

Chapter 4

The Role of Telemedicine in Paediatric Cardiology

Brian A. McCrossan

The Royal Belfast Hospital for Sick Children, Northern Ireland

Frank A. Casey

The Royal Belfast Hospital for Sick Children, Northern Ireland

ABSTRACT

Paediatric cardiology is a subspecialty ideally suited to telemedicine. A small number of experts cover large geographical areas and the diagnosis of congenital heart defects is largely dependent on the interpretation of medical imaging. Telemedicine has been applied to a number of areas within paediatric cardiology. However, its widespread uptake has been slow and fragmentary. In this chapter the authors examine the current evidence pertaining to telemedicine applied to paediatric cardiology, including their own experience, the importance of research and, in particular, economic evaluation in furthering telemedicine endeavours. Perhaps most importantly, they discuss the issues relating transitioning a pilot project into a sustainable clinical service.

INTRODUCTION

Telemedicine continues to expand its range and scope. Over the past 25 years telemedicine has matured and should have now moved beyond feasibility studies. However, there remains a wide gap between what telemedicine is technically capable of achieving and its utilisation/

incorporation into routine clinical services. A lack of communication and cooperation between the interested parties (people with technological knowledge and resources, clinicians, health service funders) is a significant, recurring obstacle. A failure to appreciate the different needs of various clinical subspecialties and geographical settings is an aspect of this problem.

This chapter aims to highlight limitations to the clinical practice of paediatric cardiology that are suitable for telemedicine intervention.

DOI: 10.4018/978-1-4666-2979-0.ch004

We shall describe our experience in addressing these problems and how the solutions have been translated into sustained clinical services. We shall discuss the importance of economic evaluation of telemedicine research to its translation into routine care. This chapter will also suggest potential directions and themes for future research and development of telemedicine in paediatric cardiology. Finally, it is hoped that the reader will have a clearer understanding of the potential for telemedicine to meet the needs of patients with congenital heart disease and feel encouraged to utilise this exciting clinical tool!

BACKGROUND

In order to employ telemedicine technology in a congenital cardiac setting it is essential to understand what paediatric cardiology is, how clinical care is currently provided, what aspects of paediatric cardiology practice are suited to telemedicine and the evidence base.

What is Paediatric Cardiology?

Paediatric cardiology is the medical specialty concerned with diseases of the heart in the growing and developing individual. (Workforce Review Team, 2009) Paediatric cardiologists investigate and treat patients with congenital or acquired heart disease, diseases of cardiac rhythm and conduction, and disturbances of cardiac and circulatory function. The specialty provides a service for acute and chronic conditions from fetal life through childhood into adulthood (National Health Service).

Paediatric cardiology is a demanding and exciting specialty to work in. There have been great advances in paediatric cardiology over the last two decades. Improvements in diagnostic imaging, intensive care, introduction of prostaglandin therapy, catheter procedures and in particular surgical procedures have contributed to dramatically improved outcomes for patients with CHD.

In the UK, the national average 1 year survival rate for all operations and catheter intervention is 95%. (Congenital Cardiac Audit Database, 2009) In particular children with complex CHD, typified by single ventricle physiology, now have the possibility of life beyond the neonatal period. (Marino, 2002).

Current Service Provision for Paediatric Cardiology in the UK

Paediatric cardiologists are responsible for the care of patients ranging from fetus to adult with a wide range of defects, both congenital and acquired and even patients with no discernable cardiac disease. Paediatric cardiologists tend to monitor their patients' progress indefinitely so that the caseload appears ever increasing. There are approximately 80 consultant paediatric cardiologists in the UK which is 100 less than is currently recommended by the British Cardiovascular Society. (NHS - medical careers, 2009) Care is centralised in 14 paediatric cardiology centres throughout the UK, 12 of which provide a surgical service. At these tertiary centres, the workload of paediatric cardiologists includes the assessment of patients presenting as acute emergencies or routine outpatient referrals; performing specialised investigations and procedures such as MRI and cardiac catheterisation; and co-ordinating referrals to cardiac surgeons. Paediatric cardiologists are also closely associated with intensive care units, providing pre and post-operative care for their own patients but also supporting multi-disciplinary teams in the care of patients with severe and complex conditions. (Royal College of Physicians, 2009) There is close liaison with paediatrics and its sub-specialties, adult cardiology, obstetrics, radiology and pathology.

However, the care of patients with CHD is not confined to the tertiary centre. Paediatric cardiologists hold outreach clinics at a number of DGHs within their region, travelling on a half day or full day once a month or once every two

43 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/role-telemedicine-paediatric-cardiology/74641

Related Content

Preparing Healthcare Organizations for New IT Systems Adoption: A Readiness Framework

Robert Breasand Matthew Waritay Guah (2011). *Healthcare Delivery Reform and New Technologies: Organizational Initiatives* (pp. 124-137).

www.irma-international.org/chapter/preparing-healthcare-organizations-new-systems/50156

Artificial Intelligence in Health and Applications

Asl Köse (2023). *Integrating Digital Health Strategies for Effective Administration* (pp. 20-31).

www.irma-international.org/chapter/artificial-intelligence-in-health-and-applications/323777

Using Data Analytics to Predict Hospital Mortality in Sepsis Patients

Yazan Alnsour, Rassule Hadidiand Neetu Singh (2019). *International Journal of Healthcare Information Systems and Informatics* (pp. 1-18).

www.irma-international.org/article/using-data-analytics-to-predict-hospital-mortality-in-sepsis-patients/225461

Applications of Policy Based Agents in Wireless Body Sensor Mesh Networks for Patient Health Monitoring

Kevin Millerand Suresh Sankaranarayanan (2011). *International Journal of E-Health and Medical Communications* (pp. 24-45).

www.irma-international.org/article/applications-policy-based-agents-wireless/53819

Systems Modeling of Proliferation Mechanisms in Childhood Acute Lymphoblastic Leukemia

George I. Lambrou, Apostolos Zaravinos, Maria Adamakiand Spiros Vlahopoulos (2013). *E-Health Technologies and Improving Patient Safety: Exploring Organizational Factors* (pp. 227-256).

www.irma-international.org/chapter/systems-modeling-proliferation-mechanisms-childhood/73115