Healthcare Quality Page Blog

Nancy Dixon

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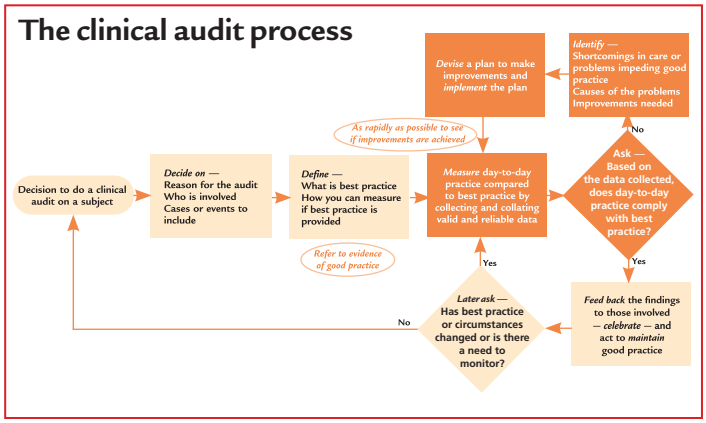
Audit and feedback — Where did the inappropriate mantra come from?



The mystery behind 'audit and feedback'

If you work at grass roots on developing methods for designing, carrying out, reporting on and teaching the clinical audit process, it is hard to understand the academic world's research and publication about an activity they call 'audit and feedback'. Where did this 'discipline' called audit and feedback come from? Why is feedback the stage that naturally follows the 'audit' part of the process? It is puzzling where this mantra emerged from the history of clinical audit.

The first journal article on 'medical audit'

The first published reference that described a systematic process most of us today would recognize as clinical audit was published in 1956 by Paul Lembcke. The article was called Medical Auditing by Scientific Methods.[1] Lembcke expanded on the history of medical audit in an article published in 1967.[2] What Lembcke meant by scientific methods for audit included, for example, identifying accurately the exact cases to be included; sampling appropriately; abstracting information from clinical records reliably; using valid criteria to judge individual cases; comparing the degree of compliance with criteria; setting standards through which performance can be measured and compared; and reporting on findings of the comparison with criteria for individual doctors.[1]

Lembcke described presenting the data collected from medical audits in his hospital to a joint liaison committee representing the governing board, medical staff and hospital managers. The medical staff members of this committee met with the doctors who were not performing in accordance with the agreed standards to seek their compliance with the audit criteria. People could say that Lembcke provided 'feedback' to doctors whose cases were included in an audit; however, with the involvement of hospital trustees and managers, it is likely that this form of feedback wasn't just 'feedback': it delivered a clear message that the hospital's trustees and managers had an expectation that doctors in their hospital would deliver best clinical practice.

Externally conducted medical audit as the original intention

Lembcke's review of the history of medical audit[2] explains how the 'hospital standardization programme' was created by the American College

of Surgeons in 1917. This program eventually led to The Joint Commission, a national accreditation organization for healthcare providers in the US. The original intention of the standardization programme was to have external auditors audit 'professional care by the individual case method.'[1] This approach was prompted by Codman's 'end-results' system[3] in which Codman's hospital in Boston tracked every patient's outcomes by following patients for a long enough time to determine if the treatment was effective. If treatment was not effective, the hospital then would try to find out how to prevent similar failures in the future. Codman identified four possible areas of responsibility for patients whose outcome was not successful or was unsatisfactory: (1) the physician or surgeon responsible for the patient's treatment, (2) the organization carrying out the detail of the treatment, (3) the disease or condition of the patient, and (4) the personal or social conditions preventing the cooperation of the patient.[4] In this very earliest description of a method for evaluating the quality of medical care, Codman did not limit the action to take on clinical audit data to feedback to the practitioner.

Lembcke and others[5–6] explained that the College was unable to raise sufficient funding for such an intensive programme, and so the hospital standardization program was limited to setting a standard, among four other standards, that hospitals should have rules, regulations and policies that specifically provide … 'that the staff review and analyse at regular intervals their clinical experience in the various departments of the hospital, such as medicine, surgery, obstetric and other specialties; the clinical records of patients, free and pay, to be the basis for such review and analyses.'[7]

The bi-cycle model of medical audit

In his later article, Lembcke refers to others who collected data about clinical practice. However, the next major contribution to the 'science' of audit was published by Brown and Fleisher in 1971,[8] who described their experience with what they called the 'bi-cycle' concept of audit. The bi-cycle approach to audit included 12 steps; the first eight steps included Lembcke's steps in the audit process, but with the involvement of the medical staff on setting priorities for audit and more reliance on the use of data in routinely maintained databases on patient care. Where the Brown and Fleisher process differs is at steps 9 and 10 which they defined as planning and carrying out an educational programme based on the clinical audit data.

