

# Chyme Reinfusion Therapy

with Adults and Neonates

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Clinical Nurse Specialist Stomal Therapist

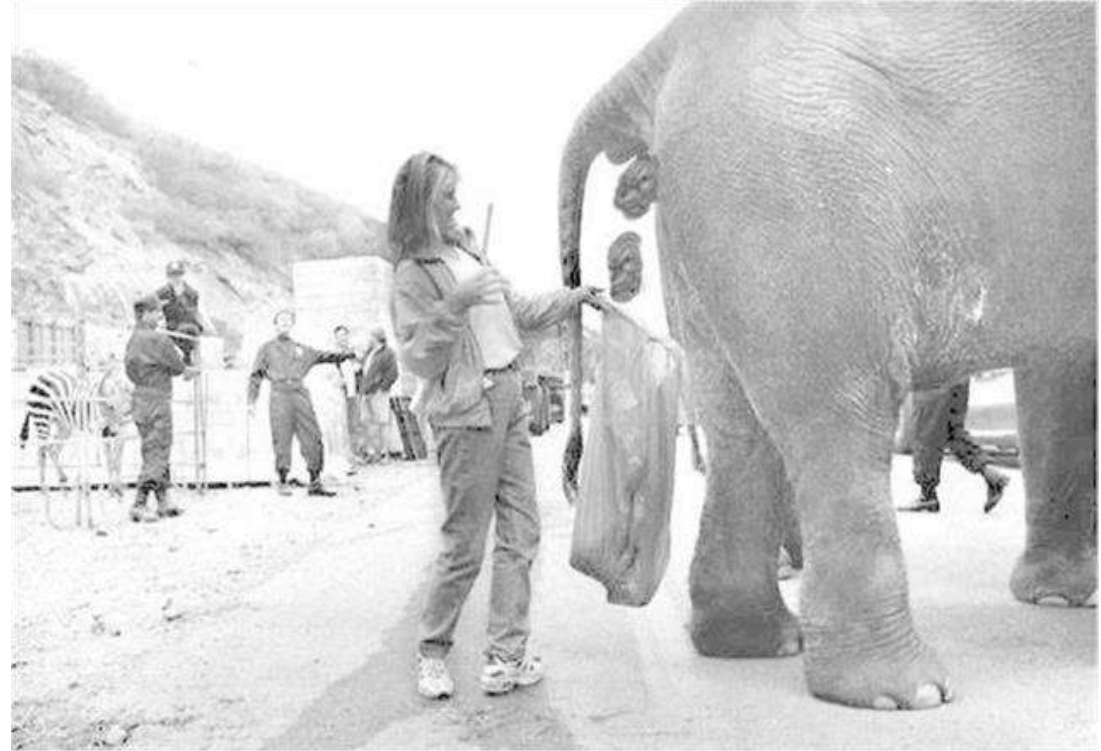


# Declarations

- I am an employee and have invested in The Insides Company
- I am the current chair of the NZNO College of Stomal Therapy Nurses

# Overview

- The basics
- Why are we doing it?
- Who are we doing it with?
- How are we doing it?



# Anatomy and Physiology

## Chyme (“κλιμ”)

- A pulpy semi-fluid composition of partly digested food, fluid, stomach acid/gastric juices, and digestive enzymes. Chyme is nutrient rich and readily absorbed in the small intestine to keep the person nourished.



