Alarm symptoms in primary care

These greatly increase the risk of cancer, but the diagnosis is still rare

DR P MARAZZI/SPL

RESEARCH, p 1040

Robin Fox general practitioner
Robin.Fox@gp-K84052.nhs.uk
John Fletcher general practitioner, clinical epidemiologist, *BMJ* Health Centre, Bicester, Oxon OX26 6AT

Competing interests: None declared.
Provenance and peer review: Commissioned; not externally peer reviewed.

BMJ 2007;334:1013-4
doi: 10.1136/bmj.39212.467037.BE

A new diagnosis of cancer is rare in primary care, and the role of general practitioners (GPs) in diagnosing cancer can be challenging. In the United Kingdom, a GP with a list size of 1500 will on average see only 1.39 cases of lung cancer, 0.23 oesophageal cancers, 0.99 colorectal cancers, and 0.45 renal or bladder cancers each year.[1] We seek to diagnose the few patients with cancer out of the many who are concerned about it or who have non-specific problems. In this week's *BMJ*, a cohort study by Jones and colleagues assesses the association between alarm symptoms and a subsequent diagnosis of cancer in just under 800 000 patients in primary care.[2]

Diagnostic errors are one of the leading causes of medicolegal claims against GPs,[3] and they can damage the faith of our patients. However, GPs have a role as gatekeepers of health resources and more recently the added responsibility of managing a budget. Over-referral to secondary care can unnecessarily raise patients' anxiety while awaiting investigation and waste precious resources.

What are we to make of alarm symptoms? Are certain symptoms or signs so suggestive of cancer that no further consideration is needed apart from how to write the urgent referral letter? On the face of it, the high positive likelihood ratios for cancer reported by Jones and colleagues,[2] which range from 75 for rectal bleeding to around 300 for dysphagia, might suggest this. Put simply, the presence of dysphagia makes it 300 times more likely that a patient has cancer. But strangely, even this is not enough for the GP to refer because most patients with such symptoms will not have cancer. The positive predictive value (PPV) of dysphagia for cancer is only 2% in women and 5% in men; that is, more than 95% will not have cancer.

Further difficulties arise when we analyse what doctors mean when they code symptoms. Current guidelines from the National Institute for Health and Clinical Excellence (NICE)[4] define dysphagia as interference with the swallowing mechanism that occurs within five seconds of having started swallowing. It advises urgent referral of dyspeptic patients with dysphagia who have "suspected cancer." But dysphagia has been reported as a symptom in 37% of patients with erosive oesophagitis, and this resolves in most patients (83%) after treatment with a proton pump inhibitor.[5]

The recent Montreal definition and classification of gastro-oesophageal reflux disease highlights this problem.[6] It defines "troublesome dysphagia" as dysphagia that causes patients to alter their eating patterns or have symptoms of solid food getting impacted. Dysphagia is troublesome only in a minority of patients with gastro-oesophageal reflux disease. The Montreal classification suggests that troublesome and worsening dysphagia, especially for solids, is an alarm symptom and should be investigated. Jones and colleagues found that the PPV of dysphagia for cancer was only 0.16-0.21% if patients were less than 45 years old. GPs have to decide whether to treat young patients at lower risk who have non-troublesome dysphagia initially with a one month trial of proton pump inhibitors or automatically to refer them all.

While Jones and colleagues found the PPV of haematuria was high for urological cancer (5.5%. for men, 2.5% for women), age and sex have a strong effect—the PPV is only 0.22% for women under 45 years. If a 40 year old woman presents with a first episode of cystitis-like symptoms and haematuria, a urinary tract infection may be the most likely diagnosis, but this should be confirmed by a midstream urine specimen. In a 70 year old man, similar symptoms should be viewed with high suspicion as the PPV for urological cancer is 11.2% in such patients,[2] and this is not altered by the presence or absence of dysuria.[7 8] This supports the NICE guidelines, which suggest urgent referral of adults with painless macroscopic haematuria.[4] Patients with symptoms suggestive of a urinary infection and macroscopic haematuria should be referred urgently if infection is not confirmed by investigation. Patients aged 40 years or more who present with recurrent or persistent urinary tract infection associated with haematuria should also be referred urgently, as urological cancer can present in this way.[4]

NICE guidelines suggest haemoptysis should be investigated by chest radiography.[4] If the results are negative, those aged 40 or more should be referred urgently if haemoptysis persists. Secondary care studies suggest 6-21% may have lung cancer when investigated further, and these cancers may be smaller and more curable than those detected on radiography.[9] This is supported by the findings of Jones and colleagues, where the PPV was 4.1-20.4% in patients over 55 but only 0.21-0.36% in those under 45. The PPV for the younger patients in particular may be an overestimate because this is a General Practice Research Database study, which is dependent on GPs correctly coding haemoptysis. GPs may be more likely to do this if they plan to make a referral than if a small amount of blood is mixed with sputum in a young patient with a presumed chest infection.

