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Women in Cardiology

The British Junior Cardiologists' Association identifies challenges

Cardiology training in the UK: an outline

Current specialist cardiology training in the UK takes 5 years and commences after completion of the 2-year Foundation Program, and two further years of general Physicians training (Core Medical Training). After this, successful applicants begin 5 years of Cardiology training (as a registrar or fellow), gaining core cardiology skills and competencies. The final 2 years focus on 'advanced specialist area modules' such as interventional cardiology or electrophysiology. At the end of training a 'Certificate of Completion of Training' (CCT) is awarded, at which point a consultant post can be applied for.

Data on cardiologists in training come from several sources. These include the General Medical Council's (GMC) annual survey and data on admissions and progression from the Joint Royal College of Physicians Training Board (JRCPTB). The British Junior Cardiologist's Association (BJCA) also run an annual, trainee-designed survey, to capture trends in trainee experience.

Gender differences in UK cardiology training

Women are a minority in UK Cardiology. Despite making up over half of medical students and CMTs in the UK, recent data show that women represent 28% of cardiology trainees and only 13% of cardiology consultants (*Figure 1*).[1] In the United States the proportion of female cardiology consultants is almost identical.[2] In 2003, 16.8% of UK cardiology trainees and 7.4% of consultants were female.[3] It has been hypothesized that there is simply a 'lag' before the proportion of female consultants increases, although there is little available data on how many cardiology trainees in the UK do not obtain a CCT or what the average duration of training is.

There are clear gender differences in sub-specialty interest. The 2018 BJCA Survey shows that 43% of male trainees selected interventional cardiology as their preferred advanced module compared to 29% of female trainees (*Figure 2*). A similar trend is also seen in electrophysiology, with 17% of male trainees vs. 6% of female trainees. The converse pattern is seen in imaging, heart failure and devices, although the absolute number of male trainees in these sub-specialities is higher. Adult congenital heart disease (ACHD) is the exception, where there is a greater absolute number of female trainees.[4]

Accessible female role models

Historically, cardiology has been a male-dominated field. This existing gender imbalance may be a deterrent to potential female cardiologists. A survey carried out by Douglas *et al.* looking at Diversity and Inclusion in America emphasized the importance of positive role models in influencing the career decisions of female trainees.[5] This may explain the gender differences in sub-speciality choice; sub-specialities within cardiology that have attracted more female trainees continue to proportionally attract more women due to a greater presence of role models within these areas. There are of course some 'extraordinary' female role models in cardiology, including the current European Society of Cardiology President, Professor Barbara Casadei, in Britain the immediate Past President of the British Cardiovascular Society, Dr Sarah Clarke and the Editor-in-Chief of *Heart* Professor Catherine Otto. However, in routine practice the female trainee has few direct positive female role models to follow.

Sexism in tertiary centres may influence female cardiologists

Recent BJCA survey data have suggested other explanations for gender differences when they choose to train in cardiology, or elsewhere. 2017 results revealed that 9.4% of female trainees have experienced or witnessed sexist language whilst in a cardiology post, compared to 3.5% of male trainees. Fewer than 6% of early stage (ST3/ST4) female trainees reported sexism, but this number increased to 15% in ST5, traditionally the year when trainees move to a tertiary centre and make decisions on advanced training. This is further supported by the observation that 17.8% of women working in tertiary centres experienced or witnessed sexism, compared to 7.0% in district general hospitals. The pattern is repeated in men, where 9.5% of men experienced or witnessed sexism in the tertiary centre, compared to 4.8% in district general hospitals (*Figure 3*). Tertiary cardiology centres in the UK have higher rates of reported sexist language than district general hospitals, which may be a factor in women favouring certain sub-specialties, or other medical specialties entirely.

Over 5 years the BJCA survey has asked cardiology trainees about their preferred advanced modules. For the 3 years before starting advanced training (ST3–ST5), male trainees generally persist with their initial career choices. Female trainees demonstrate significant changes in favour of ACHD, Heart Failure and Imaging, and away from Electrophysiology, Device Therapy and Interventional Cardiology, primarily in ST5 (*Figure 4*).

