EDITORIAL

MONITORING PRACTICE PATTERNS – TOWARDS LESS VARIATION?

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"At the Strasbourg meeting on breast cancer, one of the British surgeons present pointed out that the lumpectomy would tend to be favoured by British surgeons for a reason other than its aesthetic results: it's an easier operation. While an American or French surgeon gets more money for more difficult operations, and would therefore be better paid for performing a radical mastectomy than a lumpectomy, the British surgeon receives the same salary no matter how he treats the disease."

– Lynn Payer, in Medicine & Culture: Varieties of treatment in the United States, England, West Germany and France, page 101[1].

Variation in medical practice among doctors from different countries, and even within the same country, is not an uncommon phenomenon[2-6]. Hysterectomies are performed three times more frequently in the United States than in England and Wales. Surgical rates for prostatectomy and tonsillectomy have been found to vary by as much as four to six-fold within the same small region in the US. Considerable variation too has been noted in other aspects of medical practice, including drug prescription[7], diagnostic testing[8,9], hospitalisation[10], and patient length of stay[11].

Variation has implications for quality. According to the late W Edwards Deming, management guru and father of the Japanese total quality movement, minimising variation is the most important path to quality. He said, "If I had to reduce my message for management to just a few words, I'd say it all had to do with reducing variation"[12].

But medical practice is not manufacturing. No two patients are exactly the same. Why should all doctors be expected to practise alike?

Nevertheless, in recent years, there has been an increase in interest in the monitoring of medical practice variation, stemming not so much from concern with quality of care but with runaway health care costs. In the United States, where 20% of health care expenditures are due to doctors' fees with the remaining 80% for services prescribed by doctors[13] (hospitalisation, surgery, referrals, X-rays, diagnostic tests, and medication, etc) there is growing concern that much of the variation may be directly related to overservicing[14].

In one American teaching hospital, up to 65% of selected laboratory tests, 30% of stat orders, and 11% of chest X-rays, were judged by an expert panel to be clinically unnecessary[15]. At another teaching hospital, between 26% and 43% of laboratory tests were considered unnecessary when similarly audited[16]. In yet other studies, as much as 25% of patient length of stay[17], 20% of surgical procedures[18], and 30% of restorative dentistry[19] were considered inappropriate.

Amidst mounting pressures to curb the high rates of use of procedures which do not necessarily lead to improved health outcomes, the setting of practice guidelines has been advocated[20]. Presumably, if doctors can be persuaded to follow standard protocols in their prescription of investigations and treatment procedures, then better health outcomes and lower health care costs will result. The problem is, nothing and least of all in medicine, is ever so simple.

Firstly, medicine being as much an art as a science, variability of medical decisions is unavoidable. The presentation of diseases is not always clear-cut and doctors do differ in their ability to pick up and interpret clinical signs and symptoms. To illustrate:

> * One investigator compared the abilities of 22 doctors to pick up cyanosis in twenty patients, the true diagnosis of cyanosis being confirmed by oximeter under controlled conditions. Only 53% of the physicians were definite in diagnosing cyanosis in subjects with extremely low oxygen content. 26% of the physicians said cyanosis existed when these subjects had normal oxygen content[21].

Secondly, the wide range of tests available for further work-up makes their selection a matter of judgement and often, personal preference. To detect colorectal cancer, for example, beyond a simple digital examination and stool test for occult blood, no unanimity exists as to which procedure should be next – rigid sigmoidoscopy, flexible 30 cm sigmoidoscopy, flexible 60 cm sigmoidoscopy, barium enema (plain or contrast) or colonoscopy. Each has a different sensitivity and specificity, and the cost-risk considerations vary. When one starts to consider the less well-defined symptoms like fatigue, headache or fever, each of which has definitely more than a dozen causes, the range of tests to choose from can be mind-boggling.

With poor availability of scientific data on the value of most tests there is really no way of proving whether a doctor is right or wrong in prescribing a test or in choosing one test over another. Even if the same tests are carried out, there may still be a wide variation in the interpretation. For example,

> *A group of experts compiled 100 electrocardiogram tracings, 50 of which showed myocardial infarctions, 25 of which were normal and 25 of which showed some other abnormality. These ECGs were then given to 10 other cardiologists to test their diagnostic abilities. The proportion of ECGs judged by the 10 cardiologists to show infarcts varied by a factor of two[22].

Thirdly, the indications for treatment and the choice between a conservative or aggressive approach, are not clear-cut:

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*Three expert panels comprising 3 distinguished specialists each, were convened to rate the appropriateness of indications for performing a number of medical and surgical procedures. A cardiovascular panel rated indications for coronary angiography and coronary artery bypass graft surgery; a gastrointestinal panel rated indications for cholecystectomy, upper gastrointestinal endoscopy and colonoscopy; a cerebrovascular panel rated indications for carotid endarterectomy. Despite being allowed to discuss with one another and to revise their own initial ratings with a view to working towards a consensus, the experts agreed only on 42% to 56% of the indications and disagreed on 11% to 29%[23].

