervention: 4 studies included. Mixed results: A&F favoured in 2 studies.

Ed. mtg. vs. other intervention or control: 7 RCTs & 2 CBAs: Group ed. mtgs. + A&F resulted in change in proportion of pts. Receiving 1st-line antibiotic compared to controls (1.0% - 17%, p. =001). 7 outcomes favoured educational mtgs. vs. control for outcomes of interest. Most studies had units of analysis errors, therefore interpret with caution.

Physician reminders vs. another intervention or control: 3 RCTs: in 2 studies outcomes favoured reminders (1 study: reminder + educational material vs. printed material alone; 2nd study: reminder vs. control); in 3rd study no sig. dif. after controlling for physician characteristics. Therefore too few studies on which to draw firm conclusions.

Multi-faceted vs. other intervention or no intervention: 7 studies included (RCTs and CBAs): An assortment of multi-faceted interventions. 6 out of 7 appear to favour the multi-faceted interventions; however clinical effects are modest in most cases.

Comments/Study Limitations:

⁵ R1= Rater 1, R2=Rater 2, HE=Health Evidence Rating

Appendix 3: Data Extraction Table for Systematic Reviews

Large number of studies, wide range of interventions and outcomes, difficult to make real comparisons. Small changes in prescribing may be achieved with simple interventions (e.g. guideline distribution), ed. mtgs., A&F. However interventions of greater complexity (e.g. multi-faceted interventions) may be more effective in changing antibiotic prescribing behaviours. No effect on patient outcomes. Explore cost-effectiveness.

2.

Year, Author, Title: Bloom,B., 2005, Effects of continuing medical education on improving physician clinical care and patient health: A review of systematic reviews.

Quality Rating: Moderate (R1)

Objectives of the Review: To examine effectiveness of current CME tools and techniques in changing physician clinical practices and improving patient health outcomes.

Number of Primary Studies Included: Meta-review. No primary studies. 26 systematic reviews included.

Types of Studies: Primary studies within each systematic review included RCTs, other control designs and uncontrolled studies.

Databases Searched/Years Searched: Medical Literature Analysis and Retrieval System On-line, Database of Abstracts of Reviews of Effects, Cochrane Collaborative, Cinahl Excerpta MedicaDatabase, Psycinfo, CMA Infobase, National Guidelines Clearinghouse, Evidence-based Medicine Reviews, American College of Physicians Journal Club, HealthSTAR

Inclusion & Exclusion Criteria: Inclusion: English-language only, peer-reviewed journals, formal meta-analysis with calculated effect sizes or otherwise structured review. Exclusion: Literature reviews alone.

Description of Interventions, Settings & Study Sample: Interventions:

8 Educational techniques: Didactic programs, Information only (print material distribution)

Opinion Leaders

Clinical practice guidelines

Interactive education

Audit and feedback

Academic detailing/outreach

Reminders

Settings: Unknown

Sample: Physicians

Main Comparisons, Outcome Measures & Summary of Analysis Conducted: Provider behaviour (care processes), Patient health outcomes. All 26 systematic reviews used quantitative or combined quantitative and qualitative methods

Main Findings of Review:

Physician Behaviours: Most effective education tools: interactive programs, academic detailing/outreach. **Moderately effective:** Audit and feedback, reminders. **Low or no effect:** Didactic programs, opinion leaders, Print information only

Patient Outcomes: High: Few strategies highly effective (Reminders, academic detailing), **Moderate:** Audit and Feedback, academic detailing, reminders, Interactive education, **Low or no effect:** Didactic programs, interactive education, Findings are contextual, A&F effective for optimal versus actual care provided, Academic detailing effective for best practices

Comments/Study Limitations: Supports conclusions drawn in the other systematic reviews. Critical appraisal of the primary studies not completed. "The CME tools and techniques most commonly used are the least-effective ones in helping physicians adapt to new diagnostic and therapeutic interventions." p. 383. Combining strategies needs to be further explored, particularly cost-effectiveness. Strategies need to be grounded in clear models of integration of knowledge into clinical practice.

Appendix 3: Data Extraction Table for Systematic Reviews

3.

Year, Author, Title: Doumit, G. et al, 2007. Local opinion leaders: effects on professional practice and health care outcomes (Review)

Quality Rating: Strong (R1=7 R2=7 HE=9)

Objectives of the Review: To assess the effectiveness of the use of local opinion leaders in improving the behaviour of health care professionals and patient outcomes.

Number of Primary Studies Included: 12

Types of Studies: RCTs

Databases Searched/Years Searched: MEDLINE, Health Star, SIGLE, Cochrane EPOC Trials Register, no date restrictions, search last updated in Feb. 2005. Search strategy included.

Inclusion & Exclusion Criteria: **Inclusion:** used objective measures of performance/behaviour and/or patient health outcomes.
Exclusion: studies measuring knowledge or performance in a test situation, studies that did not use 1 of 4 defined methods of identifying opinion leaders.

Description of Interventions, Settings & Study Sample:

Geographical Settings: 9/12 trials U.S., 2/12 trials Canada, 1 trial China,

Intervention Settings: 8/12 trials hospital-based interventions, 4/12 trials in outpatient clinic

Sample: Health care professionals in charge of patient care

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

Use of local opinion leaders compared with no intervention.

