



## State of the art: A roadmap for the national echocardiography team 2023

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### ABSTRACT

Over the past 30 years, echocardiography has carved a vital professional role within the care of millions of patients per year. Here, I examine the provision of this vital service through the lens of the people who provide it, focussing on the challenges and opportunities facing this unique workforce over the next 10 years.

### Situation report

Echocardiography is, and will likely remain, the cornerstone test of cardiac structure and function. Current data suggest that 1.7 million outpatient echo examinations are requested annually, and echocardiography remains the universal first-step test where multi-modality imaging is required.<sup>1</sup>

Since becoming widely available in static form 30 years ago, echo machines have become increasingly portable, which, in itself, has driven the application of echocardiography to the assessment of patients all over the hospital who are acutely unwell.<sup>2</sup>

The development of acute echocardiographic protocols, processes, guidelines and qualifications represents the most significant area of growth in the field of echo over the past decade. Technological developments have driven insights into disease states not previously fully appreciated, heralding deeper investigation and definition of acute cardiac conditions, such as septic cardiomyopathy.<sup>3</sup>

The importance of this development is plainly visible throughout the most recent Getting It Right First Time (GIRFT) cardiology document, published in February 2021, which makes specific reference to addressing variability in access to acute structural and functional cardiac assessment in patients who are acutely unwell.<sup>4</sup> The more recently published Shock to Survival report from the Intensive Care Society goes one step further, mandating the need for acute echocardiography in all patients with a low output state whether thought to be cardiac in origin or driven by other disease states. This is a landmark in the medical literature signifying cross-specialty appreciation of the commonality of cardiac involvement in acute and critical illness. This powerful appreciation will change curricular, training programmes, training and patient care.<sup>5</sup>

### The echocardiography workforce in 2023

The UK echocardiography workforce benefits from an unusually broad multidisciplinary representation among NHS professional groups. Accredited members of the British Society of Echocardiography (BSE) are drawn from over 20 professional, medical and scientific backgrounds, including members as diverse as those following a scientific career pathway to those practising medicine at the front door of the hospital.<sup>6</sup>

Professional broadening among membership of the BSE began significantly 10 years ago, demonstrating a gradual shift from predominantly physiologist and cardiologist members to a membership that now reflects the developing role of echocardiography. Over 35% of members are now derived from acute specialties, including intensive care, anaesthetics, acute medicine, and accident and emergency, and many of these new member groups have a medical professional background.<sup>6</sup>

The 2022 national workforce stocktake marshalled by the BSE demonstrates a workforce crisis with a 10% locum occupancy rate across the UK. Deeper analysis of the data showed that this issue is not one simply of supply but much more significantly of retention of senior staff, who contribute the bulk of service leadership, quality enhancement and, most importantly, training within a department.<sup>6</sup>

Echocardiography is an advanced practical skill that is physically and cognitively demanding. Data acquisition and interpretation need to be accurate to avoid misinterpretation, which has significant potential clinical consequences. This is poignantly reflected in the survey of members of the same year, which reported high levels of musculoskeletal injury, work-related stress issues and a workload that often prevents the completion of non-clinical tasks, such as administrative work, key to

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the running of a department, quality assurance, research, training and appraisal.<sup>7</sup>

## Training

Training a new echocardiographer is a high-skill, high input process. Learning to accurately visualise the heart and then report those visual findings effectively is a 2-year process at the Masters level. Echocardiography is both an art and a science requiring the acquisition of a complex 3D physical skill and underpinning anatomical and physiological knowledge to understand and interpret the images acquired.

In the UK, most echocardiographers seek accreditation with the BSE, which is the UK national provider for echocardiography examinations. Exam processes are available in six different specialty areas: adult transthoracic echo (2000), transoesophageal echo (2000), critical care echo (2013), stress echo (2017), acute care Level I echo (2018), and congenital echo (2021). The evolution of these different examination processes over the past 30 years is a clear reflector of national practice development in the same timeframe.<sup>8</sup>

New learners in echocardiography are derived from two main professional groups: those pursuing scientific or medical career pathways.