*A survey of 1,000 eleven-year-old school children in New York found that 65% of them had undergone tonsillectomy. The remaining children were sent to a group of physicians for examination and 45% were selected for tonsillectomy. Those rejected were examined by another group of physicians and 46% were selected for surgery. When the remaining children were examined again by another group of physicians, a similar percentage was recommended for tonsillectomy, leaving only 65 students from the original cohort. At that point, the study was halted[24].

The factors that influence medical practice patterns are thus multiple and complex. Variation can be explained by professional uncertainty over diagnosis, investigation or treatment, as well as differences in training, experience, fear of litigation, availability of facilities or even patients' preferences. But only up to a point. Unfortunately, medical decision-making can also be influenced by financial considerations[25]. Although the picture of a venal doctor wilfully prescribing unnecessary interventions would be an exaggeration, the fact of the matter is, doctors, like everyone else in society, are creatures of economic desires. Overservicing must account for some of the observed variation.

To be fair, overservicing may arise from a genuine desire to provide the most good to the patient. Even then, it would still be worthwhile curbing since precious health care resources can be saved without lessening quality. Doing more for the patient does not necessarily mean better care. We need to shift practice styles towards patterns which achieve the best health outcomes and best value for resources spent.

In the United States, health maintenance organisations (HMOs) have been successful in significantly reducing hospitalisation[26,27] and utilisation of diagnostic tests[28] compared to individual practice association on fee-for-service. This shows that doctors' practice patterns are indeed malleable and can be manipulated given the right incentives (and disincentives)[29].

Organisational ethos and peer pressure are also important in modifying doctors' behaviour. It has been found that overuse of medical resources can be reduced and the quality of care improved, if doctors are provided with feedback on their practice patterns. Feedback is most likely to be successful if the data are individualised, if doctors are compared with their peers, and if the information is delivered personally by a physician in a position of clinical leadership[30]. For example,

*It was found that individualised computerised feedback in an ambulatory setting increased the use of generic drugs from 21% to 58%, a significant increase compared with that of a control group[31].

*In one hospital which required that whenever an audit of the records detected unnecessary pacemaker implantation, the doctor involved had to justify the implantation before a committee of peers, decreases of more than half were seen in the number of pacemaker implantations[32].

*In a project to improve physician performance with respect to colorectal cancer screening, using a minimal standard of a digital examination and stool test for occult blood at annual check-ups of patients aged 40 years or older, the researchers found that doctors who received monthly feedback of individual performance ranked with that of peers, improved significantly compared to a control group, and that behaviour changes persisted at 6 and 12 months after intervention[33].

Still other studies have shown that utilisation review and feedback can result in improved antibiotic prescription[34], improved test-ordering behaviour[35,36], improved drug-therapy decisions[37], reduction in tonsillectomy rates[38] and reduction in unjustified hysterectomies[39].

Can Singapore's medical profession steer towards a similar vision of more appropriate and less variable practice patterns?

A comprehensive information system that allows characterisation of medical practice patterns would be a logical starting point. The idea is not new – Florence Nightingale, in attempting to better understand the differences she had observed in the results of treatment among different hospitals, lamented that "In attempting to arrive at the truth I have applied everywhere for information but in scarcely an instance have I been able to obtain hospital records fit for any purpose of comparison. If they could be obtained they would enable us to decide many other questions besides the ones alluded to. They would show subscribers how their money was being spent, what amount of good was really being done with it and whether the money was not doing mischief rather than good"[40].

That was in 1863. We now have information technology and analytical tools of sufficient sophistication, that will allow a level of transparency hitherto not possible to the process of health care delivery. If we have a clear picture of what is taking place in an otherwise black box, we can begin to find answers to pressing questions concerning utilisation, cost, and quality of care.

The infrastructure needed to do this would cost only a fraction of the total health care expenditure but yield far greater returns than if the same resources were spent on curative medicine. It would enable identification of waste and inefficiency, targeting of programmes to improve doctors' performance, and long-term evaluation of effectiveness and outcomes of care.

The objective is not to catch the few "errant" culprits. If the information obtained is fed back to the medical profession in a positive and non-threatening manner, it will stimulate self-regulating, continuous improvement towards better clinical care.

The monitoring of medical practice patterns, towards less variation, is a potentially powerful approach to improving the quality of medical practice and controlling health care costs. It ought to become as routine and important as the epidemiological surveillance of disease.

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