

Evidence Brief: Cardiology (2021-2022)

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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.

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Key publications

[The National Audit Cardiac Programme Report 2022](#) NICOR (NHS Barts Trust, HQIP)

The 2022 annual report of the National Cardiac Audit Programme (NCAP) focuses on how cardiovascular services were impacted by the first year of the COVID-19 pandemic. NCAP comprises six domains, each of which is concerned with a particular cardiovascular disease area or treatment.

[The Digital Future of Heart Failure Care.](#) **Curr Heart Fail Rep 19, 109–113 (2022). Cowie, M.R., McBeath, K.C.C. & Angermann, C.E**

In our article published in this edition of the journal we review the body of evidence on tele- and remote monitoring in patients with heart failure (HF), including the use of cardiac implantable electronic devices, implantable haemodynamic monitors and wearable digital technology. We discuss the lessons learnt and what a contemporary HF model of care might look like. These technologies and lessons cannot, and should not, be viewed in isolation. They are part of a broader digital health care evolution in a complex and highly regulated healthcare environment. In this commentary, we discuss some of those broader contextual issues, including the evaluation and regulation of technology, data security and the use of artificial intelligence. Vital to success is the appreciation that patients need to be seen in a holistic context, with an understanding of their digital and health needs and capabilities, including their knowledge, skills, attitudes and access.

[The distribution of doctor quality: evidence from cardiologists in 22/30 England](#) Working Paper George Stoye Institute for Fiscal Studies August 2022

There is widespread and unexplained variation in the outcomes of similar patients across place and providers in all developed health systems. This paper provides new evidence on the role senior doctors play in determining patient outcomes. I exploit within-hospital quasirandom assignment of patients to senior doctors following a heart attack to estimate the effectiveness of individual doctors, and to estimate returns to experience for these doctors. 28% of doctors work in multiple hospitals over a 13 year period, enabling the separate identification of doctor effects from hospital effects or observable patient characteristics. I find that a standard deviation increase in doctor quality reduces mortality rates over the next year by 3.6 percentage points, or 25% of mean mortality. There are relatively modest returns to specific experience, with mortality reductions from a standard deviation increase in the physician's 3-year caseload equivalent to around 6% of a standard deviation in permanent doctor quality. Estimating the effectiveness of each physician when treating patients with specific diagnoses, I analyse potential mortality reductions from reallocating doctors across patients. I find that mortality could be reduced by 8% by reassigning doctors within-hospital to patients on the basis of their comparative ability to treat each patient type. These results suggest that substantial improvements in patient outcomes could be achieved by reallocating existing senior staff resources.

[Artificial Intelligence in Cardiology—A Narrative Review of Current Status](#)

Koulaouzidis, G et al J. Clin. Med. 2022, 11, 3910

Artificial intelligence (AI) is an integral part of clinical decision support systems (CDSS), offering methods to approximate human reasoning and computationally infer decisions. Such methods are generally based on medical knowledge, either directly encoded with rules or automatically extracted from medical data using machine learning (ML). ML techniques, such as Artificial Neural Networks (ANNs) and support vector machines (SVMs), are based on mathematical models with parameters that can be optimally tuned using appropriate algorithms. The ever-increasing computational capacity of today's computer systems enables more complex ML systems with millions of parameters, bringing AI closer to human intelligence. With this objective, the term deep learning (DL) has been introduced to characterize ML based on deep ANN (DNN) architectures with multiple layers of artificial neurons. Despite all of these promises, the impact of AI in current clinical practice is still limited. However, this could change shortly, as the significantly increased papers in AI, machine learning and deep learning in cardiology show. We highlight the significant achievements of recent years in nearly all areas of cardiology and underscore the mounting evidence suggesting how AI will take a central stage in the field

[Novel Artificial Intelligence Applications in Cardiology: Current Landscape, Limitations, and the Road to Real-World Applications.](#)

J. of Cardiovasc. Trans. Res. (2022). Langlais, É.L. Thériault-Lauzier, P., Marquis-Gravel, G

Cardiovascular diseases are the leading cause of death globally and contribute significantly to the cost of healthcare. Artificial intelligence (AI) is poised to reshape cardiology. Using supervised and unsupervised learning, the two main branches of AI, several applications have been developed in recent years to improve risk prediction, allow large-scale analysis of medical data, and phenotype patients for personalized medicine. In this review, we examine the key advances in AI in cardiology and its limitations regarding bias in the data, standardization in reporting, data access, and model trust and accountability in cases of error. Finally, we discuss implementation methods to unleash AI's potential in making healthcare more accurate and efficient.