### Scientific training pathways

In the UK, scientific pathways are accessed through the National School of Healthcare Science (NSHCS; <https://nshcs.hee.nhs.uk/>). There are currently three common pathways in use as well as bespoke routes through individual departments:<sup>9</sup>

- > Practitioner Training Programme (PTP): post A-level learners can apply for a departmental apprenticeship or self-fund to become a cardiac physiologist. They learn echo and other cardiac practitioner skills usually over a 3-year period. On completion of the PTP, candidates can apply for scientific training programme (STP) equivalence (see below).
- > Scientific Training Programme (STP): this is a 3-year graduate-entry programme funded by Health Education England. On completion, candidates are eligible for Health and Care Professions Council (HCPC) registration as a Registered Healthcare Practitioner.<sup>10</sup>
- > Echocardiography Training Programme (ETP): this is a new training process funded directly by Health Education England run in conjunction with the NSHCS and, more recently, in partnership with the BSE. Candidates are completely supernumerary while undertaking their programme of echo training, allowing a fast-track to accreditation in echocardiography. This process is newly developed and is under cyclical review to assess whether a training period of 18 months is adequate.

### Medical training pathways

The most common medical specialties recognising and formalising the learning and performance of echocardiography as a core skill are cardiology, accident and emergency, acute medicine, perioperative medicine, intensive care (both general and cardiothoracic) and anaesthetics. In these clinical environments, echo is becoming an increasingly central portable effective diagnostic and monitoring tool, which is delivered usually by the transthoracic or, if need be, the transoesophageal route. Within these specialties, the concept of a 'clinician-echocardiographer' using echo as an essential part of their daily medical practice is being recognised.<sup>11</sup>

The acquisition of echo skills is an early and essential part of training a cardiology registrar, who is often the only echocardiographer on site out of hours, particularly in district general hospitals. The current cardiology curriculum recommends acquisition of at least a basic (Level I equivalent) level of skill before the end of the first year of specialist training.<sup>12</sup> Access to training for this group varies regionally and is

currently the primary focus for training improvement identified by the British Junior Cardiologists Association (BJCA) survey of 2021. Factors affecting training access and experience encompass many factors, from individual trainer and trainee engagement to competing service delivery pressures and departmental footprint.<sup>13</sup>

Non-cardiology medical echo training pathways are not yet a formalised part of any curriculum. However, given the vital role of echo in the assessment of patients who are acutely unwell and the changing rhetoric within the medical literature, this is unlikely to remain the case. Providing high-quality echo training to those specialties serving the patients who are most unwell is likely to become a national focus over the next 5 years.

Formal training programmes have been developed for non-cardiology trainees seeking a high level of echo competence and some now have a proven track record of over a decade.<sup>11</sup> This is powerfully reflected in the steadily increasing numbers of BSE Adult Critical Care Echo-accredited echocardiographers, which now stands at 31 since its launch 2012, and the 78 clinical echocardiographers who have achieved Level I accreditation since the launch of that exam in 2018.<sup>14</sup>

## Challenges facing the UK national echo team over the next 10 years

There are four major challenges facing the UK echo team in the coming decade, as discussed below.

### Lack of professional unity and recognition

There is a strong signal from the UK echo workforce that the external knowledge of echocardiographer skill level has not kept pace with the reality of their professional development. One potent example of this is that the image acquirer and reporter is rarely present at the multidisciplinary team (MDT) meeting where patient care is determined.<sup>15</sup>

A second key issue has been the lack of universal professional recognition of the workforce other than that provided by accreditation with the BSE. Some echocardiographers are members of a Royal College through their base training pathway: for example, cardiologists are members of the Royal College of Physicians. However, most practitioners training through a scientific pathway do not have Royal College membership or Chartered status. Registration with the HCPC remains voluntary and registration does not confer 'expert' status on echocardiographers because the HCPC is not included in the Academy of Royal Colleges group.<sup>16</sup> Addressing this issue is key to raising the professional profile of echocardiographers, providing a recognised professional status at the correct national level and making science graduate career advisors aware of echocardiography as a potentially rich career pathway.<sup>17</sup>

