

expected to differentiate three groups: a completely normal study; an abnormal study requiring a standard echocardiogram; and critical disease (eg tamponade) requiring immediate management. Practical training is complemented by a training set of abnormal scans on the departmental archive.

All scans are checked by the supervisor who must attest that the candidate is competent and safe to operate independently within the devolved echocardiography department; this includes regular quality assurance exercises, case discussions and continuing education. There is then a written assessment which requires ten cases to be reported.

Limitations and strengths of point-of-care scans

A point-of-care scan allows immediate, potentially life-saving treatment. It may also detect clinically unexpected but important findings⁴ and aids triaging the urgency with which a full standard echocardiogram needs to be performed. Imaging without Doppler is an established part of advanced life support (FATE).⁵ However, much of the work validating the technique outside the peri-arrest scenario has been collected by cardiologists or sonographers experienced in transthoracic echocardiography.

We believe that the use of hand-held devices should be subject to many of the same standards as apply to the use of full transthoracic echocardiography. Practitioners must have expert supervision and back-up, and continuing education with quality control through the central echocardiography department. Continuing education needs to be accredited by a recognised body such as the British Society of Echocardiography. The point-of-care scan is not equivalent to an echocardiogram. It is effectively an ultrasonic stethoscope or an extension of the clinical examination. Accreditation is not necessary for the stethoscope, but treatment decisions are rarely executed after auscultation alone without a confirmatory test.

In the face of rising clinical activity, echocardiography departments are already hard pressed to deliver training to cardiac physiologists, clinical scientists and cardiology registrars. The addition of AIM physicians, and perhaps in time medical students, will require a systematic upgrading of training programmes. We believe that echocardiography departments need to be recognised as core hospital services rather than adjuncts of cardiology and must have central funding to match. There need to be designated staff sessions and also examination rooms and an appropriate cardiac ultrasound machine earmarked for training.

Conclusions

We believe that broad standards for the point-of-care scan in AIM should be agreed nationally; however, certification could be performed locally since there are too many candidates to make a national system viable and local supervision is essential. Properly managed, the point-of-care scan could represent as big an advance as the stethoscope, but without systematic training and supervision it could be potentially dangerous. ■

JOHN B CHAMBERS

*Professor of clinical cardiology and consultant cardiologist,
Department of Cardiology, Guy's and St Thomas' NHS
Foundation Trust, London, UK*

RONAK RAJANI

*Consultant cardiologist, Department of Cardiology,
Guy's and St Thomas' NHS Foundation Trust, London, UK*

NADIA SHORT

*Consultant in acute internal medicine, Department of Acute
Internal Medicine, Guy's and St Thomas'
NHS Foundation Trust, London, UK*

KELLY VICTOR

*Sonographer lead for ITU, Department of Cardiology,
Guy's and St Thomas' NHS Foundation Trust, London, UK*

KEVIN O'KANE

*Consultant in acute internal medicine, Department of Acute
Internal Medicine, Guy's and St Thomas'
NHS Foundation Trust, London, UK*

References

- 1 Hothi SS, Sprigings D, Chambers J. Point-of-care cardiac ultrasound in acute medicine – the quick scan. *Clin Med* 2014;14:1–4.
- 2 Victor K, Rajani R, Bruemmer-Smith S *et al*. A training programme in screening echocardiography. *Clin Teach* 2013;10:176–80.
- 3 Spencer K, Kimura B, Korcarz C *et al*. Focused cardiac ultrasound: recommendations from the American Society of Echocardiography. *J Am Soc Echo* 2013;26:567–81.
- 4 Fedson S, Neithardt G, Thomas P *et al*. Unsuspected clinically important findings detected with a small portable ultrasound device in patients admitted to a general medicine service. *J Am Soc Echo* 2003;16:901–5.
- 5 Sicari R, Galderisi M, Voigt J-U *et al*. The use of pocket-size imaging devices: a position statement of the European Association of Echocardiography. *Eur J Echocardiogr* 2011;12:85–7.

Educating clinician leaders: can the NHS benefit from the US MD/MBA experience?

The correlation between strong clinical leadership and improvement across various healthcare measures – patient experience, outcomes, organisational performance, staff engagement and overall care quality – has generated considerable interest.¹ By contrast, effective healthcare management remains under-celebrated, despite evidence suggesting that management responsibility is widely distributed in the NHS, with most clinicians receiving minimal management training.² As the UK's healthcare architecture assimilates increasing complexity, there is a growing implication that clinicians should formally acquire capability in subjects traditionally considered non-clinical, including financial and operational management, human resources and service transformation, to better understand healthcare as both system and industry, and best navigate, lead and improve services for patients.