[Advances in Clinical Cardiology 2021: A Summary of Key Clinical Trials.](#) **Adv Ther 39, 2398–2437 (2022). Savage, P Cox, B., Linden, K**

The authors reviewed clinical trials presented at major cardiology conferences during 2021 including the American College of Cardiology (ACC), European Association for Percutaneous Cardiovascular Interventions (EuroPCR), European Society of Cardiology (ESC), Transcatheter Cardiovascular Therapeutics (TCT), American Heart Association (AHA), European Heart Rhythm Association (EHRA), Society for Cardiovascular Angiography and Interventions (SCAI), TVT-The Heart Summit (TVT) and Cardiovascular Research Technologies (CRT). Trials with a broad relevance to the cardiology community and those with potential to change current practice were included.

[Applications of Machine Learning in Cardiology.](#)

Cardiol Ther 11, 355–368 (2022). Seetharam, K. Balla, S., Bianco, C

In this digital era, artificial intelligence (AI) is establishing a strong foothold in commercial industry and the field of technology. These effects are trickling into the healthcare industry, especially in the clinical arena of cardiology. Machine learning (ML) algorithms are making substantial progress in various subspecialties of cardiology. This will have a positive impact on patient care and move the field towards precision medicine. In this review article, we explore the progress of ML in cardiovascular imaging, electrophysiology, heart failure, and interventional cardiology.

[Current and future applications of virtual reality technology for cardiac interventions.](#) **Nat Rev Cardiol (2022). Mahtab, E.A.F. Egorova, A.D.**

Virtual reality is a fast-evolving technology that already has several promising applications in medicine. In this Clinical Outlook, we discuss the current evidence and the future challenges for virtual reality applications in cardiac interventions. The incorporation of virtual reality in daily practice will inevitably make clinical care more robust, patient-centred and safe.

[Applications in Cardiology: A Review](#)

Journal of Industrial Integration and Management Vol. 07, No. 02, pp. 183-202 (2022) Mohd Javaid and Ibrahim Haleem Khan Virtual Reality (VR

Virtual reality (VR) has applications in cardiology to create enhancement, thereby improving the quality of associated planning, treatment and surgery. The need is to study different applications of this technology in the field of cardiology. We have studied research papers on VR and its applications in cardiology through a detailed bibliometric analysis. The study identified five significant steps for proper implementation of this technology in cardiology. Some challenges are to be undertaken by using this technology, and they can provide some benefits; thus, authors contemplate extensive research and development. This study also identifies 10 major VR technology applications in cardiology and provided a brief description. This innovative technology helps a heart surgeon to perform complex heart surgery effectively. Thus, VR applications have the potential for improving decision-making, which helps save human life. VR plays a significant role in the development of a surgical procedure. This technology undertakes 3D heart model information in full colour, which helps to analyze the overall heart valve, blockage and blood flow. With the help of this digital technology, a surgeon can improve the accuracy of heart surgery, and he can simulate the surgery. A surgeon can undertake surgery in a virtual environment on a virtual patient. The unique purpose of this technology is to practice pre-operatively on the specific circumstance. A cardiologist can also check the proper status of inner and outer heart wall layer. Thus, by using this 3D information, the surgeon can now interact with heart data/information without any physical touch. This technology opens a new opportunity to improve the heart surgery and development in cardiovascular treatment to improve patient outcome.

[GIRFT National Report for Cardiology](#) **British Heart Rhythm Society Sarah Clarke, Simon Ray September 2021**

The report supports the concept of a mobile workforce with the development of *staff passports* enabling teams to work more flexibly.

[Heart Failure A call to action](#)

Alliance for Heart Failure 2021

Health Education England and primary care professional organisations should support initiatives to raise awareness and improve education among all healthcare professionals likely to encounter heart failure patients. Each Primary Care Network (PCN) should appoint a heart failure champion. All Clinical Commissioning Groups (CCGs) should commission NT-proBNP testing to eradicate any residual regional variation in access.

Health Education England should support initiatives to encourage its use for diagnostic purposes by GPs, community diagnostic hubs, and emergency departments. The echocardiography workforce shortage should remain an urgent priority for **Health Education England**. **Health Education England**, in collaboration with professional bodies, should increase the roll out of training in advanced communication skills. All CCGs should urgently address delays to postdischarge follow-up. Community providers and Acute Trusts should urgently review and increase the number of heart failure specialist nurses (HFSNs), **in the range of 2-4 whole-time equivalent per 100,000 population**, to ensure numbers match workloads and patients are seen by highly skilled specialists.

[Cardiology digital playbook](#)

NHSX July 2021

How to use digital ways of working to improve outcomes for patients This resource provides support to clinical teams and organisations that are looking for digital tools that support the delivery of patient pathways. It concentrates on cardiology pathways and how to deliver monitoring and support to patients.