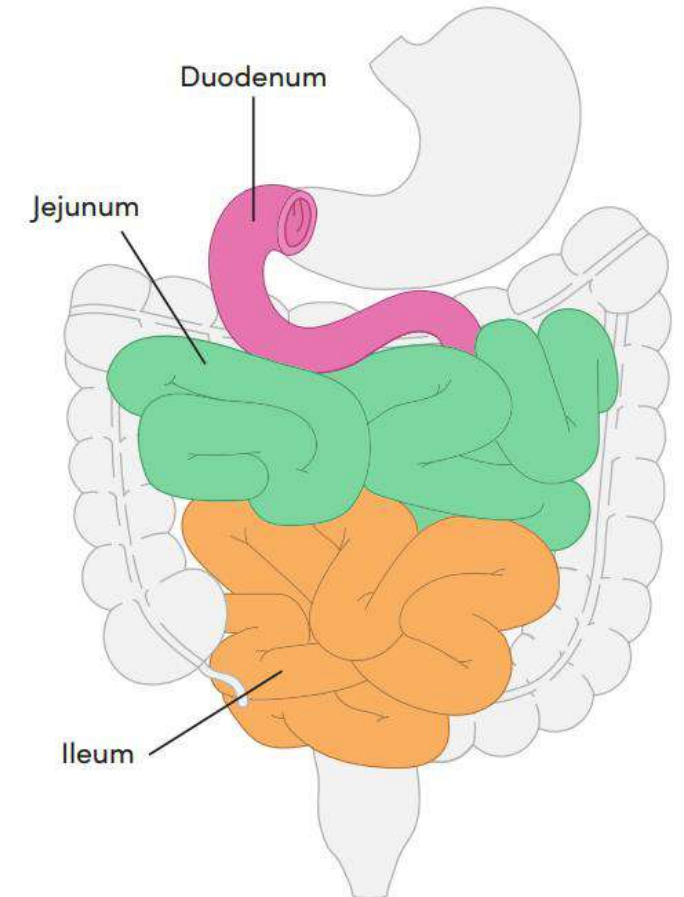
## Small Intestine

- Approximately 6 metres long
- Proximally it is joined to the stomach. Distally it is joined to the Caecum and ascending colon
- Jejunum absorbs 80% of the nutrients taken from the food you eat, and your ileum absorbs the last 20%.

## Intestinal Failure

Is a condition characterised by the gut's inability to absorb sufficient macronutrients and micronutrients to sustain life

- Requires Multidisciplinary team to manage (Parenteral nutrition, ostomy and wound care, resolve sepsis, psychological support)
- Generally, in hospital for an extended period
- Generally, originates from Short Bowel Syndrome



“Your small intestine absorbs nutrients to keep you nourished and your large intestine absorbs water and salt to keep you hydrated”