Use of local opinion leaders compared to a single intervention.

Use of local opinion leaders plus a single intervention compared to the same single intervention.

Use of local opinion leaders as part of multiple interventions compared to no intervention.

Total of 64 outcomes.

No meta-analysis conducted.

Main Findings of Review:

Summary:

ARD varied from - 6% (favours control) to 25% (favours intervention) absolute decrease in non-compliance. Overall, median ARD is .1 (10%) absolute decrease in non-compliance in intervention group.

Use of local opinion leaders compared with no intervention:

4 included studies were of high risk of bias - none stat. sig. - in 3/4 studies error in calculating p values.

Use of local opinion leaders compared to a single intervention:

2 studies included 1 of low risk of bias the 2nd of moderate risk of bias: p values not reported due to calculation errors, however median ARD for the 2 studies was .14 indicated positive effect.

Use of local opinion leaders plus a single intervention compared to the same single intervention:

5 trials included- 1 of low risk of bias, 2 of moderate risks, 2 of high risk of bias. Findings: 3 not sig., 2 p values not reported due to error in calculation. median ARD for the 5 trials was .09 (9%) absolute decrease in non-compliance.

Use of local opinion leaders as part of multiple interventions compared to no intervention:

4 trials included: 3 studies at high risk of bias and 1 study of moderate risk of bias. ARD of non-compliance with desired practice ranged from .01 to .14. (Small effect) 1 trial reported opinion leader + A&F + chart reminder + grand rounds resulted in patients less at risk of not receiving antenatal corticosteroids (Median ARD=.14 (p<.01). Only outcome reporting stat. sig. Sisk study - the study most relevant to public health practice (mother's intention to breast feed) was at high risk of bias. Intervention showed no improvement (adjusted odds ratio of .95, CI .86-1.05) favouring the intervention.

Effect of method used to identify opinion leaders (1 of 4 methods):

Studies using the informant method of identifying opinion leaders showed larger effects than the sociometric method.

Use of local opinion leaders as part of multiple interventions compared to no intervention:

Studies at high risk of bias had smaller adjusted risk differences.

Overall: Modest quality evidence supports small effects for use of local opinion leaders to impact professional practice.

Comments/Study Limitations:

Behaviours targeted included general mgmt. of clinical problems. One breastfeeding study included (Sisk, 2004).

However these results should be interpreted with caution as p values were often not reported and statistical significance was therefore in question.

Role of opinion leader is often ill-described. Role and approach of opinion leaders varied widely across studies.

Appendix 3: Data Extraction Table for Systematic Reviews

4.

Year, Author, Title: Farmer, A. P. et al, 2008. Printed educational materials: effects on professional practice and health care outcomes.

Quality Rating: Strong (R1=6, Updated HE=9)

Objectives of the Review: To determine effectiveness of PEMS in improving process outcomes (including the behaviour of health-care professionals) and patient outcomes. To explore whether the effect of characteristics of PEMS can influence process outcomes.

Number of Primary Studies Included: 23

Types of Studies: RCTs, CCTs, CBAs (controlled before and after studies), ITS (Times Series Analysis)

Databases Searched/Years Searched: EPOC Group Specialised Register, Cochrane Central Register of Controlled Trials, Medline, EMBASE, CINAHL, CAB Health

Inclusion & Exclusion Criteria: **Inclusion:** Study sample- Students only if majority of participants were health professionals

Exclusion: Knowledge outcomes, web-based interventions

Description of Interventions, Settings & Study Sample:

Geographical Settings: 7 studies – Canada, 7 studies – US, 7 studies – England, 1 study – Netherlands, 1 study – Denmark

Intervention Settings: 14 in general family practice or community-based practice, 1 in a behavioural healthcare organization, 2 in obstetrics, 4 in hospitals

Sample: majority were physicians

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

PEMs compared to no intervention

PEMs c.t. single intervention

Multi-intervention including PEMS c.t. multi-intervention without PEMS.

PEMS characteristics that influence process outcomes.

No meta-analysis.

Main Findings of Review:

PEMs compared to no intervention:

(12 RCTs) Small effect noted: (RCTs & CCTs: median unadjusted absolute risk difference across studies was 4.3% improvement in performance for PEMS but range was -8.0% favouring control - to 9.6% favouring PEMS) and a RRD of +13.6% on continuous professional process outcomes (range -5.0% to +26.6%). In contrast, the median ARD was -4.3% for patient categorical outcomes (range -0.4% to -4.6%) and a decline in continuous patient outcome data

PEMs c.t. single intervention: (3 studies)

Effect size calculated for only 1 of the 3 studies: out of 10 comparisons 6 showed small effect favouring PEMS (Kottke, 1989). Kottke, 1989 study:

Evaluation of the effects of a 1-mth campaign to help pts. stop smoking. Print materials were Quit & Win booklets process outcomes included if pts. were asked: if smoke to quit set a quit date follow-up appt. receive supporting material pt. outcome: reporting on attempt to quit smoking agreeing to quit smoking reported not smoking at interview duration of smoking cessation months of quit attempt

Multi-intervention including PEMS c.t. multi-intervention without PEMS: no studies found for this comparison

Secondary outcomes: not able to do sub-analysis

Comments/Study Limitations:

Small effect for professional outcomes but not for patient outcomes.

