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INFATRINI CHD ASSETS

November 2025



Helping kids bounce back

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Objective

Currently, there are more than 2M infants in the world that are at risk or impacted by malnutrition.

Sometimes, malnutrition is a consequence of an underlying disease or condition. And one of them is **Congenital Heart Disease (CHD).**
CHD is among the most frequent reasons of infants' death, and up to 51% of paediatric CHD patients are malnourished.
However, only HALF of that half is actually getting nutritional support.

Our objective is to reach as many babies with CHD as possible and help them bounce back from malnutrition.

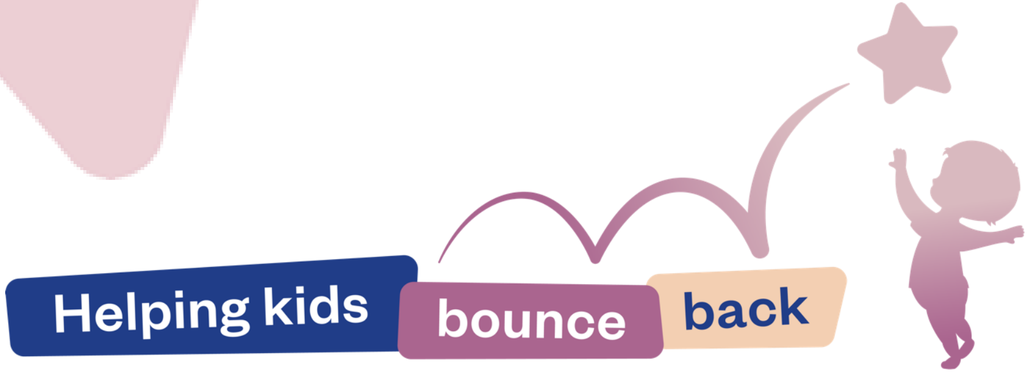
That's why we need to talk. And that is why we are releasing these assets: to provide relevant, relatable communication materials for local teams to use.



INFANT CHD TOOLKIT

What’s in the toolkit?

1. WHAT IS CHD?
2. CHD JOURNEY
3. TARGET AUDIENCES
4. INFANT CHD ASSETS



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1. WHAT IS CHD?

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WHAT IS CHD?

Congenital heart disease (CHD) is a general term for a range of defects in the structure of the heart or great vessels that are present at birth.

These are the most common birth defects and are **one of the main causes of infant mortality in the world**.

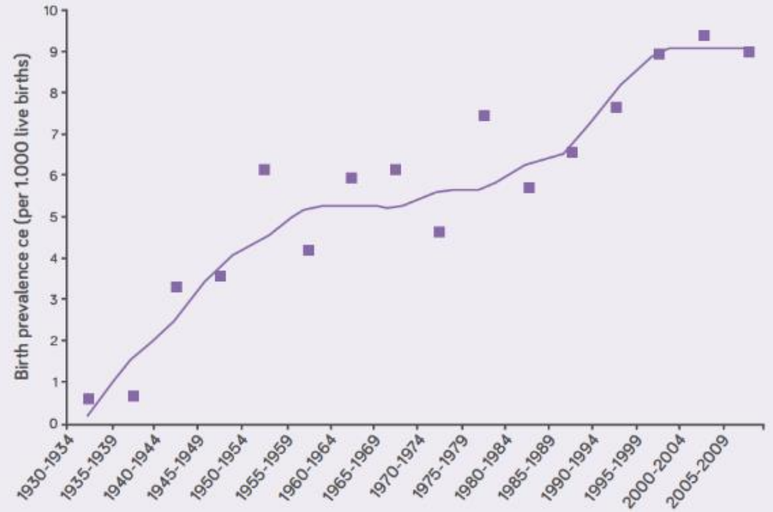


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The worldwide prevalence of CHD is increasing

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Prevalence worldwide: 9.1 per 1000 live births[1]





Time course of reported total congenital heart disease (CHD) birth prevalence from 1930 until 2010.
The purple line shows the time trend, and the squares represent the calculated birth prevalence values for each time period.

