



Recertification – evidence to support change

Background

1. The Medical Council of New Zealand has adopted and published, after consultation, the “Vision and principles for recertification”. The principles are that recertification should be:
 - Evidence-based.
 - Formative in nature.
 - Informed by relevant data.
 - Based in the doctor’s actual work and workplace setting.
 - Profession-led.
 - Informed by public input and referenced to the Code of Consumers’ Rights.
 - Supported by employers.
2. Council has also published a document ‘Policy on Regular practice Review’ a formative process designed to improve practice. Council is encouraging Colleges to have this process available as an option for continuing professional development. The policy states that RPR will:
 - Be informed by a portfolio of information on the performance of the doctor that may include audit and log books
 - Must include multisource feedback
 - Must include external assessment by an external peer
 - Must include method of giving constructive feedback.
3. This review firstly provides the evidence base that supports Council’s vision and principles for recertification and secondly provides educational evidence to support RPR.

Literature review process

4. The search criteria for this review were systematic reviews of methodologies (overall approach) and methods (specific instructional techniques) in medical education that had, as an end point, either improved physician performance or better patient outcomes. Studies limited to outcomes of physician approval or gain in knowledge alone were excluded.
5. Phase 1 – The initial search was from 2007 onward in the databases PubMed, ERIC, PsycInfo, Ovid and Cochrane.
6. Phase 2 – Index citation for forward tracking in Google Scholar, Scopus and PubMed. Backward tracking from references without date restrictions.
7. Results – 19 systematic reviews that inform on effectiveness of methodologies and methods.

Evidence that continuing medical education works

8. The term ‘Continuing medical education’ will be used to cover activities undertaken to inform physicians of recent advances in their field as well as refresh existing knowledge and skills that are necessary to practice medicine.
9. Studies on the effectiveness of continuing medical education have been reported for over 40 years. The collection of evidence is now substantial. The most informative paper for understanding the current state of the field is a synthesis of systematic reviews published in 2015¹. The paper reviewed eight systematic reviews published since 2003. The conclusion is

that CME is effective in improving physician knowledge and skills. The methodologies that are most effective are those that are interactive, use multiple methods, involve multiple exposures and are focused on topics considered relevant to the learner. As the authors stated, there are now 39 systematic reviews on effectiveness of CME and the methods of delivery.

Evidence for overarching educational structure

10. Davis and Galbraith reviewed 105 papers for evidence of both short- term (<30 days) and long-term (> 30 days) gains in physician practice performance². Over 70% of the papers reported a positive result. The papers facilitate the use of an evidence grading system for evidence of effectiveness of methodology; strong evidence exists for using multiple exposures, multiple instructional techniques and multi-media delivery. This data is presented in the table below:

Table 1. Exposure and methods, % of papers			
	Met objective	Some improvement	No improvement
Single method	9%	27%	64%
Multiple methods	62%	21%	17%
Multiple exposures	66%	4%	30%

11. They also found convincing evidence that single print media is ineffective. Similar results on effectiveness of delivery methods were found in a review of 136 papers and an additional 9 systematic review as well as a separate systematic review of 37 studies³⁴. Interestingly, despite Problem Based Learning (PBL) holding such potential as a method, a review of 15 studies concluded no significant gain when compared to other delivery methods⁵. It can be surmised that abstract problems are not a valid substitute to the problems encountered in day-to-day practice.
12. Improvements in physician knowledge were greater than changes to performance, which was greater than improvements in patient outcomes in a review of 31 studies⁶. The authors also found that active methods, using combinations of methods, multiple exposures, longer contact time and smaller group sizes were important positive moderators. Smaller changes in patient outcomes than gains in knowledge were also found in a Cochrane review⁷.
13. A useful review of 13 papers on audience characteristics found that years of practice, age of physician, gender, race, practice setting made no difference to the response to an educational intervention⁸. The relevance of this finding is that no changes need to be made for audience characteristics.
14. **Evidence on which methods are most effective**
 Several reviews focused on effectiveness of methods. Of these, the most important review by Bloom informs on a range of delivery modalities and separates physician behaviour from patient outcomes⁹. The data for both outcomes is presented below:

Table 2. Effect on care delivered, % of papers	High	Moderate	Low	None	Number
Academic detailing (face-to-face education by pharmacists etc)	100%				6
Reminders	35%	46%	19%		26
Interactive education	29%	35%	24%	12%	17
Audit with feedback on difference between actual and optimal performance	26%	48%	17%	9%	23
Didactic programs		15%	35%	50%	20
Opinion leaders		33%	45%	22%	9
Guidelines		60%	40%		5
Information only		15%	23%	62%	13

Table 3. Effect on health outcomes, numbers of papers, % of papers	High	Moderate	Low	None	Number
Didactic programs				100%	4
Interactive education		43%	16%	43%	7
Audit with feedback on difference between actual and optimal performance		50%	30%	20%	10
Academic detailing (face-to-face education by pharmacists etc)	17%	66%	17%		6
Opinion leaders	100%				1
Reminders	22%	44%	22%	11	9
Guidelines		100%			1
Information only			33%	66%	3

15. By ranking the data, the most effective delivery methods are academic detailing, reminders and interactive education. Audit with feedback has moderate effects. Didactic programs, guidelines, opinion leaders and isolated information have little effect.

