Paediatric Anaesthesia in Papua New Guinea
Challenges, Developments and the Future

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INTRODUCTION
After Australia, Papua New Guinea (PNG) is the largest of the Pacific Island countries with 6.7 million people. PNG lies directly north of Australia and comprises 4 main regions: Southern Coastal (Papuan) Region, Northern Coastal (Momase) Region, Highlands Region, and New Guinea Islands Region. The governance system is a parliamentary democracy based on the Westminster model. As a member of the Commonwealth, the head of the Independent State of Papua New Guinea is Queen Elizabeth II. Access to widely scattered rural communities (87.5% of the country’s population live in rural areas) is often difficult, slow and expensive. Only 3% of the roads are paved and many villages can only be reached on foot. The capital, Port Moresby, is not linked by road to the rest of the country.

PNG attained its independence in 1975 and the people are Melanesian. There are 3 official languages - English, Pidgin and Motu, however there are over 800 separate languages within the country. The average number of live births/year is 4.4 with half the population being less than 15 years old. PNG’s relative level of poverty in relation to neighboring countries is increasing and it now ranks 148th out of 177 countries on the United Nations Development Programme Human Development Index. Papua New Guinea has made some progress in social development over the last 30 years. For example, the literacy rate has risen from 32% to 58%. However, only half of all women aged 15 years and above and two thirds of all men aged 15 years and older have ever attended school and enrolment rates vary significantly across provinces.

HEALTH STATISTICS
• Average life expectancy is about 53 years.
• Infant mortality rate at 49 per 1000 live births. Infants < 1 year old are twice as likely to die if living in a rural setting. Adequate space [12-13yrs] between births provides for greater survival rates of children. Infant mortality is also influenced by family size; children who are fourth born or of higher parity are over 50% more likely to die in infancy.
• Maternal mortality rate is very high at 733 per 100,000 live births; a figure which has doubled since 1996 to 2006 and is on par with Afghanistan and sub-Saharan Africa.
• Malaria and TB are endemic with a rising HIV rate.
• One child in every 13 born in PNG will die before the age of five years, a rate far greater than any other countries in the Pacific region.

ANAESTHESIA IN PNG
STAFFING: There are 15 physician anaesthetists who have undertaken the 4 year postgraduate Masters of Medicine (Anesthesiology) from the University of PNG. Approximately 11 are working in government hospitals and there are 11 registrar trainees – this is for a population of 6.7 million. The majority of anaesthesia in PNG is provided by 91 Anaesthetic Scientific Officers (ASOs) who have a nursing or other background and have passed a one year Diploma of Anaesthetic Science from UPNG. There is a Senior Lecturer in Anaesthesia at UPNG, Dr Harry Algeeling (centre picture on right) who coordinates all training within the country.

EQUIPMENT & MONITORING: The majority of anaesthetic machines are old Boyles machines which are rarely serviced. Oxygen is available in cylinders only at most hospitals and oxygen concentrators are used in recovery and ward areas. There are only a few biomedical engineers for the country. Most intraoperative monitoring consists of a pulse oximeter where available and a manual BP cuff. ECG can be used via defibrillator if dots are available. ETCO2 analysis is only for the country. Most intraoperative monitoring consists of a pulse oximeter where available and

CHALLENGES FOR ANAESTHESIA
There are over 40 hospitals – both government, missionary and mining, where general anaesthesia is provided. The majority of these are often in remote areas where medical supplies and disposables can be unreliable. This is particularly relevant for infants and babies with equipment often inadequate for these children.

The majority of these hospitals have no physician anaesthetists and rely on only a few ASOs.

Current training in anaesthesia is provided by PNG surgeons and anaesthetists. Over the last 7 years, average 16 cases/year, have been performed (see 2 graphs below),total of 113, and 2 deaths. Ages: 3 months – 28 years (mean 4.5yrs). Safe: 29 M; 84 F. It is hoped that in the next 5 years, a paediatric unit with cardiac bypass facilities can be set up for the country.

CURRENT INITIATIVES
There has been a major restructure in administration within the national health department and provinces in the last 18 months, which is hoped will lead to greater funding for the purchase of better equipment and consumables for the provision of safe anaesthetic services. There has also been more emphasis placed on training of physician anaesthetists.

PNG LIGATION OF NEONATAL PATENT DUCTUS ARTERIOSUS (PDA) PROGRAM
With the support of the Operation Open Heart Program from Australia, there are now 2 trained cardiothoracic surgeons and a cardiothoracic anaesthetist (AK). When OOH is not in country there is no cardiac bypass facilities. However an offshoot of these annual visits has been the development of a PNG specialist program for neonatal PDA ligation. These are performed entirely by PNG surgeons and anaesthetists. Over the last 7 years, average 16 cases/year, have been performed (see 2 graphs below).total of 113, and 2 deaths. Ages: 3 months – 28 years (mean 4.5yrs). Safe: 29 M; 84 F. It is hoped that in the next 5 years, a cardiothoracic unit with cardiac bypass facilities can be set up for the country.

EXTERNAL SUPPORT FOR ANAESTHESIA
Currently PNG is supported by subspecialty surgical teams from the Royal Australasian College of Surgeons (RACS) visiting 1-2 times/year. These include paediatric surgeon, mastectomist, ophthalmologist, orthopaedic, obstetrician and plastic surgeon (via Interplast). This program also funds visits for teaching and examination support (www.surgeons.org).

The Australian and New Zealand College of Anaesthetists (ANZCA www.anzca.edu.au) provides teaching, educational and examination support for ASO and MMed training and the Anaesthesia Refresher Courses every second year in Port Moresby. ANZCA also have an International Scholarship for the Asia / Pacific region offering one year training in Australia.

FUTURE DEVELOPMENTS
Anaesthesia in PNG will continue to have significant challenges for many years to come but of late there has been an increase in the number of medical trainees. These and non-physician anaesthetists will need major ongoing support for teaching, education and where possible equipment and drug supply.

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