### Lack of recognition of trainers

Data from the 2022 BSE members survey tell us that 46% of respondents reported not having the time or capacity to teach within their job plan. The current NHS job plan for a Band 8a practitioner does not specifically list the skill of teaching as a criteria.<sup>18</sup> This omission fails to recognise the leading role of the trainer within both a department and a workforce and discourages senior staff from developing this aspect of their skillset because it is not attached to financial or professional career progression.

### Demand-driven service design impacting the workforce

Following the 2019 Coronavirus (COVID) pandemic, attention was drawn to the echocardiography waiting list, which stood at 165,000 outpatient tests in January 2023, with many patients in the UK waiting more than three times the accepted 6 weeks for a standard echocardiogram.<sup>1</sup>

Over the past 5 years, demand for echocardiography has been increased by several key factors in addition to the effect of COVID:

- > the unmeasured impact of inpatient requests on outpatient workflow;
- > the increasing complexity and detail of a comprehensive (minimum) dataset;
- > demand for advanced tests, for example stress echo and grown-up congenital heart disease assessment;
- > lack of uniform triage processes across the UK; and
- > open-access testing in community diagnostic centres not subject to internal triage.

#### *Neglect of inpatient service planning*

As discussed above, echocardiography is fast becoming an increasingly central part of inpatient care. It is the only quick non-invasive test that can diagnose the cause of a shock state in seconds in the right trained hands. There are currently no national governance principles surrounding the make-up and deployment of acute echo services, which will need to be formalised to prevent patient harm. Currently ad hoc demand for inpatient echocardiography is likely affecting outpatient workflows to an unmeasured degree.

#### **Solutions: a 10-year roadmap**

The single most powerful mindset change we need to make as a profession is to understand that our workforce and professional are in a continual state of training and apprenticeship. This, alongside service provision to the patients, is our one key function.

The educational literature provides three key underpinning principles, which we must use to strengthen the UK echo workforce and develop professional identity over the coming decade.

#### *The importance of a 'community of practice'*

A 'community of practice' is a powerful concept in learning. It describes a group of people 'who share a common concern or a passion for something they do and learn how to do better as they interact regularly'.<sup>19</sup> Communities of practice within the field of echocardiography are crucial because they facilitate learning from the moment a novice enters the echo room for the first time. Communities of practice powerfully signal the legitimacy of the individual participant, however inexperienced they are, whether that is within an actual practice environment or within a wider concept of a community, for example through the BSE.

Understanding this concept is vital for both national leaders and local trainers. Acknowledging and creating explicit communities of practice and recognising and encouraging legitimacy of participation are two powerful tools to address workforce issues and improve patient care.

#### *Aligning learning with intentional outcome*

Constructive alignment is a second powerful educational concept, which we can use to develop our profession and workforce. It describes a process of clearly signalling an intended output through process. Through this, we can bring out professional development elements even when focussed on mechanism. An example of this would be using training days for dual purpose; the overt aim to train and the hidden aim of creating links between trainees and trainers, who will come to rely on each other for learning or service provision interdependently. Importantly, constructive alignment is a process that can be used in both the educational and service provision aspects of our professional service to patients.<sup>20</sup>

#### *Recognising the importance of trainers*

The devaluation of trainers within medical clinical practice is a well-recognised phenomenon that extends into the arena of echocardiography. Current literature describes how powerful the recognition and

revaluing of clinical teachers is because it is senior trainers who establish and hold communities of practice together.<sup>21</sup> Using these three principles, we can develop mechanisms of professional development and workforce preservation that benefit both practitioner and patient and address the key issues facing the echocardiography workforce.