Some of the print materials not defined well. Grouped a large number of disparate interventions together. Not able to provide a context for when PEMS or under what conditions PEMS are effective.

Future studies would benefit from guidance by relevant communication theories to influence persuasiveness of messaging. Few studies examined specific characteristics of PEMS and their effect on professional practice or how to optimize PEMS. Several methodological weaknesses identified in the primary studies. Authors highlight PEMS as being relatively inexpensive as compared to other methods.

Appendix 3: Data Extraction Table for Systematic Reviews

5.

Year, Author, Title: Flodgren,G.et al, 2010. Interventions to change the behaviour of health professionals and the organisation of care to promote weight reduction in overweight and obese people (Review).

Quality Rating: Strong (R1=8 R2=9 HE=10)

Objectives of the Review: To assess the effectiveness of strategies to change the behaviour of health professionals and the organization of care to promote weight reduction in overweight and obese people.

Number of Primary Studies Included: 6

Types of Studies: RCTs

Databases Searched/Years Searched: (This review is the second update) MEDLINE, (OVID), EMBASE (OVID), Cinahl, PsycInfo, Cochrane Central Register of Controlled Trials, Reference lists of included studies

Inclusion & Exclusion Criteria: **Inclusion:** Any intervention aimed at improving the effectiveness of health professionals working to reduce the weight of overweight or obese people. Studies that had standard care as the comparator arm of the study.

Exclusion: Studies that varied the clinical content or intensity of care without a normal care control group. Studies that did not report patients' weight or body mass index. Studies that did not report BMI or weight. Studies that only reported knowledge or attitudes of health professionals or patient satisfaction with no objective measure of professional performance or patient outcomes.

Description of Interventions, Settings & Study Sample: **Interventions:**

Four studies compared professional interventions with standard care. Measured the impact of training and/or giving educational materials on obesity mgt. to GPs alone or to GPs and their practice teams, and the effects of reminders to physicians to perform preventive actions (e.g. recommending diets).

Outcome measures varied, but all 4 measured patients' weight or weight change. Two included studies evaluated organizational interventions. (Not reviewed for purposes of this study.)

Geographical Settings: USA or UK based.

Sample: GPs alone or GPs and their practice teams. Mean age of patients included in 3 of the 4 studies was over 40; predominantly women

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

Comparisons: Interventions targeting health professionals vs. std. care. Interventions targeting organization of care were not reviewed for the purposes of this study

Meta-analysis completed (for the three trials that considered educational interventions) results were pooled using the mean difference method (Deeks, 2008). Used a random-effects model with inverse variance weighting.

Main Findings of Review:

Interventions targeting health professionals vs. std. care:

Pooled results indicated that pts. whose GPs received the intervention lost on average, 1.2 kg more than pts. receiving std. care, but this difference was not statistically significant. (95% CI ranged from 0.4 weight lost in the control group to 2.8 kg more weight lost in the intervention group).

Rogers (1982) study measured the effects of physician reminders on giving diet advice to pts. This study found that reminders led to sig. more diet advice provided (13.5%) more. At 10 - 15 mths., men and women had lost 5.3 kg and 1.4 kg more weight respectively than those receiving std. care but the difference was not sig. different for either men or women. At 22 -24 mths, men in the intervention had a net loss of 11.2 kg compared to std. care, whereas women had a net loss of 1.3 kg; differences between the intervention and std. care was only sig. for men. It can be concluded that a small reduction in weight can be anticipated in pts. who received care from GPs who have participated in educational interventions or who have participated in a reminder system. However this wgt. loss is i) short term ii) and neither statistically or clinically significant. (Weight loss of \geq 5% or 3-5 kgs in obese people is reported to positively affect health outcomes). In this was review the wt. loss experienced was modest. (<2%).

Comments/Study Limitations:

Contained small number of studies for the comparisons (3 for meta-analysis). Sample studies dominated by women.

Not able to determine the extent to which the weight change strategies used in the interventions were based on evidence.

Heterogeneity of interventions, small sample sizes, high drop-out rates among pts. and low levels of implementation make it difficult to draw firm conclusions.

The 3 studies pooled for meta-analysis had different end points; characteristics of providers were not compared at baseline. Publication bias may also be a threat.

Appendix 3: Data Extraction Table for Systematic Reviews

6.

Year, Author, Title: Forsetlund, L. et al, 2009. Continuing education meetings and workshops: effects on professional practice and health care outcomes (Review).

Quality Rating: Strong (R1=8 R2=9 HE= 9)

Objectives of the Review: To assess the effects of educational meetings on professional practice and healthcare outcomes. Questions: 1. Are educational mtgs. and workshops alone or in combination with other interventions, effective in improving professional practice or healthcare outcomes? 2. How does the effectiveness of education mtgs. compare with that of other interventions? 3. Can educational meetings be made more effective by modifying how they are done?

Number of Primary Studies Included: 81

Types of Studies: RCTs

Databases Searched/Years Searched: (Updated Review) Cochrane EPOC Trials Register and pending studies. Reviewed reference lists of related systematic reviews. Updated search in EMBASE, Scopus, and the EPOC trials register (2006 - December 2007).