Evidence for effectiveness of audit

16. Audit remains a commonly used tool in continuing professional development programs. There are features that increase the effectiveness of audit. A Cochrane review was undertaken on 104 studies into effectiveness of audit on both physician performance as well as patient outcomes¹⁰. Modest gains were found overall, but better outcomes occurred when the baseline performance of the physician was poor. Feedback would appear to be a key factor in improving the educational outcome of audit. For optimal effect, feedback should be delivered by a supervisor or senior colleague, delivered multiple times using multiple formats and offers instruction with both goals and action plans.

Evidence for multisource feedback

17. Multisource feedback, similarly to audit, appears to function better when feedback is judiciously provided. A review of 16 studies into workplace-based assessment concluded

“...multisource feedback can lead to performance improvement, although individual factors, the context of the feedback, and the presence of facilitation have a profound effect on the response”¹¹. A further review of 15 papers on the impact of feedback on workplace-based assessment also found that well implemented feedback was influential in increasing effectiveness of this modality¹².

Evidence for education occurring at the place of work

18. Academic outreach visits (trained facilitators visiting the workplace of the doctor) have historically been utilised mainly as a method of improving prescribing practice. A Cochrane review of 69 studies revealed that such visits are effective in changing physician performance with modest results¹³. Prescribing changes would appear to reliably improve but other facets of practice have more variable results. Physician peers rather than non-physician peers are advantageous.

Learning that reflects individual practitioner needs

19. The most effective teaching reflects practice needs. A study of 23 research papers into teaching evidence based medicine found that learning on real world problems resulted in a greater depth of education¹⁴. Teaching that is relevant to real world practice has the capability to improve skills, knowledge, attitudes and behaviours whereas standalone teaching that is not based on practice improves knowledge only.

Observation of practice

20. Observation of practice remains a cornerstone of medical training and increasingly in revalidation, relicensure and recertification programs. A review of 39 papers was undertaken on tools to assess observation of single patient encounters¹⁵. They concluded that while tools such as the mini-CEx has demonstrable validity and reliability, there are no systematic reviews that inform on the educational value.

Learning information technology

21. Information technology (clinical decision support, electronic health records etc) in primary care has been shown to improve several parameters of practice¹⁶. Such interventions have been shown to improve physician-patient communication, facilitate safe and rational prescribing and improve some patient outcomes. Computer generated reminders and computer-generated feedback made improvements in physicians performance in a review of 12 studies on interventions to improve treatment of hypertension¹⁷.

The importance of feedback

22. Feedback, defined as any clinical summary of clinical performance over a specified period of time, features as a variable that predicts the effectiveness of many learning modalities. A review of factors that increase effectiveness was reported in a systematic review of 41 studies¹⁸. Over 70% of the studies showed beneficial effect of feedback on performance. The source and the duration of feedback are both important. Feedback from professional groups or administrative groups had greater effect than from academic groups. The duration was also positively associated with effectiveness. Contrary to commonly held belief, involvement in the design of the feedback process was not associated with better effectiveness. Comparison with local statistical norms or guidelines did not have a significant effect. A scoping review of 650 research papers on feedback added different insights¹⁹. The review found that praise improved knowledge and skills but criticism did not. Yet feedback needs to clearly describe deficiencies too for it to be effective. Similar to other studies, feedback that is both immediate and longitudinal is more effective. Individual rather than group feedback increases effectiveness.

Limitations

23. The review sought to find only systematic reviews. As much as such reviews provide a robust picture of the state of evidence, they can miss important evidence from individual papers or small groups of reported research that has not been subject to systematic review. There may be good research to support the use of modalities that have not featured in systematic reviews.
24. The outcome of educational meetings has had conflicting conclusions in the evidence. Part of the uncertainty is due to the varied nature of such meetings and the difficulty of combining outcome data. Historically the evidence for effectiveness of didactic meetings has supported the notion that such meetings are ineffective. Further research has revealed some effectiveness. While both purely didactic and purely interactive meetings have low impact, the combination of didactic and interactive have greater impact.
25. Of the methods discussed above, observation of consultations has the least evidence regarding effectiveness of education and quality improvement for vocationally registered practitioners. It is also one of the least studied methods and it may well be that there is insufficient research on feedback of observed consultations to give a firmer view of its usefulness as part of continuing professional development. There is considerable face validity to observation of consultations used in this way as it is commonly used in undergraduate and post-graduate training with demonstrable reliability.