However, when the authors described their meaning of educational programme, they acknowledge that some actions taken on audit data, such as responding to referrals, were 'not classically educational but organizational.'[8] In their explanation of the educational process, the authors refer to analysing existing behaviours of staff to identify why they don't perform in accordance with the audit criteria, for example, lack of knowledge, need for improvement in problem solving skills, new psychomotor skills or attitudinal changes.[8] They referred to learning experiences being provided for practitioners that are based on meeting patient care needs, as revealed by the audit process.[8] In other words, even an 'educational' approach to acting on audit data did not rely on feedback alone to achieve change.

The formalizing of medical audit in US accreditation

By this time in the US, the need to formalize the audit process beyond expecting doctors to review individual cases using patient records was recognized by the Joint Commission on Accreditation of Hospitals (JCAH, now The Joint Commission). In December 1973, the JCAH Board of Commissioners stated that it 'considers the quality of patient care to be the central purpose of its entire accreditation process,' and it identified five major measures it believed to be directly contributory to the preservation and improvement of the quality of patient care. One of the measures referred to was 'the retrospective review and

evaluation of the quality of patient care through a valid and reliable patient care evaluation procedure.'[9]

In April 1974, the JCAH added a new section to the *Accreditation Manual for Hospitals* called Quality of Professional Services, which essentially was a description of the audit process largely based on the principles first described by Lembcke, with one important addition: 'If analysis indicates inappropriate patterns of patient care, action must be taken to correct problems. Such action should be specific to the problem and may include educational or training programs, amended policies or procedures, increased or realigned staffing, provision of new equipment or facilities, or adjustments in staff privileges.'[10] To make an obvious point: The first published 'standard' on the audit process did not limit action to 'feedback' and in fact acknowledged that organizational changes, such as policies or procedures, staffing, equipment, and changes to facilities could be actions that are implemented as part of the audit process.

JCAH also published practical guidance for doctors and other healthcare professionals on the audit process in a book called *Performance Evaluation Procedure for Auditing and Improvement Patient Care (PEP) Primer*.[11] This guidebook advised that after variations from established criteria are reviewed by a peer group, the cause/s of any variations that are not justified to peer satisfaction are identified, and action is implemented on the cause/s, with later repeat measurement to determine if the action implemented has been effective in achieving improved compliance with the audit criteria. Once again, the US national model for the clinical audit process was clear about action on clinical audit findings not being limited to 'feedback'.

Research on the medical audit process

So why do academics and researchers continue to perpetrate the model of 'audit and feedback', rather than represent the audit process as it was described by a reputable national accreditation body nearly 50 years ago? In 1984, a study by Palmer et al of the implementation of the audit process (called quality assurance) in eight general medicine provider groups in two teaching hospitals and six related health centres in Boston involved over 300 doctors.[12] Four types of actions were implemented to achieve improvement: provider feedback (six different approaches); changes in protocols and policies; changes in follow-up systems; and changes in a laboratory system.

A year later in 1985, Mitchell and Fowkes reviewed the audit process, observing that audit is often incomplete because no attempt is made to change clinical practice.[12] They stated: 'It is commonly assumed that the information produced by audit will naturally lead to change' and they questioned if 'the evidence supports the assumption that the provision of information on performance changes clinical behaviour.'[13]

The title 'audit and feedback' appears

A number of publications in the early 1990s, however, used the title 'audit and feedback' to report the experience of carrying out clinical audits in various settings.[13–19]

The Palmer et al randomized controlled trial of the audit process (again called quality assurance) in 16 ambulatory care practices drew the conclusion that knowledge of clinical guidelines of a subject of an audit or discussion of audit criteria were less effective as actions than feedback to providers of data on their performance. However, the authors acknowledged that the audit data reveal both practitioner variation from good practice, addressed through feedback to practitioners, and systems issues that cannot be addressed by individual practitioners. In the trial, unimproved tasks were associated with the perceived need for delivery systems changes beyond the immediate control of the individual practitioner.[20–21]

Clinical audit as a quality improvement process

A lot has happened since these initial studies were published. In 2001, the National Institute for Health and Care Excellence (NICE) in the UK positioned clinical audit firmly as a quality improvement process, defining clinical audit as 'a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit measures and the implementation of changes in practice if needed.'[22] Following extensive review of the evidence base, NICE did not limit actions from an audit to feedback. In addition, by clearly placing clinical audit in the quality improvement domain, NICE set the expectation that principles of quality improvement would be applied in the clinical audit process, and action after data collection would not be limited to feeding back data to practitioners and expecting them to change. The NICE concept of clinical audit as a quality improvement process has been widely accepted in the UK and referred to in other countries.