Inclusion & Exclusion Criteria: **Exclusion:** Studies using quasi-randomization or other methods. Undergraduate students only. Knowledge measures, performance in a test situation only. **Inclusion:** RCTs, qualified health professionals or health professionals in postgraduate training, studies reporting objectively measured health professional practice behaviours or patient outcomes in a health care setting

Description of Interventions, Settings & Study Sample:

Main Comparisons, Outcome Measures & Summary of Analysis Conducted: **Interventions:** Included educational mtgs., conferences, lectures, workshops, seminars, courses.

Note: Printed educational materials were considered to be a component of educational mtgs. and not as an additional independent intervention. Multifaceted interventions were defined as including 2 or more interventions, such as ed. mtgs. and reminders. Educational mtgs. were also assessed for format (interactive vs. didactic, or mixed); complexity and seriousness (of the outcome).

Geographical Settings: 32 studies based in North America, 34 studies based in Europe

Intervention Settings: General family practice, community-based, Hospital, Mixed or other.

Sample: 81 trials involving more than 11,000 health professionals. In most trials, health professionals were physicians. Other health professionals included nurses, pharmacists.

Targeted behaviours: preventive care: mg. problems in marital relationships, smoking cessation, breastfeeding promotion activities, exercise and health behaviours counselling, nutrition counselling & follow-up of patients with coronary artery disease

test ordering behaviour change: screening behaviours for cancer, hypertension Others: reducing use of antibiotics, general mgt. of health problems, improving communication skills use of research evidence in public health, referral practice, guideline consistent behaviour.

Wide range of outcome measures 62% of studies used dichotomous measures, 32% used continuous measures, 4 studies used both types of measures.

Comparisons: Any intervention including educational mtgs. vs. no intervention.

Secondary Comparisons: Educational mtgs. vs. no intervention, Educational mtgs. vs. other interventions, Any intervention including educational mtgs. vs. educational mtgs. alone, Interactive educational mtgs. vs. didactic educational mtgs., Any other comparison of different types of educational mtgs.

No meta-analysis: Adjusted RDs and adjusted % changes were calculated and reported separately as ranges. Meta-regression analysis was performed on 30 studies to determine circumstances in which educational mtgs. would be most successful.

Main Findings of Review:

Any intervention including educational mtgs. vs. no intervention: 30 studies included in this comparison.

36 comparisons reported for dichotomous **health professional outcomes:** adjusted RDs in compliance with desired practice ranged from -2.0% to 36.2%, median 6% (interquartile range= 1.8% to 15.9%); 18 trials reported continuous outcomes adjusted relative % ranged from 0 - 53% (median=10%, interquartile range 2.0% - 14.7%)

patient outcomes (21 trials) (dichotomous) ARDs ranged from -9%- 4.6%, median=3.0% (interquartile range=.1%- 4.0%); continuous outcomes - 1% -26%, median 4.0% (interquartile range=0% - 11%).

Summarized result: Adjusted absolute Improvement (ARD): Compliance with desired practice: Median 6% (1.8-15.9 interquartile range)

Patient Outcomes: Median 3.0% (.1%-4.0%, interquartile range)

the effect appears to be larger under the following circumstances: higher attendance, with mixed interactive/didactic content; not effective for complex behaviours & less effective for less serious outcomes.

Educational mtgs. vs. no intervention:

24 trials for this comparison: dichotomous outcomes: ARD ranged from -2.0 - 29.3%, median 6% (interquartile range 2.9% - 15.3%); continuous outcomes: ARD ranged from 0% - 50%, median=10% (interquartile range 8%-32%)

Pt. outcomes (9 studies) ARDs for dichotomous variables ranged from -0.9 to 4.0, median improvement=3.0% (interquartile range -.9 to 4.0%);

continuous variables, Adjusted relative % change ranged from -1% - 26%, median 8% (interquartile range from 0% to 12%) Therefore similar results to comparison #1.

Appendix 3: Data Extraction Table for Systematic Reviews

Educational mtgs. vs. other interventions : (Based on 2 trials): comparison interventions were an office system to improve early detection of cancer and an EOJ intervention to increase prescribing of non-steroid based anti-inflammatory drugs. Educational mtgs vs. educational outreach: ARD was -1.4% decrease in compliance for educational intervention group; therefore educational outreach had a slight advantage over educational mtgs.

Comments/Study Limitations: Small positive effect on professional practice and smaller improvements in pt. outcomes. Outcomes likely to be small (6%) even with educational mtgs. that vary on a number of dimensions (e.g. format etc.).

Limitations: 20 studies could not be included as they were judged as high risk of bias. & only 30 provided data that could be included in a meta-regression analysis, therefore few conclusions can be drawn about when ed. mtgs. are likely to be most effective.

For multi-faceted interventions it was often difficult to determine the contribution of the educational mtgs. The nature of the educational mtgs. were often not described. Comparisons of education of different types are more likely to make valuable future research contributions.

Due to high risk of bias and insufficient data, only 24-30 studies were included in the main comparisons.

7.

Year, Author, Title: Francke, A. L. et al, 2008. Factors influencing the implementation of clinical guidelines for health care professionals.

Quality Rating: Strong (R1)

Objectives of the Review: There were 2 aims for this meta-review: i) to gain a better understanding of which factors affect the implementation of guidelines and ii) to provide insight into the "state-of-the-art" regarding research in this field.

Number of Primary Studies Included: No primary studies. Meta-review.

