



TAU FELLOWSHIPS PROJECT REPORT



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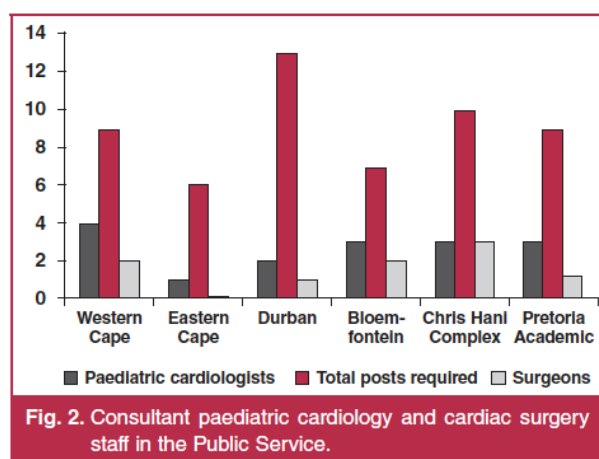
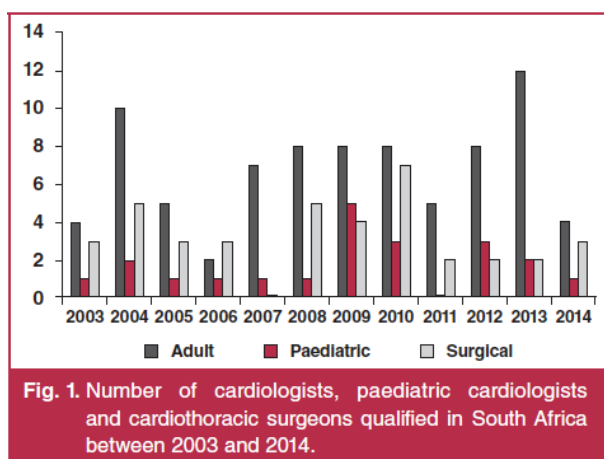
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RE-IMAGINING ECHOCARDIOGRAPHY: A NOVEL WAY FOR SKILL CREATION AND DISSEMINATION – CREATING COMMUNITIES OF PRACTICE IN SUB-SAHARAN AFRICA (SSA)

1. INTRODUCTION

The South African Health Care Sector faces a dire challenge with a quadruple burden of disease in the form of communicable diseases (infections), non-communicable diseases (like cardiac disease), maternal and perinatal disease, and injury-related disease, all resulting in a fight for competing resources. We are currently facing a growing burden of non-communicable disease (NCD) with cardiovascular disease being responsible for 38.3% of all NCD mortality and 22.9 million disability-adjusted life years (DALY's) in Africa¹. Powerful historic and social forces further contribute to our failing healthcare system.

South Africa currently has just over 160 registered cardiologists serving 60 million people, i.e. 1 cardiologist per 356 450 population. Furthermore, specialists are disproportionately located in the private sector. The private sector serves 16% of our population and has +/- 140 cardiologists. Fewer than 30 cardiologists serve 84% of the population in the public health care system. In 5 out of 9 provinces, no cardiology service exists in the public health care sector. At present, South Africa trains fewer than 10 cardiologists per year (see figure below), as it takes 13 years to train a cardiologist (7 additional years after completing internship and community service)². There are currently only 8 cardiology training centers, many whom have lost even their existing few training posts over recent years.



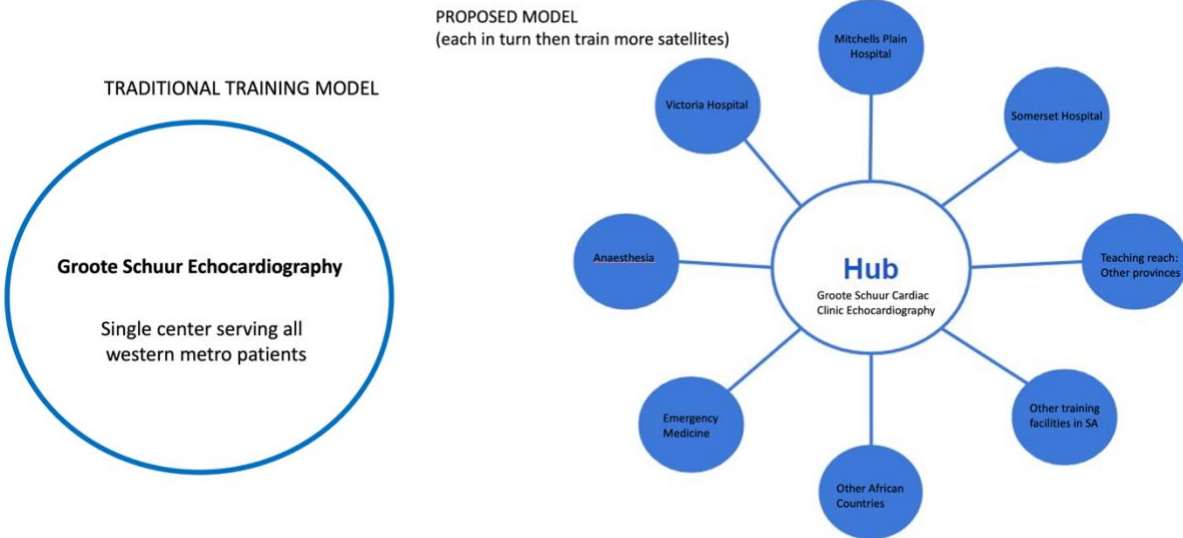
Echocardiography is an essential clinical skill used to image the heart and is required to diagnose cardiac disease. Currently it is available in the private health care sector and in select tertiary academic centers in South Africa. Because echocardiography has traditionally been taught only to cardiologists and cardiology

