

Friendly bacteria (probiotics) saving tiny lives Healthy Living

Introduction

In Australia 5-6% of preterm neonates (<32weeks gestation) could suffer from the serious condition *necrotising enterocolitis* (NEC).

Our previous research has shown that probiotics significantly reduces the risk of NEC and in 2011, Nepean Hospital Neonatal Intensive Care Unit (NICU) became the first neonatal unit in Australia to offer probiotics routinely.

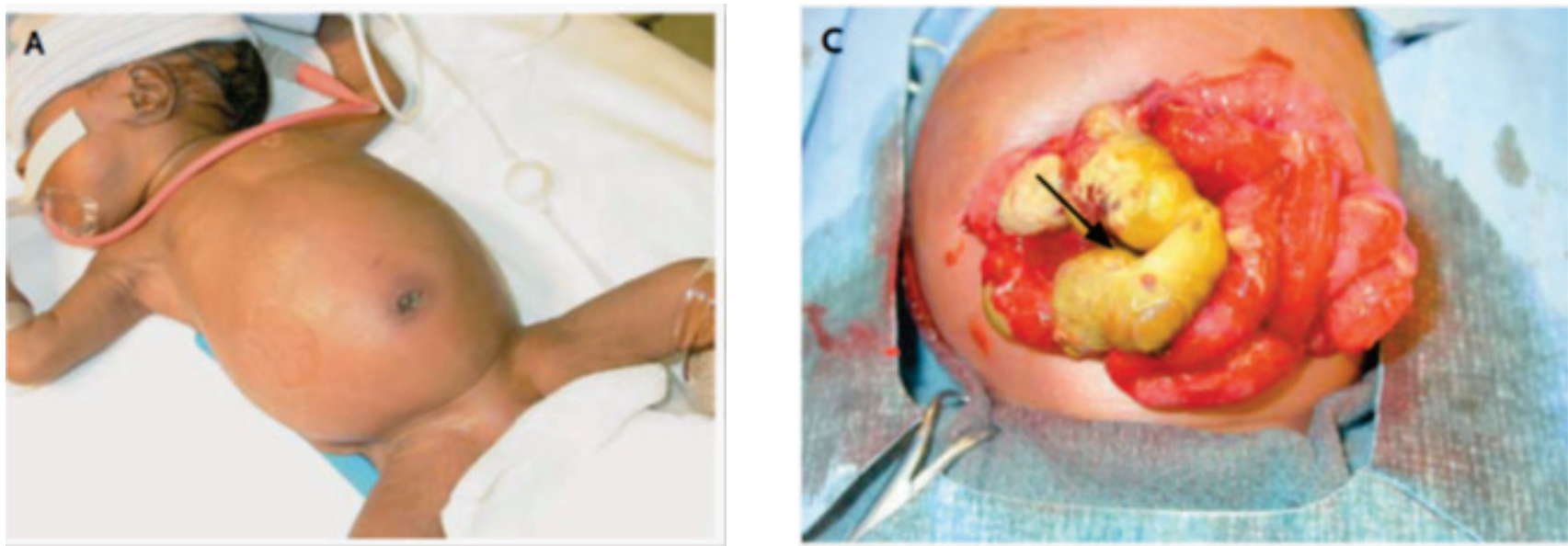


Figure 1: A baby with NEC (Neu J NEJM 2011)

Challenges to introducing probiotics were the absence of clinician-friendly guidelines to use routine probiotics, and no probiotic product registered with the Therapeutic Goods Administration (TGA) which could be used in high risk preterm neonates.

Aim

To implement a stepwise plan for introducing routine probiotic supplement in preterm neonates for prevention of NEC and compare key outcomes with a retrospective cohort that did not receive probiotic.

Methods

The project was difficult and required a step wise approach (figure 3) incorporating:

- Departments: Neonatology, Microbiology and Pharmacy; and
- Authorities: Local drug and ethics committee, and TGA, Australia
- Funding: Nepean Neonatal Parent Support Group (NNICUPS) donated \$5000 towards the cost of probiotics and Australian Women & Childrens Research Foundation (OZWAC) awarded the research grant of \$16,050
- Prospective audit comparing key outcomes (NEC, mortality, sepsis) before (two years: 2010-2011) vs. after introducing probiotic (2012) was conducted