Rectal bleeding is the most common alarm symptom in primary care identified by Jones and colleagues. It has the lowest PPV overall—only around 2%—which highlights the difficulties GPs face when presented with this symptom. Many patients with rectal bleeding fear they have bowel cancer but do not quite fit the criteria for urgent referral. Hopefully, the national bowel screening programme will improve things for the future.

The take home message is that alarm symptoms need to be considered seriously. The 2005 NICE guidelines on referral for suspected cancer[4] provide a valuable and pragmatic tool that can help GPs make realistic referral decisions. These guidelines are now supported by evidence from primary care.[2] However, the action that a GP takes will depend on their intimate knowledge of the patient and his or her wishes.

1 Scottish Executive. *Scottish referral guidelines for suspected cancer.* Edinburgh: SE, 2002. www.scotland.gov.uk/Publications/2002/05/14862/5418.
2 Jones R, Latinovic R, Charlton J, Gulliford MC. Alarm symptoms in early diagnosis of cancer in primary care: cohort study using General Practice Research Database. *BMJ* 2007 doi: 10.1136/bmj.39171.637106.AE.
3 Royal College of General Practitioners. In safer hands. Issue 6. 2004. www.rcgp.org.uk/PDF/ISH6.pdf.
4 National Institute for Health and Clinical Excellence. *Referral guidelines for suspected cancer*. London: NICE, 2005. www.nice.org.uk/pdf/cg027niceguideline.pdf.
5 Vakil NB, Traxler B, Levine D. Dysphagia in patients with erosive esophagitis: prevalence, severity, and response to proton pump inhibitor treatment. *Clin Gastroenterol Hepatol* 2004;2:665-8.
6 Vakil N, Van Zanten Z, Kahrilas P, Dent J, Jones R; Global Consensus Group. The Montreal definition and classification of gastroesophageal reflux disease: a global evidence-based consensus. *Am J Gastroenterol* 2006;101:1900-20.
7 Bruyninckx R, Buntinx F, Aertgeerts B, Van Casteren V. The diagnostic value of macroscopic haematuria for the diagnosis of urological cancer in general practice. *Br J Gen Pract* 2003;53:31-5.
8 Mommsen S, Aagaard J, Sell A. Presenting symptoms, treatment delay and survival in bladder cancer. *Scand J Urol Nephrol* 1983;17:163-7.
9 Hamilton W, Sharp D. Diagnosis of lung cancer in primary care: a structured review. *Fam Pract* 2004;21:605–11.

The value of administrative databases

Is growing but their contribution to improving quality of care remains unclear

COMSTOCKCOMPLETE.COM

RESEARCH, p 1044

Mohammed A Mohammed senior research fellow
m.a.mohammed@bham.ac.uk
Andrew Stevens professor
Department of Public Health and Epidemiology, University of Birmingham, Birmingham B15 2TT

Competing interests: None declared.
Provenance and peer review: Commissioned; not externally peer reviewed.

BMJ 2007;334:1014-5
doi: 10.1136/bmj.39211.453275.80

Modern health care involves the routine collection of administrative data primarily for management and accounting purposes. Such databases include some clinical data (such as type of surgery, diagnosis, length of stay) that might be useful in monitoring quality of care.[1-4] In this week's *BMJ*, Aylin and colleagues[5] have used hospital episode statistics (HES) data, which are routinely collected by the UK National Health Service, to develop statistical models for predicting hospital mortality adjusted for case mix in three well defined clinical areas—cardiac surgery, aortic aneurysm repair, and colorectal cancer.

Previous comparisons of administrative databases and clinical databases or medical notes (chart review) have found administrative databases to be lacking in three important ways—scope (the relevant data not available), data quality, and ability to adjust for factors relating to patient case mix.[1-6] This has led to the credibility of administrative databases being questioned, but as a result of several high profile events, this view of HES data may be changing.