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2. CHD JOURNEY

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PAEDIATRIC CHD PATIENTS ARE NUTRITIONAL COMPROMISED THROUGHOUT THEIR MANAGEMENT[1-7]

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Pre-operative



Post-operative



Post hospital discharge

INCREASED NUTRITIONAL NEEDS

- Tachycardia & tachypnoea
- Fever, sepsis & infections
- Post-operative metabolic stress & wound healing
- Catch-up growth needs

Mean total energy expenditure of infants with CHD is 50% higher than that of healthy infants [8]

&/OR DECREASED NUTRITIONAL INTAKE

- Fluid restrictions
- Tachypnea, breathlessness & fatigue while feeding
- Early satiety & decreased gastric volume due to hepatomegaly
- Frequent vomiting
- Oral aversion, dysphagia & swallowing abnormalities
- Gastro-oesophageal reflux

&/OR DECREASED NUTRIENT UTILISATION

- Vomiting
- Excessive nutrient losses through acidosis, hypoxia, high pulmonary pressure & wounds
- Edema of the small bowel wall / mucosa
- Compromised gastric emptying & malabsorption

... IMPACTING SURGICAL AND CLINICAL OUTCOMES AND RECOVERY[9-14]

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- Decreased cardiac function & risk of cardiac arrest
- Delays in surgery
- Longer hospital length of stay
- Higher risk of infection
- Poorer quality of life
- Higher risk of adverse neurodevelopmental outcomes & long-term cognitive impairment
- Higher mortality rates



INFATRINI IS THE MOST RESEARCHED ENDF, WITH 17 CLINICAL STUDIES, 5 DEDICATED TO PAEDIATRIC CHD PATIENTS[35, 36, 39-52]

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- **Well tolerated**
- **Increased nutritional intake**
- **Promotes catch-up growth**
- **Improved associated clinical outcomes**

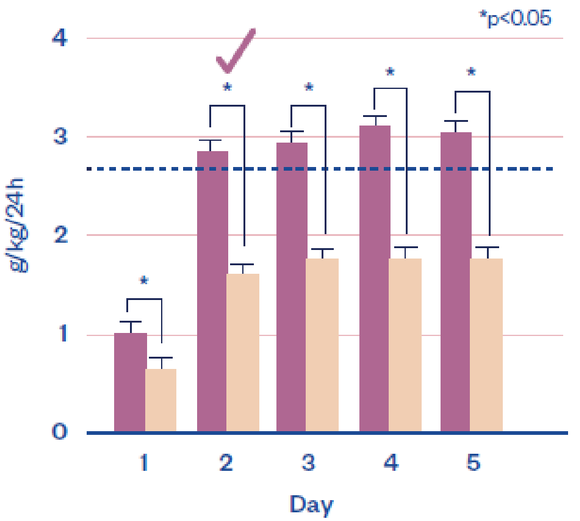
17
CLINICAL STUDIES
& more research ongoing

INFATRINI: CLINICALLY DEMONSTRATED TO BE WELL TOLERATED & IMPROVE NUTRITIONAL INTAKE IN POST SURGICAL CHD PATIENTS[49]

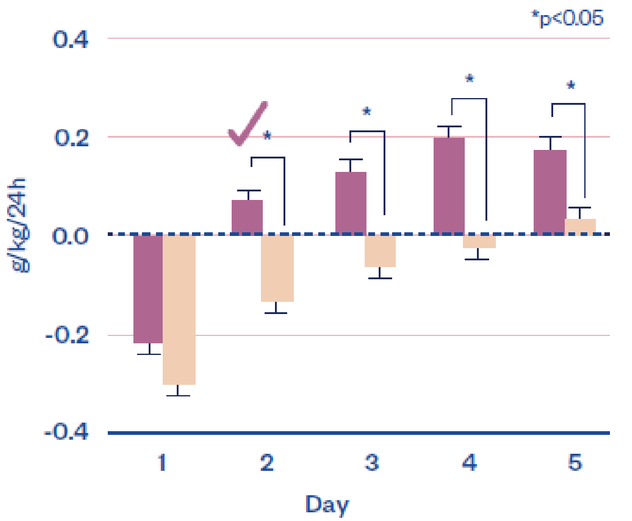
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- Infants receiving Infatrini had a significantly higher intake of nutrients after day 1
- Positive nitrogen balance 3 days earlier

