

Butterfly ultrasound probe for Angau Memorial Provincial Hospital Emergency Department

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The aim of this project was to reduce morbidity and mortality from some common diseases in Papua New Guinea, with the purchase of a portable Butterfly IQ- a whole-body Ultrasound probe handheld device. Many invasive procedures are completed blindly by medical officers, and the US probe will increase accuracy and reduce risk of harm. On the other hand, there are diagnoses that cannot be made easily or at all such as ectopic pregnancy – ultrasound access will provide reliable answers, to ensure patients are admitted to theatre in a timely manner.

Angau Memorial Provincial Hospital Emergency Department (AMPH ED) is the second biggest ED in Papua New Guinea and sees around 9,000 patients a month from a wide catchment, meaning many patients have come from a long way away and arrive very sick.

With very limited medical and nursing staffing, ongoing shortages of drugs and equipment and very constrained diagnostic capacity, the staff work under constant pressure.

Bedside ultrasound has been increasingly utilised as a valuable tool in early and effective clinical diagnosis for a wide range of patient presentations in the Emergency Department setting. Doctor Piamnok, one of the two senior clinicians at AMPHED, has recognized for a long time that access to bedside ultrasound would make an enormous difference to her clinical care, and spoke frequently about the need for this equipment on my previous deployment to the ED in 2021.

One of the key interventions requiring ultrasound guidance in PNG is pericardiocentesis, the removal of fluid to relieve pressure from the sac around the heart which will otherwise cause tamponade and inevitable death. Because of the high burden of TB in the area, pericardiocentesis is a relatively common procedure in PNG, whereas in Australia it would require specialist cardiology intervention with ultrasound. In the absence of ultrasound, in AMPHED this very dangerous procedure is carried out using only landmarks, with a high risk of patient harm.

A further area of high clinical importance locally is splenic trauma. Many people in Morobe province have an enlarged spleen due to the extremely high burden of malaria in this wet lowland environment. With a very high incidence of trauma presentations to the ED, being able to assess splenic damage along with visualisation of other organs in a trauma scan will have a significant impact on patient outcomes.

At the moment, ultrasound access at AMPHED is only available for @ two hours in the mornings, and not every day. The radiology department is situated a long way from the ED and patients have to be stable enough to be taken there. With no CT at the hospital, XRAY is the only other diagnostic visualisation tool.

In August 2022 while delivering a training program in Vanuatu, Bronwen Griffiths met up with Dr Jono Henry, who had obtained funding and support from Counties Manukau NZMFAT to introduce butterfly probe ultrasounds and PEARLS (POCUS for Emergency and Acute Care in Resource Limited Settings) training to registrars in the Emergency Department at Port Vila Central Hospital.

"I immediately thought of Dr Piamnok, and the need for this vital equipment at AMPHED. Dr Jono offered to provide mentoring and support for her through his PEARLS network of volunteer specialist mentors if we could get funding for the probe and helped with the submission to SVPHF.

Unfortunately, owing to bereavement, Dr Piamnok was away from the hospital for an extended period, so we had to wait until her return to get the letter of support from the DMS required to complete the funding submission, and then wait until I was returning to PNG as part of the DFAT supported Covid Clinical Support project to deliver it."

Bronwen Griffiths, Clinical Nurse Specialist in Emergency Medicine, Pacific Emergency Education

Dr Piamnok is now receiving training and support from both Jono and Dr Elise Pascoe via the PEARLS network, and will be able to upload ultrasound images in real time for cloud based support from the network as needed.

While in its early days currently, once Dr Piamnok has received training and support, the scanner will make an enormous difference to timely diagnosis and the provision of definitive care to a whole range of acute patients at AMPHED.

Photos (taken with family/patient consent) show Dr Piamnok examining the heart of an unconscious patient and the leg of a patient with likely fracture and extensive soft tissue swelling.

Being able to access small grants for much needed items of equipment such as this one is a tangible way to improve patient outcomes and clinical care in resource constrained areas of the Pacific. The difficulty for Pacific clinicians in accessing the grants themselves, however, is in the need for advance purchase of items, with extensive delays in the reimbursement process. With limited credit card use in remote settings and difficult postal access, the system relies on a go-between being able to undertake the submission process on behalf of local clinicians.

However, having experienced the vicarious frustration of working alongside expert Pacific clinicians who are unable to get the tools required to deliver the care their patients need and deserve, I am grateful for the opportunity to use this funding avenue.

"I wish to sincerely thank Bronwen Griffiths and Dr Jono Henry for your relentless efforts to assist me and the people of Morobe Province by way of securing funding to obtain this very vital diagnostic tool, Butterfly probe.

Furthermore, Our gratitude is extended to Dr Elise Pascoe and Dr Jono Henry who have wasted no time in reaching out to me and my team here to teach and coach us in using our Butterfly probe.

For us here at AMPH ED, it's a long awaited dream come true so thank you again for all your kindest help, support and guidance.

It will most certainly relieve us of much stress in making prompt life-saving clinical decisions whilst we await (hopefully) the sponsor of a bedside ultrasound machine in our ED by our Governor et. al.

Angau Memorial Provincial Hospital Emergency Department (AMPHED) senior clinician Dr Donna Piamnok

