

## Debate & Analysis

# 30th George Swift Lecture:

generalism in undergraduate medical education — what's next?

### INTRODUCTION

In his 1984 George Swift Lecture, *The World Turned Upside Down*, Julian Tudor Hart proposed that medical education should be community-based, led by academic departments of general practice, and delivered through extended networks of practices. In the intervening quarter of a century much of his vision has come to pass. Academic GPs are leaders of medical education in many of our undergraduate schools, and two schools now have GPs as deans. GP-led primary care research is also highly valued in a number of universities, and its outputs are changing practice. Meanwhile, the role of the GP seems to be changing, away from providing personal continuity of care and towards leading multidisciplinary teams in the triage of acute problems and organisation of care for chronic diseases. The future GP may have to act as a specialist in complex comorbidity and polypharmacy, providing a second opinion for non-medical GPs. So should we now be preparing future doctors for a role as community-based consultant medical generalists? If so, what are the implications for primary care based undergraduate and postgraduate teaching, and research?

### THE WORLD TURNED UPSIDE DOWN

In 1984 Julian Tudor-Hart proposed a vision of 'the world turned upside down', in which undergraduate medical education was largely based in the community.<sup>1</sup> He pointed out that the undergraduate curriculum in the 1980s was controlled largely by specialists, with less than 10% of teaching delivered outside hospitals. As a result it was not preparing students for general practice, the commonest career destination. He proposed that the curriculum should be community-based, led by academic departments of general practice, and delivered by extended networks of general practices.

In his 2006 George Swift Lecture John Spencer revisited Julian's vision of the world turned upside down and showed how much of that vision had come to pass. The particular experiences it offered to undergraduate medical students are listed below:

- hands-on experience of common conditions rarely seen in hospital;
- the early presentation of problems as yet undifferentiated and unclassified by

diagnostic category or even by body system;

- longitudinal aspects of illness and the importance of continuity of care;
- the management of uncertainty and tolerance of risk;
- the integration of psychological, social, public health, and environmental aspects in a holistic, patient-centred approach;
- the gatekeeper role, referral decisions, the interface with secondary care, and care after discharge; and
- the organisation of general practice; and an appreciation of general practice as a challenging but rewarding career.

By 2001 an average of 36% of local practices were linked to a particular medical school, with 9% of the curriculum being delivered in general practice.<sup>2</sup> In the new medical schools set up in the early years of the new millennium the degree of general practice involvement is extraordinary. For example, 50% of clinical placements at Hull York Medical School (HYMS) are in general practice and many of our student selected components are provided by our GP teachers. A particular feature of the HYMS curriculum is its emphasis on problem-based learning (PBL): all of our PBL tutors are clinicians and the majority are GPs.

### MEDICAL GENERALISM

The Medical Schools' Council response to the Royal College of General Practitioner's commission on medical generalism earlier this year<sup>3</sup> listed the experiences that GP based teaching offers our students pointed out by John Spencer, plus two areas of experience which are becoming increasingly important to practice today:

- patient journeys across an increasingly fragmented NHS; and
- the challenges of managing multimorbidity and polypharmacy.

The traditional all-encompassing role of the GP is challenged by increasing chronic illness and multimorbidity among our ageing practice populations. We help people to live longer nowadays but the longer they live the more problems they develop, and they often receive many different treatments, increasing the risk of drug side effects and interactions. The coordinating role of the GP is now even more important. Chronically ill patients consult multiple specialists whose inputs are poorly coordinated, contributing to poorer outcomes. The GP role is essential in coordinating and rationalising care, to keep down costs, and to avoid what Michael Balint called the 'collusion of anonymity' whereby no one individual takes responsibility for the overall care of the patient.<sup>4</sup> The World Health Organization (WHO) recognised the importance of this function in its 2008 report Primary Health Care. Now more than ever.<sup>5</sup>

### MULTIMORBIDITY

That WHO report was heavily influenced by the work of Barbara Starfield, whose seminal work comparing measures of health across a range of countries showed the value of well developed primary care systems in optimising the efficiency of provision and reducing health inequalities.<sup>6</sup>

Starfield also worked on measuring and classifying multimorbidity, developing with others the Johns Hopkins Adjusted Clinical Groups (ACG®) diagnostic classification system.<sup>7</sup> The ACG system is a person-focused method of categorising illness across disorders rather than by specific diagnoses or body systems. It includes around 100 categories that are based on 260 mutually exclusive 'expanded diagnostic clusters' and take into account measures of severity as well as age and sex. Starfield, Weiner, and colleagues have shown that the ACG categories have utility in predicting patient morbidity and the use of health services by individual patients.<sup>7</sup>

