

How can we finally reduce repetitive routine laboratory tests for hospitalised patients?

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Repeatedly performing routine laboratory tests on hospitalised patients is unnecessary and harmful. It causes discomfort, iatrogenic anaemia, biological waste, disrupted sleep, financial costs and spurious results that trigger cascades of further testing and interventions.¹ Yet, every day in hospitals around the world, patients are awoken with a pre-dawn needle in the arm.

Since at least the 1970s, medical educators have attempted various programmes to teach resident physicians to order fewer routine tests, nearly always observing that any effects quickly dissipated once the education was stopped.^{2 3} In one memorable example, hospital administrators provided a finite number of coupons to resident physicians that could be redeemed for individual laboratory tests, quickly resulting in counterfeit coupons appearing on the wards.² More recently, numerous programmes have taken a multipronged intervention approach, with some combination of education, audit and feedback, electronic health record (EHR) modifications and policy changes.⁴ These programmes are generally small, single-institution efforts without clear evidence of potential for sustainability nor scale. Indeed, more than a decade now since the launch of the Choosing Wisely campaign in the USA, which included recommendations to avoid repetitive routine inpatient laboratory testing, there is a lack of evidence to suggest that laboratory testing has measurably decreased in hospitals. It seems for years we have temporarily decreased laboratory testing in imperceptibly small pockets, in a cyclic and futile whack-a-mole approach.

In this issue of *BMJ Quality & Safety*, Ambasta and colleagues share the results of their multipronged intervention bundle to effectively and safely reduce routine laboratory testing across all four hospitals in a single geographical health zone.⁵ This was a robust effort that built upon the team's prior pilot work on a single medical unit.⁶ The bundled intervention included asynchronous education (via an online module) and social comparison reports paired with facilitated report discussion sessions. The quality improvement (QI) approach of this programme included many exemplary components that should guide other QI study efforts. The team developed and tested the interventions on a single unit and showed efficacy prior to attempting to spread. They also applied a more rigorous evaluation plan with a cluster randomised step-wedge design, rather than merely reporting pre-intervention and post-intervention rates as many published QI studies do.⁷ The intervention included both clinical teaching units (with resident physicians and medical students) as well as hospitalist units at each hospital. Over the course of more than 125 000 patient-days, there was a 14% overall reduction in ordering of routine tests with the intervention, and a 20% increase in routine test-free patient-days, without any concerning patient safety findings.

WHAT WORKED TO DECREASE LABORATORY ORDERING?

As reports of standalone laboratory reduction interventions now begin to pile up, it is important that we consolidate knowledge about common elements of interventions that appear to work for decreasing laboratory ordering. A recent

systematic review of 41 studies identified five effective interventions for reducing laboratory ordering: audit and feedback, cost display, education, EHR change and policy change.⁸ Looking closer at the implementation of the RePORT Programme, which included further spread and impact than the majority of programmes currently reported in the literature, there are additional nuanced lessons that are likely to have contributed to their success and can guide future approaches.

- ▶ *Multipronged interventions:* multipronged interventions are more successful than single interventions for achieving behaviour change.^{4,8} Education is often necessary but insufficient and should be paired with other QI tactics.⁹ In RePORT, social comparison reports or individualised report cards ('audit and feedback'), along with regular reminders, helped reinforce the programme.
- ▶ *Facilitated discussions about the feedback data:* it has been said, 'it's not the data, it's the conversations about the data' that can drive impact. While it is resource-intensive, it seems committing to facilitated sessions to discuss the reports, verify the validity of the data, answer questions and guide physicians through their reactions to the data was important in establishing buy-in and shared approaches for the programme. The feasibility for widespread adoption of this practice is a concern, though it very well may be a key investment for success.
- ▶ *Local peer messengers and role models:* peer local champions shared their own reports and helped the groups focus on change planning and identifying concrete strategies. Peer opinion leaders exert influence through their representativeness and credibility, which are key to uptake of behaviour change by groups.¹⁰

WHAT CAN BE DONE BETTER?

While the RePORT Programme was successful in reducing laboratory tests by up to 14%, there are additional approaches that may enhance the effect, sustainability and further spread of the programme.

- ▶ *'Hard-wiring' changes in the EHR and/or hospital policies:* changes to EHRs and hospital policies appear to most often have the greatest effect and sustainability in reported laboratory test reduction programmes.^{4,8} EHR changes may directly restrict the frequency of ordering (eg, not allowing orders at time of admission of indefinitely repeating daily morning laboratory tests), though these more forceful approaches are often received more negatively by clinicians.¹¹ Changing hospital policies and workflow, for example, shifting when routine blood draws occur to later in the morning or making it easier to 'add on' or draw blood following patient care rounds, can also ease some of the pressures that drive preemptive ordering, as well as mitigate unintended effects such as the increase in urgent laboratory orders as was seen during the RePORT Study.