Opportunities for UK medical students to build fundamental skills in these areas are limited. Efforts to introduce general leadership themes into core curricula have achieved mixed reception,³ and little robust evidence indicates that existing approaches have improved leadership development.¹ A restricted number of medical schools offer intercalated bachelor degrees in management principles, conferring comparable competency to undergraduate science. Students demonstrating early potential as clinician researchers, however, can further undertake integrated MB/PhD degrees at a selection of institutions, while ongoing clinical and management preparation remains separate. UK medical

schools are yet to embrace the best regarded management qualification, the MBA, as a joint degree programme.

The MD/MBA pathway is well established in the US. Medical students join traditional MBA cohorts, representing diverse employment backgrounds, to graduate with a broadened appreciation of healthcare amid other sectors. The majority appear to pursue clinical training, later assuming leadership and executive positions.⁴ In healthcare, the ability to communicate with clinical and non-clinical colleagues in their respective languages, while determining strategic, operational and financial objectives according to patient priorities, informed by clinical experience, seems particularly valued.

Of challenges raised by the MD/MBA, tuition costs rank foremost; top US two-year MBA programmes charged approximately \$115,000 (£78,800) on average in 2014/15. Averages in Europe were approximately \$77,800 (£53,300). In context, the Personal Social Services Research Unit estimated in its 2014 publication, *Unit costs of health and social care*, that the total investment required to train a UK medical graduate was £236,129. Though policies vary, US institutions often reduce costs by integrating the six years required to attain MD and MBA degrees in series into a five-year joint programme, with many providing financial assistance during the year in which students are enrolled as MBA candidates.

Another concern is the potential for deskilling, if early MBA exposure is not reinforced by sustained management responsibilities throughout clinical training. Innovative US residency programmes, combining continuing education,

clinical and management rotations, relevant project work and focused mentorship, offer guidance here.⁵ Similarly, UK postgraduate management training could borrow from the Walport Academic Clinical Pathway,⁶ releasing trainees from service to pursue appropriate activities and concurrently delivering benefit to the wider system.

The NHS requires clinician leaders who are equipped to lead. Competitive selection of MB/MBA students, alongside ongoing postgraduate leadership and management opportunities, could produce a calibre of healthcare executive not seen before in the UK (see Box 1 for recommendations to improve medical education, training and practice). ■

Acknowledgements

We are grateful to the Rouse Ball Research Fund (Trinity College, Cambridge) and Gates Cambridge Trust for supporting the presentation of this work at the 13th Annual International Conference on Health Economics, Management and Policy, hosted by the Athens Institute for Education and Research, Greece, in June 2014.

NICK CORK

Medical student

*University of Cambridge School of Clinical Medicine,
Cambridge, UK*

CHRISTOPHER A DEVINE

Medical student

Harvard Medical School, Boston, MA, USA

Box 1. Formally equipping clinicians to lead: ten recommendations to improve medical education, training and practice.

Undergraduate education

1. UK medical schools should consider offering integrated MB/MBA degree programmes, based on the US model.
2. MB/MBA student funding, competitively awarded, should be made available by the NHS, as an investment in its emerging leadership talent and to widen access (see recommendation 6).
3. Admissions processes should recruit students who are motivated by service improvement and addressing national health priorities, and can demonstrate effective working with, and leadership of, others.

Postgraduate training

4. Relevant UK stakeholders should broker consensus on a standardised clinical leadership and management postgraduate curriculum and training pathway, and determine entrance criteria based on leadership potential.
5. Clinical leadership and management training should combine coaching, networking, project work, and formal operational and strategic roles, as in the US.⁵
6. Graduates in receipt of NHS MB/MBA funding could be required to pursue the clinical leadership and management pathway or repay their grant.

Clinical practice

7. Existing pay differentials between clinical and leadership roles must be deconstructed to retain trainees, in full-time clinical, non-clinical or combined positions, on training completion.
8. Clinicians in non-clinical roles looking to return to clinical practice must be facilitated to retrain. Executives whose positions, through no infraction, have become politically untenable should receive support to assume alternative healthcare appointments.