#### *Enhancing professional unity and recognition*

National leaders in echocardiography must be focussed on creating strong communities of practice. Many elements of this are in place through the work of the BSE, including seeking a Royal Charter for both the society and individual practitioners.<sup>22</sup>

Development of the existing regional representatives group will identify and reinforce regional practice communities and must emphasise the whole of the MDT to be fully effective: regional representatives roles should be filled by echocardiographers from a variety of clinical backgrounds.<sup>23</sup>

#### *Recognising and revaluing trainers*

One potential clear and effective mechanism to spotlight senior trainers is the creation of a trainer faculty group. This would create a new community of practice specifically for trainers, facilitating discussion about appropriate pay and recognition for this senior role with local and national bodies.<sup>24</sup>

An identifiable faculty allows faculty development to begin, emphasising the role and allowing entrants to it access to development opportunities. This reflects the successful Resilience Programme put in place by the BSE for managerial leads and would create an equivalence between these two roles, driving professional recognition and helping to preserve senior trainers within the echocardiography workforce.<sup>25,26</sup>

There are many examples nationally where reciprocity between professional groups who are training each other is strengthened by a welcoming community or practice. The BJCA training data make this very clear. There are many examples of excellent practice up and down the UK using individual ideas and approaches to create a mutually beneficial learning and service relationship between echocardiographers of different professional backgrounds. We need to access and advertise these practice examples nationally, because what they all do is welcome novice echocardiographers overtly and make them into legitimate participants.<sup>13</sup>

#### *Addressing service demand through a strengthened community of practice*

Communities of practice also enhance clinical practice and can be used to share the burden of decision making, which is particularly high in general practice.<sup>27</sup> Effective triage of all incoming departmental requests has been shown to reduce waiting lists from 12–13 weeks down to 6 weeks over 6 months.<sup>28</sup> Senior triage roles should be developed that build on the established success of triaging by adding a layer of communication between senior triagers (Responsible Clinicians) and requestors, creating a stronger community of practice.<sup>29</sup> Broadening the members of a practice community to include administration staff and support workers as designated by each individual department is another powerful way of enhancing patient care.

Ultimately, the patient should also be considered an effective part of the community of practice and patient engagement should be used to reduce did not attend (DNA) rates, which are as high as 18% in some areas.<sup>30</sup>

#### *Constructively aligning inpatient service planning*

Establishing governance principles for inpatient echo services is a vital next step in preserving outpatient workflow, reducing repeated interruptions to accommodate individual care provision on the wards or

at the front door. The principle of constructive alignment informs us about how to do this well.

Inpatient echo services should be designed around governance principles *a priori*, and not created ad hoc driven by the availability of practitioners. National standard setting and leadership are vital at the planning stage and should be led by appropriately qualified experts with the national membership body.

Leadership of the inpatient echo team should itself be expert and can come from any branch of the echo MDT. Team leaders should run inpatient echo services in accordance with national governance standards and be able to demonstrate the equivalent service quality of a footprinted department, creating an echo service ‘without walls’.

Membership of the inpatient echo team should be appointed by the lead and can be rotated according to local need. Communities of practice can grow to include neighbouring hospitals and regional centres.

### The bottom line

The single most powerful effector on our profession will be our own identification of ourselves as ‘Echocardiographers’, regardless of our professional arena.

Annual data gathering, as now established by the BSE, should be the single point of reference for professional development in echocardiography. All external bodies seeking to work with us as a profession must respect the validity and importance of those data and align their proposals with them.

The direction of the profession of echocardiography must be driven internally by the members of that profession: external drive risks focussing solely on overt measurable criteria, such as waiting lists, and ignores the potential power of a fully engaged, fully recognised workforce.

The importance of revaluing trainers cannot be overstated. We have an opportunity to reframe our profession by changing the rhetoric from service to training. The strongest possible national community of practice will be led and driven by a faculty of senior echo trainers, and this must be our ultimate aim.

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