Protein intake



Nitrogen balance



Infatrini group
Standard infant forumla group

Day 2: Infatrini group achieved all adequate nutritional intakes vs standard infant formula

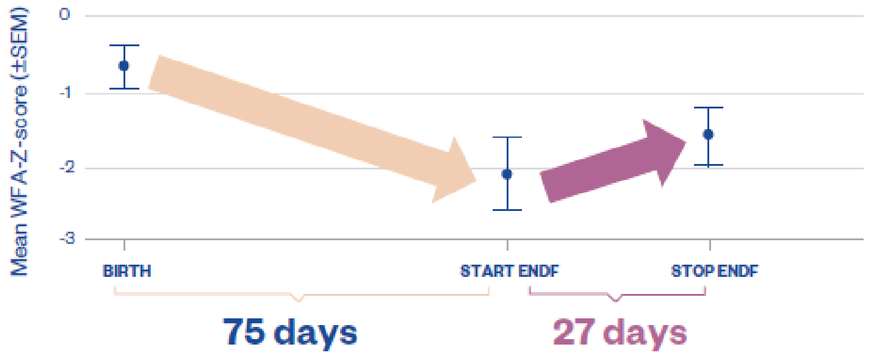
Infants following CHD surgery received either Infatrini (n=26) or standard IF (n=24) for 5 days

... CONSISTENTLY ACHIEVING GROWTH GOALS IN CHALLENGING PAEDIATRIC CHD PATIENTS

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WEIGHT GAIN ACHIEVED IN 93% OF CRITICALLY ILL PATIENTS, INCLUDING POST CARDIAC SURGERY[43]

Retrospective database study of 70 infants (incl 24 padiatric CHD patients)in PICU receiving Infatrini for >2 weeks

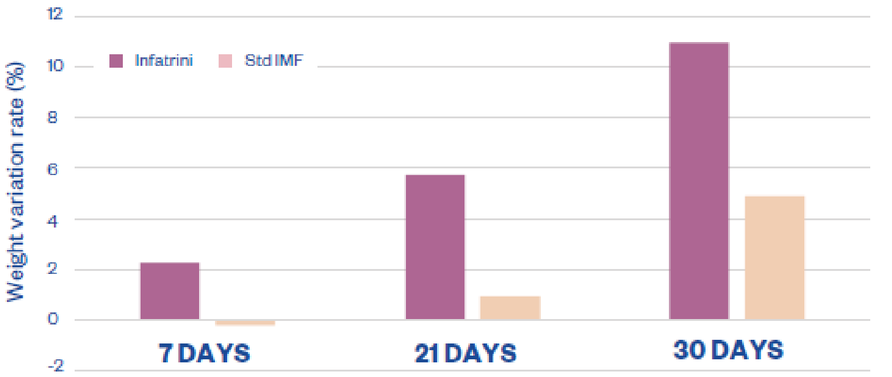


Weight-for-age (WFA) Z-scores over time (n=70). Energy-nutrient dense formula (ENDF).

Infants receiving Infatrini demonstrated significant increase in weight-for-age z score & **weight gain achieved matched that of healthy infants**

IMPROVED GROWTH FOLLOWING CHD SURGERY[51]

Infants following CHD surgery received Infatrini (n=29) or std IF (n=30) for 30 days with similar energy intake targets