Evaluation

9. A national graduate cohort should be established to assess the effectiveness of the MB/MBA, and clinical leadership and management pathway, and to monitor any loss of investment to private industry.
10. Measures could include the proportion entering and completing clinical training, preferred training pathway for MB/MBA graduates, and career outcomes (proportions attaining executive or leadership roles).⁴

References

- 1 West M, Armit K, Loewenthal L *et al*. Leadership and leadership development in healthcare: the evidence base. London: The King's Fund: 2015. Available online at www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/leadership-leadership-development-health-care-feb-2015.pdf [Accessed 14 March 2015].
- 2 Buchanan DA, Denyer D, Jaina J *et al*. How do they manage? A qualitative study of the realities of middle and front-line management work in health care. *Health Serv Deliv Res* 2013;1(4).
- 3 Abbas M, Quince TA, Wood D, Benson JA. Attitudes of medical students to medical leadership and management: a systematic review to inform curriculum development. *BMC Med Educ* 2011;11:93.
- 4 Patel MS, Arora V, Patel MS *et al*. The role of MD and MBA training in the professional development of a physician: a survey of 30 years of graduates from the Wharton Health Care Management Program. *Acad Med* 2014;89:1282–6.
- 5 Ackerly DC, Sangvai DG, Udayakumar K *et al*. Training the next generation of physician-executives: an innovative residency pathway in management and leadership. *Acad Med* 2011;86:575–9.
- 6 Walport M. *Medically and dentally qualified academic staff: recommendations for training the researchers and educators of the future*. Report of the Academic Careers Sub-committee of Modernising Medical Careers and the UK Clinical Research Collaboration. London: UK Clinical Research Collaboration, 2005.

Letter to the Royal College of Physicians regarding the suitability of the National Early Warning Score in the assessment of the unwell spinal cord injury patient

We recently undertook an audit on the utilisation of the National Early Warning Score (NEWS) in spinal cord injury (SCI) patients at the London Spinal Cord Injury Centre. At the same time we calculated and used the sensitivity and specificity to determine how suitable the NEWS was for this patient group, analysing the results separately for the tetraplegic and paraplegic groups.

The recommendations made in the Royal College of Physicians' report¹ stated: the NEWS should not be used in children (ie aged <16 years) or women who are pregnant

because the physiological response to acute illness can be modified in children and by pregnancy. Furthermore, the chronically disturbed physiology of some patients with chronic obstructive pulmonary disease (COPD) could influence the sensitivity of the NEWS, which should be recognised when interpreting NEWS in these patients.

We also know that the sympathetic nervous system is disrupted in SCI patients (tetraplegic and high paraplegic patients), which in turn can lead to an altered baseline physiology and response to illness. Unopposed activity of vagal tone (parasympathetic system) in tetraplegics and high paraplegics can lead to lower baseline blood pressures and bradycardia. In addition, the usual vasomotor response to changes in environmental temperature can be impaired leading to poikilothermia (commonly a temperature less than 36°C). The patient is usually well, and these values represent their baseline physiological values. We postulated that these responses, unique to this patient group, may lead to the production of false 'triggers' on the NEWS system (Fig 1).

Autonomic dysreflexia is a condition commonly seen in SCI patients, and represents sympathetic overactivity below the level of the spinal cord lesion in patients with a T6 injury level and above. The condition results in vasoconstriction and severe hypertension. It is partly defined as a rise in systolic blood pressure of ≥ 20 mmHg above the patient's baseline and is a medical emergency and potentially fatal condition if not treated early. It therefore requires high sensitivity from the NEWS as an early warning test system for prompt recognition and treatment. However, these patients may not trigger on the NEWS as the scoring system tolerates systolic blood pressures of 111–219 mmHg (Fig 2).

In total, 100 separate NEWS records were identified at the London Spinal Cord Injury Centre (49 involving tetraplegics and 51 involving paraplegics). The NEWS was correlated with a medical assessment of the patient. The sensitivity, ie the ability of NEWS to trigger urgent clinical reviews for all patients who were unwell (a score of ≥ 5 correctly identifying unwell patients), and the specificity, ie the ability of NEWS not to trigger urgent clinical reviews for well patients (a score

Fig 1. Baseline physiological parameters in a well SCI patient producing a 'false trigger' score of 5 on the NEWS system. Reproduced with permission.¹ NEWS = National Early Warning Score.

PHYSIOLOGICAL PARAMETERS	3	2	1	0	1	2	3
Respiration rate	≤ 8		9–11	12–20		21–24	≥ 25
Oxygen saturations	≤ 91	92–93	94–95	≥ 96			
Any supplemental oxygen		Yes		No			
Temperature	≤ 35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥ 39.1	
Systolic blood pressure	≤ 90	91–100	101–110	111–219			≥ 220
Heart rate	≤ 40		41–50	51–90	91–110	111–130	≥ 131
Level of consciousness				A			V, P, or U