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Government

Metro North
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Thankyou for the opportunity to provide a submission to the Inquiry into Telehealth Services in Qld.

I am a senior medical officer/neonatal paediatrician at the Royal Brisbane and Womens' Hospital in the newborn nurseries and have worked in newborn care with Qld Health since 1989. Some time ago we documented the difficulties of telephone-only interaction with referring hospital clinicians for episodes of acute care involving retrieval to our tertiary nursery and in instances where advice only was being sought. We also noted the higher mortality that has been documented in outborn (Birth outside one of the 3 tertiary nurseries delivering care) preterm infants when compared with those inborn in tertiary hospitals in Queensland. We speculated that telemedicine was an intervention that could improve the process and outcome in sick infants cared for remotely.

The application of telemedicine in this clinical group required significant design iterations and validation which was completed with collaboration with the University of Qld Centre for Online Health, in particular Dr Nigel Armfield who designed and provided a purpose-built, mobile remote nursery telemedicine platform.

We have now completed a clinical trial of this acute neonatal care system between the RBWH and four remote nurseries in Hervey Bay, Caboolture, Nambour and Redcliffe. I have attached an executive summary of the results of this study and the economic analysis which provides substantial clinical and fiscal support for remote preterm infants having measurably improved outcomes when telemedicine access was available in their remote nursery.

I submit to the inquiry there is a sound economic and clinical case for providing neonatal telemedicine access in further level 2 hospitals based on this analysis. This perinatal service needs strong consideration in any statewide telemedicine plan.

Yours sincerely,

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Appendix

SUMMARY OF NEONATAL CONSULTATION TELEMEDICINE PROJECT

In many countries, regionalisation is recognised as being the most effective and efficient way of providing specialised perinatal care. In such a model, high-risk infants are transported in utero to allow delivery at a centre where an appropriate level of care may be provided to the mother and to the infant. However, not all births are predictable and some infants are unavoidably born away from the level of care that they need. For these infants, any delay in transportation to a specialist centre may have significant implications for their outcome. In Queensland, the setting for the work described in this thesis, the highly distributed population and long distances impede access to specialist perinatal care and lead to lengthy infant retrieval missions.

Real-time telemedicine may be an effective way of connecting specialists in tertiary intensive care nurseries with clinicians in referring hospitals. Specifically, it may allow earlier review of an infant by a specialist than would otherwise be possible. During a telemedicine consultation, the infant, X-rays and patient monitors can be remotely visualised by a specialist. This may allow for early intervention or appropriate modification to infant management prior to infant retrieval. In some cases, it may be that in some infant retrieval may be avoided. While telemedicine has been shown to have potential in other areas of neonatal care, no formal studies regarding teleconsultation for infant retrieval management have been reported in the literature.

The aim of this thesis was to explore the potential of telemedicine for remote neonatal consultation in Queensland. In the absence of a suitable commercially available product, a custom neonatal telemedicine system was designed and developed to support the process of remote neonatal clinical consultation between a tertiary perinatal centre and referring hospitals. The telemedicine system was developed with a senior neonatologist through a process of iterative refinement. The system comprised two parts: a mobile, wireless trolley containing camera equipment and a microphone which was placed adjacent to the infant, and a personal computer based console which allowed remote control of the cameras and a number of functions to support clinical consultation. Following the development work, a number of studies were designed to examine the feasibility, efficacy, preliminary effectiveness, economics and the acceptability of telemedicine for remote neonatal consultation.

The feasibility and efficacy of telemedicine facilitated neonatal assessments was established using a method-comparison study which was conducted in the controlled environment of a neonatal intensive care nursery. In this study, telemedicine assessments of infants and other clinically relevant visual information such as X-rays, views of patient monitors and ventilators were compared with simultaneous in-person assessments. While there was a high level of overall agreement between assessment methods, the study highlighted that some tasks, such as assessment of respiratory rate by observation, were difficult to conduct by telemedicine.

To provide a preliminary assessment of the effectiveness of teleconsultation in

routine clinical use, a multi-centre observational study was designed. The 12 month study, involving four referring nurseries and a tertiary perinatal facility, found that the visual information provided by telemedicine made an important contribution to management decisions and could lead to some infant retrievals being avoided. Independent expert review found that in 93% of cases telemedicine provided new clinical information and in 14% of cases a change of management was agreed. In 33% of cases there was a change in transport decision and in 26% of cases retrieval was avoided. Using these results, the economics of neonatal teleconsultation was modelled. The results clearly demonstrated that telemedicine can offer significant savings to the health system through the avoidance of transport. While the use of telemedicine was lower than predicted during the study period, the transport costs which were avoided through its use (AUD \$102,338) significantly outweighed the total cost of providing telemedicine (AUD \$45,686) yielding a saving of AUD \$56,652. A further projection showed that savings could have been achieved with an avoidance rate of only 5% if telemedicine had been used to manage all retrievals for the four referring hospital in the 12 month period.

Finally, in order to assess the acceptability of telemedicine as a mode of consultation in the context of neonatal care, clinicians who had been involved in the multicentre trial were surveyed. Overall acceptance of telemedicine was high with no significant differences between tertiary and peripheral clinician opinions. Some clinicians indicated that they perceived telemedicine to be too time consuming or that it offered no advantage over the telephone. Further work is required to determine whether these perceptions may be overcome.

The work described in this thesis has demonstrated that telemedicine is a feasible and efficacious tool for assessing infants remotely. It has also provided preliminary evidence that telemedicine is an effective means of supporting the care of newborn infants who have been delivered remote from a tertiary perinatal facility. Further, this research has demonstrated that economic benefit may accrue through the avoidance of infant transport and that the use of telemedicine is generally acceptable to clinicians involved in providing neonatal care.

Extract from Thesis: Dr Nigel Armfield
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