[Disparity in clinical outcomes after cardiac surgery between private and public \(NHS\) payers in England](#)

Benedetto, U. Dimagli A et al The Lancet Regional Health - Europe Volume 1, February 2021, 100003

The main finding of the study was that in the UK, private payer status was associated with a lower risk of mortality and major complications in patients undergoing heart surgery with NHS providers. The primary analysis showed that private payer status was associated with 21% relative risk reduction in mortality after controlling for case mix, variables related to the surgical procedures and neighbourhood socioeconomic status. The disadvantage for NHS payer status was more marked in elective patients, for those undergoing isolated CABG surgery and for those with most deprived neighbourhood socioeconomic status.

[Cardiac surgery outcome during the COVID-19 pandemic: a retrospective review of the early experience in nine UK centres.](#)

Sanders, J., Akowuah, E., Cooper, J. et al *J Cardiothorac Surg* 16, 43 (2021)

To mitigate against the risks of Covid-19, particularly the post-operative burden, robust and effective pre-surgery diagnosis protocols alongside effective strategies to maintain a Covid-19 free environment are needed. Dedicated cardiac surgery hubs could be valuable in achieving safe and continual delivery of cardiac surgery

HEE Star

SUPPLY

[Representation of Women in Internal Medicine Specialties in North America, the United Kingdom, and Australasia: Cardiology's Outlier Status and the Importance of Diversity,](#)
The American Journal of Cardiology, 2022, Sarah Zaman, Elizabeth Shaw

Decades of research demonstrate the value of workplace diversity. Reports from individual countries show that women are underrepresented in internal medicine workforces. However, large pooled international studies are not available. This study investigates the current representation of women in the internal medicine workforce internationally and identifies specialties in which underrepresentation is evident. Peer-reviewed studies, government reports, and medical association reports were used to determine proportions of specialists and doctors training in internal medical specialties and in comparator surgical specialties. Data were available from

Australia, Canada, England, New Zealand, the United States, Wales, Scotland, and Northern Ireland. A total of 380,263 doctors were studied, including 268,822 practicing specialist physicians (also known as attendings or consultants) and 53,226 doctors in internal medicine specialty training programs (also known as residents, fellows, advanced trainees, or specialist registrar trainees). Among practicing physician specialists, the rate of representation of women was 35% (95,195/268,822, $p < 0.001$). Among trainees, the rate of representation of women was 43% (22,728/53,226, $p < 0.001$). Among physician specialties evaluated, cardiology (15%, 4,152 of 27,328), gastroenterology (20%, 3,765 of 18,893), and respiratory/critical care (24%, 5,255 of 21,870) had the lowest representations of women compared with men ($p < 0.001$ for all). Cardiology and particularly the subspecialty of interventional cardiology were clear outliers as the internal medicine specialties with the lowest representation of women at practicing specialist and trainee levels. In conclusion, this study is the largest international study of women in internal medicine specialties. It found that cardiology, gastroenterology, and respiratory/critical care specialties have the most substantial underrepresentation of women. These data are a global call to action to establish more successful strategies to provide a diverse and representative cardiology workforce.

[Bullying in UK cardiology: a systemic problem requiring systemic solutions](#)

Heart 2022;108:212-218. Camm CF, Joshi A, Moore A

Bullying and inappropriate language are commonly experienced by cardiology trainees and disproportionately affect women and those who attended non-UK medical schools. Consultants both in cardiology and other specialties are the most commonly reported perpetrators.

[Women in Cardiology: Role of Social Media in Advocacy.](#) **Curr Cardiol Rev. 2021;17(2):144-149. Patel H, Volgman AS**
 Digital and social media have transformed the field of medicine. They are powerful tools that academic and non-academic physicians and healthcare providers are using to influence others, promote ideas, obtain knowledge, disseminate research and communicate with others. The history of advocacy for women in medicine and the role of social media in influencing the choice of women to choose Cardiology as a career and its role in advocacy for Women in Cardiology (WIC) have been reviewed. It has changed the way cardiologists learn, educate, and interact with each other. Social media has proven especially useful in advocating for WIC, but whether it can help improve the numbers of female doctors going into Cardiology remains to be seen. In addition to encouraging women to pursue cardiology, social media has drawn attention to key women's rights issues affecting practicing female cardiologists.

