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## **Congenital Heart Surgery in a Developing Country: A Few Men for a Great Challenge**

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## Congenital Heart Surgery in a Developing Country A Few Men for a Great Challenge

Noedir A.G. Stolf, MD

The article by Larrazabal et al<sup>1</sup> in this issue of *Circulation* can be analyzed from several points of view. The first is the humanitarian aspect involved in the decision of Dr Aldo Castañeda to return to Guatemala and start a program of congenital heart surgery. After so many contributions to congenital heart surgery as chair of the Department of Cardiovascular Surgery at the Children's Hospital in Boston with all its available facilities, facing the difficulties of a country with tremendous social and economic problems was an example of persistence and idealism. It is also noteworthy that the recognized human and material support came from United States. Furthermore, the success of the project is measured by the increasing number of patients in each period studied, by the decrease in mortality, and especially by the training of personnel. This last aspect is well demonstrated in the case of the surgeons in that Dr Castañeda was progressively replaced in each surgical procedure. Finally, it is worth mentioning the methodology to validate the improvement in results with risk adjustment and comparison with US standards.

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Nevertheless, during the study period, a high percentage of simpler cases and older patients is constant. The next step could be to work on early referral and diagnosis of heart disease in the neonatal population to extend the benefits to complex cases.

Performing congenital heart surgery in developing countries is one of the greatest challenges in cardiovascular surgery. The possible options are referring the patients to other countries, having foreign surgeons come to operate on patients, and developing a specialized center for congenital heart surgery.

Referring patients to other countries is the worst option. It has high costs, benefits a small number of, usually wealthy, patients, and does not create human and organizational expertise for the country.

Bringing foreign surgeons to operate in the country is a better alternative but also assists only a limited number of patients. The results are not consistently satisfactory because

hospital conditions are frequently not good enough. The only advantage is the possible training of local surgeons and hospital personnel.

The ideal option is to develop the program in  $\geq 1$  institutions in the country. It is a challenging choice because it requires investing in technology, training cardiologists in diagnosis and intervention, and training surgeons and intensive care unit personnel. Dr Castañeda's group is to be congratulated for choosing this option.

In all developing countries of Latin America, referral of congenital cases to the United States, Brazil, or other countries has been very common, individually or in efforts to establish some kind of cooperation. In several countries, surgeons were always present who had trained in the United States, Brazil, or other countries in congenital heart disease surgery, and in some countries, US or Brazilian surgeons have operated regularly. Nowadays, in some of these services, congenital heart surgery is performed routinely even in complex cases, but in others, this kind of cooperation did not succeed in creating specialized services. As far as I know, only 5 countries in Latin America besides Guatemala have  $\geq 1$  centers performing an adequate volume of and all kinds of operations.

Brazil, in several aspects a developing country, had an early development in cardiovascular surgery, being able to produce national technology at a low price. About 70 000 cardiovascular operations and  $\approx 20\,000$  pacemaker/cardioverter-defibrillator implantations are performed annually in the country. Of these, 13% are operations for congenital heart disease. One-hundred-eighty-four services of cardiovascular surgery exist, and congenital heart disease surgery is performed in every single center.<sup>2</sup> Nevertheless, only 15 services perform large volumes of complex, neonatal cases. Even with a long tradition in cardiovascular surgery, obtaining material resources and training specialized professionals for implantation of these services was a very difficult process.

In Brazil, only 1 evaluation is performed by the Ministry of Health of mortality in cardiovascular surgery, including congenital, but no risk stratification or deeper analysis is performed.<sup>3</sup> This additional evaluation is part of an ongoing study. In regard to follow-up of the results, the only available data for complex congenital surgery are those presented in scientific meetings showing an improvement during the time periods.