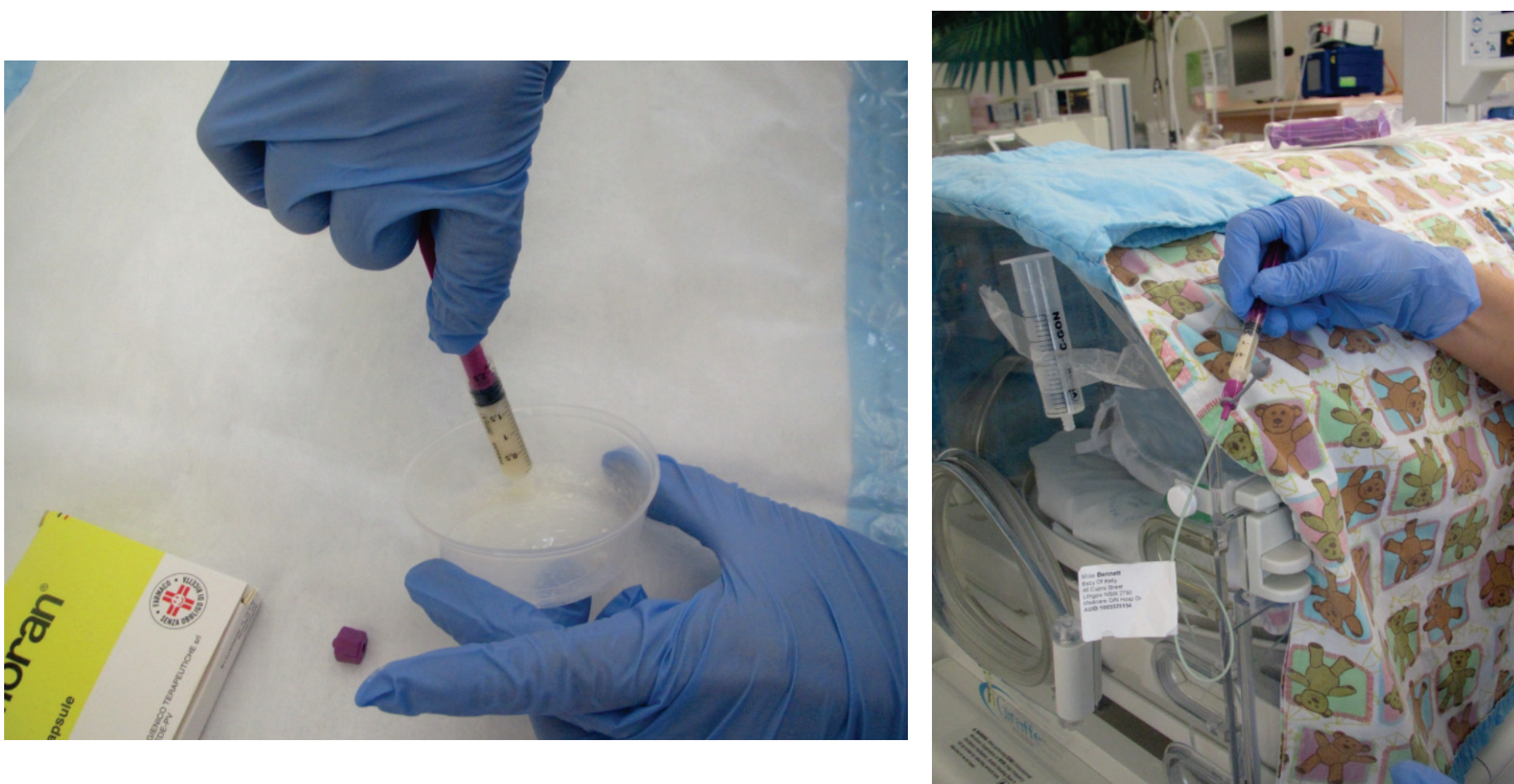


Figure 2: Mixing probiotics with breast milk and administering to preterm neonates