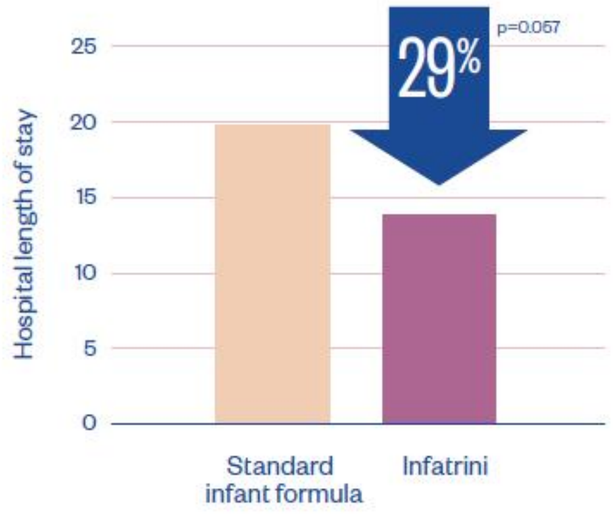


Infants receiving Infatrini demonstrated significant **increase in weight-for-age z score** & significantly higher **weight gain velocity**

... SUPPORTING CLINICAL GOALS IN PAEDIATRIC CHD PATIENTS[51]

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Reduction in length of hospital stay





Reduction in antibiotic use



Infants following CHD surgery received Infatrini (n=29) or std IF (n=30) for 30 days

RAISING THE STANDARDS OF CARE FOR PAEDIATRIC CHD PATIENTS WORLDWIDE

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- **The most researched ENDF**
- **Supporting paediatric CHD patients** with positive nutritional, surgical, and recovery outcomes
- **First and only ENDF adding HMO 2'-FL** to our blend scGOS/lcFOS (9:1)

References: 1. Toole BJ. et al. Congenital Heart Disease. 2014;9(1):15-25; 2. Roman B. Pract Gastroenterol. 2011;8:11-32; 3. Steltzer M. et al. Clinics in perinatology. 2005;32(4):1017-30; 4. Norris MK, Hill CS. Crit Care Nurs Clin North Am. 1994;6:153-63; 5. Leitch CA. Prog Pediatr Cardiol. 2000;11:195-202; 6. McGrail K. Topics in Clinical Nutrition. 1997;13(1):62-8; 7. Anderson JB. et al. Ann Thorac Surg. 2011;91:1460-6; 8. Barton et al, Arch Dis Child 1994; 70: 5-9; 9. Radman et al, J Thorac Cardiovasc Surg. 2014;147(1):442-50; 10. Martini et al, Nutrients. 2021;13(3):932; 11. Diao et al, J Pediatr. 2022;242:39-47.e4; 12. Miller et al, Neoreviews. 2023;24(8):e492-e503; 13. Murni et al, PLoS One. 2023;18(2):e0281753; 14. Ross et al., Cardiol Young 2017; 27(9): 1716-1725; 15. Abbas, et al. Sci Rep 15, 25738 (2025); 16. Mignot et al., 2023; 17. Zhang et al., BMC pediatr, 2023; 18. Sermet-Gaudelus AJCN 2000; 19. Rocha J Pediatr (Rio J) 2006; 20. Hulst Clin Nutr 2010; 21. Campanozzi 2009 Nutrition; 22. Hecht et al. Clin Nutr 2014; 23. Moeni et al Acta Pediatrica 2013; 24. van der Velde et al 2015; 25. Huysentruyt et al. Acta Paediatr 2013; 26. Belanger, J of Pediatrics, 2019; 27. Young et al., Clin Nutr 2025;28. Ni et al., European Journal of Pediatrics (2023) 182:513–524 2023; 29. WHO/FAO/UNU Expert Consultation 2007; 30. Cooke et al. J Pediatr Gastroenterol Nutr. 2023; 31. Meyer R. 2024. Ann Nutr Metab. 2024;80(Suppl 1):18-28; 32. Karger Publishers. 2024 Fast Facts: Infant Faltering Growth CME accredited eLearning course. 33. Golden, 2009; 34. Davis & Baker, 1996; 35. Clarke et al., 2007; 36. Evans S, et al. 2006; 37. Meyer et al., 2012; 38. World Health Organization. World Organ Tech Rep Ser.2007;(935):1-265.4; 39. van Waardenburg et al., 2009; 40. De Betue et al., 2011; 41. De Betue et al., 2013; 42. Smith et al., 2018; 43. Eveleens et al., J Hum Nutr Diet 2019; 44. Marino et al., 2019; 45. Goday et al., 2022; 46. McCandish, et al., 2023; 47. Delsoglio et al., 2024.
CHD references: 48. Cui et al., 2017; 49. Cui Y, et al. JPEN J Parenter Enteral Nutr 2018; 50: 196-204; 44. Zhang et al., 2018; 51. Scheeffer et al. JPEN 2019; 52. Zhou et al., 2021

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3. TARGET AUDIENCES

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TWO MAIN TARGET AUDIENCES

PARENTS



HCPS (CARDIOLOGISTS)



THE ASSETS BELOW WILL BE TARGETTING HCP.