In 2001, Dr Foster[7] used HES data to produce standardised mortality ratios adjusted for case mix using methodology proposed by Jarman and colleagues.[8] The methodology was later adopted by the Institute for Healthcare Improvement in the United States in its drive to reduce hospital mortality.[9] In 2002, the inquiry into the high death rates after paediatric cardiac surgery in Bristol used HES (as well as a clinical database) to show that Bristol was a statistical outlier.[10] The inquiry report stated that HES "was [sic] not recognised as a valuable tool for analysing the performance of hospitals. It is now, belatedly." Furthermore, the inquiry also remarked that the "dual" system (HES and the clinical database) of collecting data in the health service was "wasteful and anachronistic."[11] In 2004, Harley and colleagues[12] also used HES data retrospectively to show that Rodney Ledward, the discredited gynaecologist who was the subject of the Ritchie Inquiry, was also a statistical outlier. Also in 2004, the *BMJ* started publishing Dr Foster case notes,[13] which draw on analyses of HES data undertaken by the Dr Foster Research Unit.[7]

The present study by Aylin and colleagues[5] shows that HES based models to predict hospital mortality, in three well defined conditions, compare favourably with dedicated clinical databases. Although the choice and interpretation of some of the variables (such as year and deprivation) may be questionable, in statistical terms HES based models predict hospital mortality as well as their clinical counterparts. Clinical databases are often more costly; so are they still necessary?

In our view, it would be premature to discard clinical databases, because their purpose is not limited to predicting mortality. They may also measure longer term outcomes, incorporate rapid changes in treatments (administrative databases are constrained by inertia), and include other outcomes (such as quality of life) that are not often found on administrative databases. Furthermore, administrative databases seldom (without linkage) cover mortality adequately. In-hospital mortality is a key outcome only in a few important diseases. Other potentially useful process outcomes such as length of stay are also limited. Crucially, clinical databases are clinically owned vehicles driven to improve quality of care through a peer led educational process, as exemplified by the Department of Veterans Affairs.[14] Currently, HES data are not.

We advocate that where HES based analyses are accurate they should be incorporated into the existing quality improvement framework alongside clinical databases. This would help clinicians to test their usefulness in delivering quality improvement and so develop

trust in the quality of HES data. Only when HES based analyses are considered fit for purpose, after extensive comparison with clinical databases, would the criticism about "dual" databases be valid.[11] Dual databases can be useful, however. For example, hospital death rates adjusted for case mix after surgery for congenital heart disease in the UK identified Oxford Radcliffe Hospital as a high outlier using HES data, but this was explained by incomplete case ascertainment in HES, which recorded 20% fewer cases than the central cardiac audit database.[15]

Another routinely collected data set—which unlike administrative databases has not been closely scrutinised—that is fit for purpose, clinically meaningful, and has no apparent credibility problems is laboratory data. Prytherch and colleagues[16 17] showed that models for predicting hospital mortality produced from laboratory data were as good as the best models reported by Aylin and colleagues.[5] This is even more remarkable as Prytherch and colleagues predicted deaths in general surgery and general medicine and not the specific areas selected by Aylin and colleagues.[5] Most modern hospitals now have computerised laboratory databases so further research into the use of these databases is needed.

Ultimately a key purpose of data (and analyses) is to support continual quality improvement. While clinical databases have a track record in delivering improvement, the extent to which administrative databases can be incorporated into clinical quality improvement processes remains, by and large, to be seen.

1 Iezzoni L. Assessing quality using administrative data. *Ann Intern Med* 1997;127:666-74.
2 Mcloughlin V, Millar J, Mattke S, Franca M, Jonsson PA, Somekh D, et al. Selecting indicators for patient safety at the health system level in OECD countries. *Int J Qual Health Care* 2006;(suppl 1):14-20.
3 Williams JG, Mann RY. Hospital episode statistics: time for clinicians to get involved? *Clin Med* 2002;2:34-7.
4 Gordon HS, Johnson ML, Wray NP, Petersen NJ, Henderson WG, Khuri SF, et al. Mortality after noncardiac surgery. Prediction from administrative versus clinical data. *Med Care* 2005;43:159-67.
5 Aylin P, Bottle A, Majeed A. Use of administrative data or clinical databases as predictors of risk of death in hospital: comparison of models. *BMJ* 2007 doi: 10.1136/bmj.39168.496366.55.
6 Marshall W. Administrative databases: fact or fiction? *CMAJ* 1998;158:489-90.
7 Dr Foster. *Homepage*. www.drfoster.co.uk/.
8 Jarman B, Gault S, Alves B, Hider A, Dolan S, Cook A, et al. Explaining differences in English hospital death rates using routinely collected data. *BMJ* 1999;318:1515-20.
9 The Institute for Healthcare Improvement. *Move your dot: measuring, evaluating, and reducing hospital mortality rates*. 2005. www.ihi.org/IHI/Results/WhitePapers/MoveYourDot MeasuringEvaluatingandReducingHospitalMortalityRates.htm.
10 Department of Health. *Report of the public inquiry into children's heart surgery at the Bristol Royal Infirmary 1984-1995: learning from Bristol. (The Kennedy Report.)* London: Stationery Office, 2001.
11 Bristol Royal Infirmary Inquiry. *Learning from Bristol: the report of the public inquiry into children's heart surgery at the Bristol Royal Infirmary 1984-1995*. July 2001. www.bristol-inquiry.org.uk/.
12 Harley M, Mohammed MA, Hussain S, Yates J, Almasri A. Was Rodney Ledward a statistical outlier? Retrospective analysis using routine hospital data to identify gynaecologists' performance. *BMJ* 2005;330:929.
13 Clark J. Dr Foster case notes. *BMJ* 2004;328:362.
14 Khuri SF, Daley J, Henderson WG. The comparative assessment and improvement of quality of surgical care in the Department of Veterans Affairs. *Arch Surg* 2002;137:20-7.
15 Keogh B. Surgery for congenital heart conditions in Oxford. *BMJ* 2005;330:319-3.
16 Prytherch DR, Sirl JS, Weaver PC, Schmidt P, Higgins B, Sutton GL. Towards a national clinical minimum data set for general surgery. *Br J Surg* 2003;90:1300-5.
17 Prytherch DR, Sirl JS, Schmidt P, Featherstone PI, Weaver PC, Smith GB. The use of routine laboratory data to predict in-hospital death in medical admissions. *Resuscitation* 2005;66:203-7.

