

Evidence Brief: Echocardiographers

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Produced by the HEE Knowledge Management team Evidence Briefs offer a quick overview of the published reports, research, and evidence on a workforce-related topic.

Date of publication: October 2022

Please acknowledge this work in any resulting paper or presentation as:

Evidence Brief: Echocardiographers. Katie Nicholas. (October 2022). UK: Health Education England Knowledge Management Team

Evidence Brief: Echocardiographers

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- [Complete Evidence Brief list – link for HEE staff](#)
- [Complete Evidence Brief list – link for External staff](#)

Key publications – the big picture

A survey of the echocardiography workforce in the UK

Author(s): Punshon and Leary

Source: British Society of Echocardiography

Publication date: February 2022

In September 2021 the BSE commissioned an independent survey of echo leads across the UK. The survey was designed to ascertain a true picture of the echo workforce relating to capacity and demand and to better understand issues around training and recruitment and retention. The survey was prioritised in recognition of the perfect storm facing echocardiography: historical shortages in the workforce exacerbated by COVID, against a backdrop of increasing demand and a backlog driven by the pandemic. In its report, The Untold Heartbreak¹, the British Heart Foundation reported that 37% of patients were waiting more than 6 weeks for echo across the UK as opposed to 4% in February 2020. More recent data for England suggests the current backlog stands at 155,000 with 66,000 waiting more than 6 weeks. This puts immense pressure on the workforce. However, this level of scrutiny also offers an opportunity. The scale of the problem has now been recognised and there is a willingness to act. We have already seen the introduction of the Echo Training Programme from the National School of Healthcare Science (NSHCS), an initiative to help fast track trainees into echo. This is welcome, but simply adding more trainees cannot be the only answer, we must ensure we retain people, that pathways for progression are in place and the issues creating burnout in the current workforce are addressed.

The Untold Heartbreak

Source: British Heart Foundation

Publication date: 2021

Covid-19 has had a devastating impact on cardiovascular care. Discover the full extent of this disruption and what needs to be done to build a stronger and more resilient cardiovascular health system that gives all heart patients the support they need.

Cardiology: GIRFT Programme National Specialist Report Free NHS Futures account required to view the report

Author(s): Clarke and Ray

Source: NHS England Getting It Right First Time (GIRFT)

Publication date: February 2021

See p. 21 Workforce, rostering, rotas and job planning
Workforce issues are a common theme across the NHS.* In cardiology, deep dives have uncovered high vacancy rates in a number of roles, notably in cardiac physiology, as well as variation in how the workforce is utilised and the extent to which extended roles have been adopted. In some cases, a perverse incentive in the form of competitive band inflation is acting as another barrier to staff retention. Increasing capacity where necessary, and training and upskilling are key to meeting growing demand and delivering care in the most efficient and cost-effective way. ACP roles offer the opportunity for healthcare professionals from a variety of backgrounds to acquire the skills and experience required to practice at an advanced level across traditional professional boundaries.¹² We strongly encourage the development of ACP roles within cardiology services for nursing, pharmacy and other advanced roles. We support the concept of a mobile workforce through the implementation of 'staff passports'. The ability to work across hospital sites facilitates delivery of network functions and also provides support in case of staff shortages. Examples are included throughout the report but include delivery of on-call rotas, weekend ward rounds, outpatient services and emergency temporary pacing.

Diagnostics: Recovery and renewal – Report of the independent Review of Diagnostics Services for NHS England

Source: NHS England

Publication date: October 2020

See p. 39 “The Cardiorespiratory diagnostics workforce”

5.19 The cardiorespiratory diagnostics workforce has until now largely been part of cardiology and respiratory services within acute hospitals. In addition, some relatively simple diagnostic tests are undertaken in primary care. The numbers of people working in these areas is difficult to define as there is no national data collection. However, as with other diagnostic disciplines, it is clear that workforce capacity has not kept up with demand. This is particularly the case for echocardiography.

5.20 The establishment of community diagnostic hubs provides new opportunities to deliver high quality, efficient and patient-centred services for a range of patients with possible or known cardiac and respiratory conditions.

5.21 In addition to an increase in echocardiographers, new roles should be piloted, with expertise in a range of tests such as ECG, rhythm monitoring, spirometry and some other lung function tests. This will support the development of skills and different ways of working and encourage diversity in the diagnostic workforce.

5.22 Recommendation 15: The number of echocardiographers and clinical scientists supporting cardiac arrhythmia diagnosis, pulmonary function testing, sleep studies and blood gas analysis should be expanded. Diagnostic professionals who can ‘multitask’ are required to deliver spirometry, issue sleep studies, ambulatory ECG and blood pressure monitoring, phlebotomy and point of care testing.

Securing the future workforce supply: sonography workforce review

Source: Centre for Workforce Intelligence

Publication date: March 2017

The Centre for Workforce Intelligence (CfWI) was commissioned by the Department of Health (DH) and Health Education England (HEE) to contribute qualitative and quantitative research, data analysis, and modelling to support HEE and NHS England in providing sufficient ultrasound practitioners to deliver diagnostic services across England. The research will inform short and long term workforce plans up to 2035.