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PARENTS PROFILE



WHAT IS THEIR ROLE?

- Spend a **lot of time in the hospital** with their babies.
- **Follow HCPs** recommendations.
- **Take care of the treatment at home** once the baby is out of hospital.

HOW DO THEY FEEL?

Scared and worried if baby will survive/ implications on their life.

HOW CAN WE HELP THEM?

- ✓ We can **help their baby gain necessary weight** to be able to go through surgery.
- ✓ Get the **baby's growth on track** after the surgery.
- ✓ Our role is of an **ally that eases their tensions and brings them hope** back for their kid to have a 'normal' childhood/life.

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HCP (CARDIOLOGIST) PROFILE



WHAT IS THEIR ROLE?

- Diagnose & prescribe treatment.
- Accompany the baby and parents during their journey.

HOW CAN WE HELP THEM?

- ✓ We can remove the barrier of **lack of knowledge** on the importance of malnutrition treatment, alongside CHD treatment.
- ✓ Educate about the **benefits of ENDF** and why it is a better solution vs. modular feeds (not only weight gain).
- ✓ Our role is of a trusted partner who can **help them do their job better and quicker, while also providing better outcomes** both for the baby and HCP/ hospitals.

THE ASSETS BELOW WILL BE TARGETTING HCP.

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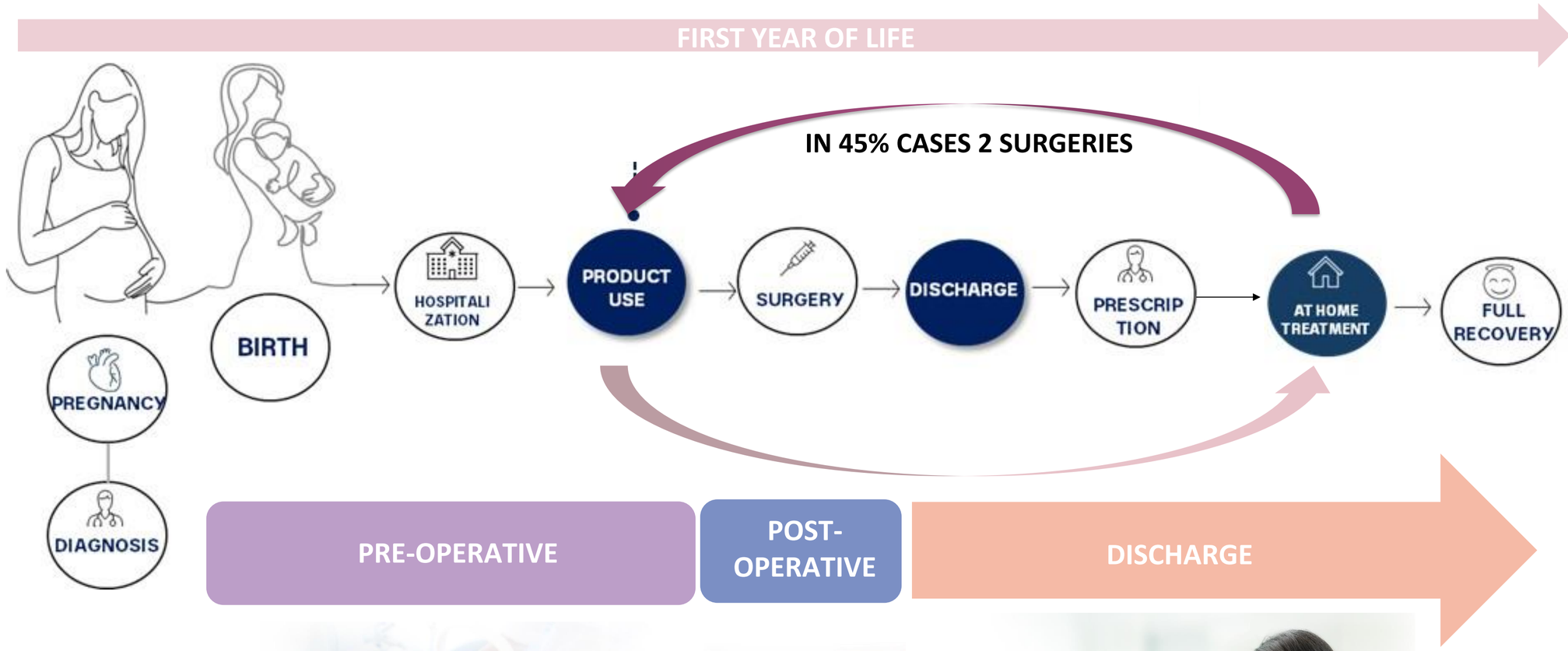
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4. INFANT CHD ASSETS