[Gender and career in cardiology—a cross-sectional study](#)
Dettmer, Susanne; Wenzel Arlett; Trenkwalder, Teresa; Tiefenbacher Christiane; Regitz-Zagrosek Vera Prof Dr med Dr hc. Herz; Munich Vol. 46, Iss. 2, (Mar 2021): 150-157. DOI:10.1007/s00059-021-05027-0
 The proportion of women as leading physicians in cardiology in university medicine has stagnated and the share of women in senior positions in cardiology is low compared with other medical specialist fields. Here, we analyze the typical barriers

for women as doctors in cardiology and point to issues that make the discipline less attractive for both genders.

[Racism and Cardiology: A Global Call to Action](#)
CJC Open Volume 3, Issue 12, Supplement, December 2021, Pages S165-S173
 Racism and racial bias influence the lives and cardiovascular health of minority individuals. The fact that minority groups tend to have a higher burden of cardiovascular disease risk factors is often a result of racist policies that restrict opportunities to live in healthy neighbourhoods and have access to high-quality education and healthcare. The fact that minorities tend to have the worst outcomes when cardiovascular disease develops is often a result of institutional or individual racial bias encountered when they interact with the healthcare system. In this review, we discuss bias, discrimination, and structural racism from the viewpoints of cardiologists in Canada, the United Kingdom, and the US, and how racial bias impacts cardiovascular care. Finally, we discuss proposals to mitigate the impact of racism in our specialty.

[Lack of Equity in the Cardiology Physician Workforce: A Narrative Review and Analysis of the Literature](#)
Michelle Keir CJC Open
Volume 3, Issue 12, Supplement, December 2021, Pages S180-S186
 The gender and racial diversity in the cardiology workforce in Canada does not reflect that of the population we serve. As social awareness of the principles of equity, diversity, and inclusion rises, our profession must rise to meet the challenges they present. We detail contemporary examples of publication

bias in the cardiac sciences literature and describe the factors that led to oversight in the peer-review process. We performed a narrative review to summarize the published literature on equity and diversity among cardiac physicians. We also summarize the challenges faced by women and racial-minority physicians when pursuing and thriving in a career in cardiology, and the systemic barriers to their success. In the past decade, social justice movements have advanced. Professionalism standards are changing, and awareness and understanding of these advances in terminology is imperative for all physicians. In this review, we summarize key language and concepts, with cardiology-specific examples, and propose a new paradigm of professionalism.

[Sexism experienced by consultant cardiologists in the United Kingdom](#)

Jaijee SK, Kamau-Mitchell C, Mikhail GW, et al
Sexism experienced by consultant cardiologists in the United Kingdom *Heart* 2021;107:895-901.

Female cardiologists in the UK experience more sexism and sexual harassment than male cardiologists. Sexism impacts the career progression and professional confidence of female cardiologists more, including their confidence when working with patients and colleagues. Future research is urgently needed to test interventions against sexism in cardiology and to protect the welfare of female cardiologists at work.

[Gender Equity Imbalance in Cardiology Scientific Sessions in the Americas](#)

Current Problems in Cardiology Volume 46, Issue 4, April 2021, 100785

Women remain largely under-represented in cardiology worldwide. This is especially reflected in scientific sessions

where panelists have a male preponderant representation. The amount of gender equity in cardiology during scientific activities in the American continent is unknown. The objective was to compare gender distribution of invited panelists in cardiology scientific sessions across the Americas during the period 2019-2020. A retrospective analysis of the cardiology scientific sessions held in North, Central, and South America was conducted. Sessions published on the official site and social networks of the national cardiology societies from January 1, 2019 to August 10, 2020 were included

LEADERSHIP

[A roadmap of strategies to support cardiovascular researchers: from policy to practice.](#) *Nat Rev Cardiol* 19, 765–777 (2022)

Chapman, N., Thomas, E.E., Tan, J.T.M.

Cardiovascular disease remains the leading cause of death worldwide. Cardiovascular research has therefore never been more crucial. Cardiovascular researchers must be provided with a research environment that enables them to perform at their highest level, maximizing their opportunities to work effectively with key stakeholders to address this global issue. At present, cardiovascular researchers face a range of challenges and barriers, including a decline in funding, job insecurity and a lack of diversity at senior leadership levels. Indeed, many cardiovascular researchers, particularly women, have considered leaving the sector, highlighting a crucial need to develop strategies to support and retain researchers working in the cardiovascular field. In this Roadmap article, we present solutions to problems relevant to cardiovascular researchers worldwide that are broadly classified across three key areas: capacity building, research funding and fostering diversity and

equity. This Roadmap provides opportunities for research institutions, as well as governments and funding bodies, to implement changes from policy to practice, to address the most important factors restricting the career progression of cardiovascular researchers.