Functional foods

Their long term impact and marketing need to be monitored

USDA

ANALYSIS, p 1037

Tim Lang professor of food policy
Centre for Food Policy, City University, Northampton Square, London EC1V 0HB
t.lang@city.ac.uk

Competing interests: TL is chair of the UK Co-operative Group's Responsible Retailing Advisory Group.

Provenance and peer review: Commissioned; not externally peer reviewed.

BMJ 2007;334:1015-6
doi: 10.1136/bmj.39212.592477.BE

Functional foods, also known as "nutraceuticals" or "designer foods" are foods containing supplements that are intended to improve health, and they are slowly emerging on supermarket shelves worldwide. The market is divided into two main categories. Firstly, breakfast cereals fortified with fibre and sometimes vitamins and, secondly, dairy or yoghurt drinks and yoghurts with probiotic bacteria. Manufacturers of foods, soft drinks, and drugs have invested heavily in this sector to create a market that aims to cover 5% of the value of food sales worldwide.[1] By 2005, global sales were an estimated $73.5bn (£36.9bn; €54.3bn) and, although slowing, still on target to reach $167bn after 2010.[2] In this week's *BMJ*, de Jong and colleagues[3] discuss various aspects of functional foods—their effectiveness, long term safety and marketing.

There are two broad positions on functional foods. Proponents argue that they are a consumer friendly way to improve diets and fulfil the aim of nutrition as a source of preventing ill health. They see them in the forefront of "personalised medicine" and health through consumer choice. Sceptics argue that the market for functional foods is corporate and driven by the need to diversify and create niche sectors in saturated food markets. They also argue that functional foods are affordable and appealing only to the "worried well," or worse, could be an extra burden on poor people's finances.

Functional foods were developed and first regulated in Japan in the 1980s,[4] then spread to North Europe and North America, also affluent consumer markets.[5] The expansion was shaped by these regions' particular consumer cultures and health sensitivities, not least their experience of food scandals.[6 7] Consumer organisations have lobbied for controls on health claims, sound verification, and accurate labelling. Companies have concurred, but their main concern has been safety. Twenty years after bovine spongiform encephalopathy, no company wants to risk its reputation or share price on unsafe products.

Regulators and policymakers are right to keep a watchful eye on functional foods. The European Union, the world's largest single consumer market, introduced a regulation on the use of nutrition and health claims for such foods in December 2006.[8] Companies and scientists have worked with relevant regulatory bodies and organisations at different levels of governance from the United Nations to EU to national governments.[9 10]

Now that functional foods are in the market place—

with more emerging aimed at "mental performance" and sports, for example—the arguments given by de Jong and colleagues for postlaunch monitoring are sound.[3] Such monitoring could take a second look at need and synergistic effects, a research direction raised by the impact of food colourings, for example, which are used extensively in food and soft drinks.[11]

If evidence is robust that these products improve health, then what was wrong with people's diets in the first place?[12] Attention to global nutrition has historically been on underconsumption, but more recently the reliance on preprocessed foods in industrialised society means that obesity has also become a problem.[13] So where do functional foods fit? Are they the first phase of fine tuning the consequences of the industrialised diet and lifestyle?[14] Or are they part of the wider struggle to improve diet in populations, which the WHO and Food and Agriculture Organization championed in 2004?[15]

Proponents argue that functional foods and drinks allow people to eat and drink more healthily without radically changing their diet.[2] Certainly, big changes in diet are needed.[13] Functional foods and drinks may be legal, make money, and reshape the way we think about food and drink. However, at best they are likely to be technical fixes, and at worst, another confounding factor that nutritional epidemiologists will have to unravel for years to come.