See section 2.7.2 Echocardiographers

The majority of cardiac ultrasound examinations (echocardiography) are done by clinical physiologists, specifically cardiac physiologists. Some cardiac ultrasound examinations are done by specialist doctors and GPs. Those not medically qualified use the term echocardiographer or cardiac sonographer. Most echocardiographers work in cardiac departments i.e. not in radiology, imaging or obstetrics. Some work in silos in GP practices and some offer purely locum or freelance services. The British Society of Echocardiography (BSE) has indicated that the current workforce shortage in cardiac physiology services means there are insufficient numbers of echocardiographers to deliver a seven day a week diagnostic echocardiography service. This is documented in the joint Society for Cardiological Science and Technology (SCST) and British Cardiovascular Society (BCS) report Strategic Review of Cardiac Physiology Services (BSE, 2015) and in the CfWI healthcare scientists training capacity survey report (CfWI, 2015). It is further exacerbated by the currently low intake of Scientist Training Programme (STP) trainees (CfWI, 2015), which the BSE fears will result in further echocardiographer shortages and the inability to meet expected future demand. The BSE maintains that this will result in inadequately qualified staff being expected to deliver echocardiography, which will have a direct negative impact on patient care and put a greater burden on senior staff and cardiologists. The HEE are considering a review of the cardiology workforce in 2017. This

would be the most opportune time to consider the issues facing echocardiography in terms of cardiac ultrasound provision.

Cardiac physiology workforce options analysis

Source: British Heart Rhythm Society

Publication date: May 2016

There is a major shortfall in the cardiac physiology workforce which threatens the ability to meet increasing demand and to delivery of 7 day working. • Options are outlined in the document as to how this shortage might be overcome, with economic costings that take into account training and the health costs of a shortage of physiology staff. • While no single option is likely to meet the shortage in a timely manner, recommendations are made that include improved workforce planning, foreign recruitment, increased admissions to the Practitioner Training programme and a need to support departments in delivering postgraduate training.

Strategic Review of Cardiac Physiology Services in England: Final report

Source: British Cardiovascular Society; SCST

Publication date: 2015

The overall purpose of the Review is to inform NHS England and other parts of the new health system architecture (for example Health Education England) of how cardiac physiology services and their associated scientific workforce need to respond to the challenges of: • increased demand and prevalence of some conditions coupled with an ageing population • increase in demand for long term follow up of patients with corrected congenital heart defects • scientific and technological advances (for example supporting early intervention, improved implantable devices and telemedicine and remote monitoring) • delivering services 7 days a week and supporting both emergency and elective care • reducing inequalities in provision and access through new models of care

and new commissioning models informed by clinical standards and guidelines • defining, measuring and assuring quality • new training programmes, roles and training infrastructure • the NHS England Outcomes Framework and the delivery of the associated indicators¹⁴ • delivering the Outcomes Strategy for Cardiovascular Disease^{6, 7}. The Review has considered a number of areas including: • identifying technological advances and their impact on future care • investigating innovative models of service delivery • reviewing the quality assurance and the assessment of quality in cardiac physiology services to identify a robust quality framework. • identifying what workforce, and education and training support is needed for cardiac physiology services to meet their potential

In the news/ blog posts

Echocardiography in 2021: the opportunity post Covid (published as part of a paid advertising agreement)

Source: British Society of Echocardiography

COVID-19 placed echocardiography departments under mounting new pressures while shining a floodlight on existing challenges.

Demand for services was already growing to the point of outstripping workforce capacities before 2020, a trend that has been accelerated by the emergence of SARS-CoV-2. And while healthcare teams have been forced to divert their attention to coronavirus, the pandemic of cardiovascular disease (CVD) - the number one cause of morbidity and mortality worldwide - has been festering.

The evolution of clinical science in cardiology: scientist-led services

Author(s): Oxley

Source: British Society of Echocardiography

Cardiac physiology as a profession was relatively unheard of when I started my career in 2001, despite our vital diagnostic services being an integral part of patient pathways. Our work, at this time, was often overseen by cardiologists with reports being countersigned by them or other medical teams. The introduction of technician led exercise testing was really the starting point for the development of more autonomous practice across cardiac physiology. The developments that we have seen have been driven by service need, well supported by our medical colleagues and underpinned by improved access to education, training and accreditation in line with recommendations made in the BCS/ SCST strategic review of cardiac physiology services published in 2015. Modernising scientific careers has raised the profile of our profession by identifying cardiac physiology, and indeed other physiological sciences, as part of the wider healthcare science service giving us a bigger voice and more representation.

HEE Star

More resources and tools are available in the [HEE Star](#)

Statistics

You can find relevant statistics on the [Health and Care Statistics Landscape](#) under under “**Health and Care**”

HEE National Data Programme

HEE staff can look at the [National Data Warehouse \(NDL\)](#) SharePoint site to find out more about datasets and Tableau products.

Published Peer Reviewed Research

Supply

[Maintaining the Cardiac Sonographer Pipeline: A Regional Approach to Trainee Cardiac Sonographer Recruitment and Training that Rationalises Use of Resource and Mitigates Impact on Echo Department Productivity](#)

Item Type: Conference Proceeding

Authors: Walsh, H., Jones, L., Mok, J., Reffell, S., Julian, W., Bhana, N. and McKenzie, H.

Publication Date: 2022

Publication Details: Heart Lung and Circulation. Conference: Cardiac Society of Australia and New Zealand Supplementary Meeting (New Zealand). Virtual, Online. 31(Supplement 2) (pp S24); Elsevier Ltd,