Work–life balance and flexible training

Cardiology is a competitive speciality and the bar is high in terms of expectations. Traditionally a high proportion of trainees undertake higher degrees. The core cardiology curriculum requires competencies in numerous practical skills including angiography, pacing, and echocardiography. To achieve these often requires working beyond scheduled hours, as demonstrated by both the GMC and BJCA Surveys. Sub-speciality out-of-program fellowships are also common. All of these factors mean that cardiology training is longer in comparison to other medical specialities with less predictable hours. The American Task Force Survey also demonstrated that stable hours and family friendliness were important factors for female trainees in deciding on their future career.[5] There is a clear disparity between the requirements of a cardiology training post and the most common priorities laid out by female doctors choosing their future speciality.

According to the 2017 GMC survey 10.7% of all UK trainees work less than full time (LTFT) and 91.2% of LTFT trainees are female.[6] In the UK most applications to train LTFT are related to childcare responsibilities ('Category 1'), of which few are rejected.[6] Recent BJCA data indicated that approximately 4% of cardiology trainees work LTFT.[4] This proportion is small, particularly when compared to specialities such as paediatrics (24.2%), obstetrics and gynaecology (20.3%), and general practice (27.3%), although is similar to surgery (3.1%).[6] The reasons for these differences are unclear. A flexible