technicians as part of their formal university-based programme, there exists a very limited skillset at national level. The urgent and dire problem we now face is that the current training model, based on an antiquated UK system, is not meeting the needs of the existing burden of disease, nor the expected exponential rise in cardiovascular disease (CVD) sufficiently, and would thus never be able to meet the demand, resulting directly in poor patient access to care and poor clinical outcomes.

A landmark Lancet publication in 2009 looking at strategies to address ‘Health in South Africa’ remarks on the urgent need for innovative strategies for existing problems, including the way services are structured³. Given that a rapid sudden influx of resources and teachers is unlikely, an alternative, novel teaching model for echocardiography is required to meet the needs of both the trainees, and the escalating burden of disease. A paradigm shift of moving from siloed, university-based training for a select few (the cardiologists) to a broader model of teaching that extends to community and district level clinicians is required. If successful this new transformative model would ultimately result in a systematic increase of this skill across a vast geographical area, multiple institutional arenas, and across borders into neighboring countries. It would not only create greater capacity but a sustainable skillset in practitioners other than those in traditional cardiology roles (task-shifting and task-sharing).

2. DESCRIPTION OF PROJECT

In 2015, at the Groote Schuur Hospital (GSH) Cardiac Clinic, I started an echocardiography teaching program, to increase the quality of imaging of our cardiology trainees but also to extend training to other clinicians who, within the traditional training model, would not have had access to formal echocardiography training (e.g. cardiac technicians, physicians, emergency medicine consultants, anesthesiologists, cardiothoracic surgeons). This programme initially entailed a weekly 1-hour tutorial, with presentations by my cardiology trainees and supervised and moderated by me. With the advent of the COVID-19 pandemic, the teaching platform shifted online, and is currently in a hybrid format. The online component has allowed us to achieve a greater reach with colleagues from Zimbabwe, Mozambique, Namibia, Ethiopia, and Kenya now participating online. For the clinicians based at district level hospitals in the Western Metro, I embarked on a practical learning component of intensive one-on-one training time (a full day per week) in addition to the lectures. The programme extends over a one-year period and has been repeated annually since 2015.



This has resulted in the creation of a community of practice (COP)⁴⁻⁶ in echocardiography, improving collaboration, scope for research and improved pathways for referral of patients. A hub-and-spoke model focuses on upskilling existing personnel to a proficiency that would allow for the training of others (see figure above), thus building a pipeline, has been successfully utilized, both locally and internationally, and shows promise in low- and middle-income countries (LMICs)⁷.

This proposed model would provide an important shift for UCT Faculty of Health Sciences/Department of Medicine to decentralize teaching and learning of echocardiography from an elite small group teaching environment at the big tertiary institution, to a broader group of clinicians serving a wider community base, thus providing greater access to quality teaching without having to expend personal financial resources or compete for limited spots at elite institutions. It speaks directly to transformative teaching practice, capacity building and improved healthcare for previously marginalized communities.

For my TAU project, I assessed the efficacy of the existing hybrid echocardiography program with the aim of improvement toward a more formal and robust teaching platform. I conducted a cross-sectional survey in April/May 2023 (UCT HREC 231/2023) examining various aspects of the current program. All prior course attendees, still on the active mailing list, were invited to participate. Though I initially aimed to get an idea of knowledge/content testing, I restricted the questionnaire to aspects related to the impact and principles of referral and shared knowledge improvement. I evaluated the 'reach' of the program, the theoretical and academic value of the program, the networks and referral pathways, and the creation of communities of practice. I further questioned aspects related to sustainability of the program as well as focusing on areas of improvement. This survey formed the basis of a first iteration cycle of a design-based research approach. This research has its basis in flux pedagogy, critical pedagogy, and humanizing pedagogy.