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OUR CHD ASSETS ARE ADDRESSING EACH STAGE OF THE JOURNEY



EXECUTION EXAMPLE







INFANT CHD ASSETS

CONTENT SUMMARY:

- **HCP communication:**
  - KV execution linked to each stage of the CHD journey
  - Banners in different measurements
  - E-detailer
  - Infographic
  - Product leaflet

- **High-res images**: more possibilities for countries to change/ adapt.
  Linked to each stage of the CHD journey. Images in the next slides.

OBJECTIVE:

Drive **HCP recommendation** by raising awareness on the importance of malnutrition treatment and the benefits of ENDF in CHD infants.

USE:

External.

Important note to local teams: please review, align and adapt the assets based on local regulations and needs.

CLICK HERE TO ACCESS THE OPEN FILES

KV



Banners



E-detailer



Infographic



Leaflet



PRE-OPERATIVE IMAGES





CLICK HERE TO ACCESS THE HIGH-RES IMAGES

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POST-OPERATIVE IMAGES





CLICK HERE TO ACCESS THE HIGH-RES IMAGES

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DISCHARGE IMAGES









CLICK HERE TO ACCESS THE HIGH-RES IMAGES

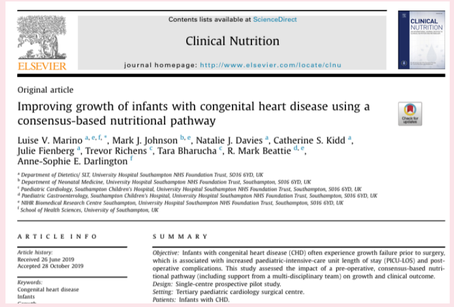
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DNC RELEVANT LINKS

IMPROVING GROWTH OF INFANTS WITH CHD USING A CONSENSUS-BASED NUTRITIONAL PATHWAY


Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Original article

Improving growth of infants with congenital heart disease using a consensus-based nutritional pathway

Luise V. Marino [a, e, f, *], Mark J. Johnson [b, e], Natalie J. Davies [a], Catherine S. Kidd [a], Julie Fienberg [a], Trevor Richens [c], Tara Bharucha [c], R. Mark Beattie [d, e], Anne-Sophie E. Darlington [f]

ARTICLE INFO

Article history:
Received 26 June 2019
Accepted 28 October 2019

Keywords:
Congenital heart disease
Infants

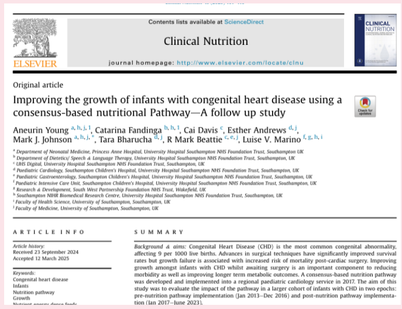
SUMMARY

Objective: Infants with congenital heart disease (CHD) often experience growth failure prior to surgery, which is associated with increased paediatric-intensive-care unit length of stay (PICU-LOS) and post-operative complications. This study assessed the impact of a pre-operative, consensus-based nutritional pathway (including support from a multi-disciplinary team) on growth and clinical outcome.
Design: Single-centre prospective pilot study.
Setting: Tertiary paediatric cardiology surgical centre.
Patients: Infants with CHD.