1 Ashwell M. *Concepts of functional foods*. Brussels: International Life Sciences Institute, 2002.
2 Research and Markets. *Functional foods market assessment 2007*. 2007. www.researchandmarkets.com/reports/.
3 de Jong N, Verhagen H, Wolfs MCJ, Ocké MC, Klungel OH, Leufkens HGM. Functional foods: the case for closer evaluation. *BMJ* 2007 doi: 10.1136/bmj.39196.666377.BE.
4 Katan MB. Health claims for functional foods. *BMJ* 2004;328:180-1.
5 Heasman M, Mellentin J. *The functional foods revolution: healthy people, healthy profits?* London: Earthscan, 2001.
6 Cannon G. *The politics of food*. London: Century, 1987.
7 Nestle M. *Food politics*. Berkeley: University of California Press, 2002.
8 Commission of the European Communities. *Regulation (EC) No 1924/2006 of the European Parliament and of the Council of 20 December 2006*. Official Journal of the European Union L 404 of 30 December 2006. Brussels: Commission of the European Communities, 2006.
9 Food and Agriculture Organization/WHO. *Guidelines for the evaluation of probiotics in food. Report of a joint FAO/WHO working group.* London, Ontario, Canada. April 30 and May 1, 2002. Rome: FAO and WHO, 2002.
10 International Life Sciences Institute. Scientific concepts of functional foods in Europe. Consensus document. *Br J Nutr* 1999;81:S1-S27.
11 Bateman B, Warner JO, Hutchinson E, Dean T, Rowlandson P, Gant C, et al. The effects of a double blind, placebo controlled, artificial food colourings and benzoate preservative challenge on hyperactivity in a general population sample of preschool children. *Arch Dis Child* 2004;89:506-11.
12 Lang T, Heasman M. *Food wars: the global battle for mouths, minds and markets.* London: Earthscan, 2004.
13 WHO/Food and Agriculture Organization. *Diet, nutrition and the prevention of chronic diseases*. Report of the joint WHO/FAO expert consultation. WHO Technical Report Series No 916. Geneva: WHO/FAO, 2003. www.fao.org/DOCREP/005/AC911E/ac911e00.htm.
14 Popkin BM. The nutrition transition in the developing world. *Dev Policy Rev* 2003;21:581-97.
15 WHO. *Global strategy on diet, physical activity and health*. WHA 57.17, agenda item 12.6. Geneva: World Health Assembly, 2004. www.who.int/gb/ebwha/pdf_files/WHA57/A57_R17-en.pdf.

Multimorbidity's many challenges

Time to focus on the needs of this vulnerable and growing population

Martin Fortin professor Martin.Fortin@USherbrooke.ca
Hassan Soubhi assistant professor
Catherine Hudon assistant professor, Department of Family Medicine, University of Sherbrooke, J1H 5N4, Quebec, Canada
Elizabeth A Bayliss assistant professor, Department of Family Medicine, University of Colorado Health Sciences Center, Denver, CO, 80237, USA
Marjan van den Akker assistant professor, Department of General Practice, Maastricht University, 6200 MD, Netherlands

Competing interests: None declared.
Provenance and peer review: Non-commissioned; externally peer reviewed.

BMJ 2007;334:1016-7
10.1136/bmj.39201.463819.2C

Patients with multiple conditions are the rule rather than the exception in primary care.[1] In a recent study of 21 family practices in the Saguenay region, Quebec, the prevalence of multimorbidity was 69% in 18-44 year olds, 93% in 45-64 year olds, and 98% in those aged over 65, and the number of chronic conditions varied from 2.8 in the youngest to 6.4 in the oldest.[1] Other countries report a similar burden.[2 3] The number of Americans with multimorbidity is estimated to rise from 60 million in 2000 to 81 million by 2020.[4]

Having multiple chronic medical conditions is associated with poor outcomes: patients have decreased quality of life,[5] psychological distress,[6] longer hospital stays, more postoperative complications, a higher cost of care, and higher mortality. Multimorbidity also affects processes of care and may result in complex self care needs[7]; challenging organisational problems (accessibility, coordination, consultation time); polypharmacy; increased use of emergency facilities; difficulty in applying guidelines; and fragmented, costly, and ineffective care.