[Do look up: how UK cardiovascular science and our patients benefit from international collaboration: a European Society of Cardiology perspective](#)

Barbara Casadei Heart May 2022 Vol 108 No 10

The European Society of Cardiology (ESC) encompasses 57 National Cardiac Societies spanning from Ireland to Russia and from Iceland to Tunisia. The British Cardiovascular Society (BCS).

UP-SKILLING (inc. TRAINING)

[Paediatric and adult congenital cardiology education and training in Europe](#)

McMahon CJ (2022). Paediatric and adult congenital cardiology education and training in Europe. Cardiology in the Young, page1-18

Training varies markedly across European countries. Although formal fellowship programmes exist in many countries, several countries have informal training or no training. Only a minority of countries provide both exit examination and certification. Harmonisation of training and standardisation of exit examination and certification could reduce variation in training thereby promoting high-quality care by European congenital cardiologists.

[Face of Medical Education in the aftermath of COVID-19: The True Digital Era Begins](#)

Shouvik K. Haldar, Guy Lloyd, G. Andre Ng, Simon G. Ray, Rebecca Dobson, Claire Cartwright, Carolyn Hargreaves, Rachael O'Flynn & John P. Greenwood (2022) Journal of European CME, 11:1, 2035949

The global pandemic has been a major inflection point in digital innovation, and online learning has emerged as a disruptive and important tool for the future of medical education. Through necessity, we have seen the rapid dissemination of knowledge globally to help countries deal with this crisis, and as a result, we have seen the stratospheric rise of online learning. Given the sudden switch to online learning, the tools we use at present have not yet had the chance to mature, but despite this, we have still seen significant benefits in faster and more efficient learning, improved engagement, and reach. The full potential of online learning has yet to be realised and as a result, this delivery method is here to stay with a hybrid approach of offline and online learning as the optimal model for the future of education

[Medical education and training within congenital cardiology: current global status and future directions in a post COVID-19 world. McMahon CJ, Tretter JT, Redington AN, Bu'Lock F, Zühlke L, Heying R, Mattos S, Krishna Kumar R, Jacobs JP, and Windram JD \(2022\) Cardiology in the Young 32: 185–197](#)

Despite enormous strides in our field with respect to patient care, there has been surprisingly limited dialogue on how to train and educate the next generation of congenital cardiologists. This paper reviews the current status of training and evolving developments in medical education pertinent to congenital cardiology. The adoption of competency-based medical education has been lauded as a robust framework for

contemporary medical education over the last two decades. However, inconsistencies in frameworks across different jurisdictions remain, and bridging gaps between competency frameworks and clinical practice has proved challenging. Entrustable professional activities have been proposed as a solution, but integration of such activities into busy clinical cardiology practices will present its own challenges. Consequently, this pivot towards a more structured approach to medical education necessitates the widespread availability of appropriately trained medical educationalists, a development that will better inform curriculum development, instructional design, and assessment. Differentiation between superficial and deep learning, the vital role of rich formative feedback and coaching, should guide our trainees to become self-regulated learners, capable of critical reasoning yet retaining an awareness of uncertainty and ambiguity. Furthermore, disruptive innovations such as “technology enhanced learning” may be leveraged to improve education, especially for trainees from low- and middle-income countries. Each of these initiatives will require resources, widespread advocacy and raised awareness, and publication of supporting data, and so it is especially gratifying that Cardiology in the Young has fostered a progressive approach, agreeing to publish one or two articles in each journal issue in this domain

[The Digital Cardiologist’: How Technology Is Changing the Paradigm of Cardiology Training](#) **Current Problems in Cardiology** Volume 47, Issue 12, December 2022, 101394
Sebastian Vandermolen

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—catalyzed by COVID-19—and the requirement to

adapt age-old methods of both teaching and health care 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.

[How Technology Is Changing Interventional Cardiology.](#)
Curr Cardiovasc Risk Rep 16, 1–10 (2022). **Steitieh, D., Sharma, N. & Singh, H.S**

In this review, we will highlight some of the essential advances in interventional cardiology in recent years, as well as the technological advances on the horizon. In particular, we will delve into the advances in percutaneous coronary intervention and structural heart disease, the use of imaging for complex cases, and the anticipated changes that this new technology will bring with it.

[Integrating clinical genetics in cardiology: Current practices and recommendations for education](#) **Genetics in Medicine** Volume 24, Issue 5, May 2022, Pages 1054-1061

Participants recognized the benefit but felt underprepared to provide recommendations for genetic testing and, in some cases, lacked organizational resources to refer patients to a genetics expert. Additional training in genetics for cardiology

practitioners and ensuring availability of a genetics expert can improve the use of genetics in cardiology settings.