In regard to financing, among the Brazilian estimated population of 180 million inhabitants, only 40 million have private insurance; an unknown number have totally private insurance, and the rest are covered by the government social security. These include employed people who pay a minimum

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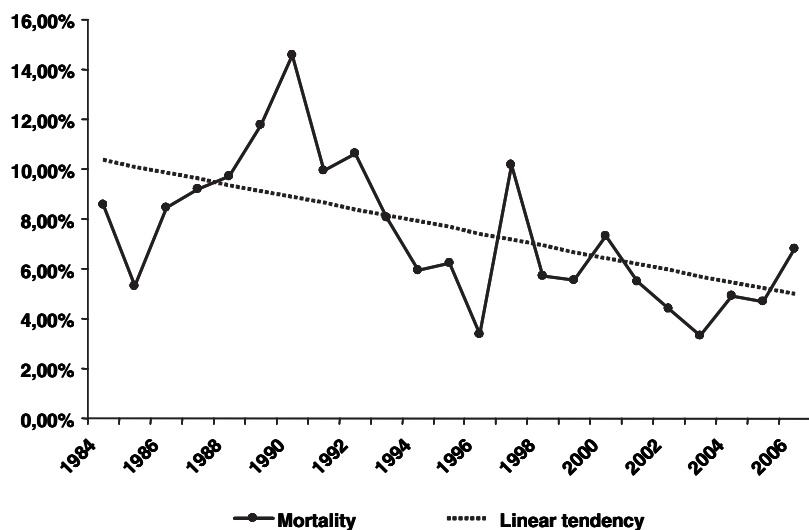


Figure. Heart Institute University of São Paulo database. Mortality of congenital heart surgery.

and those who pay nothing, according to a principle of the government that “health assistance is a right of the citizen.” Consequently, the greatest portion of the operations in cardiovascular surgery, especially congenital cases, in private or public hospitals are paid for by the Ministry of Health. Although payment is higher for congenital cases, it is still quite low for the hospital and medical team.

In our country, the most important reference center for congenital heart surgery is the Heart Institute–University of São Paulo, with a growing number of cases per year, reaching a plateau of  $\approx 800$  cases. The service is a reference for complex heart disease for all the regions in the country and for other South American countries. Recently, the majority of patients have had complex cases, and despite the increasing complexity of the diseases, mortality has decreased in the institution (the Figure).

As shown by the Larrazabal et al article analyzing the Guatemalan experience, competent centers for congenital heart surgery can be established in developing countries and can improve their performance over the years. However, this difficult task involves local or foreign investment and considerable creativity, the same creativity shown by such original contributions of Latin American surgeons as the switch arterial operation or Jatene operation,<sup>4</sup> Barbero-Marcial technique for truncus arteriosus,<sup>5</sup> da Silva modification of Ebstein<sup>6</sup> from Brazil, or the Fontan modifications by Kreutzer<sup>7</sup> in Argentina.

In conclusion, and in other words, “a few good men for a noble task.”

## Disclosures

None.

## References

- Larrazabal LA, Jenkins KJ, Gauvreau K, Vida VL, Benavidez O, Gaitán GA, Garcia F, Castañeda AR. Improvement in congenital heart surgery in a developing country: the Guatemalan experience. *Circulation*. 2007;116:1882–1887.
- Leão BF, Bernardes MM, Levin J, Moura L, Bandarra E, Modesto LM, Sousa AM, Cunha RE, Filho MR. The Brazilian national health informatics strategy. *Medinfo*. 2001;10(pt 1):38–42.
- Ribeiro AL, Gagliardi SP, Nogueira JL, Silveira LM, Colosimo EA, Lopes Nascimento CA. Mortality related to cardiac surgery in Brazil. *J Thorac Cardiovasc Surg*. 2006;131:907–909.
- Jatene AD, Fontes VF, Paulista PP, Souza LC, Neger F, Galantier M, Sousa JE. Anatomic correction of transposition of the great vessels. *J Thorac Cardiovasc Surg*. 1976;72:364–370.
- Barbero Marcial M, Riso A, Atik E, Jatene A. A technique for correction of truncus arteriosus types I and II without extracardiac conduits. *J Thorac Cardiovasc Surg*. 1990;99:364–369.
- da Silva JP, Baumgratz JF, da Fonseca L, Franchi SM, Lopes LM, Tavares GM, Soares AM, Moreira LF, Barbero-Marcial M. The cone reconstruction of the tricuspid valve in Ebstein’s anomaly: the operation: early and midterm results. *J Thorac Cardiovasc Surg*. 2007;133:215–223.
- Kreutzer GO. Atrioventricular connections versus atriopulmonary anastomosis. *J Thorac Cardiovasc Surg*. 1984;87:147.

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