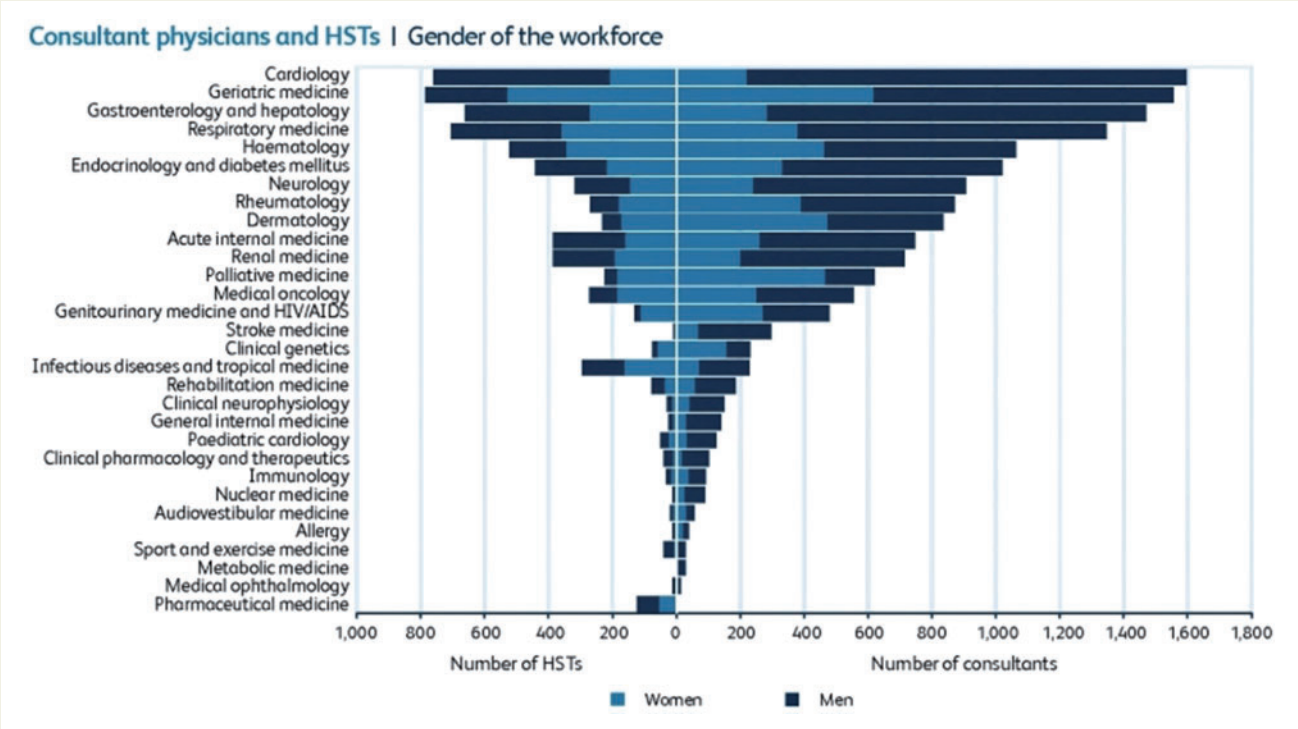

Figure 1 Gender distribution in UK Physicians. Cardiology has the highest number of Consultants, and amongst the highest number of specialist trainees. The proportion of female Consultants (13%) and specialist trainees (28%) is amongst the lowest across medical specialties. Figure adapted from Focus on physicians: census of consultant physicians and higher specialty trainees 2016–17. London: RCP, 2017.

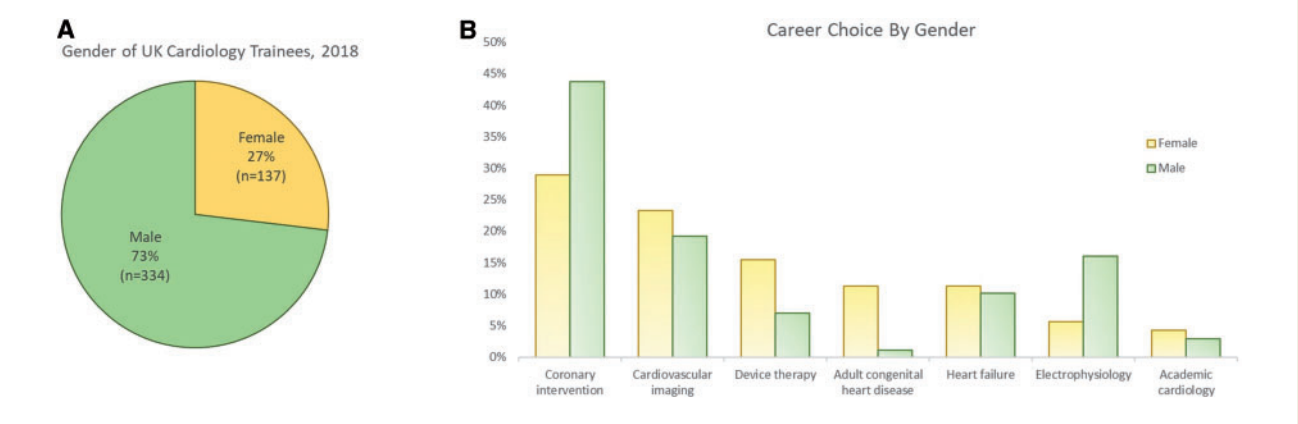

Figure 2 (*A*) Gender distribution in UK Cardiology Trainees (*B*) Choice of Advanced Modular training by gender. Coronary intervention is the most popular first choice career for both genders. Data from the British Junior Cardiologists' Association Trainees' Survey, 2018.