Yet most research and clinical practice is still based on a single disease paradigm which may not be appropriate for patients with complex and overlapping health problems. Classic clinical trials tend to emphasise efficacy at the expense of effectiveness. In doing so, they exclude patients with multiple conditions, thereby compromising the external validity and the relevance of the trials for this population.[8]

Research on multimorbidity is in its infancy.[9] So far, most research has investigated the epidemiology of multimorbidity, its effect on physical functioning, and its measurement. Much less studied is the effect of multimorbidity on processes of care and what constitutes "best care" for these patients.

Areas for potential investigation of multimorbidity fall primarily into three categories—defining and categorising the population; developing the tools needed to explore multimorbidity and its consequences; and using these tools to investigate promising processes of care.

Who are the patients with several conditions? What is their risk profile? How do we distinguish multimorbidity from related concepts such as complexity, frailty, and polypharmacy? How do we classify multimorbidity and comorbidity in terms of conditions that need disparate versus congruent treatment strategies? For example, how does the patient with coronary disease, hypertension, and diabetes differ from the one with pulmonary disease, arthritis, and depression? In which situations is a subjective or an objective measure of multimorbidity more appropriate? Investigators have begun to look at several of these complex questions, but standards have not yet been developed.[10]

The results of prevalence studies reveal a complex picture of coexisting diseases. We now require a clear conceptual framework that includes consistent measures of multimorbidity and permits comparisons between studies. This will facilitate the next step—investigating improved processes of care. What are the best processes for making decisions in the context of multiple, often ill defined, problems and fragmentary evidence?[11] How should we assess the shifting priorities of patients and providers, design adaptive responses to unpredictable aspects of the illnesses, and organise multiple resources to achieve specific health goals?[11] What affects processes of care, and what constitutes best care? Which outcomes matter to these patients in which situations? How do we implement whatever best care turns out to be?

Answers to these questions will require continual experimentation, with substantial innovation and reform in healthcare delivery and organisation. Models of collaborative, patient centered, and goal oriented care are more likely to meet the complex needs of patients with multimorbidity. Involving patients in the research process and making good use of mixed methods research designs that incorporate both patient and provider perspectives may also help answer complex clinical questions.

The study of multimorbidity is particularly appropriate for the international research community for several reasons. Research is in its infancy, and appropriate collaboration may minimise redundancy and promote efficient and timely research. Different international communities have varied access to administrative data that can be used to paint broad pictures of caring for people with several conditions. The World Health Organization has given priority during the next decade to worldwide prevention and care of chronic illness.[12] International collaboration specifically among primary care researchers may result in patient centered and low tech care practices that can be translated into practice in varied settings and across different healthcare systems.

As a step towards facilitating this collaboration, we have started a virtual research community to discuss research questions specifically directed towards international communication on multimorbidity (www.med.usherbrooke.ca/cirmo/). The increasing number of primary care research networks in many countries also offers an ideal setting for collaboration to occur. The time has come not only to include people of all ages with multimorbidity in research efforts, but to focus on improving the care of this vulnerable and growing population.

1 Fortin M, Bravo G, Hudon C, Vanasse A, Lapointe L. Prevalence of multimorbidity among adults seen in family practice. *Ann Fam Med* 2005;3:223-8.
2 Wolff JL, Starfield B, Anderson G. Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Arch Intern Med* 2002;162:2269-76.
3 Van den Akker M, Buntinx F, Metsemakers JF, Roos S, Knottnerus JA. **Multimorbidity in general practice: prevalence, incidence, and** determinants of co-occurring chronic and recurrent diseases. *J Clin Epidemiol* 1998;51:367-75.
4 Mollica RL, Gillespie J. *Care coordination for people with chronic conditions.* www.partnershipforsolutions.org/DMS/files/Care_coordination.pdf .
5 Fortin M, Bravo G, Hudon C, Lapointe L, Almirall J, Dubois MF, et al. Relationship between multimorbidity and health-related quality of life of patients in primary care. *Qual Life Res* 2006;15:83-91.
6 Fortin M, Bravo G, Hudon C, Lapointe L, Dubois MF, Almirall J. Relationship between psychological distress and multimorbidity of patients in family practice. *Ann Fam Med* 2006;4:417-22.
7 Bayliss EA, Steiner JF, Fernald DH, Crane LA, Main DS. **Descriptions of** barriers to self-care by persons with comorbid chronic diseases. *Ann Fam Med* 2003;1:15-21.
8 Fortin M, Dionne J, Pinho G, Gignac J, Almirall J, Lapointe L. Randomized clinical trials: Do they have external validity for patients with multiple comorbidities? *Ann Fam Med* 2006;4:104-8.
9 Fortin M, Lapointe L, Hudon C, Vanasse A. Multimorbidity is common to family practice. Is it commonly researched? *Can Fam Physician* 2005;51:244-5.
10 Van Weel C, Schellevis FG. **Comorbidity and guidelines: conflicting** interests. *Lancet* 2006;367:550-1.
11 Soubhi H. *Invited commentary: multiple morbidities, multiple designs.* www.annfammed.org/cgi/eletters/4/2/104#3952.
12 World Health Organization. *Preventing chronic diseases: a vital investment.* WHO global report. www.who.int/chp/chronic_disease_report/contents/part1.pdf.