Infants with congenital heart disease (CHD) often face growth failure before surgery, which increases the risk of complications and lengthens paediatric intensive care unit stay (PICU-LOS). This article explores a consensus-based pre-operative nutritional pathway, designed to improve weight and height outcomes in infants with CHD and to reduce the impact of poor growth on clinical outcomes.

LINK HERE

IMPROVING THE GROWTH OF INFANTS WITH CHD USING A CONSENSUS-BASED NUTRITIONAL PATHWAY - A FOLLOW UP STUDY


Contents lists available at ScienceDirect

Clinical Nutrition

journal homepage: http://www.elsevier.com/locate/clnu

Original article

Improving the growth of infants with congenital heart disease using a consensus-based nutritional Pathway—A follow up study

Aneurin Young [a, b, j, l], Catarina Fandinga [b, h, i], Cai Davis [c], Esther Andrews [d, j], Mark J. Johnson [e, h, j, *], Tara Bharucha [b, g], R Mark Beattie [e, f, g], Luise V. Marino [f, g, h, i]

ARTICLE INFO

Article history:
Received 23 September 2024
Accepted 12 March 2025

Keywords:
Congenital heart disease
Infants
Nutrition pathway
Growth

SUMMARY

Background & aims: Congenital Heart Disease (CHD) is the most common congenital abnormality, affecting 9 per 1000 live births. Advances in surgical techniques have significantly improved survival rates but growth failure is associated with increased risk of mortality post-cardiac surgery. Improving growth amongst infants with CHD whilst awaiting surgery is an important component to reducing morbidity as well as improving longer term metabolic outcomes. A consensus-based nutrition pathway was developed and implemented into a regional paediatric cardiology service in 2017. The aim of this study was to evaluate the impact of the pathway in a larger cohort of infants with CHD in two epochs: pre-nutrition pathway implementation (Jan 2013–Dec 2016) and post-nutrition pathway implementation (Jan 2017–June 2021).

Congenital heart disease affects around 9 in every 1,000 live births and poses major challenges for infant growth and recovery. This resource presents findings from a large follow-up study assessing the impact of a structured nutritional pathway on infants with CHD. It highlights how early, targeted nutrition significantly improved growth velocity in the first months of life, helping reduce risks linked to malnutrition and supporting better long-term outcomes.

LINK HERE

PART I: IMPROVING NUTRITION AND GROWTH OUTCOMES IN INFANTS WITH CHD



This talk provides a better understanding of the role of nutrition management in infants with congenital heart disease. There will be a particular focus on the practical management of these infants (via case studies and expert panel discussion) that show the current nutrition practices and strategies for optimizing nutrition in the UK while highlighting how appropriate and tailored nutritional intervention is key for improved outcomes in these infants.

LINK HERE

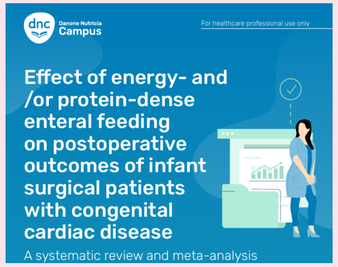
PART II: IMPROVING NUTRITION AND GROWTH OUTCOMES IN INFANTS WITH CHD



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LINK HERE

EFFECT OF ENDF ON POSTOPERATIVE OUTCOMES OF INFANT SURGICAL PATIENTS WITH CHD



This infographic highlights a systematic review and meta-analysis on the effect of ENDF in infants with CHD undergoing surgery. It summarizes key findings on how enriched nutrition can support better energy intake, protein balance, and weight maintenance during the critical postoperative period. Backed by evidence from randomized controlled trials, this resource offers valuable clinical insights for improving nutritional care in vulnerable pediatric populations.

LINK HERE

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