Conclusions

26. The recommendation that Colleges offer RPR as an optional part of continuing professional development has basis in educational evidence of effectiveness. The Malatest independent evaluations of Inpractice for doctors who do not have or are not working towards vocational registration (available on the MCNZ website [here](#)) indicate that RPR is considered effective, useful and acceptable by the majority of involved doctors.
27. Care must be taken to avoid a 'straight-jacket' position where only modalities with this level of evidence are used. Innovation and feasibility must also be considered as important factors when designing programmes of continuing professional development. The information provided in this review should inform, not dictate progress.

Literature review completed July 2017

1 Cervero RM, Gaines JK. The impact of CME on physician performance and patient health outcomes: an updated synthesis of systematic reviews. *J Contin Educ HealthProf.* 2015 Spring;35(2):131-8.

2 Davis D, Galbraith R; American College of Chest Physicians Health and Science Policy Committee.. Continuing medical education effect on practice performance: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* 2009 Mar;135(3 Suppl):42S-48S.

3 Marinopoulos SS, Dorman T, Ratanawongsa N, Wilson LM, Ashar BH, Magaziner JL, Miller RG, Thomas PA, Prokopowicz GP, Qayyum R, Bass EB. Effectiveness of continuing medical education. *Evid Rep Technol Assess (Full Rep).* 2007. Jan;(149):1-69.

4 Mazmanian PE, Davis DA, Galbraith R; American College of Chest Physicians Health and Science Policy Committee. Continuing medical education effect on clinical outcomes: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* 2009 Mar;135(3 Suppl):49S-55S.

5 Al-Azri H, Ratnapalan S. Problem-based learning in continuing medical education: review of randomized controlled trials. *Can Fam Physician.* 2014. Feb;60(2):157-65. Review.

-
- 6 Mansouri M, Lockyer J. A meta-analysis of continuing medical education effectiveness. *J Contin Educ Health Prof.* 2007 Winter;27(1):6-15.
- 7 Forsetlund L, Bjørndal A, Rashidian A, Jamtvedt G, O'Brien MA, Wolf F, Davis D, Odgaard-Jensen J, Oxman AD. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev.* 2009 Apr 15;(2):CD003030.
- 8 Lowe MM, Bennett N, Aparicio A; American College of Chest Physicians Health and Science Policy Committee.. The role of audience characteristics and external factors in continuing medical education and physician change: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest.* 2009 Mar;135(3 Suppl):56S-61S.
- 9 Bloom BS. 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 Summer;21(3):380-5.
- 10 Ivers N, Jamtvedt G, Flottorp S, Young JM, Odgaard-Jensen J, French SD, O'Brien MA, Johansen M, Grimshaw J, Oxman AD. Audit and feedback: effects on professional practice and healthcare outcomes. *Cochrane Database Syst Rev.* 2012 Jun 13;(6):CD000259.
- 11 Miller A, Archer J. Impact of workplace based assessment on doctors' education and performance: a systematic review. *BMJ.* 2010 Sep 24;341:c5064.
- 12 Saedon H, Salleh S, Balakrishnan A, Imray CH, Saedon M. The role of feedback in improving the effectiveness of workplace based assessments: a systematic review. *BMC Med Educ.* 2012 May 2;12:25.
- 13 O'Brien MA, Rogers S, Jamtvedt G, Oxman AD, Odgaard-Jensen J, Kristoffersen DT, Forsetlund L, Bainbridge D, Freemantle N, Davis DA, Haynes RB, Harvey EL. Educational outreach visits: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev.* 2007 Oct 17;(4):CD000409.
- 14 Coomarasamy A, Khan KS. What is the evidence that postgraduate teaching in evidence based medicine changes anything? A systematic review. *BMJ.* 2004 Oct 30;329(7473):1017. Review.
- 15 Pelgrim EA, Kramer AW, Mookink HG, van den Elsen L, Grol RP, van der Vleuten CP. In-training assessment using direct observation of single-patient encounters: a literature review. *Adv Health Sci Educ Theory Pract.* 2011 Mar;16(1):131-42.
- 16 Chauhan BF, Jeyaraman M, Mann AS, Lys J, Skidmore B, Sibley KM, Abou-Setta A, Zarychanski R. Behavior change interventions and policies influencing primary healthcare professionals' practice-an overview of reviews. *Implement Sci.* 2017 Jan 5;12(1):3. doi: 10.1186/s13012-016-0538-8. Review. Erratum in: *Implement Sci.* 2017 Mar 17;12(1):38.
- 17 Tu K, Davis D. Can we alter physician behavior by educational methods? Lessons learned from studies of the management and follow-up of hypertension. *J Contin Educ Health Prof.* 2002 Winter;22(1):11-22. Review.
- 18 Veloski J, Boex JR, Grasberger MJ, Evans A, Wolfson DB. Systematic review of the literature on assessment, feedback and physicians' clinical performance: BEME Guide No. 7. *Med Teach.* 2006 Mar;28(2):117-28. Review.
- 19 Bing-You R, Hayes V, Varaklis K, Trowbridge R, Kemp H, McKelvy D. Feedback for Learners in Medical Education: What Is Known? A Scoping Review. *Acad Med.* 2017 Feb 7. [Epub ahead of print] PubMed PMID: