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United in earnest: first pilot sites for increased surgical capacity for rheumatic heart disease announced by cardiac surgery intersociety alliance

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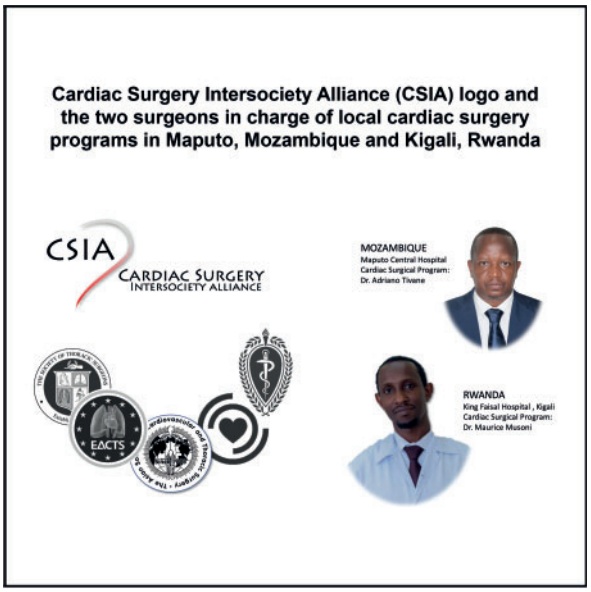

ABBREVIATIONS

AATS	American Association for Thoracic Surgery
ASCVTS	Asian Society for Cardiovascular and Thoracic Surgery
CSIA	Cardiac Surgery Intersociety Alliance
CTD	Cape Town Declaration
EACTS	European Association for Cardio-Thoracic Surgery
RHD	Rheumatic heart disease
WHF	World Heart Federation
WHO	World Health Organization

Abstract

OBJECTIVES: Rheumatic heart disease (RHD) affects >33 000 000 individuals, mostly from low- and middle-income countries. The Cape Town Declaration on Access to Cardiac Surgery in the Developing World was published in August 2018, signalling the commitment of the global cardiac surgery and cardiology communities to improving care for patients with RHD.

METHODS: As the Cape Town Declaration formed the basis for which the Cardiac Surgery Intersociety Alliance (CSIA) was formed, the purpose of this article is to describe the history of the CSIA, its formation, ongoing activities and future directions, including the announcement of selected pilot sites.

RESULTS: The CSIA is an international alliance consisting of representatives from major cardiothoracic surgical societies and the World Heart Federation. Activities have included meetings at annual conferences, exhibit hall participation for advertisement and recruitment and publication of selection criteria for cardiac surgery centres to apply for CSIA support. Criteria focused on local operating capacity, local championing, governmental and facility support, appropriate identification of a specific gap in care and desire to engage in future research. Eleven applications were received for which 3 finalist sites were selected and site visits conducted. The 2 selected sites were Hospital Central Maputo (Mozambique) and King Faisal Hospital Kigali (Rwanda).

CONCLUSIONS: Substantial progress has been made since the passing of the Cape Town Declaration and the formation of the CSIA, but ongoing efforts with collaboration of all committed parties—cardiac surgery, cardiology, industry and government—will be necessary to improve access to life-saving cardiac surgery for patients with RHD.

Keywords: Cardiac surgery • Rheumatic heart disease • Stage I lung cancer • Underserved communities

Rheumatic heart disease (RHD) is estimated to affect >33 000 000 individuals worldwide—equal in prevalence to human immunodeficiency virus [1]. RHD is a chronic autoimmune disease that occurs as a consequence of streptococcal infection of the throat or skin that can affect the heart, with its primary effects being scarring, fibrosis and calcification of heart valves (Fig. 1) [2, 3]. It is a leading cause of heart failure in the underdeveloped world [4, 5]. RHD is the most common cause of cardiovascular disease among young people and is a major contributor to cardiovascular mortality and morbidity, causing an estimated 300 000 deaths per year and 10 513 200 disability-adjusted life-years lost annually [6–8].

The international community previously formally committed itself to improving and curbing the burden of RHD through a focus on primary and secondary prevention. The Pan African Society of Cardiology, the World Health Organization (WHO) Regional Office for Africa, the World Heart Federation (WHF) and the South African National Department of Health convened to form the Drakenberg Declaration [9]. This declaration focused on raising awareness, dissemination of information about RHD, advocacy and prevention, significantly contributing to the World Health Assembly of the WHO adopting a declaration on RHD in May 2018.

Between 1990 and 2015, the estimated number of annual deaths decreased from 347 500 to 319 400 (decrease of 8.1%) [6]. Nevertheless, the burden of disease from RHD remains high [10]; there are an estimated 300 000 deaths annually and a need for 200 operations per million population in low-income countries, where it is estimated that >6 billion individuals have insufficient or no access to cardiac surgery [11]. In light of this compelling situation, the Cape Town Declaration (CTD) was drafted, endorsed and signed by all the major societies of cardiac surgery, as well as the WHF and leading corporate representatives, signalling the commitment of the global cardiac surgery and cardiology communities, as well as the medical industry and the relevant governmental bodies, to improving access to cardiac surgical care for RHD worldwide. The CTD was published simultaneously in multiple journals in the field [12].

The passing of the CTD falls in a unique period of time in the world of global surgery, especially given the many challenges remaining in delivering cardiac surgical care in low- and middle-income countries. These include the dominance of RHD in rural populations, the unavailability of valves for replacement and difficulties with anticoagulation delivery [13]. The goal of this article is to outline the history behind the CTD and its mandate for the establishment of the Cardiac Surgery Intersociety Alliance (CSIA), the action arm of the CTD that serves as an international alliance dedicated to improving access to cardiac surgical care for rheumatic heart disease patients. This article will outline the history of the CSIA, its formation, founding endeavours and initiatives to date, as well as future directions.

A HISTORICAL REVIEW

Various international conglomerations or societies have focused on the delivery of surgical care in a number of global and local contexts. For example, the International Society of Surgeons (also known as the Societe Internationale de Chirurgie) was founded in 1902 with the goal of promoting progress in science, research and discussion, for which the first international congress took place in 1905 [14]. Over the decades since, global surgery has evolved as surgical sciences have advanced.

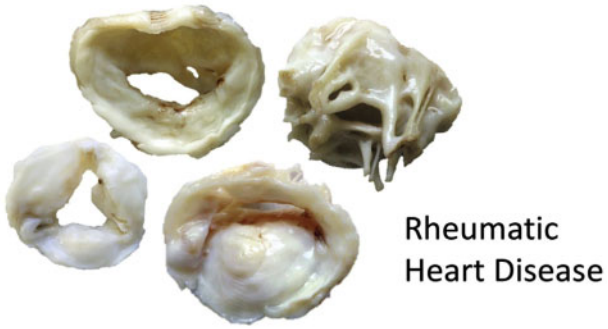

Figure 1: Typical appearance of fibrotic heart valves affected by rheumatic heart disease. With an incidence 4 times higher than congenital heart disease in low-income countries [11] together with the young age of patients, the lack of local cardiac surgical capacity is a major source of debilitating morbidity and premature mortality. (Reproduced from Scherman J, Zilla P. Poorly suited heart valve prostheses heighten the plight of patients with rheumatic heart disease. *Int J Cardiol.* 2020;318:104–114, with permission from Elsevier.)

As the United Nations Millennium Development Goals sought to improve health care broadly, many, including the WHO, have offered a role and space for surgery to help meet these goals [15, 16]. In January 2014, World Bank President, Dr Jim Yong Kim, helped reinforce the role of surgery in the field of global health. He stated 'surgery is an indivisible, indispensable part of healthcare' [17]. The Lancet Commission on Global Health published its seminal paper, 'Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development' [18]. The publication, however, was not the sole impetus from which scholars began to focus on research in this field. A Scopus review by Sgrò *et al.* [19] suggests that between 1987 and 2017, 1623 articles dealing with global surgery were published, demonstrating an increase from a total of 14 in 1987 to 149 in 2017. In September 2015, the sustainable development goals were adopted by world leaders. Scholars have since debated the role that surgery might play in obtaining the sustainable development goals [20–22].

Despite the growth in medical and surgical technologies throughout this period of time, RHD has continued to be a major public health issue in the developing world.

THE CTD

At the 97th American Association for Thoracic Surgery meeting in Boston, MA, a number of key leaders of the major international societies of cardiac surgery, along with other interested individuals, gathered to focus on the development of a south–north dialogue on the topic of increasing access to cardiac surgery in the developing world.