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Salisbury and colleagues have shown how the percentage of the population with more than one chronic condition increases with age.<sup>8</sup> The proportion with more than one chronic condition covered by the Quality and Outcomes Framework (QOF) increases with age to more than 40% of people aged over 75 years, and 20% of people over 75 have at least three of the QOF chronic conditions.<sup>8</sup>

The 17 chronic disorders included in the QOF represent only a proportion of the total number of chronic conditions patients may acquire as they age. Salisbury *et al* also looked at multimorbidity using the 260 expanded diagnostic clusters of the ACG system and found that by age 75 years males and females tended to have an average of more than six different diagnoses each. They found that 16% of patients had more than one chronic condition included in the QOF, but these people accounted for 32% of all consultations.<sup>8</sup> Using the wider ACG list of conditions, 58% of people had multimorbidity and accounted for 78% of all consultations.<sup>8</sup> People with multimorbidity had higher consultation rates but lower levels of continuity of care compared with people without multimorbidity, re-emphasising for me the need for the central coordinating role of the GP.

Valderas and colleagues have identified ways in which one condition can interfere with another in terms of diagnosis; for example coronary heart disease is more common in patients with diabetes, but the diagnosis is often made more difficult by altered pain sensation in diabetes giving rise to silent infarcts. Treatments for two conditions in the same person may be synergistic, such as physical exercise is for both COPD and diabetes, or antagonistic, such as steroids prescribed for COPD, which interfere with blood sugar control.<sup>9</sup>

### **THE COMMUNITY-BASED MEDICAL CONSULTANT**

The Department of Health's NHS Improvement Plan of 2004 envisaged three tiers of care for chronic conditions: self-care support for patients at low risk (70–80% of patients); disease management for patients at some risk, informed by evidence-based guidelines and incentivised financially

through the QOF and other pay for performance measures; and case management for the smaller number of patients with multiple, complex conditions.<sup>10</sup> As many of us are growing older, the proportion of patients in the third category is increasing rapidly. There are already too many patients with long-term conditions for the GP to act as sole provider of front-line care. I see the role of the GP as increasingly that of a community-based medical consultant, providing a second opinion to front-line non-medical practitioners and in the future possibly physician assistants and others.

### **IMPLICATIONS FOR MEDICAL EDUCATION**

In response to the issues I have been highlighting, Plochg and colleagues wrote in 2009 of the need for the education of doctors in non-clinical competencies as well as clinical ones, specifically in methods of enhancing self-management by patients, developing teamwork, and applying quality instruments and quality management systems.<sup>11</sup> They also identified the need for expert decision making, which is obviously required to underpin the kind of community consultant role described above. They suggested that expert decision making should be based on systems thinking, to accommodate the complexity of multimorbidity.<sup>11</sup>

The RCGP curriculum statements for vocational training in general practice address comorbidity under a 'comprehensive approach' to the care of the older patient, saying that: 'GPs need to be able to address multiple complaints and comorbidity in the older patients for whom they care. The challenge of addressing the multiple health issues in each individual is important, and it requires GPs to develop the skill of interpreting the issues and prioritising them in consultation with the patient'.<sup>12</sup> The 2011 RCGP guide to long-term conditions offers a more systematic approach to care.<sup>12</sup> Self-care and shared decision-making are emphasised as the necessary way forward, but the guide states that fewer than 50% of patients currently have self-care plans, although 95% of people say they'd like them.<sup>13</sup> Teamwork and collaborative care planning is greatly

emphasised, acknowledging that GPs can't provide all the care themselves, or indeed very much of it in practice. Again, there is relatively little mention of comorbidity or multimorbidity, although the guide does suggest integrating care for related conditions, for example, diabetes, hypertension, and coronary heart disease.<sup>13</sup>

With Peter Bower and colleagues in Manchester we sought GPs' and practice nurses' views of multimorbidity and the challenges it posed to general practice. Primary care doctors and nurses described the difficulties they faced in supporting self-care by patients. They emphasised the limited time they felt they could offer in their usual consultations, and how they just tended to deal with problems in priority order until the time ran out. They acknowledged that patients could be inconvenienced by multiple attendances for their various chronic disorders, that were sometimes dictated by practice arrangements for meeting the QOF requirements, although in some practices the care of related conditions such as diabetes, hypertension, and coronary heart disease was integrated into single follow-up appointments covering all three conditions. There was limited consideration of the possible interactions between disorders, or of polypharmacy, but there was recognition of the need to make sense of the relationships between physical and mental health problems.<sup>14</sup>

