

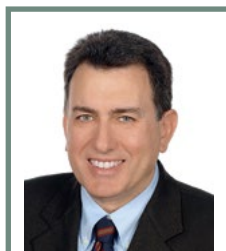
OPTIMIZING VALUE AND QUALITY IN HEALTHCARE FOR CHILDREN

PEDIATRIC CARDIAC SURGERY AS A PARADIGM OF EFFECTIVE PARTNERSHIP
BETWEEN CLINICAL MEDICINE, SCIENCE, AND ENTREPRENEURSHIP

The quality of healthcare provided to children is an important indicator of the overall status and success of any healthcare system.

An even more discriminating criterion is the quality of care provided to children with heart disease, most of whom suffer from congenital heart diseases (CHD). These are developmental defects of the heart existing at birth in approximately 1% of newborn babies around the world, that is, in 1,000 babies every year in Greece, or, in one baby born with heart disease every 30 seconds somewhere in the world.

Most patients with CHD require surgical therapy, frequently in the neonatal or infant period, and many will need more than one



— BY —
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operation. In the not so distant past, morbidity and mortality were very high. However, over the last couple of decades, thanks to progress achieved in medical knowledge and technology, we can now cure most patients born with these conditions, providing them with a normal lifespan and excellent quality of life. In fact, as a result of improved results, most children with CHD survive to adulthood, and consequently, in many western countries, the number of adult patients with CHD already exceeds the number of children with CHD. Many of these adults will also require surgical therapy.

Of course, a necessary prerequisite for a healthcare system to achieve such successes is that appropriate care be expertly orchestrated. For pediatric cardiac surgery, a very complex and demanding field, this involves sophisticated implementation of appropriate structure, organization and operation of high quality material and human resources. But how can we document the efficacy of such an organization? How can we be sure that our healthcare system provides not just acceptable but high value healthcare to our children with cardiac disease?

In healthcare, value is defined as the ratio of quality over cost. In this article, we primarily concentrate on our efforts to objectively measure, evaluate, monitor, and improve quality, the numerator. Of course, it is well known that a beneficial effect of quality care is the reduction of costs, as quality implies fewer complications, which in turn absorb many healthcare resources.

Concentrating on measuring quality, the development of the

methodology for quality assessment has been a major focus of the European Congenital Heart Surgeons Association (ECHSA – www.echsa.org), the scientific organization representing the pediatric cardiac surgeons of Europe but also of other continents. Our Association, which I have the honor to serve as president, is a sister organization to the Congenital Heart Surgeons Society of the United States, with which we have established close cooperation, sharing common scientific meetings and the same official scientific journal.

Evaluation of quality involves the assessment of the elements of the well-known Donabedian triangle, namely structure, process, and outcome. ECHSA has developed expert consensus documents regarding both the structure and recommended processes (guidelines) for managing congenital heart disease. ECHSA has also created extremely powerful tools to measure and analyze surgical outcomes—after all, in the words of William Thomson, “If you cannot measure it, you cannot improve it.”

We have thus created the ECHSA Congenital Database (www.echsacongenitaldb.org), which includes detailed demographic, preoperative, operative, and postoperative data of pediatric and congenital cardiac operations, data contributed voluntarily by pediatric cardiac centers not only in Europe but around the world, including some in the United States. The nomenclature and methodology used have been developed in cooperation with the Congenital Database of the Society for Thoracic Surgeons of the United States, permitting transcontinental comparison of results and, indeed, invaluable common research efforts.

The ECHSA Congenital Database thus contains precious information on approximately 300,000 pediatric cardiac operations, all anonymized, in full compliance with personal data protection laws. This big data allows each participating center to analyze its own results, comparing with the standard of care, both overall and by disease or operation type, regarding not only mortality but also many other quality indicators, such as length of intensive care and hospital stay, complications,



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and, ultimately, costs. More recently, at ECHSA, in collaboration with renowned scientists at a major U.S. academic institution, as well as with Greek startup 3D Life (www.3dlife.gr), a leader in the innovative use of 3D-printing and other disruptive technologies to enhance outcomes in pediatric and adult cardiac care, we are exploring the enormous possibilities afforded by modern techniques of artificial intelligence. The goal is to transform the information accumulating in our ECHSA Database and in 3D Life’s cloud anatomic 3D-printed Cardiac Model Library (www.3dlife.gr/categories.php) into a unique and powerful toolset, enabling solutions of optimal quality and truly personalized patient-specific patient care. Our tools, which include important analytical adjust-

ments for the complexity of case mix and patient-dependent risk factors, as well as sophisticated pre-surgical planning and surgical education modules, can all be made available to health authorities and insurance providers who may wish to assess and optimize the value of provided healthcare.

As president of and on behalf of ECHSA, and as a Greek national caring for our country, I gladly offer to the Greek health authorities and to the public health insurance agencies our Association’s support with the full spectrum of the tools available to ECHSA and our partners in any effort aiming to improve the quality of care of children with heart disease in Greece. I feel this is our obligation to the children, and I also believe that this approach can and should be applied to all other medical fields, resulting in measurable significant improvements to the quality and value of healthcare in general. 🇬🇷