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The opioid prescribing problem: an opportunity to embed rigorous evaluation within initiatives to improve population healthcare

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“The Chinese use two brush strokes to write the word 'crisis.' One brush stroke stands for danger; the other for opportunity.”

John F. Kennedy

The US and Canada are experiencing an ‘opioid crisis’, with an ongoing rise in related mortality.(1) Other higher-income countries risk going down the same road unless current prescription trends are reversed.(1) The majority of prescribing in high-income countries happens in primary care, with marked variations in opioid prescribing amongst practices and practitioners, incompletely explained by patient and practice factors.(2,3) Across different healthcare systems, both patients and physicians are also dissatisfied with opioid prescribing in chronic pain management.(4)

This significant and important problem demands both individual and population-level responses. Interventions aimed at individual patients have limited evidence of effectiveness and population-level prescribing guidelines are often insufficient by themselves to change clinical behaviour.(5) However, guidelines can be made more useful if complemented by Audit and feedback, exploiting large-scale, routinely collected data to encourage safer prescribing.

Audit and feedback aims to improve patient care by reviewing health care performance against explicit standards. Ideally, where a discrepancy is detected, changes are implemented at individual, team, and service levels. The effect size of audit and feedback may be small, but its scalability creates the potential for large population effects and it appears particularly effective at changing prescribing behaviour.(6) Feedback is generally acceptable to primary care physicians.(7,8) The increasingly widespread use of electronic medical record systems in high-income countries has made practice-aggregated primary care prescribing data accessible meaning audit and feedback can be conducted at relatively low cost.(9)

Feedback targeting opioid prescribing can go beyond simple comparison of performance against standards or peers. It can also include persuasive messaging (e.g. advice to think twice before initiating opioids), suggested action plans for clinical teams, and co-interventions such as computerised prompts (e.g. for opioid medication reviews of patients who may not be benefiting) and educational outreach to practices with greater needs for support.(7,10)

In this issue of the journal, Moffat and colleagues demonstrate a complex intervention that resulted in a welcome reduction of opioid prescribing for people with chronic non-cancer pain in Australia.(10) Their one-off feedback targeted over 8000 primary care physicians with additional co-interventions to multiple stakeholders addressing the biopsychosocial barriers to prescribing change, including deprescribing guidance, information on catastrophising assessment, pain neuroscience education and a cognitive tool for use by patients with their healthcare providers. Moffat and colleagues add to growing evidence that feedback, with or without co-interventions, can reduce opioid prescribing for non-cancer chronic pain in primary care across different healthcare systems and are now ready to be implemented at scale to tackle this international priority.(9) However, the study has two important issues that should be considered when interpreting the findings.

First, the study design entailed an interrupted time series analysis without a concurrent control group. Such quasi-experimental designs are useful when, for example, during the national roll-out of an improvement initiative, randomisation is not possible.(11) However, it also means that investigators cannot completely rule out the effects of other contemporaneous influences on clinical behaviour, such as letters from the chief medical officer of Australia to the top 20% of opioid prescribers in primary care encouraging them to review their prescribing (10). This lack of clarity

means for pressing problems such as opioid prescribing, the drive to do something can result in harms, particularly wasted resources on ineffective actions, as well as missed opportunities to learn about what works.(12) Waiting for randomised controlled trials to be funded, designed, conducted and reported in the hopeful expectation that any findings will be translated rapidly and faithfully into practice is not a realistic or attractive option either.

Second, evidence-based medicine is "about integrating individual clinical expertise and the best external evidence."(13) Therefore, anyone considering adapting the feedback strategy used by Moffat and colleagues may need to make some judgements about how to put their own initiatives into action based upon evidence, theory and available resources.(14)

The findings of Moffat and colleagues prompt us to consider the broader issue of how researchers at both national and international level can learn from ongoing real world healthcare improvement initiatives. These initiatives typically respond to urgent priorities, applying 'best bet' approaches to address real-world problems. What if it were possible to address a pressing population health problem and produce rigorous, scalable evidence at the same time? We propose a learning health system approach to address problematic opioid prescribing in primary care, and suggest that it can be efficiently applied to a range of population healthcare priorities.