### **A SYSTEMS APPROACH**

Ahn and colleagues in 2006 contrasted two approaches to developing medical treatments: reductionism, on the one hand, versus systems science on the other.<sup>15</sup> A reductionist approach breaks things down into their component parts, ignoring relationships between components in time, space, or context, and studying them in isolation. A systems approach doesn't break down the components but addresses the interrelationships and dynamics between them. Relationships between components in time, space, and context are included in the analysis of disorders and development of treatments, which inevitably makes those processes considerably more complex.<sup>15</sup>

A specific example of a systems approach in action highlighted by Plochg and colleagues is the development of the Diabetes Personal Health Decisions risk engine, which is available online through the American Diabetes Association website.<sup>16</sup> Based on a software program called Archimedes, the risk engine is built using more than 100 variables including biological

factors, symptoms, tests, treatments, and outcomes. Data are entered as continuous variables rather than yes-no or high-low dichotomous data, and the software is written with differential equations.

The Archimedes risk engine has been used to simulate trials of treatments in thousands of patients and to identify which interventions would likely be most beneficial for different patients with diabetes over a 10-year period, by Firestone and Mold.<sup>17</sup> The possible interventions included in the simulation were losing weight, exercise, reducing HbA1c, reducing blood pressure, reducing LDL cholesterol, and the use of low dose aspirin, ACE inhibitors, and beta-blockers. The outcomes were the risks of myocardial infarction, stroke, end stage renal disease, blindness, foot ulceration, and amputation, estimated over a 10-year period. This approach threw up some counter-intuitive results: across different ages, sexes, ethnicities, and baseline levels, low-dose aspirin, and exercise were consistently the most influential interventions in diabetes in terms of reducing major outcomes such as myocardial infarction and stroke, although reduction in HbA1c was necessary to reduce the risk of foot ulcers and amputations.<sup>17</sup>

### TACKLING POLYPHARMACY

The counterintuitive result of the Archimedes simulation raises the question of whether our patients benefit from the multiple drug treatments we give them as they get older and acquire more chronic disorders. Many of our patients actually feel worse on treatment than without it, and an increasingly important question is to what extent we can take older people off their multiple medications.

Garfinkel and Mangin reported the success of an uncontrolled trial of withdrawal of drug treatments using the Good Palliative-Geriatric Practice algorithm.<sup>18</sup> They studied 70 patients in the community, with a mean age of nearly 83 years. Sixty-one per cent had three, and 26% had five or more disorders, and they were taking a mean of 7.7 medications each at baseline. The Good Palliative-Geriatric Practice protocol indicated that nearly 60% of the patients' drugs could be stopped without immediate harm. Only 2% had to be restarted over 19 months, and at follow-up the patients were taking an average of <4 medications each. The most striking outcome was that almost 90% of the patients felt better.<sup>18</sup>

### CONCLUSION

I suggest that all medical students need to learn about the limitations of the reductionist

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approach, and the complexity of the causes of conditions and interactions in multimorbidity. This is particularly important for those who do not go on to become GPs, because specialists need to know where their own increasingly narrow view of the world fits into the bigger picture. All students should also learn about the contributions of medical and non-medical colleagues in primary and secondary care, both their autonomous contributions, as specialists in a particular area, and the contribution they bring to multidisciplinary teams.

As far as the postgraduate curriculum is concerned, all GP trainees need to understand how to set up a practice to facilitate self-care and joint decision making with patients; the roles of other professionals in primary care; the complex aspects of managing multimorbidity; the complex interactions that can arise between disorders, and how to tackle polypharmacy through drug reduction, or better still how to avoid it in the first place, since it's much easier to put patients on drugs than it is to stop them once started. They will need to be able to understand and use risk engines which can handle multiple factors at once. They will also need to learn how quality can be measured and managed across multiple conditions, rather than within separate silos for the various disorders, as currently exemplified in the QOF.

Researchers in health care should continue to map out instances of multimorbidity, polypharmacy, and the interactions between disorders and their treatments. They will need increasingly to work with colleagues in computer sciences, as well as biological sciences and epidemiology, to develop more comprehensive models of multimorbidity and polypharmacy. We need more research to test the utility of computerised risk engines, to conduct randomised controlled trials of drug reduction initiatives, and to develop new measures of quality across conditions, taking multimorbidity into account and adjusting for person-based risk.

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