

Halting the growth in diagnostic testing

It is time to focus on reducing inappropriate test ordering

THE COMPLEXITY OF MODERN MEDICINE has promoted an excessive reliance on the results of empirical tests rather than clinical acumen. In Australia, this is reflected in the fact that the rise in the costs of diagnostic testing in pathology and radiology is second only to the rise in cost of pharmaceutical prescriptions, the fastest-growing sector in our healthcare budget.

Many reasons have been cited for this increase in clinicians' reliance on pathology and radiology testing. Among community-based practitioners, ordering patterns are most likely to be influenced by medicolegal concerns, time constraints, screening needs, or ingrained practice habits. Among hospital-based clinicians, test-ordering practice may be determined by level of clinical experience, fear of censure for lack of testing, medicolegal concerns, and the desire to provide a "one-stop" service to evaluate all possible physiological parameters.¹

In addition, the pressures of shorter consultation times in community practice and diminishing hospital beds have led to the increased use of investigations to fast-track patient throughput.

In acute hospital settings, it has been estimated that as many as a third of all tests ordered are inappropriate in terms of their ability to contribute to the diagnosis and treatment of individual patients.² This overtesting is not without consequences. If a healthy individual is subjected to 10 unnecessary tests, there is a 40% chance of at least one false-positive result.³ As well as exposing the patient to potential harm from unnecessary tests and treatment, this may expose the clinician to an increased, rather than a decreased, medicolegal risk, as patients are exposed to greater risks of complications while they proceed along an unnecessary testing spiral.

In a community that is struggling to cope with the financial demands of modern healthcare, the wastage of resources on unnecessary pathology and imaging testing has an adverse effect on the provision of services that are legitimately required. Furthermore, in most settings, it is the relatively cheap, common tests that account for the bulk of testing expenditure. In our own institution, about 80% of the costs of biochemistry and haematology testing are accounted for by full blood counts and testing of electrolytes, urea, creatinine, liver function and cardiac markers. Although more complex investigations, such as gene testing, may individually be more expensive, the sheer volume of common tests drives the overall costs of investigations, and suggests that attempts to reduce inappropriate testing should focus on these tests.

In this issue of the Journal, Stuart and colleagues (*page 131*) report on a comprehensive program of education, audit, feedback and structural change to reduce the number of investigations performed in a public hospital emergency

department.⁴ Although their program focused on reducing inappropriate testing and improving result follow-up in an emergency department, the lessons learned about how to produce sustainable change in clinician practice are equally applicable to the rest of the acute hospital environment, and to the community sector.

There has been a plethora of reports on the implementation of educational or other programs aimed at curbing the costs of inappropriate testing. Most describe utilisation of tools such as education programs,^{5,6} incentives for clinicians,^{7,8} information about costs of testing, audit of ordering profiles, feedback on ordering patterns, guidelines, decision-support systems, and process changes.^{9,10} The study by Stuart et al demonstrates the key features required for sustainable improvement in test-ordering behaviour. A multifaceted approach that results in alteration to the core processes of test

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ordering is more likely to promote lasting improvements than strategies aimed just at increasing awareness or knowledge among individuals. In public hospitals, where the junior medical staff who are responsible for most test-ordering rotate through departments at three-monthly intervals, it is essential that whatever changes are made to improve test-ordering are capable of affecting a mobile workforce. It is unlikely that educational programs alone could cope with the demands of this rostering pattern, unless concomitant process changes are implemented hospital-wide to ensure applicability in all clinical settings.

As conceded by Stuart et al, the effects on patient outcomes of attempts to reduce overtesting were not addressed. No data are provided on readmission rates, length of stay, adverse events and rates of missed or incorrect diagnoses. It is possible that attempts to reduce numbers of tests performed could result in harm to patients through underinvestigation of symptoms. Therefore, future studies in this area should include measures of patient outcomes to ensure that an overall improvement in patient care accompanies the reduction in costs of investigation.

Computerised systems are widely available in general practice for prescribing, and, in some places, for test ordering, but have yet to be widely implemented in the acute care sector. At present, these systems have focused on facilitating the ordering process rather than ensuring its appropriateness. The future is likely to see implementation of computerised order-entry systems that provide real-time feedback on ordering patterns, guidance on test appropriateness, improved result checking, and information on the costs of tests ordered. Such systems already exist, and are currently being tested in several Australian hospitals. It is hoped that overcoming existing deficiencies in information systems will enable clinicians to order tests and check results more efficiently and more appropriately than they currently do.

An academic analysis of current test-ordering practices might suggest that further research is needed into why doctors order tests the way they do, whether there really is such a high rate of unnecessary testing, and what value current ordering patterns add to our highly complex health-care system. A pragmatic view, however, would suggest that there is enough published evidence that overtesting is a characteristic of healthcare systems in the developed world, and enough information in existing research to guide what should be done to reduce waste and harm resulting from inappropriate testing.

It is time that the focus of work in this area shifted to development of practical, sustainable means of improving the appropriateness of testing. Future research may be best directed to understanding the place of sophisticated decision-analysis models, the role of point-of-care guidance and feedback systems, and effective clinical change-management strategies. In the meantime, hospitals around Australia have already embarked upon attempts to change current practice. In Melbourne, the National Institute of Clinical Studies is sponsoring a 12-month project, involving hospitals from four States and Territories, aimed at developing transferable and sustainable changes in test-ordering practices. Similarly, hospitals involved in the Health Roundtable in Sydney have been involved in exchanging information on effective strategies to improve test ordering. The Royal Australasian College of Pathologists is developing undergraduate education programs aimed at improving ordering practices.

The lessons learned from these groups should inform national strategies to deal with the problem of inappropriate

testing. As in the study by Stuart et al, it is likely that a coordinated, multifaceted, sustained approach to this problem will be required to achieve lasting success.

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