Abstract: Background: It is historically difficult to recruit trained Cardiac Sonographers within NZ and internationally. Northern Region district health boards (DHBs) have significant and on-going workforce shortages. Auckland metro district health boards (DHBs) have consistently used vacant qualified FTE to employ trainees and support them to obtain Cardiac Sonographer qualifications. The first few months of training require intensive one-on-one supervision. This reduces throughput as the supervisor is removed from the workforce. We sought to investigate how a combined approach to training,

in the initial 6 weeks, would impact on trainees, trainers, and departments in terms of throughput. Method(s): Auckland Metro DHBs worked together, with NRA support, to plan and prepare a 6-week introduction program for trainees. Each DHB took responsibility for preparing and providing teaching materials for a 2-week block and planned to undertake the hands-on training for that period. They recruited and started 1 trainee each, concurrently. Result(s): COVID lockdown prevented trainees leaving their home DHB. They attended presentations by Zoom and provided constructive and generally positive feedback. The time commitment for each DHB and impact on throughput was reduced. Relationships between the DHBs and the trainees was enhanced. Conclusion(s): It is workable and advantageous for regional DHBs to work collaboratively when recruiting and training Cardiac Sonographers. This leads to economical use of time and resource, develops collegial relationships, and support networks for the trainees. With new technology, the reach of the teaching sessions could be expanded to include participants outside of the region. Copyright © 2022

Echocardiography service provision in New Zealand: the implications of capacity modelling for the cardiac sonographer workforce

Author(s): Buckley et al.

Source: NZMA Journal 129(1428)

Publication date: January 2016

AIM: Regional disparity in both utilisation and the cardiac sonographer workforce has previously been identified. We sought to model the capacity of the cardiac sonographer workforce at a national and District Health Board level to better understand these regional differences. METHOD: In 2013, surveys were distributed to 18 hospitals who employ cardiac sonographers (return rate 100%). Questions related to cardiac sonographer demographics, echo utilisation and workflow. Actual clinical capacity was calculated from scan duration and

annual scan volumes. New Zealand national actual capacity was compared to predicted capacity from three international models. Potential clinical capacity was calculated from the workforce size in fulltime equivalent (FTE) and clinical availability. RESULTS: In New Zealand, scan duration and population-based clinical capacity varies between centres. The New Zealand capacity is similar to the UK 30:70 model, and consistently less than the US model for all scan types. There are marked regional differences in potential versus actual capacity, with 10/16 DHBs demonstrating excess potential capacity. CONCLUSION: There is regional disparity in the capacity of the cardiac sonographer workforce, which appears to be strongly related to scan duration. Workforce capacity modelling should be used with need and demand modelling to plan adequate levels of service provision.

Upskilling

Echo workforce development in the Fiji islands

Author(s): Anna Harris

Source: Australasian Journal of Ultrasound in Medicine 23(1) pp. 30-32

Publication date: February 2020

Echocardiography has a wide scope of practice and requires many years of training and experience for one to be proficient; however, contextualised echo may be taught for the purpose of screening for rheumatic heart disease (RHD). In recent experience in the Fiji Islands, an echo workforce training programme was implemented with the intention of teaching general sonographers and physicians echo for the purpose of screening RHD with very positive results. This course was completed over three separate one week courses in a clinical setting.

Training and Education

Learning echocardiography in the workplace: a cognitive load perspective

Author(s): Blissett et al.

Source: Academic Medicine

Publication date: March 2021

Purpose: Although workplace learning environments provide authentic tasks to promote learning, elements of clinical settings may distract trainees and impede learning. The characteristics of workplace learning environments that require optimization are ill-defined. Applying principles of cognitive load theory (CLT) to optimize learning environments by managing intrinsic load (complexity of the task matched to learner knowledge and skill), minimizing extraneous load (any aspect that is not part of task completion), and increasing germane load (processing for storage in long-term memory) could be advantageous. The authors explored trainee perceptions of characteristics that helped or impaired learning from a cognitive load perspective. Echocardiography interpretation was used as a model. Method: The authors conducted semistructured interviews between December 2018 and March 2019 with a purposeful sample of 10 cardiology trainees at the University of California, San Francisco, School of Medicine until thematic sufficiency was achieved. Participants represented a range of training levels (3 fourth-year trainees, 2 fifth-year trainees, 3 sixth-year trainees, and 2 advanced echocardiography fellows) and career aspirations (4 desired careers in imaging). Two independent coders analyzed interview transcripts using template analysis. Codes were mapped to CLT subcomponents. Results: Trainees selected their own echocardiograms to interpret; if trainees' skill levels and the complexity of the selected echocardiograms were mismatched, excess intrinsic load could result. Needing to look up information essential for task completion, interruptions, reporting software, and time pressures were characteristics that

contributed to extraneous load. Characteristics that related to increasing germane load included the shared physical space (facilitating reading echocardiograms with attendings and just-in-time guidance from near peers) and the availability of final reports to obtain feedback independent of teachers.

Conclusions: As interpreted from a cognitive load perspective, findings highlight characteristics of workplace learning environments that could be optimized to improve learning. The findings have direct application to redesigning these learning environments.

3-D Echocardiography Is Feasible and More Reproducible than 2-D Echocardiography for In-Training Echocardiographers in Follow-up of Patients with Heart Failure with Reduced Ejection Fraction.

Item Type: Journal Article

Authors: Baldea, Sorina Mihaila;Velcea, Andreea Elena;Rimbaz, Roxana Cristina;Andronic, Anca;Matei, Lavinia;Calin, Simona Ionela;Muraru, Denisa;Badano, Luigi Paolo and Vinereanu, Dragos

Publication Date: 2021

Journal: Ultrasound in Medicine & Biology 47(3), pp. 499-510

Abstract: Left ventricular volumes (LVVs) and ejection fraction (LVEF) are key elements in the evaluation and follow-up of patients with heart failure with reduced ejection fraction (HFrEF). Therefore, a feasible and reproducible imaging method to be used by both experienced and in-training echocardiographers is mandatory. Our aim was to establish if, in a large echo lab, echocardiographers in-training provide feasible and more reproducible results for the evaluation of patients with HFrEF when using 3-dimensional echocardiography (3-DE) versus 2-dimensional echocardiography (2-DE). Sixty patients with HFrEF (46 males, age: 58 +/- 17 y) underwent standard transthoracic 2-D acquisitions and 3-D multibeat full volumes of the left ventricle.