Quality improvement is a lot more than feedback

In today's practice of quality improvement, no proponents of the quality improvement process in a healthcare setting would see the process as being focused on giving feedback to practitioners. The challenges relating to achieving sustained improvements in the quality of patient care are recognized by academics working on the subject of quality improvement in healthcare;[23–28] however, their focus is far beyond exploring different ways of giving feedback. 'Improving quality requires a broader perspective than a model focused exclusively on decision-making by individual clinicians at the point of care,' and '… typically draws on disciplines such as human factors engineering, operations management and behaviour economics.'[29]

Much attention has been given to a 'theory of change for improvement', which involves identifying a range of types of changes that are needed to achieve the exact improvement intended, that is, the level of compliance with established criteria or standards used in a clinical audit, for example.[23–26, 30–31] The theory of change is more encompassing than a theory of feedback. As many as 25 factors have been identified as influencing the achievement of improvement of the quality of patient care.[32] The most frequently referred to factors include: professional acceptance of the need to change practice; social influences, including from peers and peer groups; organizational issues, including structural, staffing, communication, educational, and systems changes needed to achieve and sustain improvement; and the role of financial and regulatory incentives.[23, 32–37]

So, when quality improvement researchers are telling us to make 'a conceptual leap in our understanding of how healthcare systems respond',[37] why are there still academic researchers focusing narrowly on mechanisms of feedback as the action to take on audit findings?[39–42] It feels as it the academics pursuing these directions are entirely out of touch with what is actually happening in the healthcare system.

A plea to academics to read each other's work

At the grass roots of working in the healthcare sector, we are being driven to try to understand and apply 'systems thinking' to achieving substantial and sustained improvements in the quality and safety of patient care.[38] We are being driven to understand human factors.[43] These perspectives are clear: You can't achieve substantial and sustained improvement in the quality or safety of patient care by giving people feedback about their performance and expecting compliance with quality-of-care measures to automatically change. We are being driven to see that today's healthcare services are limited and controlled by organizational systems that are beyond the ability of individual practitioners to change.

To continue to rely on telling practitioners to improve through feedback seems out of touch with our reality. Why don't the academics involved

read each other's work, and also have some knowledge of the history of the field in which they are researching?