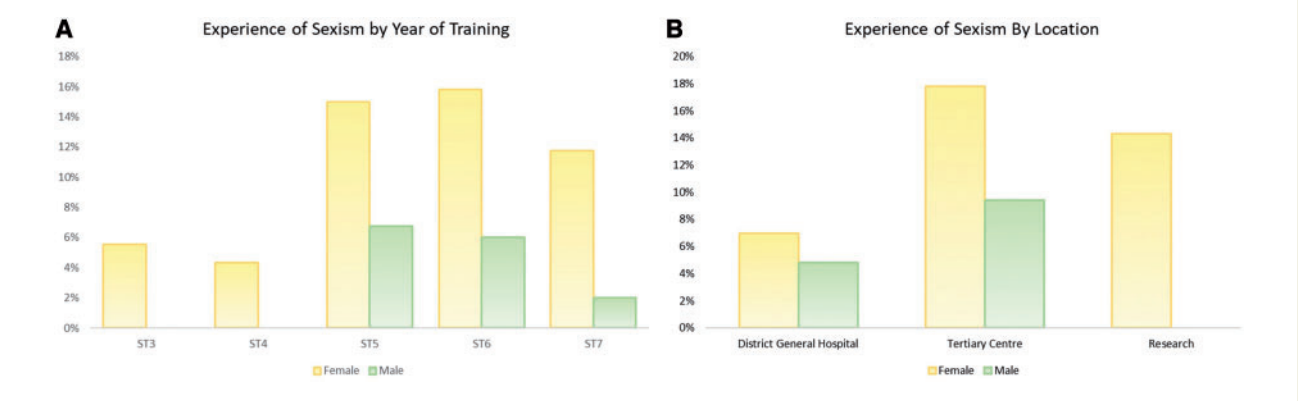

Figure 3 UK Trainees' experience of sexist language by (*A*) year of training and (*B*) location of training. Trainees' experience most sexism in their later years of training, and in Tertiary Cardiology centres. Trainees were asked whether 'In the past year at work, I have witnessed or experienced my colleagues use sexist language.' Data from the British Junior Cardiologists' Association Survey, 2017.

career is an important consideration when family planning and if there is a perception of a lack of support for LTFT training in cardiology this may deter potential applicants. On a positive note, the 2016 BJCA survey demonstrated that whilst LTFT is generally viewed with trepidation, those actually training LTFT report overall good levels of support from colleagues and institutions (*Figure 5*).

A fair future

The Working group of the British Cardiovascular Society recommendations published by Timmis *et al.* in 2005 described the under-representation of women in cardiology along with issues such as sexism, access to LTFT training and access to interventional sub-specialities.[3] Whilst the proportion of female cardiologists has increased many of the other issues seem to remain unchanged. If gender inequality is to be addressed, perceptions of cardiology need to change so that women feel that they are equally able to have a successful career as a cardiologist. Role models are clearly important to demonstrate that this is possible. All senior cardiologists have a responsibility to encourage junior doctors who show potential to consider a career in cardiology, whether they are male or female. There must be support for LTFT training for both genders, allowing trainees the flexibility to pursue other life ambitions. Support is not merely saying 'yes' to requests but creating a positive attitude towards LTFT training. Finally, sexism in the workplace must end, if talented women are to feel encouraged to pursue specialist cardiology training.

Representing and supporting female cardiologists is a core commitment of the BJCA. There are a number of ways in which the BJCA are pursuing this ambition. This year advice about LTFT training was added to the 'National Cardiology Induction Handbook', which is circulated to all new cardiology trainees. Survey questions in 2019 will focus on issues facing LTFT trainees and women, in order to monitor known issues and identify any new ones. We also recognize that there are some issues that are unique to female trainees, such as returning to work after maternity leave. The BJCA LTFT and Women's Representative is involved in a regional mentorship scheme that will be

Figure 4 UK Trainees' aspirations for Advanced Modular training by year of training. Trainees select Advanced Modules in ST5. Female trainee appear to change their training aspirations to a greater degree, and later than male trainees. Data from the BJCA Survey, 2014–2018.