It was within this context that international leaders in cardiac surgery, cardiology, industry and government were called together by Peter Zilla, MD, the Christiaan Barnard Professor of Cardiac Surgery at the University of Cape Town. Dr Zilla selected the occasion of the 50th Anniversary of the first heart transplant, which was performed at Groote Schuur Hospital in Cape Town, to convene this body to address the vast inequality in access to cardiac surgery that exists between the developed and the developing world. The deliberations of the gathered participants resulted in 'The Cape Town Declaration on Access to Cardiac Surgery in the Developing World'. This document was adopted

Table 1: Criteria for site selection—cardiac surgery intersociety alliance applications[a]

1.	A 'project development plan' that lays out the financial and organizational details of the current cardiac surgical capacity as well as proposed growth curve over the next 5 years (e.g. 50–200 cases annually) with clear distinction between existing local commitments and the gap that is sought to be closed by involving CSIA members and institutions.
2.	Clear explanation of current staff capacity, showing the limits of capacity of the existing team and the needs arising from growth, highlighting the time plan when training needs to commence of further doctors/nurses/perfusionists, and, again, the local contribution to these needs versus the gap requested to be closed with CSIA assistance.
3.	A strong letter of intent by the local 'initiator/champion' explaining why he/she thinks that the site should qualify for CSIA support, and a statement that he/she will be the person(s)/organization interacting with the CSIA and driving the process on the ground with passion and commitment.
4.	Written commitment by a local authority (local government or city council, ministry of health, etc.) that they support the program within the envisaged scope and guarantee their part for sustainability, including specific portions of the program for which they will guarantee support.
5.	A written commitment by the institution to be 'enabling' regarding hospital space (intensive care unit, operating rooms, wards) and staff (doctors, nurses, perfusionists, etc.).
6.	Statement of willingness to participate in a future cardiac surgical registry and database to help improve the gap in data available on cardiac surgery outside high-income countries.

CSIA: Cardiac Surgery Intersociety Alliance.

[a]Adapted from Cardiac Surgery Intersociety Alliance [24], with permission from The Society of Thoracic Surgeons.

by the major international societies of cardiac surgery and published simultaneously in 9 journals of the specialty in mid-2018.

The mission of the CTD is to '[t]o urge all relevant entities within the international cardiac surgery, industry, and government sectors to commit to develop and implement an effective strategy to address the scourge of rheumatic heart disease in the developing world through increased access to life-saving cardiac surgery' [12]. The underlying focus was on 'building local capacity' while also encouraging a concerted effort and continued dialogue between the global South and North. Aim 1 of the CTD was to '[t]o establish an international working group (coalition) of individuals from cardiac surgery societies and representatives from industry, cardiology, and government to evaluate and endorse the development of cardiac care in low- to middle-income countries'. The embodiment of this aim of the CTD is the CSIA.

ACTIVITIES OF THE CSIA

The CSIA is composed of representatives from 4 major cardiothoracic surgery societies globally [The Society of Thoracic Surgeons, American Association for Thoracic Surgery (AATS), European Association for Cardio-Thoracic Surgery (EACTS) and the Asian Society for Cardiovascular and Thoracic Surgery], as well as representatives from the WHF. The CSIA has met at The Society of Thoracic Surgeons, AATS and EACTS meetings each year since 2017. With the CTD expressing the goal of initially endorsing one to 3 cardiac surgery centres for additional capacity building, the CSIA has worked to bring these pilot goals to fruition. Activities directed to this end have included general recruitment in the form of manned booths with handouts of key publications at exhibit halls of meetings of the societies. In addition, the CSIA has established and published criteria (Table 1) by which potential clinical sites would be evaluated for possible endorsement [23, 24]. As an acknowledgement of these efforts, at AATS Toronto in May 2019, plenary session time and a full morning session were devoted to CSIA-related presentations.

Site selection criteria

Through a series of CSIA meetings and discussions, a specific list of criteria was published for cardiac surgery centres in low- and middle-income countries to apply for CSIA endorsement. The criteria were approved by society leaders of all those societies that participated in the CSIA and published simultaneously in the major cardiothoracic surgery journals (Table 1) [23, 24]. Importantly, the focus of these criteria included a local champion, clear documentation of governmental support, a tangible project development plan, evidence of institutional support (e.g. hospital space, intensive care unit capacity) and a willingness to participate in a future cardiac surgery registry and research activities.

Site visits and announcement of selected sites

The CSIA received 11 applications from programs primarily in sub-Saharan Africa and Asia. An initial screening process narrowed this to 3 finalist sites that were presented and discussed at the EACTS meeting in Lisbon in October 2019. The CSIA deemed it of critical importance that these finalist sites each undergo an in-person site visit. In February 2020, 4 CSIA members (authors Peter Zilla, Ralph Morton Bolman, Percy Boateng and Zachary Obinna Enumah) visited the 3 finalist sites: Hospital Central Maputo (Mozambique), Parirenyatwa Group of Hospitals (Zimbabwe) and King Faisal Hospital Kigali (Rwanda). Site visits consisted of meeting with members of the cardiac surgery department locally (including the local champion), governmental officials (e.g. Minister of Health), hospital directors and ancillary staff (e.g. anaesthesia, perfusion), a tour of the facilities and a presentation of the projected plans and goals for capacity building. Gaps for which support was being requested were identified at each site, and ample time was provided for appropriate questions, answers and discussions between the CSIA team and the local cardiac surgery team and sponsors.