[The heart failure multidisciplinary team: reconnecting in the real world](#) August 2022 Br J Cardiol 2022;29(3) Tiffany Kemp

One of the most difficult challenges presented to healthcare professionals during the COVID-19 pandemic has been maintaining standards of care in non-COVID related chronic illness. Many members of our heart failure multidisciplinary (MDT) teams were redeployed and, while many have returned to their original positions, the impact of COVID-19 will be felt for years. It was, therefore, particularly poignant that in its 25th year, the British Society of Heart Failure (BSH) hosted a two-day immersive programme focusing on the heart failure MDT. Held at the Golden Jubilee Conference Hotel in Glasgow, on 12th May 2022, the meeting gave heart failure enthusiasts the opportunity to ‘reconnect in the real world’. Dr Tiffany Kemp reports on the highlights of the meeting.

[Cardiology training using technology.](#)

Chong JH, Ricci F, Petersen SE, Khanji MY European Heart Journal. 2021 Apr;42(15):1453-1455.

Key features of the e-learning process are centred on the internet with international sharing of learning resources, information broadcasts and knowledge flow through network courses, and flexible learning in a computer-based environment that overcomes barriers of distance and time. A United Kingdom (UK)-based group of registrars have come together to engage global experts for regular teaching webinars on core cardiology curriculum topics. This approach to learning could change the way fellow ‘training days’ are delivered for continuing professional development, which can in turn mitigate pre-existing rota commitments and travel requirements

[The cardiology training needs of general practice-based pharmacists,](#)

Clodagh Clarke, Sheila Tennant, Nicola Greenlaw, Briegen Girvin, Paul Forsyth International Journal of Pharmacy Practice, Volume 29, Issue 3, June 2021, Pages 245–251

There are areas of unmet cardiology training needs within GPCPs that require further support. As the GPCP role evolves, discussion is needed with national pharmacy stakeholders to decide how to incorporate this learning into routine training programmes.

[The European Society of Cardiology - A Digital Educator](#)

Kevin Fox, Susanna Price, Stephan Achenbach, Carlos Aguiar, Nico Bruining, Martin Cowie, Chris Plummer, Marco Roffi & Mark Westwood (2021)

The mission statement of the European Society of Cardiology (ESC) is “to reduce the burden of cardiovascular disease”. The ESC is the leading scientific society for cardiovascular health care professionals across Europe and increasingly the world. Recognising the need for democratisation of education in cardiology, the ESC has for many years embraced the digital world within its education programme. As in all areas of medicine, the COVID-19 pandemic required an agile response to be able to continue to provide not only a digital congress but also education, training and assessment in an almost totally digital world. In this paper we will describe the digital learning activities of the ESC, the successes and the challenges of the transformation that has taken place in the last 18 months as well as an overview of the vision for education, training and assessment in the post-COVID digital era. We understand the need to provide a portfolio of educational styles to suit a diverse range of learners. It is clear that digital CME provides opportunities but it is likely that it will not entirely replace in-

person learning. In planning for the future, we regard the provision of digital CME as central to fulfilling our mission.

[Panomics: New Databases for Advancing Cardiology](#)

Front. Cardiovasc. Med., 10 May 2021 Dara Vakili

Sec. Cardiovascular Genetics and Systems Medicine

The multifactorial nature of cardiology makes it challenging to separate noisy signals from confounders and real markers or drivers of disease. Panomics, the combination of various omic methods, provides the deepest insights into the underlying biological mechanisms to develop tools for personalized medicine under a systems biology approach. Questions remain about current findings and anticipated developments of omics. Here, we search for omic databases, investigate the types of data they provide, and give some examples of panomic applications in health care. We identified 104 omic databases, of which 72 met the inclusion criteria: genomic and clinical measurements on a subset of the database population plus one or more omic datasets. Of those, 65 were methylomic, 59 transcriptomic, 41 proteomic, 42 metabolomic, and 22 microbiomic databases. Larger database sample sizes and longer follow-up are often better suited for panomic analyses due to statistical power calculations. They are often more complete, which is important when dealing with large biological variability. Thus, the UK BioBank rises as the most comprehensive panomic resource, at present, but certain study designs may benefit from other databases.

[The impact of COVID-19 on cardiology training](#)

Samuel Conway, Ali Kirresh, Alex Stevenson, Mahmood Ahmad
January 2021 Br J Cardiol 2021;28:22–25

- Cardiology trainees in the UK have experienced a significant loss in training opportunities due to the loss of outpatient clinics and procedural work
- The effects of the pandemic will be long-lasting, and we must examine potential solutions to help reduce the impact of reduced opportunities on trainee progression
- Video conferencing and online education have been a rare positive of the pandemic, and simulation will play a larger role
- Learning how other specialties and other countries have adapted will be essential to ensure cardiology training in the UK remains world class

[The cardiology training needs of general practice-based pharmacists,](#)

International Journal of Pharmacy Practice Volume 29, Issue 3, June 2021, Pages 245–251

There are areas of unmet cardiology training needs within GPCPs that require further support. As the GPCP role evolves, discussion is needed with national pharmacy stakeholders to decide how to incorporate this learning into routine training programmes.