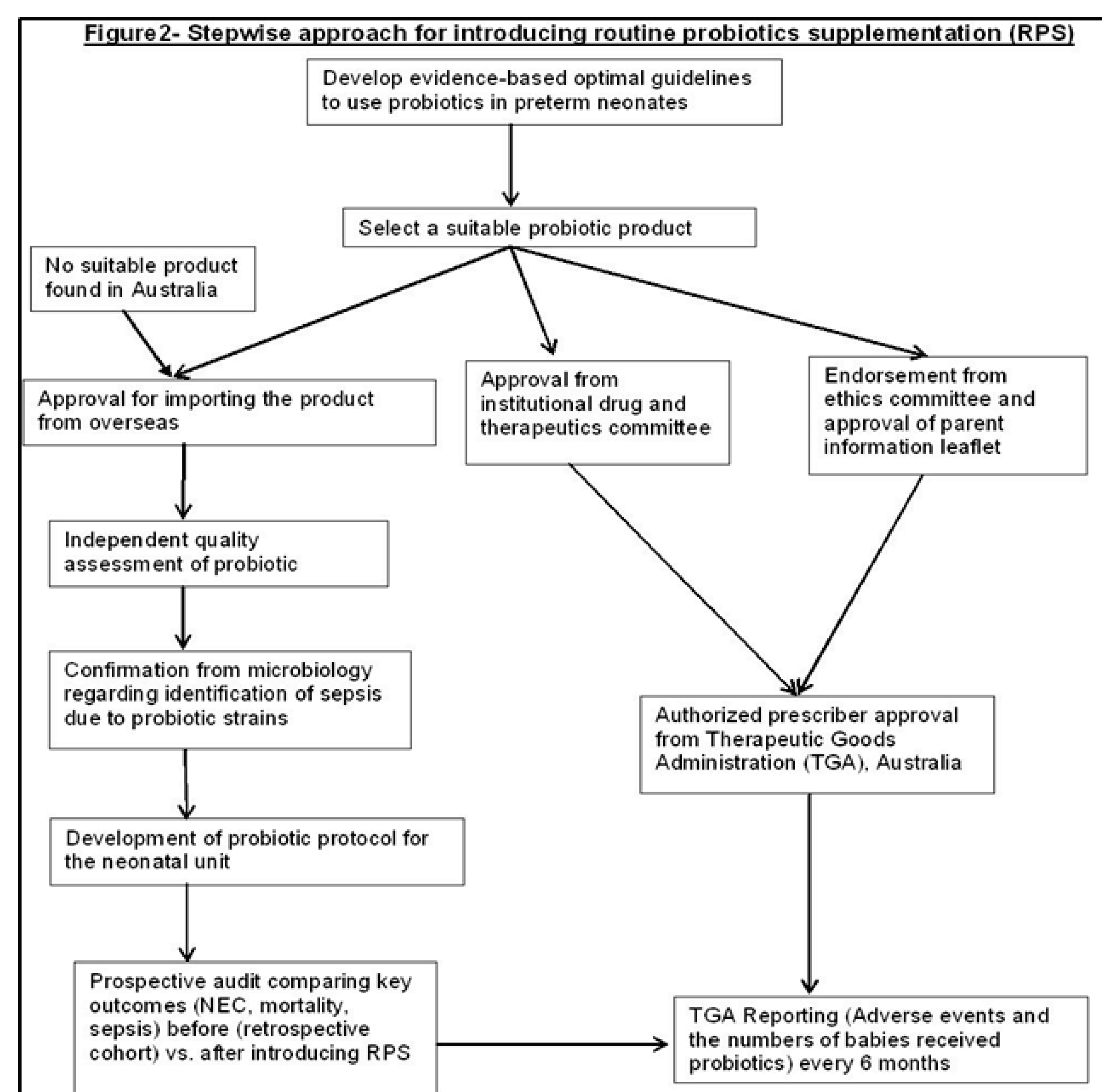


Figure 3: Stepwise approach to introduce probiotics at Nepean NICU

Results

- following stepwise process, probiotics were introduced in December 2011
- Last year 84/86 eligible neonates received probiotics (two died before receiving it)
- significant reduction in definite NEC (\geq Stage II) in the probiotic versus retrospective cohort [0% (0/84), vs. 5.4% (8/144), ($p=0.027$)]
- time to full feed was significantly less in probiotic cohort (table 2). This is important as could save three days of intravenous nutrition (cost:\$180/day)
- probiotics were well tolerated without any adverse events

Variable	Probiotic (Jan 2012-Jan 2013) (n=84)	No probiotic (Jan 2010-Dec 2011) (n=144)	p-value
All stage NEC	1 (1.2%)	16 (11.1%)	p=0.006
NEC (\geq Stage II)	0 (0%)	8 (5.5%)	p=0.027
NEC (\geq Stage II)for birth weight \leq 1000g	0/36 (0%)	6/65 (9.2%)	p=0.084
Death due to NEC	0	0	NS
Late onset sepsis	13 (15.4%)	34 (23.6%)	p=0.17
Death (>7days)	1 (1.2%)	5 (3.4%)	p=0.41
Time to full feeds	13.7 \pm 6.3	16.43 \pm 8.62#	p=0.02

Conclusion

After introducing routine probiotics for preterm neonates there was significant reduction of NEC and trend towards reduction of infection.

The estimated cost savings to Nepean Hospital over next two years could be as high as \$1.5 million dollars.

Nepean NICU has supported various neonatal units locally in NSW, nationally and internationally (USA, New Zealand, Netherlands, Singapore, Thailand, India) to introduce ground-breaking intervention of probiotics.

Acknowledgements

- Nepean neonatal parent support group (NNICUPS)
- OZWAC foundation
- Nepean NICU medical and nursing staff, Pharmacy and Infectious Diseases departments
- parents and their babies in the NICU



Figure 4 and 5: Madison Parsey, born at 27 weeks weighing 640g; the first baby to receive routine probiotics. (with permission)