After all visits, each centre was judged against the criteria published. The 2 sites that best approximated the published site criteria and were thus endorsed by the CSIA were:

- Hospital Central Maputo in Maputo, Mozambique; and
- King Faisal Hospital Kigali in Kigali, Rwanda.

Strong attributes of the selected cardiac surgery programmes in Mozambique and Rwanda included a tangible plan to increase surgical volume beyond the current level, strong and transparent

Figure 2: Cardiac Surgery Intersociety Alliance meeting with the cardiac surgery team and the Minister of Health—Mozambique. (Photograph from Peter Zilla's personal collection on behalf of the Cardiac Surgery Intersociety Alliance.)

governmental support and extensive collaboration within the local hospital system (e.g. support from hospital administration, cardiology and anaesthesiology) (Fig. 2).

Hospital Central Maputo is the largest government hospital in Mozambique. Since 2007, Hospital Central Maputo has performed about 30–50 heart surgeries each year with the primary pathology being RHD (∼90%). King Faisal Hospital Kigali performs about 50 heart surgeries a year and is a major referral centre in Rwanda. This site is unique from Hospital Central Maputo in that it is run through a public–private partnership between the hospital and the Ministry of Health, but it does accept patients with all tiers of insurance. King Faisal Hospital Kigali is at a unique transition time in its cardiac surgery department, as formerly all cases were performed in collaboration with visiting international cardiac surgery teams, but it is currently transitioning to be self-sufficient by now having the only Rwandan cardiac surgeon in the entire country.

It should also be noted that in this year of the COVID-19 pandemic, the activities and momentum of the entire site selection process of CSIA have been disrupted and delayed. The site visits in Zimbabwe, Mozambique and Rwanda were accomplished in early February 2020. COVID-19 was just emerging on the world stage at that time. Of note, we were screened at each airport we visited with temperature measurement or a travel and symptom questionnaire. With the ongoing suspension of in-person meetings, CSIA has been unable to publicly announce the final sites selected for endorsement, a necessary step before initiating fundraising efforts for those sites. That is why the decision was taken to prepare a manuscript detailing the process employed and the outcome of that process, namely, the endorsement of the 2 sites listed in this publication.

Other benefits

As a result of the collaborations and site visits, a number of unpredicted benefits have also come to fruition. This includes the invitation and involvement of 1 cardiac surgeon from Mozambique in a mitral valve workshop that took place in Cape Town, South Africa. This was fully sponsored. Additionally, liaising among CSIA members and industry on behalf of an applicant program directly resolved an impasse between 1 applicant programme and a supplier, thus reopening avenues for acquisition of consumables for cardiac surgery.

FUTURE DIRECTIONS

As the unmet need in global cardiac surgery remains staggeringly high, the need for continued focus on improving access to cardiac surgery for patients with RHD is increasingly timely. Substantial progress has been made in progressing dialogue and activities since the passing of the CTD 3 years ago. With official sites (Hospital Central Maputo in Mozambique and King Faisal Hospital Kigali in Rwanda) now endorsed, the goal of the CSIA will be to continue working with these sites in appropriate fundraising, resource acquisition (e.g. through donations) and educational initiatives. The WHF has commissioned an investment case for the prevention and management of RHD in the African Union, 2021–2030, which will provide detailed costing for cardiothoracic surgery. This report should be available by the end of 2021 [25].

A noted former global medical industry executive has generously agreed to work with CSIA to help identify resources for the endorsed sites. This will be done primarily through approaching international healthcare companies and foundations for their assistance in providing critical supplies and resources. An ongoing dedicated effort with collaboration of all committed parties—cardiac surgery, cardiology, anaesthesiology, industry and government—will be necessary to help close the gap in resources and knowledge and improve access to life-saving cardiac surgery for patients with RHD. While the efforts of the CSIA are focused on increasing access to life-saving cardiac surgery for patients with established late-stage RHD, early diagnosis and prevention of RHD still remain overriding goals of the international cardiology and cardiac surgery community. Only through a combination of interventional and preventive approaches can the scourge of RHD ultimately be eliminated from the developing world, as it has from the developed world.

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