References

1. Lembcke PA. Medical auditing by scientific methods. Illustrated by major female pelvic surgery. *JAMA* 1956;162(7):646–56. doi: 10.1001/jama.1956.72970240010009
2. Lembcke PA. Evolution of the medical audit. *JAMA* 1967;199(8):111–8. doi:10.1001/jama.1967.03120080077012
3. Codman EA. The product of a hospital. *Surgery, Gynecology and Obstetrics* 1914;18:491–6. reprinted in *Arch Pathol Lab Med* 1990;114(11):1106-11.
4. Codman EA. *A Study in Hospital Efficiency as Demonstrated by the Case Reports of the First Five Years in a Private Hospital*. Boston: 1916; p. 137. https://collections.nlm.nih.gov/catalog/nlm:nlmuid-53210030R-bk. Accessed Oct 2023.
5. Schlicke CP. American surgery's noblest experiment. *Arch Surg* 1973;106(4):379–85. doi: 10.1001/archsurg.1973.01350160001001
6. Roberts JS, Coale JG, Redman RR. A history of the Joint Commission on Accreditation of Hospitals. *JAMA* 1987;258(7):936–40. doi: 10.1001/jama.1987.03400070074038
7. American College of Surgeons. The Minimum Standard of the American College of Surgeon's Hospital Standardization Program. *Bull Am Coll Surgeons* 1924;8:4.
8. Brown CR, Fleisher DS. The bi-cycle concept—relating continuing education directly to patient care. In Stearns NS, Getchell ME, Gold RK. Continuing medical education in community hospitals: A manual for program development. *New Engl J Med* 1971;284(20) Suppl; reprinted in *J Contin Educ Health Prof* 2014;34(2):141–8. doi: 10.1002/chp.21193
9. Jacobs CM, Christoffel TH, Dixon N. *Measuring the Quality of Patient Care: The Rationale for Outcome Audit*. Cambridge MA: Ballinger; 1976. https://www.amazon.co.uk/Measuring-Quality-Patient-Care-Rationale/dp/0884101282. Accessed Oct 2023.
10. Quality of professional services. *Accreditation Manual for Hospitals*. Chicago: Joint Commission on Accreditation of Hospitals; 1974.
11. Jacobs CM, Dixon N. *Performance Evaluation Procedure for Auditing and Improving Patient Care (PEP) Primer. 2nd ed*. Chicago: Joint Commission on Accreditation of Hospitals; 1975.
12. Palmer RH, Strain R, Maurer JVW, Rothrock JK, Thompson MS. Quality assurance in eight adult medicine group practices. *Med Care* 1984;22(7):632–43. doi: 10.1097/00005650-198407000-00005
13. Mitchell MW, Fowkes FGR. Audit reviewed: Does feedback on performance change clinical behaviour? *J R Coll Physicians Lond* 1985;19(4):251–4.
14. Braham RL, Ruchlin HS. Physician practice profiles: a case study of the use of audit and feedback in an ambulatory care group practice. *Health Care Manage Rev* 1987;12(3):11–6. doi: 10.1097/00004010-198701230-00005
15. Lomas J, Enkin M, Anderson GM, Hannah WJ, Vayda E, Singer J. Opinion leaders vs audit and feedback to implement practice guidelines. Delivery after previous Cesarean section. *JAMA* 1991;265(17):2202–7. doi: 10.1001/jama.1991.03460170056033
16. Kiwanuka AI, Moore WM. Influence of audit and feedback on use of Caesarean section in a geographically-defined population. *Eur J Obstet Gynecol Reprod Biol* 1993; 50(1):59–64. doi: 10.1016/0028-2243(93)90165-9
17. Hanson JM, Johnson G, Clancy MJ. The effect of audit and feedback on data recording in the accident and emergency department. *J Accid Emerg Med* 1994;11(1):45–7. doi: 10.1136/emj.11.1.45
18. Robinson MB, Thompson E, Black NA. Evaluation of the effectiveness of guidelines, audit and feedback: improving the use of intravenous thrombolysis in patients with suspected acute myocardial infarction. *Int J Qual Health Care* 1996;8(3):211–22. doi: 10.1093/intqhc/8.3.211
19. Holmboe E, Scranton R, Sumption K, Hawkins R. Effect of medical record audit and feedback on residents' compliance with preventive health care guidelines. *Acad Med* 1998;73(8):901–3. doi: 10.1097/00001888-199808000-00016
20. Palmer RH, Louis TA, Hsu LN, Peterson HF, Rothrock JK, Strain R, Thompson MS, Wright EA. A randomized controlled trial of quality assurance in sixteen ambulatory care practices. *Med Care* 1985;23(6):751–70. doi: 10.1097/00005650-198506000-00001
21. Palmer RH. Does quality assurance improve ambulatory care? Implementing a randomized controlled trial in 16 group practices. *J Ambul Care Manage* 1986;9(4):1–15. doi: 10.1097/00004479-198611000-00003
22. National institute for Clinical Excellence. *Principles for Best Practice in Clinical Audit*. Abingdon UK: Radcliffe Medical Press; 2002, p. 1. https://www.nice.org.uk/media/default/About/what-we-do/Into-practice/principles-for-best-practice-in-clinical-audit.pdf. Accessed Oct 2023.
23. Braithwaite J, Churruca K, Long JC, Ellis LA, Herkes J. When complexity science meets implementation science: a theoretical and empirical analysis of systems change. *BMC Med* 2018;16(1):63. doi: 10.1186/s12916-018-1057-z
24. Davidoff F, Dixon-Woods M, Leviton L, Michie S. Demystifying theory and its use in improvement. *BMJ Qual Saf* 2015;24(3)228–38. doi: 10.1136/bmjqs-2014-003627
25. Dixon-Woods M, Bosk CL, Aveling EL, Goeschel CA, Pronovost PJ. Explaining Michigan: developing an ex post theory of a quality improvement program. *Milbank Q* 2011;89(2):167–205. doi: 10.1111/j.1468-0009.2011.00625.x
26. Greenhalgh T, Papoutsi C. Spreading and scaling up innovation and improvement. *BMJ* 2019;365:l2068. doi: 10.1136/bmj.l2068
27. Grol R, Wensing M, Bosch M, Hulscher M, Eccles M. Theories on implementation of change in healthcare. In: Grol R, Wensing M, Eccles M, David D, editors. *Improving Patient Care. The Implementation of Change in Health Care. 2nd ed*. Chichester: Wiley Blackwell BMJ Books; 2013. https://www.wiley.com/en-us/Improving+Patient+Care%3A+The+Implementation+of+Change+in+Health+Care%2C+2nd+Edition-p-9781118525975 Accessed Oct 2023.