[Did the 'Digital Experience' improve women's representation at the European Society of Cardiology congress?](#)

Ana-Catarina Pinho-Gomes Heart June 2022 Vol 108 No 12

Despite substantial progress over the past 4 years, women remain under-represented at the ESC congress, particularly among faculty, who are likely to be more senior than abstract presenters. Although this reflects the overall under-representation of women within the ESC and in academic and clinical cardiovascular medicine, it emphasises the need to ensure international conferences adopt women-friendly policies

and practices to address longstanding and avoidable gender inequalities

More resources and tools are available in the **[insert appropriate sections]** section of the [HEE Star](#)

Statistics

[European Society of Cardiology: cardiovascular disease statistics 2021](#) Timmis, A et al *European Heart Journal*, Volume 43, Issue 8, 21 February 2022, Pages 716–799.

This report from the European Society of Cardiology (ESC) Atlas Project updates and expands upon the widely cited 2019 report in presenting cardiovascular disease (CVD) statistics for the 57 ESC member countries.

[Female speaker representation at national cardiology conferences](#)

Dobson R, Appleby C, Pathimagaraj R
Heart 2021;107:A144.

Women are under-represented in cardiology in the UK (28% of cardiology trainees and 13% of cardiology consultants are female despite women accounting for >50% of medical students). Lack of female role models is one of the commonly cited reasons for the lack of women within the field. Fair representation of female speakers at national cardiology conferences is therefore important to increase the visibility of women within cardiology. We assessed the extent of female representation at UK national cardiology conferences over the last 4 years.

[Two thirds of female cardiologists have experienced discrimination, survey finds](#)

Abi Rimmer BMJ 2021;372:n748

Two thirds of female consultant cardiologists (62%) have had experience of discrimination at work—three times the proportion (20%) of men who have, a survey has found

You can find relevant statistics on the [Health and Care Statistics Landscape](#) under **<insert appropriate subheadings and filters>** e.g. under “**Health and Care**” and use the “**Cancer**” filter

Include any other useful relevant sources to statistics

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

[It's time to 'Build Back Fairer': what can we do to reduce health inequalities in cardiology](#) August 2022 **Br J Cardiol 2022;29:106–8** Cong Ying Hey

Disparities in cardiovascular morbidity and mortality are among the leading health and social care concerns in the UK. The disruption of the COVID-19 pandemic to health services has further placed cardiovascular care and the respective patient

communities at the sharp end, not least in exacerbating existing health inequalities across service interfaces and patients' health outcomes. While the pandemic engenders unprecedented constraints within established cardiology services, it conduces to a unique opportunity to embrace novel transformative approaches within the way we deliver patient care in maintaining best practices during and beyond the crisis. As the first step in navigating toward the 'new norm', a clear recognition of the challenges inherent in cardiovascular health inequalities is critical, primarily in preventing the widening of extant inequalities as cardiology workforces continue to build back fairer. We may consider the challenges through the lens of health services' diverse facets, including the aspects of universality, interconnectivity, adaptability, sustainability, and preventability. This article explores the pertinent challenges and provides a focused narration concerning potential measures to foster equitable and resilient cardiology services that are patient centred in the post-pandemic landscape

[Patient-initiated cardiovascular monitoring with commercially available devices: How useful is it in a cardiology outpatient setting? Mixed methods, observational study](#)

A'Court et al. BMC Cardiovascular Disorders (2022) 22:428

This study suggests patient-generated data are being used for clinical decision-making in ad hoc and opportunistic ways. Given shifts towards remote monitoring in clinical care, accelerated by the pandemic, there is a need to consider how best to incorporate patient-generated data in clinical processes, introduce relevant training, pathways and governance frameworks, and manage associated risks.

Competency Frameworks/Guidance

[Stroke pathway — An evidence base for commissioning — An evidence review for NHS England and NHS Improvement \[version 1; peer review: Review NIHR Open Research 2022, 2:43 2022 Iain Marshal](#)

This overview was commissioned by NHSE to summarise what we currently know and don't know across the breadth of the care pathway. We conducted a series of evidence reviews to inform NHSE and its providers (commissioners, primary and secondary care teams, networks) of what needs to be achieved to deliver world class services equitably across England. Here, we present a concise summary of this work.