Thromboprophylaxis for adults in hospital

An intervention that would save many lives is still not being implemented

PRACTICE, p 1053

David A Fitzmaurice professor of primary care
d.a.fitzmaurice@bham.ac.uk
Ellen Murray research fellow
Department of Primary Care and General Practice, University of Birmingham, Birmingham B15 2TT

Competing interests: DF was a member of the expert working group on the prevention of venous thrombosis in hospitalised patients. DF and EM have received research income from Leo Laboratories.

Peer review and provenance: non-commissioned; externally peer reviewed.

BMJ 2007;334:1017-8
doi: 10.1136/bmj.39210.496505.BE

The evidence that pharmacological thromboprophylaxis can reduce the rate of venous thromboembolism by 60-65% is compelling.[1-3] Last month the United Kingdom's National Institute for Health and Clinical Excellence (NICE) published guidelines on venous thromboembolism in patients having surgical procedures,[4] which are summarised in this week's *BMJ*.[5] The risks to surgical patients, particularly those undergoing orthopaedic procedures, are well known, but most people who develop venous thromboembolism in hospital are medical patients.

The prevention of venous thromboembolism in adult patients in hospital was the main challenge to patient safety in 2001, according to a technical assessment by the Agency for Healthcare Research and Quality in the United States.[6] In 2005, the UK government's Health Select Committee reported that venous thromboembolism caused more than 25 000 potentially preventable deaths a year, and probably half of these deaths resulted from admission to hospital.[7]

Despite all this evidence, mortality due to venous thromboembolism after hospital admission is still at least 10 times greater than the more widely publicised mortality due to methicillin resistant *Staphylococcus aureus* (MRSA). Overall, the number of deaths from venous thromboembolism in the UK each year is five times greater than the combined total number of deaths from breast cancer, AIDS, and road traffic incidents. Indeed a revised estimate, based on an epidemiological model using extrapolation from European data, suggests that about 60 000 deaths from venous thromboembolism occur annually in the UK.[8] Autopsy data indicate that about 10% of deaths in hospital are due to pulmonary embolism.[9]

Summary of expert working group's recommendations on thromboprophylaxis for adults in hospital

Medical patients
Particularly those admitted for longer than four days, who have reduced mobility with either severe heart failure, respiratory failure, inflammatory illness, or cancer: heparin, preferably low molecular weight heparin

High risk surgical or orthopaedic patients
Mechanical prophylaxis and low molecular weight heparin or fondaparinux

Intermediate risk surgical patients
Mechanical prophylaxis and low molecular weight heparin or fondaparinux

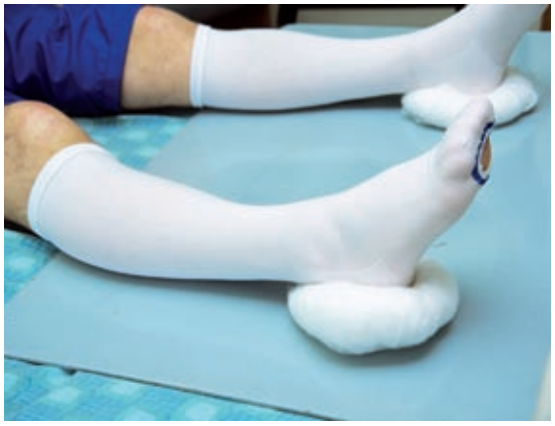
Low risk surgical patients
Mechanical prophylaxis and early mobilisation

Despite the considerable evidence base for thromboprophylaxis, it is poorly implemented in the UK. A combination of factors may be responsible—as a result of poor education, health professionals' lack awareness of this condition; venous thromboembolism is often a silent disease (80% of deep vein thromboses are subclinical); and venous thromboembolism often occurs after discharge from hospital. Prescribing costs may also be a barrier to the use of thromboprophylactic drugs, but this is not clear.