One expert user in echocardiography (expert) and three echocardiographers with different levels of training in 2-DE (beginner, medium and advanced) measured the 2-D LVVs and LVEFs on the same consecutive images of patients with HFrEF. Afterward, the expert performed a 1-mo training in 3-DE analysis of the users, and both the expert and trainees measured the 3-D LVVs and LVEF of the same patients. Measurements provided by the expert and all trainees in echo were compared. Six patients were excluded from the study because of poor image quality. The mean end-diastolic LVV of the remaining 54 patients was 214 +/- 75 mL with 2-DE and 233 +/- 77 mL with 3-DE. Mean LVEF was 35 +/- 10% with 2-DE and 33 +/- 10% with 3-DE. Our analysis revealed that, compared with the expert user, the trainees had acceptable reproducibility for the 2-DE measurements, according to their level of expertise in 2-DE (intra-class coefficients [ICCs] ranging from 0.75 to 0.94). However, after the short training in 3-DE, they provided feasible and more reproducible measurements of the 3-D LVVs and LVEF (ICCs ranging from 0.89-0.97) than they had with 2-DE. 3-DE is a feasible, rapidly learned and more reproducible method for the assessment of LVVs and LVEF than 2-DE, regardless of the basic level of expertise in 2-DE of the trainees in echocardiography. In echo labs with a wide range of staff experience, 3-DE might be a more accurate method for the follow-up of patients with HFrEF. Copyright © 2020 The Authors. Published by Elsevier Inc. All rights reserved.

'Shocking' Communication Skills - Communication Skills Training for Cardiac Physiologists Deactivating Icds\$

Item Type: Conference Proceeding

Authors: Curtis, M., Evans, S. and Clayton, B.

Publication Date: 2017

Publication Details: BMJ Supportive and Palliative Care.

Conference: APM ASP Conference. Belfast United Kingdom.

7(Supplement 1) (pp A43); BMJ Publishing Group, Abstract: Background Studies have highlighted a strikingly low rate of preparatory conversations regarding the deactivation of patients' implantable cardiac defibrillators (ICDs) at the end of life. Rates of implantation of ICDs have increased, indicating that managing ICDs at the end of life will become a more common occurrence. Cardiac Physiologists carry out the deactivation of ICDs, yet locally in Devon, Cardiac Physiologists have highlighted that they have no training of how to communicate with patients when deactivating their ICDs. Aims To improve end of life communication skills for Cardiac Physiologists. Methods A joint educational programme was developed to improve end of life communication skills for Cardiac Physiologists and increase the ICD-related knowledge base of Palliative Care teams. Interactive role-play sessions were developed based on examples of challenging or common communication scenarios provided by the Cardiac Physiologists prior to the session. Feedback was collected immediately after the session and then 4 months later to assess the impact on their actual practice. Results Immediate feedback stated the training had been very useful. Further results regarding how well the Physiologists have put the learning into practice will be available in the near future. The majority of Palliative Care attendees admitted to little understanding of cardiac devices before the study day compared to a good understanding afterwards. Conclusions Cardiac Physiologists are a group of the non-cancer workforce who are potentially neglected with regards to end of life communication skills training. We would encourage other services around the country to provide this training to improve the end of life care for patients with ICDs. Interactive role play appears to have been a successful method to provide this training. The joint educational programme between Cardiology and Palliative Care facilitated learning from shared differing experiences and helped develop relationships between the teams.

Evaluation of Computer-Based Training for Health Workers in Echocardiography for RHD.

Item Type: Journal Article

Authors: Engelman, Daniel;Okello, Emmy;Beaton, Andrea;Selnow, Gary;Remenyi, Bo;Watson, Caroline;Longenecker, Chris T.;Sable, Craig and Steer, Andrew C.

Publication Date: 2017

Journal: Global Heart 12(1), pp. 17-23.e8

Abstract: BACKGROUND: The implementation of screening for rheumatic heart disease at a population-scale would require a considerable increase in human resources. Training nonexpert staff in echocardiography requires appropriate methods and materials. OBJECTIVES: This pre/post study aims to measure the change in the knowledge and confidence of a group of health workers after a computer-assisted training intervention in basic echocardiography for rheumatic heart disease.

METHODS: A syllabus of self-guided, computer-based modules to train nonexpert health workers in basic echocardiography for rheumatic heart disease was developed. Thirty-eight health workers from Uganda participated in the training. Using a pre/post design, identical test instruments were administered before and after the training intervention, assessing the knowledge (using multiple-choice questions) and confidence (using Likert scale questions) in clinical science and echocardiography. RESULTS: The mean total score on knowledge tests rose from 44.8% to 85.4% (mean difference: 40.6%, 95% confidence interval [CI]: 35.4% to 45.8%), with strong evidence for an increase in scores across all knowledge theme areas (p Copyright © 2016 World Heart Federation (Geneva). Published by Elsevier B.V. All rights reserved.

The pediatric echocardiography Boot Camp: Four-year experience and impact on clinical performance. Abstract only*

Item Type: Journal Article

Authors: Maskatia, Shiraz A.;Cabrera, Antonio G.;Morris, Shaine A. and Altman, Carolyn A.

Publication Date: Oct ,2017

Journal: Echocardiography 34(10), pp. 1486-1494

Abstract: BACKGROUND: We previously reported on the short-term impact of an echocardiography "Boot Camp" on a single class of cardiology fellows (CF). The impact of the Boot Camp on performance throughout fellowship is unknown. METHODS: We enrolled four classes of CFs and two classes of cardiac ICU fellows (CVs) prospectively into the Boot Camp and compared CFs to a historical cohort. Experience with echocardiography was surveyed. Outcome measures included written pre- and post-Camp exams, a performance based test (PBT), self-efficacy assessments, numbers of echocardiograms performed, and echocardiogram quality during the last 3 months of fellowship. RESULTS: A total of 25 CFs and 7 CVs participated in the Boot Camp from July 2012-July 2015. Median experience score was 13/40 (4-23). Median self-efficacy improved from 22/147 (range 21-45) to 90/147 (range 49-133) ($P=st$ (37.7+/-12.2 vs 28.2+/-12.1, $P=.15$), 2nd (71.3+/-24.4 vs 47.6+/-16.0, $P=.044$), and third year of fellowship (130.4+/-44.0 vs 100.0+/-29.3, $P=.230$), and on average achieved 150 total echocardiograms in the 4.8th quarter compared to the 7.8th quarter in controls, $P=.053$. 2D quality scores were higher and shortening fraction more often obtained in echocardiograms performed by Boot Camp CFs compared to controls. CONCLUSIONS: The pediatric echocardiography Boot Camp improved self-efficacy, acquisition, and retention of echocardiography skills and knowledge, and increased echocardiogram performance. Observed differences between Boot Camp and control CFs appear to wane across fellowship. Copyright © 2017, Wiley Periodicals, Inc.

Covid-19

Exploring the impact of the Covid-19 pandemic on provision of cardiology services: a scoping review

Author(s): Yasmin et al.

Source: IMR Press 22(2)

Publication date: 2021

The coronavirus disease-19 (COVID-19) pandemic has forced hospitals to prioritize COVID-19 patients, restrict resources, and cancel all non-urgent elective cardiac procedures. Clinical visits have only been facilitated for emergency purposes. Fewer patients have been admitted to the hospital for both ST-segment elevation myocardial infarctions (STEMI) and non-ST segment elevation myocardial infarctions (NSTEMI) and a profound decrease in heart failure services has been reported. A similar reduction in the patient presentation is seen for ischemic heart disease, decompensated heart failure, and endocarditis. Cardiovascular services, including catheterization, primary percutaneous coronary intervention (PPCI), cardiac investigations such as electrocardiograms (ECGs), exercise tolerance test (ETT), dobutamine stress test, computed tomography (CT) angiography, transesophageal echocardiography (TOE) have been reported to have declined and performed on a priority basis. The long-term implications of this decline have been discussed with major concerns of severe cardiac complications and vulnerabilities in cardiac patients. The pandemic has also had psychological impacts on patients causing them to avoid seeking medical help. This review discusses the effects of the COVID-19 pandemic on the provision of various cardiology services and aims to provide strategies to restore cardiovascular services including structural changes in the hospital to make up for the reduced staff personnel, the use of personal protective equipment in healthcare workers, and provides alternatives for high-risk cardiac imaging, cardiac interventions, and procedures.

Implementation of the triage system, risk assessment scores, and telemedicine services in patients and their adaptation to the cardiovascular department have been discussed.

The impact of the Covid-19 pandemic on cardiology services

Author(s): Bryant et al.

Source: BMJ OpenHeart 7:e001359

Publication date: July 2020

Objective The COVID-19 pandemic resulted in prioritisation of National Health Service (NHS) resources to cope with the surge in infected patients. However, there have been no studies in the UK looking at the effect of the COVID-19 work pattern on the provision of cardiology services. We aimed to assess the impact of the pandemic on cardiology services and clinical activity. **Methods** We analysed key performance indicators in cardiology services in a single centre in the UK in the periods prior to and during lockdown to assess reduction or changes in service provision. **Results** There has been a greater than 50% drop in the number of patients presenting to cardiology and those diagnosed with myocardial infarction. All areas of cardiology service provision sustained significant reductions, which included outpatient clinics, investigations, procedures and cardiology community services such as heart failure and cardiac rehabilitation. **Conclusions** As ischaemic heart disease continues to be the leading cause of death nationally and globally, cardiology services need to prepare for a significant increase in workload in the recovery phase and develop new pathways to urgently help those adversely affected by the changes in service provision.

Echocardiography in Pandemic: Front-Line Perspective, Expanding Role of Ultrasound, and Ethics of Resource Allocation

Item Type: Journal Article

Authors: Drake, Daniel H.;De Bonis, Michele;Covella,

Michele;Agricola, Eustachio;Zangrillo, Alberto;Zimmerman, Karen G. and Cobey, Frederick C.

Publication Date: Jun ,2020

Journal: Journal of the American Society of Echocardiography 33(6), pp. 683-689

Abstract: The grave clinical context of the coronavirus disease 2019 (COVID-19) pandemic must be understood. Italy is immersed in the COVID-19 pandemic. Most of the world will soon follow. The United States currently has the most documented cases of COVID-19 of any nation. Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)-associated acute cardiomyopathy is common in critical care patients and is associated with a high mortality rate. Patients with COVID-19 frequently require mechanical support for adequate oxygenation. A severe shortfall of ventilators is predicted. Of equal concern is the projected shortage of trained professionals required to care for patients on mechanical ventilation.

Ultrasonography is proving to be a valuable tool for identifying the pulmonary manifestations and progression of COVID-19. Lung ultrasound also facilitates successful weaning from mechanical ventilation. Ultrasonography of the lung, pleura, and diaphragm are easily mastered by experienced echocardiographers. Echocardiography has an established role for optimal fluid management and recognition of cardiac disease, including SARS-CoV-2-associated acute cardiomyopathy. Cardiologists, anesthesiologists, sonographers, and all providers should be prepared to commit their full spectrum of skills to mitigate the consequences of the pandemic. We should also be prepared to collaborate and cross-train to expand professional services as necessary.

During a declared health care crisis, providers must be familiar with the ethical principles, organizational structure, practical application, and gravity of limited resource allocation. Copyright © 2020 American Society of Echocardiography. Published by Elsevier Inc. All rights reserved.

[Review of the efforts of the Japanese Society of Echocardiography for coronavirus disease 2019 \(COVID-19\) during the initial outbreak in Japan](#)

Item Type: Journal Article

Authors: Seo, Yoshihiro;Daimon, Masao;Yamada, Hirotsugu;Kagiyama, Nobuyuki;Ohta, Mitsuhiko;Izumi, Chisato;Yamamoto, Kazuhiro;Nakatani, Satoshi and member of the joint committee of the Education Committee, Public Relations Committee,Guidelines Committee of the Japanese Society of Echocardiography

Publication Date: 2020

Journal: Journal of Echocardiography 18(4), pp. 226-233

Abstract: Under the coronavirus disease 2019 (COVID-19) pandemic, the Japanese Society of Echocardiography (JSE) has been working to protect medical staff involved in echocardiographic examinations and to prevent secondary infections caused by the examinations since mid-March 2020. This review aims to describe the footprint of the JSE's responses, focusing on the 3 months in which the initial outbreak of COVID-19 pandemic occurred in Japan. We summarized the six parts as follows: (1) the initial actions for COVID-19 of JSE, (2) JSE's actions for infection control-associated echocardiographic examinations, (3) statements from the American Society of Echocardiography during the COVID-19 pandemic and their Japanese translation by JSE, (4) making videos for explaining the practice of echocardiography during the COVID-19 pandemic, (5) attempts with the JSE members' opinions by the communication platform and surveys, and (6) efforts of final statement during the initial spread of COVID-19. We look forward that this review will help daily practices associated with echocardiography under the COVID-19 pandemic and in the future event of an unknown infectious disease pandemic.

New ways of working

The evolution from cardiac physiologists to clinical scientists in the UK: A guide to attaining equivalence.

Item Type: Journal Article

Authors: Campbell, B.; Robinson, S. and Rana, B.

Publication Date: 2019

Journal: Echo Research and Practice 6(4), pp. R99-R105

Abstract: At its inception, transthoracic echocardiography (TTE) was employed as a basic screening tool for the diagnosis of heart valve disease and as a crude indicator of left ventricular function. Since then, echocardiography has developed into a highly valued non-invasive imaging technique capable of providing extremely complex data for the diagnosis of even the subtlest cardiac pathologies. Its role is now pivotal in the diagnosis and monitoring of heart disease. With the evolution of advanced practice and devolving care, ordinarily performed by senior doctors, to the cardiac physiology workforce in the UK, significant benefits in terms of timely patient care and cost savings are possible. However, there needs to be appropriate level of accountability. This accountability is achieved in the UK with statutory regulation of healthcare professionals and is a crucial element in the patient protection system, particularly for professions in patient facing roles. However, statutory regulation for staff practising echocardiography is not currently mandatory in the UK, despite the level of responsibility and influence on patient care. Regulators protect the public against the risk of poor practice by setting agreed standards of practice and competence and registering those who are competent to practice. Regulators take action if professionals on their register do not meet their standards. The current cardiac physiology workforce can be recognised as registered clinical scientists using equivalence process through the Academy for Healthcare Science, and this review aims to describe the process in detail. Copyright © 2019 The authors

Rapid access heart failure clinic: Impact of a physiologist-delivered service in a UK district general hospital

Item Type: Conference Proceeding

Authors: Sinclair, H., Ackrill, M., Holdsworth, H., Chase, C., Guillen, M., Bowman, L., Collins, L., Critoph, C.H. and Pine, A.C.J.

Publication Date: 2019

Publication Details: Heart. Conference: British Cardiovascular Society Annual Conference Digital Health Revolution.

Manchester United Kingdom. 105(Supplement 6) (pp A74); BMJ Publishing Group,

Abstract: Background National Institute of Clinical Excellence (NICE) Chronic Heart Failure Guideline NG106 recommends NTproBNP measurement in patients with suspected heart failure (HF). NTproBNP 400ng/L mandates referral to a rapid access HF clinic (RAHFC). Target wait is determined by NTproBNP concentration (400-2000ng/L 6 weeks and >2000ng/L within 2 weeks). In our institution, RAHFC referrals have doubled in a year. There is little published national data regarding adherence to NICE waiting targets. Initial service evaluation found that only 47% of patients were seen within the target waiting time. However, many patients with lower range NT proBNP (<1000ng/L) had no significant cardiac pathology and were discharged. It was proposed this lower range NTproBNP population (400-1000ng/l) could be safely managed in a cardiac physiologist-delivered RAHFC overseen by a HF specialist. Additional benefits would be to upskill cardiac physiologists, free consultant time for more severe HF patients and improve waiting times. Aim To introduce a supervised cardiac physiologist-led HF clinic for patients with a NTproBNP 400ng/L but <1000ng/L and monitor outcomes. Method An electronic form was developed to guide clinical questioning and data collection. The clinic was initially run by 2 cardiac physiologists and a specialist HF fellow. All clinics were

overseen by a consultant HF cardiologist. Demographics, NYHA class, NTproBNP concentration, waiting time, final diagnosis, further investigations and echo results were recorded. Outcomes at 3, 6 and 8 months were retrospectively assessed for safety. Results 34 patients were seen in the physiologist-delivered HF clinic between Jun'18 and Jan'19. The proportion seen within target waiting time rose from 47% to 70%. Mean age 81 and 50% female. Mean NTproBNP was 730ng/L. 26.5% (n=9) were diagnosed with HFPEF and 2.9% (n=1) HFREF. 32.4% (n=11) had AF or paroxysmal AF. In 41.2% (n=14) NTproBNP was felt to be a false positive. Diagnoses included: pulmonary hypertension (n=1), moderate and severe aortic stenosis (n= 2), moderate aortic regurgitation (n=1), bradyarrhythmia requiring pacing (n=1), hypertrophic cardiomyopathy (n=2), atrial tachycardia (n=1), ectopy (n=2). As cardiac physiologists gained experience, they began to review patients independently and time slots were reduced. No adverse events were recorded. Conclusion Demand for RAHFC is high and NICE waiting times are often difficult to meet with current service provision. A physiologist-delivered HF clinic proved safe, effective and dramatically reduced waiting times. There is a national shortage of cardiac physiologists, and staff retention and recruitment is difficult. Expanding the role and skill set of our cardiac physiologists has proved popular and good for staff morale. NTproBNP threshold mandating urgent referral to RAHFC for patients with AF and those of advanced age may require further research and consideration.

The rapid access chest pain clinic (RACPC) and the role of the cardiac physiologist Abstract only*

Item Type: Journal Article

Authors: Mathieson, Susan;Victor, Kelly;Jarrett-Smith, Lucy and Marber, Michael

Publication Date: 2017

Journal: British Journal of Cardiac Nursing 12(6), pp. 300-305

Abstract: Coronary heart disease (CHD) is one of the largest killers in the UK. Rapid access chest pain clinics (RACPCs) provide an effective and efficient method for the early diagnosis of patients with CHD. Currently, specialist nurses lead these services. However, there has been a shift, with the focus moving towards cardiac physiologists (CPs) and the role they have to play in delivering these services. The article reflects on the experiences and challenges of a CP's involvement in RACPC. Through these observations and learning points, we aim to encourage other CPs to implement comparable RACPC service delivery systems for the benefit of patients, the broader integrated workforce and the wider healthcare community.

Professional education, training and role of the cardiac sonographer in different countries.

Item Type: Journal Article

Authors: Nicastro, I.;Barletta, V.;Conte, L.;Fabiani, I.;Morgantini, A.;Lastrucci, G. and Bello, V.

Publication Date: 2013

Journal: Journal of Cardiovascular Echography 23(1), pp. 18-23

Abstract: Performing a good echocardiographic examination requires intensive training and highly qualified technical staff personnel, which, in many countries, is represented by the Cardiac Sonographer. Being an operator-dependent diagnostic method, a long debate has been held to help identifying the most appropriate curriculum for the training of this professional profile. Although guidelines for the education of the Cardiac Sonographers have been suggested by the American Society of Echocardiography (ASE) several years ago and many scientific publications have given credibility, trust and enhance to this professional profile in Italy, this figure is not yet recognized by the National Health System. It is encouraging that in the last decade, national authorities, such as the SIEC (Societgr; Italiana di Ecografia Cardiovascolare), have expressed interest in recognizing the Cardiac Sonographers as professionals in

our country. Per their guidelines, the Cardiocirculatory Physiopathology Cardiovascular Perfusion technicians (TFCPCs) seem to be, among the professionals, the most suitable, due to their educational training and the role they play. Taking inspiration from the positive experience of this professional figure in the USA and in the Anglo Saxon countries, it could aim to be a valid support in terms of cost and quality for the Italian health system.

Health and Wellbeing

Radiation exposure of cardiac sonographers working in an academic noninvasive cardiovascular imaging laboratory.

Abstract only*

Item Type: Journal Article

Authors: Velez, Michael R.; Orsinelli, Maryellen H. and Orsinelli, David A.

Publication Date: 2018

Journal: Echocardiography 35(1), pp. 4-8

Abstract: BACKGROUND AND AIM: Exposure to workplace radiation among cardiac sonographers has been felt to be low, and patient-related sources have been considered negligible. Sonographers may be exposed to radiation from patient emitted sources as well as external sources in interventional laboratories. This study quantified radiation exposure to cardiac sonographers. METHODS: Cardiac sonographers, vascular imaging technologists, exercise physiologists, noninvasive nursing staff, and CT/MRI technologists were provided body dosimeter badges. Sonographers were provided dosimeter rings for their scanning hands. Radiation exposure was quantified from the dosimeter data, reported in millirems (mrem) for deep, eye, and shallow exposure, as well as shallow exposure data from the rings. Data were prospectively collected for 63 employees over a 12-month period and retrospectively analyzed. RESULTS: The mean annual deep body exposure in

sonographers was 8.2 mrem/year, shallow exposure 9.8 mrem/year, eye exposure 8.5 mrem/year, and ring exposure 207 mrem/year. There was a significant difference between body and ring exposure ($P = .0002$). When comparing exposure data between the vascular imaging technologists, CT/MRI technologists, noninvasive nursing staff, and the cardiac sonographers, there were no statistical differences ($P > .23$). Exercise physiologists had significantly higher exposure compared to sonographers (P Copyright © 2017 Wiley Periodicals, Inc.

Workforce

Regional differences in echocardiography provision in New Zealand--results from the 2013 SCANZ Workforce Survey.