28. Wiltsey Stirman S, Kimberly J, Cook N. Calloway A, Castro F, Charns M. The sustainability of new programs and innovations: a review of the empirical literature and recommendations for future research. *Implement Sci* 2012;7:17. doi: 10.1186/1748-5908-7-17
29. Mondoux S, Shojania KG. Evidence-based medicine: a cornerstone for clinical care but not for quality improvement. *J Eval Clin Pract* 2019;25(3):363–8. doi: 10.1111/jep.13135
30. McDonald KM, Graham ID, Grimshaw J. Toward a theoretical basis for quality improvement interventions. In: Shojania KG, McDonald KM, Wachter RM, Owens DK, editors. *Closing the Quality Gap: A Critical Analysis of Quality Improvement Strategies, Volume 1—Series Overview and Methodology*. Technical review 9 (Contract No. 290-02-0017) to the Stanford University–UCSF Evidence-based Practice Center). AHRQ Publication No. 04-0051-1. Agency for Healthcare Research and Quality. August 2004. https://www.ncbi.nlm.nih.gov/books/NBK43908/. Accessed Oct 2023.
31. Reed JE, McNicholas C, Woodcock T, Issen L, Bell D. Designing quality improvement initiatives: the action effect method, a structured approach to identifying and articulating programme theory. *BMJ Qual Saf* 2014;23(12):1040–8. doi: 10.1136/bmjqs-2014-003103
32. Kaplan HC, Froehle CM, Cassedy A, Provost LP, Margolis PA. An exploratory analysis of the Model for Understand Success in Quality. *Health Care Manage Rev* 2013;38(4):325–38. doi: 10.1097/HMR.0b013e3182689772
33. Ramaswamy R, Reed J, Livesley N, Boguslavsky V, Garcia-Elorrio E, Sax S, Houleymata D, Kimble L, Parry G. Unpacking the black box of improvement. *Int J Qual Health Care* 2018;30(S1):15–9. doi: 10.1093/intqhc/mzy009
34. Rangachari P. Innovation implementation in the context of hospital QI: lessons learned and strategies for success. *Innov Entrep Health* 2018;5:1–14. doi: 10.2147/IEH.S151040
35. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of changes in patients' care. *Lancet* 2003;362(9391):1125–30. doi: 10.1016/S0140-6736(03)14546-1
36. Perla RJ, Parry GJ. The epistemology of quality improvement: it's all Greek. *BMJ Qual Saf* 2011;20(Suppl 1):i24–7. doi: 10.1136/bmjqs.2010.046557
37. Øvretveit J, Garofalo L, Mittman B. Scaling up improvements more quickly. *Int J Qual Health Care* 2017;29(8):1014–9. doi: 10.1093/intqhc/mzx147
38. Braithwaite J, Glasziou P, Westbrook J. The three numbers you need to know about healthcare: the 60–30–10 challenge. *BMC Med* 2020;18(1):102. doi: 10.1186/s12916-020-01563-4
39. Colquhoun H, Michie S, Sales A, Ivers N, Grimshaw JM, Carroll K, Chalifoux M, Eva K, Brehaut J. Reporting and design elements of audit and feedback interventions: a secondary review. *BMJ Qual Saf* 2017; 26(1):54–60. doi: 10.1136/bmjqs-2015-005004
40. Foy R, Skrypak M, Alderson S, Ivers NM, McInerney B, Stoddart J, Ingham J, Keenan D. Revitalizing audit and feedback to improve patient care. *BMJ* 2020;368:m213. doi: 10.1136/bmj.m213
41. Grimshaw JM, Ivers N, Linklater S, Foy R, Francis JJ, Gude WT, Hysong SJ, Audit and Feedback MetaLab. Reinvigorating stagnant science: implementation laboratories and a meta-laboratory to efficiently advance the science of audit and feedback. *BMJ Qual Saf* 2019;28(5):416–23. doi: 10.1136/bmjqs-2018-008355
42. Ivers NM, Sales A, Colquhoun H, Michie S, Foy R, Francis JJ. Grimshaw JM. No more 'business as usual' with audit and feedback interventions: towards an agenda for a reinvigorated intervention. *Implement Sci* 2014;17(9):14. doi: 10.1186/1748-5908-9-14
43. Hignett S, Jones EL, Miller D, Wolf L, Modi C, Shahzad MW, Buckle P, Banerjee J, Catchpole K. Human factors and ergonomics and quality improvement science: integrating approaches for safety in healthcare. *BMJ Qual Saf* 2015;24(4):250–4. doi: 10.1136/bmjqs-2014-003623

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