Types of Studies: 12 systematic reviews. (Primary studies cited: RCTs, CCTs, pre-test post-test studies)

Databases Searched/Years Searched: Pubmed, Cinahl, Cochrane library (excluding clinical trials register), Embase, NIVEL catalogues, GIN-website

Inclusion & Exclusion Criteria: **Inclusion:** only systematic reviews or meta-reviews (search terms must be including must include Pubmed/MEDLINE database, methodological quality of included studies was assessed. Medical staff, nurses, other health care professionals. Reviews must describe factors that influence guideline implementation.

Exclusion: Exclusive focus on consensus-based procedures or guidelines. Reviews that did not differentiate between clinical guidelines and other professional interventions. Findings exclusively based on descriptive, narrative or theoretical articles

Description of Interventions, Settings & Study Sample: **Interventions:** Guideline topics: recommendations for mental health care, preventative & curative treatments, clinical care, prescribing, smoking cessation, depression, diabetes management, diagnostic or treatment procedures, general mgt of care problems, test ordering

Settings: Unknown

Sample: Main target groups physicians. Other groups included nurses, midwives or other allied health care professionals.

Main Comparisons, Outcome Measures & Summary of Analysis Conducted: **Main Comparisons:** Characteristics of: the implementation strategies, professionals, patients, and the environment

Outcome Measures: Factors described as having a positive or negative influence on guideline implementation.

No meta-analysis. This was a meta-review.

No quantitative pooling was performed across reviews due as majority of studies did not include numbers (e.g. effect sizes), therefore conclusions based on results presented in the systematic reviews.

Main Findings of Review:

Characteristics of guidelines that promote or impede implementation:

1. Complexity: low complexity and easy to use promotes implementation
2. Characteristics of the implementation strategies: No evidence to support use of multi-strategies in the implementation of guidelines (conclusion of the strongest review) (reviews of lower quality identified 2 or more strategies as having greater impact than a single intervention).
3. Characteristics of professionals: lack of awareness, limited familiarity and lack of agreement with guidelines are the main barriers to guideline adoption; young professionals or less experienced professionals more likely to use guidelines. (Based on reviews of lower quality)
4. Characteristics of patients: No perceived need for guidelines, patient resistance (based on reviews of lower quality)
5. Environmental characteristics: Limited time and personnel resources as well as work pressure negatively impact implementation, negative attitude from peers or supervisors also negatively impact implementation (based on reviews of lower quality)

* Main results were contextualized based on methodological quality, (i.e. studies with high risk of bias dropped for analysis) therefore a good review.

Comments/Study Limitations:

10 of the 12 included reviews were critically appraised as low or moderate quality assessment indicating major or extensive flaws. Only 2 strong reviews. Main conclusion was that multiple strategies for implementation of guidelines appear to be more effective than single strategies (based on a methodologically strong review). All other conclusions are presented as tentative based on lower study quality.

Appendix 3: Data Extraction Table for Systematic Reviews

8.

Year, Author, Title: 8. Hysong,S., 2009. Audit and Feedback Features impact effectiveness on care quality.

Quality Rating: Strong (R1=7 R2=6 HE=8)

Objectives of the Review: To determine if audit and feedback positively impact provider performance. To apply Feedback Intervention Theory (FIT) to the problem of A&F effectiveness in health care settings to help explain observed findings in the health care literature.

Number of Primary Studies Included: 19

Types of Studies: RCTs

Databases Searched/Years Searched: Primary studies included (n=122) were those included in a previous systematic review + additional searches on PubMed using same strategy as Jamtvedt (2006) to include RCTs published since 2005.

Inclusion & Exclusion Criteria: **Inclusion:** Objectively measured provider performance for providers in a health care setting; A&F intervention as the tool for changing provider behaviour, studies must have group with A&F only with control group (no intervention), minimum sample size of 10 per condition, sufficient info. for calculating effect size. **Exclusion:** Students only, studies measuring knowledge only.

Description of Interventions, Settings & Study Sample: Intervention descriptions not provided. Settings not described. Not described.

Main Comparisons, Outcome Measures & Summary of Analysis Conducted: Comparisons: A&F vs. control.

Hypothesis: A&F characteristics that shift attention toward details of the task will augment the effect of A&F performance.

Hypothesis: A&F characteristics that shift the attention away from the task details will attenuate the effect of A&F on performance.

Meta-analysis done. Hedges & Okin's method was used to calculate a mean effect size for each study (std. mean dif.=d); 95% CI; random effects model used. Ominbus effect size test was used to combine results for the effect size estimate.Sub-group analysis conducted to test for moderator effects (ie. feedback characteristics).

Main Findings of Review: The effect size estimate of 0.40 (95% CI +/- 0.20 suggests that A&F has a modest but significant effect on health care provider performance. Four of moderators tested significantly impacted the effect of A&F on outcomes: correct solution information (d=.78, CI =.55-10), delivery of written feedback augmented A&F effectiveness (d=.49, CI= .38- .60; verbal (.10, CI= -.09- .29) and graphic feedback delivery (.66, CI=.51-.81) attenuated A&F effectiveness. More frequent feedback augmented A&F effectiveness (B=.07, p=.025).

Comments/Study Limitations:

Findings consistent with Jamtvedt findings that A&F have a modest effect on health professional performance and largely (with a couple of exceptions) consistent with Kluger and DeNisi stating that correct solution information, written feedback and more frequent feedback augment A&F effect on outcomes of interest. Therefore the Feedback Intervention Theory is a useful model for planning effective audit and feedback

Limitations: small sample size. 5 moderators could not be tested due to unavailability of studies in a given moderator variable arm.

Appendix 3: Data Extraction Table for Systematic Reviews

9.

Year, Author, Title: Jamtvedt, G., 2006. Audit and Feedback: effects on professional practice and health care outcomes.

Quality Rating: Strong (R1=8 R2=7 HE=10)

Objectives of the Review: To assess the effects of audit and feedback on the practice of healthcare professionals and patient outcomes.

Number of Primary Studies Included: 118

Types of Studies: RCTs

Databases Searched/Years Searched: Cochrane EPOC register and pending file (January 2004)

MEDLINE (1997 - 2000)

Reference lists of new articles

Inclusion & Exclusion Criteria: Exclusion: Studies that measured knowledge or performance in a test situation only. Outcomes measured by self-report, insufficient data (results).

Description of Interventions, Settings & Study Sample:

Interventions: A&F defined as any summary of clinical performance of health care over a specified period of time. The summary may also include recommendations for clinical action. The information may be given in a written, electronic or verbal format.

Geographical Settings: 67 trials based in North America (58 in the US; 9 in Canada, 30 in Europe, 9 in Australia, 2 in Thailand, 1 in Uganda, 1 in Laos)

Sample: Most participants were physicians, 1 study involved dentists, In other studies providers were nurses, pharmacists

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

Comparisons: Any intervention in which audit and feedback is a component compared to no intervention.

A&F compared to no intervention

A&F with educational mtgs. compared to no intervention.

A&F as part of a multi-intervention compared to no intervention.

Short term effects of A&F as compared to longer-term effects after feedback stops.

Types of outcome measures:

provider performance in health care setting or health care outcomes

Targeted Behaviours:

21 trials of preventative care (e.g. screening, vaccinations or skin cancer prevention)

14 trials of test ordering (e.g. lab tests or x-rays)

20 trials of prescribing

1 trial reduction of hospital stay

A&F with educational mtgs. or A&F as part of a multi-intervention vs. A&F alone.

A&F vs. other interventions.

All comparisons of different ways A&F is done.

No meta-analysis for main analysis. Separate adjusted RRs, adjusted RDs, adjusted % change relative to control mean post-intervention.

Meta-regression for explanatory variables: examined how the size of the effect (adjusted RR & adjusted RD) was related to 6 potential explanatory variables (type of intervention- A&F alone vs. A&F with ed. mtgs. vs. multi-interventions including A&F; intensity of A&F; complexity of targeted behaviour; seriousness of outcome; baseline compliance; study quality).

Main Findings of Review:

Any intervention in which audit and feedback is a component compared to no intervention:

88 comparisons from 72 studies with more than 13,500 health professionals. Heterogeneity across studies.

64 comparisons that reported dichotomous outcomes included 7000 professionals: Adjusted RR of compliance varied from 0.71 - 18.3 (median=1.08, interquartile range= .99 to 1.3) Baseline compliance & intensity of A&F were sig. in the multiple linear regression model.

A&F compared to no intervention:

51 comparisons from 44 trials with more than 8000 health professionals.

38 comparisons: adjusted RR= 0.7 - 2.1, median=1.07; RD= from -16% - 32%, median=4 (interquartile range=.98 to 1.18), adjusted % change for continuous outcomes ranged from -10.3% - 67.5%, median=11.9 % interquartile range=5.1 to 22.0%)

A&F with educational mtgs. compared to no intervention:

included 24 comparisons from 13 trials

Adjusted RR of compliance with desired practice ranged from 0.98-3.01, median=1.06 (interquartile range=1.03 to 1.09); Adjusted RD ranged from -1%-24% (median 1.5% (interquartile range=1.0 to 5.5%); adjusted % change for the continuous outcomes ranged from 3% to 41% (median=28.7, inter-quartile range= 14.3 to 36.5%)

Appendix 3: Data Extraction Table for Systematic Reviews

A&F as part of a multi-intervention compared to no intervention:

50 comparisons from 40 trials included

The adjusted RR of compliance with desired practice ranged from 0.78 - 18.3, median 1.10(interquartile range=1.03 to 1.36)); adjusted RD ranged from -9% - 70%, median 5.7%(interquartile range= (.85 to 13.6%); adjusted % change for the continuous outcomes ranged from 3% - 60% (median=23.8% (interquartile range= 1.2% to 16.0)

Short term effects of A&F as compared to longer-term effects after feedback stop:

8 trials with 11 comparisons: results were varied - no conclusions

A&F with educational mtgs. or A&F as part of a multi-intervention vs. A&F alone:

Varied results: overall no added benefits to multi vs. A&F alone.

A&F vs. other interventions:

Reminder systems seemed to fare better than A&F (3 studies), results for other comparisons were varied.

All comparisons of different ways A&F is done:

Generally no difference between different methods of A&F.

Overall:

A&F can be useful. Effects vary widely from small to moderate effects. No sig. difference in relative effectiveness of A&F with or without ed. mtgs. and multi-faceted interventions. Relative effects of A&F are larger when baseline adherence to recommended practice is low and when feedback is provided more intensively.

Comments/Study Limitations:

Only 28 of 118 trials had a low risk of bias.

Large variation across studies.

"Evidence presented here does not support mandatory use of the audit and feedback as an intervention to change practice." Future research requires larger, better designed trials; accompanying process evaluations, and comparisons of different types of audit and feedback.

Appendix 3: Data Extraction Table for Systematic Reviews

10.

Year, Author, Title: Mansouri, M. et al, 2007. A meta-analysis of continuing medical education effectiveness.

Quality Rating: Moderate (R1=8 R2=8 HE= 6)

Objectives of the Review: To determine the effect size of CME interventions on physician knowledge, performance and patient outcomes and the effect of moderator variables on the effectiveness of CME.

Number of Primary Studies Included: 31

Types of Studies: RCTs or B&A exp. Designs

Databases Searched/Years Searched: MEDLINE, ERIC, Primary studies between 1990 and 2004. Cross-checked reference lists

Inclusion & Exclusion Criteria: Inclusion: RCT or Before & After experimental designs, physicians; must focus on at least 1 of 3 identified outcome effects of physician knowledge, performance or patient outcome; must provide adequate description of the CME intervention; study design must support quantitative analyses.

Description of Interventions, Settings & Study Sample:

Interventions: Conferences, workshops, online education, lectures, videos, problem-based learning, multifaceted educational programs, interactive small groups, educational outreach visits, Auditing & peer group discussions, written feedback, mail-out strategy.

Settings: Information not provided.

Sample: Most participants were physicians, 1 study involved dentists. In other studies providers were nurses, pharmacists.

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

Overall effects of CME Interventions:

Mean effect size between CME and physician knowledge

Mean effect size between CME and physician performance

Mean effect size between CME and patient outcomes

Variables that may impact CME effectiveness:

Types of Interventions

Active methods vs. passive vs. mixed methods.

Meta-analysis completed. Mean effect size for set of primary studies was estimated & sampling error calculated. Mean effect sizes are expressed as correlations (r). Random effects model used. Appropriate weights by study sample size were calculated to minimize the variance. Cohen's criteria for evaluating magnitude of the Pearson correlation effect sizes were applied (.1= small, .24= moderate, .37= large).

Main Findings of Review:

Overall effects of CME Interventions:

Overall mean effect size for 61 comparisons (interventions) was $r=.28$ (95%CI =.2 - .39).

Mean effect size between CME and physician knowledge

(Close to) Moderate mean effect size ($r=.22$ 95%CI= .15-.28)

Mean effect size between CME and physician performance

Mean effect size (19 studies) was small $r=.18$ (95% CI= .08-.28)

Mean effect size between CME and patient outcomes

Mean effect size was small $r=.14$ (95% CI=.31-.63).

Variables that may impact CME effectiveness:

Types of Interventions

Mean effect size for active methods was $r=.33$; CI= .13-.5 vs. passive ($r=.2$ (CI=.15-.26) vs. mixed methods ($r=.33$ (95% CI=.24-.43), therefore CME effectiveness favours active or mixed methods. In a comparison of mixed vs. single methods, mixed methods are associated with a larger effect size ($r=.33$ CI=.24-.43).

Specific types of interventions:

largest effect sizes shown with multifaceted educational programs, repeated workshops, interactive small groups and case discussion interventions.

Interactive small groups indicated moderate size effects for both physician knowledge ($r=.44$; CI=.36-.51) and patient outcomes ($r=.35$; CI=.30-.40).

Individual training indicated moderate effect for physician performance ($r=.32$; CI .24-.38). Lowest effect sizes associated with conferences, lectures, mail-out strategies ($r=.02$; CI -.01-.04 for physician performance; based on 3 pooled studies; Majumdar et al.; Weller et al.; & Hendryx et al) and videotapes.

Participant types:

greater effect size indicated for single vs. multiple disciplines ($r=.3$ 95%CI=.16-.32 vs. $r=.13$ 95% CI=.12-.21).

Negative correlation between number of participants and effect size ($r=-.13$).

Single versus multiple sessions over time: correlation between # of sessions held & general effect size was positive: $r=.36$.

Appendix 3: Data Extraction Table for Systematic Reviews

Comments/Study Limitations: Conclusion based on a large number of studies (ie. large sample size), relatively small confidence intervals. However must interpret results with caution as quality of primary studies not assessed. Review is therefore of moderate quality. Details re. the nature of the intervention, outcomes assessed and sample as this detail not provided in the review as not reported in the primary studies. Authors suggest that future studies need to include full descriptions of CME and participants, sample size, means and std. dev. of comparison groups, numeric data in graphs displaying results, validity and reliability data about measurement tools.

This study included change in knowledge, unlike most of the other systematic reviews included in this literature review.

11.

Year, Author, Title: O'Brien, M. A. et al, 2007. Educational outreach visits: effects on professional practice and health care outcomes (Review).

Quality Rating: R1=9 R2=9 HA=9 Strong

Objectives of the Review: To assess the effects of EOVs on health professional practice or patient outcomes.

Number of Primary Studies Included: 69

Types of Studies: RCTs

Databases Searched/Years Searched: Cochrane EPOC Register (includes pending studies), MEDLINE, EMBASE, Reference lists of reviews. This is an update to a previous review. Search up to March 2007.