Learning health systems offer opportunities for researchers and healthcare systems to conduct embedded, collaborative research, using a systematic approach to iterative, data-driven improvement.(15) They aim to improve the effectiveness of a specific intervention (in this case reducing opioid prescribing for chronic non-cancer pain via A&F) while *simultaneously* producing generalizable knowledge about how to implement the intervention and optimise the effects.

The approach, similar to one described in other industries as 'radical incrementalism,' entails making small, incremental changes, supported by tightly focused (ideally experimental) evaluations, to cumulatively improve patient care whilst developing the underpinning evidence base. Already used in public policy and business, it is also highly applicable to healthcare.(16) For interventions featuring feedback to address opioid prescribing, we need to know answers to questions such as: What is the effect of having many versus fewer quality indicators in the feedback reports? Does adding additional persuasive messages such as patient stories, have any impact? Does the addition of co-interventions such as educational outreach and facilitation improve the skills and resources to engage with and respond to feedback? And perhaps most crucial of all from a system-perspective: would an adaptive intervention, where type, intensity or modality of an intervention evolve according to changing recipient responsiveness to feedback be more (cost-) effective? Modifications identified as more effective than the current standard would become the new standard whilst those which are not would be discarded. Setting up the infrastructure to deliver feedback and simultaneously answer such questions will incur costs, however these are likely to be significantly less than the costs of conducting one-off research projects to answer the above questions.

The learning health system approach is gaining traction. Successful US examples include the Veterans Health Administration and large hospital systems, whereby sustained resources for translation of research into practice coupled with rigorous randomised evaluations of quality improvement initiatives, have guided service delivery in areas such as preventive care, telehealth and discharge planning.(17,18) In the UK, a prototypical learning health system approach has embedded sequential trials within a national clinical audit programme to show that changes to the format and delivery of feedback did not reduce unnecessary blood transfusions;(19) it is just as

important to demonstrate what does not work as well as what works. By embedding randomised experiments within existing quality improvement programmes, it avoids the limitations of different concurrently implemented interventions and can assess whether different compo00nents contribute to effectiveness.

A learning health system features rigorous evaluation, but is primarily about programme development and evaluation and therefore some deviation from usual 'research' protocols for recruitment and consent may be reasonable.(20) Efforts to identify potential unintended consequences (e.g. increased referrals to pain services or other potentially harmful prescribing) should always be incorporated, with outcomes and topics for improvement ideally co-developed by patients, clinicians, *and* administrators. Optimisation of interventions can occur with little or no cost, starting with the 'low hanging fruit'(15) that have potential to reduce opioid prescribing but also contribute to the greater knowledge of audit and feedback science. The infrastructure to do this type of work (i.e., available data on opioid prescribing and a structure for compiling and delivering reports on prescribing) already exists in many jurisdictions. Ideally, a centrally controlled, web-based quality improvement support service, with extensive user-input from patients and clinicians, has the potential to provide tailored, effective interventions, while incorporating sequential trials to generate knowledge of behaviour change in practice. We envision that once the framework for an opioid prescribing learning health system is established, it could be extended to a range of high priority topics to test different ways to support improvement. This opportunity can be doubly advantageous if embedded, rigorous evaluations provide evidence on how to prevent the next population health threat.

Every crisis presents an opportunity; major challenges in population healthcare offer a chance to advance rather than evade scientific discovery. A learning health system focused on opioid prescribing is an exemplar. Moffat and colleagues' work is a welcome addition to growing evidence that feedback reduces opioid prescribing for non-cancer chronic pain in primary care. However, opioid prescribing is an international high impact quality problem and the learning health system approach that employs rigorous evaluations of major policy initiatives are feasible, relatively inexpensive and can advance science and improve quality of care. Quality improvement leaders and researchers should embrace such an opportunity.

Author's contributions

SA conceived and drafted the manuscript. All authors contributed to and approved the final manuscript.

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