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Evidence Based Practice and Identifying a Clinical Problem Case Study

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Research Into Practice Early Nutrition

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What is the clinical problem?



- Background

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What is the clinical problem?



11,000 babies born annually

2,000 admissions to MMH NCCU

240 babies born <1500g



What is the Evidence?



What is the Evidence?

Early and aggressive enteral/parenteral nutrition is important to reduce nutritional deficits and has been demonstrated to improve short and long term outcomes

Short Term Outcomes

- Reduced vulnerability to infection
- Reduced susceptibility to lung injury
- Reduced NEC
- Increased maturation of GIT and Growth

Long Term Outcomes

- Optimising brain development, intellectual attainment
- Improve cell growth in different body systems during critical periods including the cardiovascular system – reduce impact of adult chronic disease



What is the Evidence?

studies

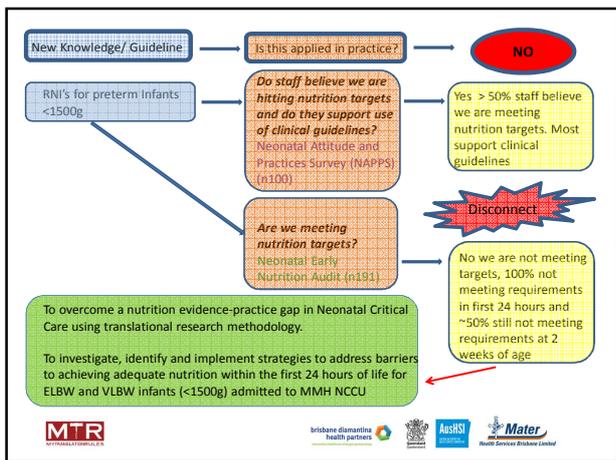
Level of Evidence

Quality of Studies









Implementation Phase

PICO	• Population, Intervention, Comparator, Outcome
Thematic Analysis	• Line by Line Coding, Synthesising codes into Categories
TDF	• Theoretical Domains Framework
COM-B	• Capability, Opportunity and Motivation to affect behaviour change
BCW	• Behaviour Change Wheel







What is the Research Question?

- Population** • In infants born <1500g
- Intervention** • Will identifying and addressing the barriers to early nutrition,
- Comparator** • Compared to usual treatment
- Outcome** • Result in implementation of new practices and improved nutrition outcomes



What was Implemented? Data Collection

- Literature Review** • Infants born <1500g should receive 2g/kg/d protein and 40-50kcal/kg/d first 24 hours of life
- Resource Review** • Orientation and education materials
• Policies, guidelines, other key documents
• PN Solution Composition - inadequate
- Survey and Audit Results** • NAPSS - staff think neonates meet RNIs
• NENA (n191) - neonates do not meet RNIs
- Observation** • NCCU Process
• Service Mapping
- Interviews** • Semi structured interviews with medical and nursing staff - theme saturation



What was Implemented? Interview Questions

- Tell me in your experience about the patient journey from birth?
- What are the treatment priorities in those first hours and day?
- What changes in the treatment priorities occur in the next few days?
- Tell me your thoughts about parenteral nutrition for preterm infants?
- What are your thoughts on establishing enteral nutrition for preterm infants?
- Research has shown the importance of establishing nutrition early, what do you see as some of the biggest challenges in achieving this in the NCCU environment?



Interview Analysis

Interviews conducted, recorded, transcribed and analysed

- Read and highlighted key points (post it notes)
- Arranged post it into themes
- Identified emerging themes and sub themes
- Aligned themes into the TDF



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Interview Analysis

Major Themes

- Decision Making
- Disconnect between Beliefs and Application of Evidence
- Monitoring and Awareness
- Roles and Responsibilities

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Emerging Themes and Sub Themes

Decision Making

- **Competing clinical priorities, Inconsistency, Ventilation and stabilisation, Size and gestation, Progressing feeds**

"Airway, breathing and circulation is always going to win, next should be nutrition"
"A baby on a ventilator can start PN"
"Consultants aren't singing from the same hymn book"