The Health Select Committee reported two years ago that thromboprophylaxis was not effectively implemented in the UK—as few as 20% of eligible patients were receiving appropriate prevention. The committee recommended that NICE should produce its planned guidelines on venous thromboembolism for surgical procedures more quickly. It also recommended that an independent expert working group be set up to investigate how current best practice and guidance on venous thromboembolism could be promoted and implemented and what resources might be needed to support delivery of any strategy through existing structures. This committee was to report to the chief medical officer in July 2006.

The expert working group's report and the chief medical officer's response were published last month.[10 11] The expert group recommended that, on admission to hospital, all adults should have a risk assessment for venous thromboembolism that is formally documented and incorporated into the hospital's system for the Clinical Negligence Scheme for Trusts.[12] The group also recommended that the Department of Health should set core standards aimed at ensuring 100% compliance with risk assessment for thromboprophylaxis. Moving on to prevention, the report stated that aspirin should not be used for thromboprophylaxis as it is less effective than other agents, such as low molecular weight heparin. The chief medical officer has brought the report to UK doctors' attention and has set up another committee to implement the recommendations of the report.

The consultation phase for the NICE guidelines was highly contentious because the draft guidelines emphasised mechanical prophylaxis—using compression stockings and, during surgery, inflatable boots—rather than drugs. Indeed, concerns about the way NICE reached its recommendations partly led to the Health Select Committee's decision some months ago to review NICE.[13]



ANTONIA REEVE/SPL

The published NICE guidelines review the same evidence as that in the expert working group's report and, while both agree that aspirin should not be used, NICE has retained the emphasis on mechanical rather than chemical means of thromboprophylaxis. Furthermore, NICE classes patients aged over 60 as being at high risk rather than those aged over 40.

The Health Select Committee's report two years ago provided an opportunity to change practice. Meanwhile, more than 25 000 people may have died needlessly each year because of the failure to implement simple thromboprophylaxis in UK hospitals.

1 Collins R, Scrimgeor A, Yusuk S, Peto R. Reduction in fatal pulmonary embolism and venous thrombosis by perioperative administration of subcutaneous heparin. Overview of results of randomised trials in general, orthopaedic and urologic surgery. *N Engl J Med* 1988;318:1162-73.
2 Mismetti P, Laporte S, Darmon JY, Buchmuller A, Decousus H. Meta-analysis of low molecular weight heparin in the prevention of venous thromboembolism in general surgery. *Br J Surg* 2001;88:913-30.
3 Cohen AT, Davidson BL, Gallus AS, Lassen MR, Prins MH, Tomkowski W; ARTEMIS Investigators. Efficacy and safety of fondaparinux for the prevention of venous thromboembolism in older acute medical patients: randomised placebo controlled trial. *BMJ* 2006;332:325-9.
4 National Institute for Health and Clinical Excellence. *Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients undergoing surgery*. April 2007. http://guidance.nice.org.uk/CG46.
5 Hill J, Treasure T. Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in inpatients having surgery: summary of NICE guidance. *BMJ* 2007 doi: 10.1136/bmj.39174.678032.AD.
6 Agency for Healthcare Research and Quality. *Making health care safer. A critical analysis of patient safety practices: summary.* Evidence Report/Technology Assessment Number 43.Rockville, MD: AHRQ, July 2001. www.ahrq.gov/clinic/ptsafety/summary.htm.
7 House of Commons Health Committee. *The prevention of venous thromboembolism in hospitalised patients. Second report of session 2004-5*. London: DoH, 2007. www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Dearcolleagueletters/DH_4116227.
8 Cohen AT, Kakkar AK. Venous thromboembolic disease in cancer patients in Europe—an opportunity for improved prevention: the VITAE thrombosis study. *Eur J Cancer* 2005;3(suppl 2):155.
9 Sandler DA, Martin JF. Autopsy proven pulmonary embolism in hospital patients: are we detecting enough deep vein thromboses? *J R Soc Med* 1989;89:203-5.
10 Department of Health. *Report of the independent expert working group on the prevention of venous thromboembolism in hospitalised patients*. London: DoH, 2007. www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_073944.
11 Department of Health. *Recommendations of the expert working group on the prevention of thromboembolism (VTE) in hospitalised patients*. London: DoH, 2007. www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Dearcolleagueletters/DH_073957.
12 Department of Health. *Making amends: a consultation paper setting out proposals for reforming the approach to clinical negligence in the NHS*. London: DoH, 2003. www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4010641.
13 United Kingdom Parliament. *Health committee press notice number 11*. February 2007. www.parliament.uk/parliamentary_committees/health_committee/hcpn070202.cfm.