Inclusion & Exclusion Criteria: Exclusion: Studies measuring only knowledge or performance in a practice setting only.

Description of Interventions, Settings & Study Sample:

Interventions: EOVs defined as use of an outreach visitor (OV) trained person from outside the practice setting who meets with healthcare professionals in their practice settings to provide information with the intent of changing their performance. Information may include feedback about performance. May be tailored to address identified barriers to change. Person delivering EOVS may be from same organization if multi-site but not same practice site.

Geographical Settings: 23 trials in North America, 22 in UK, 14 in Europe, 8 in Australia, 2 in Indonesia, 1 in Thailand

Intervention Settings: Most studies in community settings (n=53).

Sample: Most (n=53) primary care physicians or teams. Other professionals included nurses and other professionals as part of teams, pharmacists and 1 trial with dentists

Main Comparisons, Outcome Measures & Summary of Analysis Conducted:

Main Comparisons:

Any intervention in which EOVs (with or without printed educational materials) were a component compared to no intervention. EOVs alone vs. no intervention.

Any intervention in which EOVs were a component compared to another intervention including A & F and reminders.

Any comparison of different types of EOVs.

Outcome measures:

Objectively measured professional performance in a healthcare setting or healthcare outcomes.

Targeted behaviours:

29 trials were prescribing practices (decrease inappropriate prescribing)

29 trials focused on the general mgt. of problems encountered in general practice.

11 trials focused on preventive services including counselling for smoking cessation.

Meta-analysis conducted.

Meta-regression analysis conducted as well:

Primary factors

targeted behaviour (*prescribing or not*)

baseline compliance

of clinicians included @ each visit

of visits

Secondary factors

complexity of behaviour

seriousness of outcome

risk of bias

contribution of EOVS as component of the intervention

Main Findings of Review:

Intervention in which EOVs are a component compared to no intervention:

Median Adjusted RDs in compliance with desired practice= 5.6% (interquartile range 3% to 9%)

Appendix 3: Data Extraction Table for Systematic Reviews

Meta-regression analysis:

meta-regression completed for 31 studies to determine primary explanatory factors for variance in adjusted RDs. None of the factors successfully explained variance in adjusted RDs (all factors), however prescribing vs. other behaviours was sig. ($p = .002$) indicating impact of EOv on prescribing behaviours was smaller effect sizes (-7.08 CI -11.41 - -2.75) than for non-prescribing behaviours

EOVs alone vs. no intervention:

16 trials (18 comparisons) of dichotomous outcomes- median adjusted RD 5% (interquartile range=3% - 6.2%) therefore small effect. (only 1 comparison with an adjusted RD >10%.) 14 trials (15 comparisons of continuous outcomes - adjusted relative % ranged from 0% - 617% with median of 23%, huge range!

Any intervention in which EOVs were a component compared to another intervention including A & F and reminders:

Based on 8 trials (12 comparisons)

in 3 trials, EOvs + A & F were compared to A&F alone: only 1 trial demonstrated a small difference (Siriwardena, 2002) (adjusted RD=5%) in favour of EOvs + A&F. Another trial comparing EOvs + A&F + reminders to A&F alone, small effect for group receiving multi-intervention (adjusted RD=6% n.s.) (Ornstein, 2004). Other single studies of multi-interventions including EOvs indicate they are slightly more effective than A&F alone. Small differences, only 1 study with statistical sig. reported.

Any comparison of different types of EOVs:

6 trials included for this comparison:

3 studies individual vs. group EOv - 2 favoured individual EOvs

1 trial (Raisch, 1990) statistical approach favoured vs. case approach

1 trial (Kaner, 199) EOv + telephone support was favoured in strategy to reduce problem drinking vs. EOv alone or control.

1 trial compared physician peers vs. non-physicians (type of visitor) - improvement observed in both groups but marked in group receiving visits from peers. Those receiving visits from physician peers sig. improved in 4 practice areas; those receiving visits from non-physicians sig. improved in 2 areas related to pt. records.

Overall: EOvs with or without addition of other interventions can be effective in improving practice in the majority of circumstances but effect is variable. Effects of EOvs are small to moderate (median adjusted RD=4.8% (interquartile range 3.0-6.5%). Effects on prescribing are small but consistent. Effects on other behaviours is more variable (median adjusted RD 6%, Int. quart. range =3.6 - 16%).

Long-term improvements unknown (beyond 1 year). Should do a cost-benefit analysis prior to embarking on such interventions. Dichotomous outcomes median adjusted RD was 5.6%. For studies with continuous professional outcomes, there was at least 20% relative improvement in about 1/2 of 20 comparisons.

Comments/Study Limitations:

Study was unable to provide any commentary re. factors affecting the success of EOvs, as none of the variables hypothesized to explain variance of effects were statistically significant.

Considerable variation in types of interventions across studies. EOvs can be complex & were often combined with other interventions/elements making it difficult to determine beneficial components. May be helpful to ground the development of EOvs in useful models eg. Social marketing approach as used by Soumerai 1990. Future research directions are provided, including type of visitor and content of visits, variable effectiveness of EOvs, number and nature of behaviours targeted, assessment of patient outcomes and an economic analysis (cost-effectiveness).