3. FINDINGS / ACHIEVEMENTS

A total of 100 participants, since the inception of the course in 2015, were invited to participate in the survey. Thirty-four percent of invitees responded. Most responders attended within the last 3 years, making it a contemporary cohort, familiar with the current iteration of the teaching programme. Encouragingly, only 30% of the responders were cardiologists with 70% being professionals outside the direct realm of the traditional trainees, i.e. our exact target group, for expanding the practice of echocardiography beyond the realm of only the cardiologist. Healthcare professionals included were physicians (internists), emergency medicine physicians, anesthesiologists, cardiac technologists in private practice and cardiothoracic surgeons. Most respondents were within the first 5 years of qualifying with their primary degree. Two thirds of responders were based at a tertiary level university/academic hospital (like Groote Schuur Hospital) with a third of the responders being based at district/community level hospitals. Over 40% indicated that they too were involved with training students/other practitioners in echocardiography, allowing for the creation of the 'hub-and-spoke' model described earlier. The main area of suggested improvement of the programme was the desire for more case-based discussion during sessions allowing for even more interaction from the attendees (>60% of respondents suggested this). This speaks directly to more engaged participation, once again supporting the notion of a community of practice.

Twelve percent of the respondents were unsure if the format of the current teaching program is appropriate for its stated aims. More than 87% indicated that this teaching program has altered the way they think about and teach echocardiography – this was mainly related to image acquisition, and improved hemodynamic knowledge. They described the strength of the programme being the quality of teaching and the detailed concepts covered. Networking and improved referral patterns were described benefits of those in district level hospitals (15%). Most responded to areas of improvement in relation to their individual personal learning, rather than seeing it from a holistic systems or community point of view.

I am convinced that this project has the potential to create capacity and make a huge impact for the University and beyond, from a clinical and social justice point of view. We are already reaching a group of clinicians with no previous access to dedicated training, many of whom are already becoming teachers in their field. This is the ideal platform from which to expand the program and clinical services.

Data at this point is too limited to support any definitive conclusions regarding the current impact of the programme on patient care itself at community level but, it signals the potential for future directed formal approaches to reach the goal of sustainable and integrated community-based teaching of echocardiography.

4. CHALLENGES

My greatest challenge is that this project is, at present, largely a solo initiative at present with minimal buy-in from hospital management, the University and Faculty of Health Sciences and the Colleges of Medicine of South Africa (CMSA). A challenge facing many clinicians involved with the training of specialists and subspecialists, is the lack of integration and jurisdiction of the University and the body that governs subspecialist training, the CMSA. The CMSA stipulates that all training is done by a university-affiliated department and its academics. This dichotomy results in many university-affiliated academics providing all the training for sub-specialist clinicians, with no input or support from the University. The training of clinicians and the direct impact on patient care is, in fact, an area of major social responsibility and immense potential impact for the University.

The respondents mainly included trainees who themselves were part of existing University-based cardiology programs. The numbers of participants from community-based settings were fewer than anticipated. This represents an area for more directed potential recruitment to the teaching programme from district-level hospitals. The lack of a 'qualification or accreditation' of the programme poses another stumbling block for its uptake by clinicians. Creating a more sustainable programme on a robust platform (like Vula) would increase the throughput. Another potential improvement would be to expand it into an accredited /certified short course.

As with all medical training, there exists the medico-legal aspects with the potential liability of poorly trained individuals making clinical errors resulting in adverse patient outcomes. One of the greatest stumbling blocks that will require much deliberation, is the quality control of individuals exiting the programme and determining where the locus of responsibility for individuals performing these tasks unsupervised will lie.

Almost all respondents provided favorable feedback, though this is expected, given the nature of selection bias in survey responders.

Lastly, another concern centers around the concept of networking and the creation of a Community of Practice within the group. Most individuals are attending for personal academic advancement and do not see networking or capacity creation as personal goals. Through more case-based interactive teaching however, networking and increased engagement will be a natural side-effect of the programme. A further challenge would be for the concept/vision to be communicated explicitly and clearly to those in attendance, to be championed and accepted and taken forward.

5. THE NEXT STEPS

It's clear that this course is valued and provides a small yet tangible avenue of capacity building for cardiovascular diagnostics, by creating more practitioners able to perform cardiac imaging, thus reducing patient referrals to tertiary centers and meeting the patient needs at community level.

Firstly, I plan to provide feedback to the participants of the programme, and sourcing from them tangible solutions to some of the problems they've identified. This consultation will hopefully result in increased buy-

in and a sense of equal contribution and community from them.

Secondly, setting up meetings with both the University (Faculty of Health Sciences) and the Colleges of Medicine of South Africa to position this course carefully between the two will be an important and strategic step to ensure its sustainability. We need to also consider a shift in who we train and what we train for – the current needs could potentially be met with skillsets outside of ‘pure cardiology’. I would advise collaboration between the clinical services (myself) and members from Faculty and the Colleges of Medicine of South Africa. Both provincial and national Department of Health buy-in is also required. Finding a suitable robust platform to house the course material and create fora for discussion and input around clinically relevant cases is imperative. I will be exploring this with the University, in the form of a VULA platform. I’d also like to explore the possibilities for a certificate of completion to make the course more attractive to clinicians. I will need to explore the medico-legal aspects of providing a training course in a non-accredited sphere, though this should not be seen as a definitive stumbling block given the paucity of cardiologists graduating from the current training system per year at present.

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