- ▶ *Focus on a patient-centred metric:* in a resident-led programme to decrease routine laboratory tests, using a metric that resonated with physicians and patients, in that case the number of phlebotomy 'sticks' per day, was more compelling than reporting number of individual laboratory tests ordered.¹² During COVID-19, a similar project focused on the number of inpatient laboratory testing-free days.¹³ The idea of avoiding the needlestick altogether for a day is both more meaningful for patients and for actual potential healthcare cost-savings than merely avoiding the incremental costs of individual laboratory tests. Although RePORT focused on the primary outcome of reduction in routine test ordering, they also included the number of patients per day who did not receive any routine tests. Focusing on this outcome may be more salient for driving future change forward.

- ▶ *Addressing the culture of overuse with residents and other health professionals:* in the RePORT Programme, the subgroup analysis looking at clinical teaching units did not show a statistically significant reduction in laboratory testing (9%; incidence rate ratio (IRR)=0.91, 95% CI 0.83 to 1.01), whereas the hospitalist units reduced laboratory tests by 21% (IRR=0.79; 95% CI 0.73 to 0.86). Furthermore, while the authors report sustainability of changes after the study period in the hospitalist units, the clinical teaching unit changes did not sustain. This finding highlights the challenges and importance of changing resident physician ordering behaviour. Programmes that do not meaningfully and sustainably change resident practices will have limited impact and scalability. In other studies, resident physicians attribute their own test overordering to health system culture, opacity of healthcare costs and lack of faculty role models that celebrate restraint.¹⁴ Any programme that includes trainees should focus efforts on role modelling that contributes to a high-value care culture, such as explicitly making the avoidance of unnecessary overordering of tests a shared goal for attending physicians and residents, and encouraging regular prompting such as 'will the result of this test change our treatment plan?'¹⁵ Celebrating restraint, such as identifying and openly congratulating when trainees do not order unnecessary tests, can reinforce a high-value care culture.¹⁶

In addition to physicians, the attitudes and behaviours of other health professionals, such as bedside nurses, are crucial to success. Registered nurses are more likely than other healthcare providers to support routine testing—in one survey, 80% of registered nurses believed that hospitalised patients should have daily laboratory testing.¹⁷ While nurses do not directly order testing, they may prompt ordering (eg, calling the overnight physician to alert them that the patient is 'missing' laboratory orders for the morning), and their attitudes clearly influence practices. Successful sustainable test reduction programmes should pay attention to shifting nurse knowledge, attitudes and practices.

HOW TO MOVE FORWARD ON IMPLEMENTING SYSTEMIC SOLUTIONS

Recent systematic reviews⁸ and ‘evidence-based implementation blueprints’⁴ can help the field synthesise emerging evidence to support specific interventions to reduce repetitive routine laboratory testing, but we cannot hope for widespread sustainable change to occur independently unit by unit or even hospital by hospital. The next step to creating meaningful impact is to apply these lessons through coordinated systemic programmes. RePORT was a regional example of this approach.

Choosing Wisely Canada is currently introducing a national consortium programme, ‘Using Labs Wisely,’ that aims to ‘change the lab utilisation landscape in Canada’.¹⁸ The Choosing Wisely Canada centralised approach will help health systems develop annual QI plans and implement interventions while providing tools, mentoring and comparative reports on hospitals’ performances compared with peers. A goal is to create a ‘national reporting system for appropriate laboratory utilisation in Canada’.¹⁸ This is based on Choosing Wisely Canada’s experience of successfully engaging more than 100 hospitals in concerted efforts to reduce unnecessary blood transfusions.¹⁹ Hospitals voluntarily share their data to inform the benchmarks and scorecards, and if they meet national appropriateness benchmarks, they are designated as a ‘Using Blood Wisely’ hospital. The Using Labs Wisely Programme is an important potential step-forward on making a scalable national impact on laboratory ordering. It will benefit from ensuring that it is applying and promoting the best practices for success that have been identified through programmes like RePORT and others, as outlined above.

Implementing system-level changes in places that are characterised by competing hospitals and health systems, such as in the USA, is challenging. However, there could be potential for approaches such as a respected centralised organisation providing support and an official ‘designation’ (similar to Choosing Wisely Canada) and/or incorporation into current scorecards, such as the Leapfrog Hospital Scores, with the goal of galvanising more health system-wide efforts that use evidence-based approaches.

CONCLUSIONS

The history of efforts to decrease repetitive routine laboratory testing in hospitals is both encouraging and discouraging. Encouraging in that there has been a growing number of publications describing successful projects and local programmes. Discouraging in that there has yet to be convincing evidence of lasting sustainability and systematic spread. We can now consolidate key lessons and approaches

from various attempts to apply the most-promising bundled interventions. However, these lessons must inform and be applied through systematic efforts, such as those seen in Choosing Wisely Canada’s ‘Using Labs Wisely’ Programme. A commitment to thoughtful laboratory test ordering is a visible practice that is likely to help support a wider culture of high-value care delivery for our patients, and to finally stop needlessly day-after-day sticking them with needles.

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