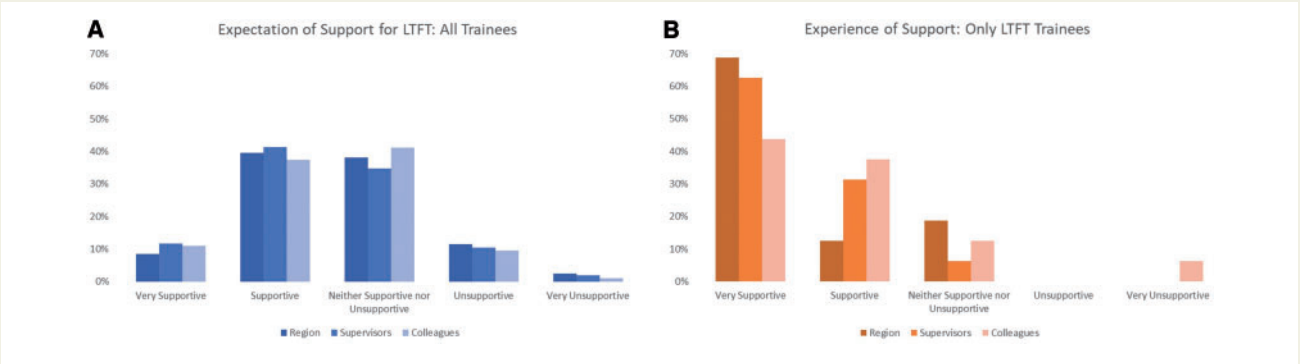

Figure 5 Perceived (*A*) and experienced (*B*) level of support from colleagues, supervisors and regional training systems for less than full time training (LTFTT) applications. Trainees were asked 'If you were to apply/when you applied for less than full time training, how supportive would/were the following be?' Trainees who undertook less than full time training ($n = 16$) reported much better support than was expected by the general trainee cohort. Data from the BJCA Survey 2016.

piloted in 2018. If successful, this could be rolled out nationally. The BJCA also introduced a 'Starter' membership to newly qualified doctors to encourage and support both male and female to apply for cardiology training. The BJCA 'Starter' Conference for potential cardiologists encourages women in its conveners, panels, speakers, and facilitators.

The wider cardiology leadership in the UK has also recognized these issues. The Cardiology Specialty Advisory Committee (SAC) will specifically include considerations for trainees in LTFT training in the design of the forthcoming curriculum. The SAC also supports the role of mentors and role models for all trainees. The British Cardiovascular Society now includes an elected Women in Cardiology position on its

Council and included a dedicated 'Women in Cardiology' session at its 2018 Conference. We sincerely hope that soon, due to these and further actions, this sort of editorial will finally start to look out of date.

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Definition of terms

GMC	General Medical Council is the regulatory body that ensures patient safety within the UK. The GMC sets standards for medical education and practice.
JRCPTB	Joint Royal College of Physicians Training Board sets and maintains the standards for high quality UK medical training
BJCA	British Junior Cardiology Association facilitates and supports training of all UK cardiology trainees. The BJCA is made up of elected trainee members throughout the UK.
BCS	British Cardiovascular Society was founded in 1922 and has evolved into a complex organization that plays a pivotal role in the delivery of cardiovascular health across the UK. The BCS aims to support and represent all those working in the fields of cardiovascular care and research.
SAC	The Cardiology Specialty Advisory Committee, which is responsible for training design and delivery in the UK.
ST3-7	Specialist Trainee Year 3, Year 4, Year 5, Year 6, and year 7 are the 5 years of cardiology training.

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References

References are available as supplementary material at *European Heart Journal* online.

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Catheter interventions for Adult Congenital Heart Disease

A European perspective presented by Alain Fraisse and Massimo Chessa

Considerable progress has been made over the last decades in the diagnosis and treatment of congenital heart disease (CHD) and over 90% of the children born with this condition are expected to survive into adulthood in the current era. This has created a substantial population of patients with adult congenital heart disease (ACHD). As the population of ACHD continues to expand rapidly, so does the potential for transcatheter interventions in this patient population.

Transcatheter interventions for CHD has dramatically evolved over the past three decades to provide definitive treatment to some of the most frequent CHDs such as atrial septal defects, patent ductus arteriosus with nearly 100% early and late survival. More complex procedures such as valve implantation and various types of stenting have emerged to provide additional alternatives to cardiac surgery and many of these complex patients will need subsequent interventions throughout their lives. In addition, the similar interventional techniques used for CHD are applied to treat other acquired cardiac conditions such as paravalvular leak closure or the more recent implantation of atrial flow reducer in patients with cardiac failure. Finally, new scientific evidence for the closure of patent foramen ovale after cryptogenic stroke will further increase the interventional program in ACHD units.

Such complex interventional programmes need to be supported by multimodality imaging that is essential for transcatheter interventions in ACHD.

- Although echocardiography remains the first line investigation for morphology and haemodynamic assessment, it is often limited, especially in patients with chest deformity due to multiple previous surgeries.
- Transoesophageal echocardiography including real-time 3D imaging can be useful in this setting, especially to assess the size and rims of an atrial septal defect before transcatheter closure.
- Cardiovascular magnetic resonance provides unlimited and accurate imaging of the heart and is the gold standard for evaluation of