[the ESC Digital Health Committee and the ESC Working Group on e-Cardiology](#)

Digital health in older adults for the prevention and management of cardiovascular diseases and frailty. A clinical consensus statement from the ESC Council for Cardiology Practice/Taskforce on Geriatric Cardiology, 2022 Digital health technology is receiving increasing attention in cardiology. The rise of accessibility of digital health tools including wearable technologies and smart phone applications used in medical practice has created a new era in healthcare. The coronavirus pandemic has provided a new impetus for changes in delivering medical assistance across the world. This Consensus document discusses the potential implementation of digital health technology in older adults, suggesting a practical approach to general cardiologists working in an ambulatory outpatient clinic, highlighting the potential benefit and challenges of digital health in older patients with, or at risk of, cardiovascular disease. Advancing age may lead to a

progressive loss of independence, to frailty, and to increasing degrees of disability. In geriatric cardiology, digital health technology may serve as an additional tool both in cardiovascular prevention and treatment that may help by (i) supporting self-caring patients with cardiovascular disease to maintain their independence and improve the management of their cardiovascular disease and (ii) improving the prevention, detection, and management of frailty and supporting collaboration with caregivers. Digital health technology has the potential to be useful for every field of cardiology, but notably in an office-based setting with frequent contact with ambulatory older adults who may be pre-frail or frail but who are still able to live at home. Cardiologists and other healthcare professionals should increase their digital health skills and learn how best to apply and integrate new technologies into daily practice and how to engage older people and their caregivers in a tailored programme of care.

[Shared decision making in cardiology: a systematic review and meta-analysis](#)

Heart Online August 2022. doi: 10.1136/heartjnl-2022-321050 Mitropoulou P, Grüner-Hegge N, Reinhold J

Evidence for the effectiveness of SDM in cardiology may help change attitudes towards this patient-centred framework and facilitate its recommendation in clinical guidelines.

[Getting the best from the Heart Team: guidance for cardiac multidisciplinary meetings Heart 2022;108:e2.](#)

Heart 2022;108:e2. doi:10.1136/heartjnl-2021-320510

Archbold A, Akowuah E, Banning AP

Subspecialisation and increasing complexity of cases have expanded the range of MDMs in cardiac surgical centres which should now include the following: Myocardial revascularisation, Aortic valve disease, Mitral and tricuspid valve disease, Endocarditis. These MDMs need to encompass the full breadth of patients from those who are stable in the

outpatient setting to patients who present acutely with haemodynamic instability. The purpose of this document is to update the existing joint British Societies recommendations published in 2015 to reflect these changes in practice. We aim to provide guidance on the structure and function of MDMs which should be taking place in every cardiac surgical centre

[United Kingdom standards for non-invasive cardiac imaging: recommendations from the Imaging Council of the British Cardiovascular Society](#)

Treibel TA, Kelion A, Ingram TE, Heart Epub ahead of print: doi:10.1136/heartjnl-2022-320799

The major characteristics of high-quality, contemporary cardiac imaging services are described in this document. Such departments should be able to demonstrate these qualities through their audit and governance processes. Further detailed recommendations regarding current national standards and position statements are contained in the appendices. It is inevitable, however, that advances in technology such as storage and processing power, together with new applications of precision medicine, artificial intelligence and virtual reality will fundamentally change the practice of non-invasive cardiac imaging over the next decade. In light of this, we recommend that this document is reviewed in 5 years.

[CVD Prevent 2nd Annual Audit Report March 2021 NHS Benchmarking Network 2021](#)

This second report presents analysis of GP recorded data for relevant patient cohorts up to March 2021 (round two). The CVDPREVENT First Annual Audit Report, covering the period up to March 2020 (round one), together with the first iteration of the CVDPREVENT Data and Improvement Tool, were published in

December 2021. In this latest report, results are compared with the pre-pandemic (round one) baseline. A key focus of the CVDPREVENT analysis is to understand variation in identification, diagnosis and management of people at risk of CVD across dimensions of potential health inequity including deprivation, age, sex and ethnicity. In round two, the first COVID-19 response year, the impact of the pandemic across the health inequality dimensions is considered.

KEY FINDINGS:The audit saw an increase in coverage of GP practices to 93%, from 79% in round one, covering 93% of England's population. Patients with coronary heart disease (CHD) are not being adequately managed after event with preventive measures. They require a structured preventive cardiology programme addressing lifestyle, risk factor management and adherence to cardioprotective medications to achieve the standards set by the British Association for Cardiovascular Prevention and Rehabilitation and JBS3 guidelines.

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