Roles and Responsibilities

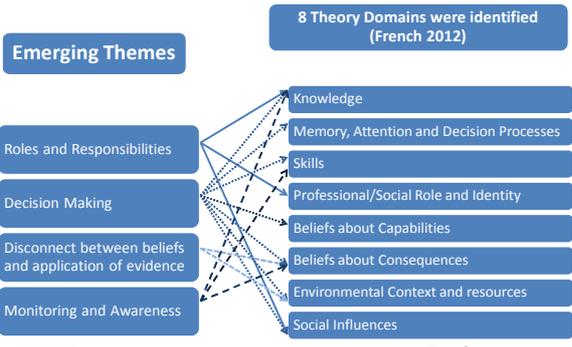
- **Role delineation, Mater Culture, Prep for PN**

"There is a big culture about waiting for WR before anyone makes a decision"

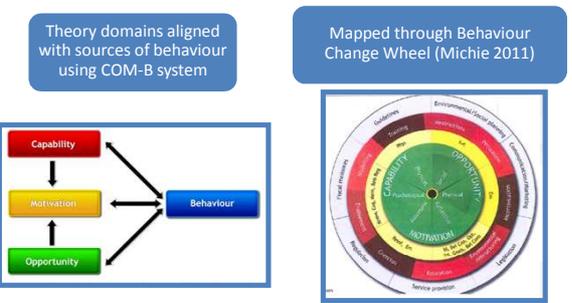
Emerging Themes and Sub Themes

Disconnect between beliefs and application of evidence	<ul style="list-style-type: none"> • Clinical fears and complications, pros and cons, PN solution composition <p><i>"Benefits outweigh risks"</i> <i>"More concentrated PN – better nutrition less fluid"</i></p>
Monitoring and Awareness	<ul style="list-style-type: none"> • Perceptions, Ordering PN, Awareness of PN content, Wasting resources, Infection and line management <p><i>"If it is busy in the unit... It takes longer to order PN.."</i></p>

Mapped using TDF



Theoretical Framework to Identify Barriers and Enablers



Theoretical Framework to Identify Barriers and Enablers



Intervention Function + Delivery Mode

Regulation (Enablement)

- Consensus Agreement from Neonatal Staff Specialists
- All infants born under 1500g and <K32 will have UVC or PICC placed to deliver PN safely within 2 hours of birth
- Creation of Nutrition Bundle (critical time points/audit/ feedback)

Guidelines (Training / Modelling/ Restrictions)

- Nutrition Guideline for <1500g
- E-learning
- Orientation Package
- Medical and Nursing training programs
- Case studies
- Identify nutrition champions



Intervention Function + Delivery Mode

Legislation (Environmental Restructuring)

- Empower all levels of medical and nursing staff to be confident with early nutrition decisions in line with consensus practice guidelines (increase target behaviour) 24/7
- Improve PN solutions to better meet RNIs with low fluid volumes

Service Provision (Education/ Coercion)

- Engage stakeholders to define Nursing role at admission and in preparation for PN initiation
- Education around the value of change to current practice



Intervention Function + Delivery Mode

- Environmental Social Planning**
(Restriction / Persuasion)
 - Admission processes that support and include nutrition early-Nutrition Bundle
 - Stickers, prompts
 - Streamlined PN Ordering
- Communication**
(Persuasion/ Incentivisation)
 - Use current communication channels and investigate novel modes to:
 - Promote nutrition and updates to nutrition practice
 - Communicate audit feedback



Outcomes

- Implementation and Settling In Phase
- Audit of new practices
- Process Outcomes**
 - Line placement and timing
 - Initiating PN within 2hrs of birth <1500g
- Clinical Outcomes**
 - Protein and energy intake within first 24hrs – Intake vs RNIs
 - Time to regain birth weight
 - Weight/Centile at 36 weeks CGA



Where to from Here?

- 2017 - Implement Consensus Guidelines
- 2017 - Implement New PN Solutions
- 2017 - Implement Nutrition Bundles
- 2018 - E-Learning, Orientation and Training Programs



The Light & The Dark

Light: What we learnt

- Research is timely
- The problem is not always obvious e.g. Infants receive nutrition based on the ventilatory support that they require - not by gestational age or weight.

Dark: What we would never do again

- Assume that we know the solution to the problem without clearly examining the issue first