Item Type: Journal Article

Authors: Buckley, Belinda A.; Poppe, Katrina; Farnworth, Mark J. and Whalley, Gillian

Publication Date: Jan 30, 2015

Journal: New Zealand Medical Journal 128(1408), pp. 47-55

Abstract: UNLABELLED: Abstract AIM: Healthcare may be unevenly distributed based on geographic location. This study aimed to identify whether regional differences in echocardiography provision exist and, if so, to explore key causes. METHOD: In March 2013, 18 public hospitals with a sonographer-led echocardiography service were surveyed, all of which provided data. Questions related to characteristics of the sonographer workforce, echocardiogram volumes and workflows. Information on District Health Board (DHB) population was obtained from public access websites. Multivariable linear regression was performed using the following variables: ethnicity, age, socioeconomic status, type of centre, sonographer full-time equivalent (FTE) and number/proportion of trainees to determine their potential contribution to echocardiogram volume. RESULTS: 1748

echocardiograms were performed per 100,000 population (mean) with significant differences seen amongst DHBs but not between tertiary surgical and regional centres (surgical median 1802, regional median 1658, $p=0.18$). Regional disparity in the population-based cardiac sonographer workforce size was observed and the number of scans performed per sonographer was higher in larger centres. In multivariable modelling, the DHB population-based scan volume was predicted by: socioeconomic status (top two quintiles of deprivation status increased scans by 75 per 100,000 population, $p=0.02$) and age (age 20 to 65 years increased scans by 131 per 100,000 population, $p=0.06$). CONCLUSION: Regional differences in echocardiography services in New Zealand exist as evidenced by marked regional disparity in both population-based echo volumes and cardiac sonographer workforce size.

Nursing

The involvement of nurses in clinical echocardiography.

Item Type: Journal Article

Authors: Chloubova, I.; Eisenberger, M.; Bulava, A.; Penicka, M. and Dieudonne, E.

Publication Date: 2015

Journal: Kontakt 17(4), pp. e206-e210

Abstract: Echocardiography is a basic examination in cardiology used to assess the anatomy and function of the heart. An echocardiography nurse is a health care specialist who is able to use echocardiographic equipment to obtain images of the heart. Standards for echocardiography personnel vary widely between countries. In the Czech Republic, there is no training program for nurses to carry out echocardiograms and the work is done almost exclusively by physicians. In many other countries, including the United Kingdom and the USA, specialist nurses carry out and report echocardiograms independently. In this article, we compare requirements for echocardiography

nurses in different countries. Copyright © 2015 Faculty of Health and Social Studies of University of South Bohemia in Ceske Budejovice. Published by Elsevier Sp. z o. o. All rights reserved.

Technology

'The digital cardiologist': How technology is changing the paradigm of cardiology training

Author(s): Vandermolen

Source: Current Problems in Cardiology

Publication date: 11th September 2022

In the same way that the practice of cardiology has evolved over the years, so too has the way cardiology fellows in training (FITs) are trained. Propelled by recent advances in technology—catalysed by COVID-19—and the requirement to adapt age-old methods of both teaching and healthcare delivery, many aspects, or 'domains', of learning have changed. These include the environments in which FITs work (outpatient clinics, 'on-call' inpatient service) and procedures in which they need clinical competency. Further advances in virtual reality are also changing the way FITs learn and interact. The proliferation of technology into the cardiology curriculum has led to some describing the need for FITs to develop into 'digital cardiologists', namely those who comfortably use digital tools to aid clinical practice, teaching, and training whilst, at the same time, retain the ability for human analysis and nuanced assessment so important to patient-centred training and clinical care.

Competency Frameworks

Heart Failure competency framework for healthcare professionals

Source: British Society for Heart Failure

Publication date: Due for renewal 2025

The British Society for Heart Failure (BSH) believes that heart failure is one of the biggest societal issues in health care today and should be treated as a national priority. This cannot be achieved by specialists alone and we welcome the inclusion and support of wide-ranging healthcare professionals. Together we can make all the difference to outcomes for patients. Heart failure is becoming a pressing health priority across all four nations of the United Kingdom. It is as common as many cancers with comparable malignancy without treatment. Heart failure rarely exists in isolation and patients typically have complex multi-factorial needs. Those with the condition need holistic care provided by a range of health and social care professionals, both specialists and generalists and involving those working across all care settings. Collaborative care is a cornerstone of treatment strategies in all national and international heart failure guidelines. This framework sets out to equip all health professionals with the core competencies required to care for people with heart failure.

Sonographer Career Framework

Source: HEE

Publication date: June 2022

Australian Sonographer competency – a new framework

Source: Sonography 9(3) pp. 108-105

Publication date: April 2022

Sonographers possess a unique and complex body of knowledge and skills, providing real health benefits to the community. The value of competency frameworks rests on their

capacity to support and facilitate professional practice in the interests of public safety. The commitment to act in the service of others carries with it a professional and ethical obligation to practice within the boundaries of accepted competency standards. The well-accepted Australasian Sonographers Association (ASA) competency standards for entry-level Australian sonographers were introduced a decade ago. At this time, ultrasound technology, its application and the sonographer's role as a critical interface to this technology continue to evolve. The article provides an overview of research used to develop a contemporary competency framework for sonographers. It describes each framework component and how these components have a potential role in sonographer education and clinical practice at different levels of expertise. Sonographer competencies were developed via a national collaborative research project led by a multi-institutional research team of academic and industry professionals. A Delphi study design elicited consensus on multiple competency characteristics from an expert panel of 55 sonographers. The expert panel contained representatives from all Australian states and territories and represented all domains of practice. The resulting project outcome consisted of a competency framework containing four significant components: sonographer competency standards, sonographer knowledge, sonographer attitudes and a holistic competency matrix.

Echocardiography Lifelong Learning Competencies

Source: American College of Cardiology

Professional Competency Framework for Sonographers (Australia)

Source: Australia

Publication date: October 2021

The project developed a professional competency framework for sonographers, which included four major domains: detailed

competency standards, sonographer knowledge, sonographer attitudes and a holistic competency matrix.

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