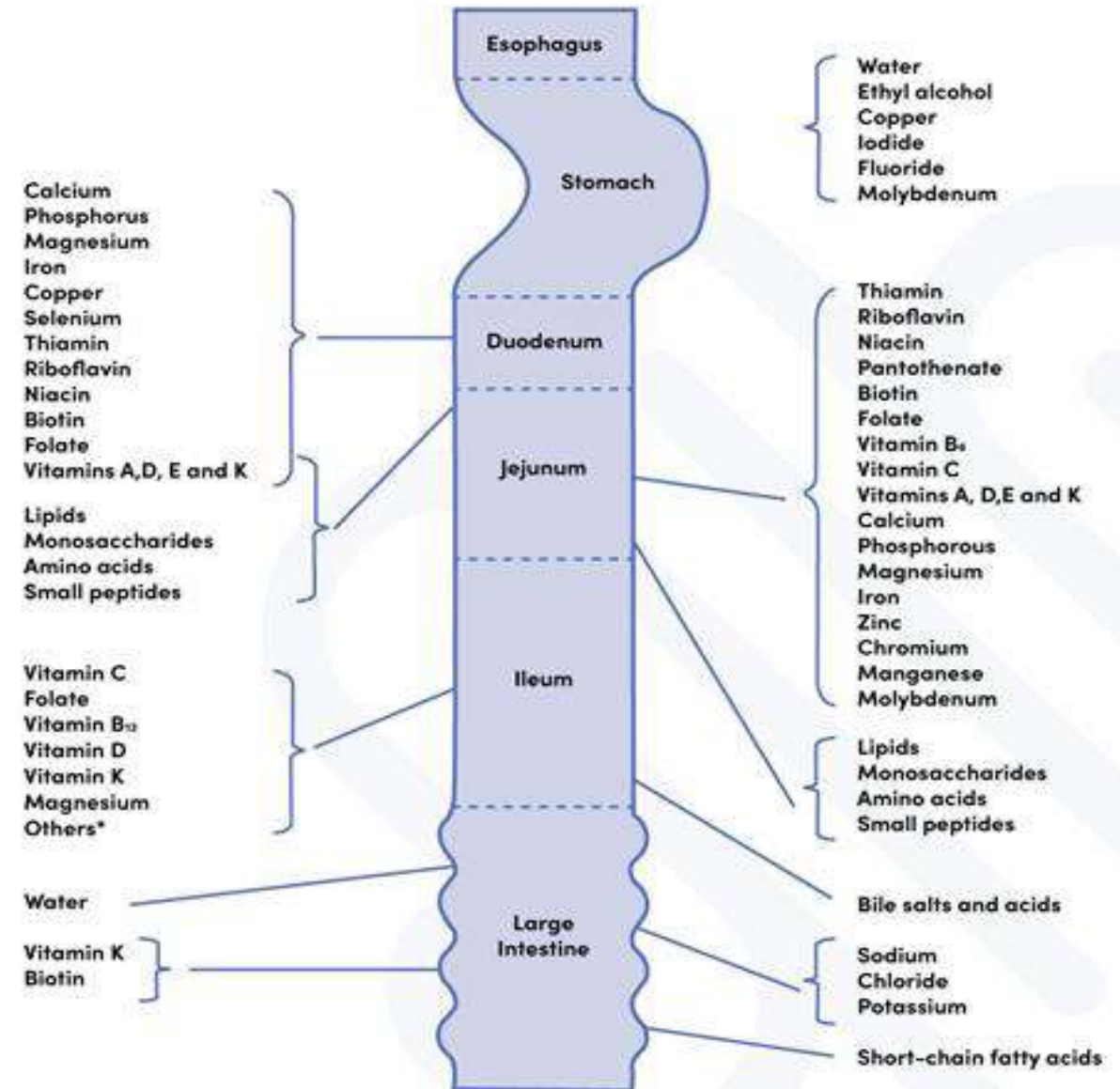
# Nutrient Absorption

## Goals (how to stay alive!):

- Nutrition
- Hydration
- Minimise complications

When a patient has a stoma or fistula, we need to be always thinking about optimisation of goals:

- Ostomy and wound care
- Medication
- Diet (Oral or IV)
- Fluids (Oral or IV)
- Psychological support
- QoL




\*Many additional nutrients may be absorbed from the ileum depending on the transit time

# Systematic Analysis Adults

Review

## Chyme Reinfusion for Small Bowel Double Enterostomies and Enteroatmospheric Fistulas in Adult Patients: A Systematic Review

Sameer Bhat<sup>1,\*</sup> ; Puja Sharma, BMedSc (Hons)<sup>1,\*</sup>; Nelle-Rose Cameron, BMedSc (Hons)<sup>1</sup>; Ian P. Bissett, FRACS<sup>1</sup>; and Greg O'Grady, FRACS<sup>1,2</sup>



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### Study demographics:

- Studies from 1983 - 2019
- 481 patients
  - 234 Men
  - 140 Women
- 18-90 years
- 24 studies,
  - 13x EAF studies
  - 18x double enterostomy studies
  - 7x both patient cohort studies

Literature available on safety and efficacy of chyme reinfusion therapy in adults with high output enterostomy's and enteroatmospheric fistulas to 2019

### Summary

- Review encompassing manual and automated chyme collection and reinfusion
- Therapy was performed for remediation of high output and proximal double enterostomy's and intestinal failure
- Multiple benefits- weight gain, wean PN, and improvement in liver function
- No adverse events reported

### Conclusions

- Safe and well-validated intervention for this patient cohort.
- Barriers to high use of manual chyme reinfusion highlighting need for automated system to ensure greater adoption in practice

# Systematic Analysis Pediatric and Neonates

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Review

## Chyme recycling in the management of small bowel double enterostomy in pediatric and neonatal populations: A systematic review



Sameer Bhat<sup>a</sup>, Nelle-Rose Cameron<sup>a</sup>, Puja Sharma<sup>a</sup>, Ian P. Bissett<sup>a</sup>, Greg O'Grady<sup>a, b, \*</sup>

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<sup>b</sup> Auckland Bioengineering Institute, The University of Auckland, Auckland 1010, New Zealand

Literature available on safety and efficacy of chyme reinfusion therapy in neonates and pediatrics to 2020

### Summary

- Review encompassing manual and automated chyme reinfusion therapy
- CRT started following proximally located enterostomy and support for nutrition and growth
- Clinical benefits include: PN reduction/cessation (19/122), weight gain, normalisation of fluid balance, improvement in liver function, and maturation of distal gut.
- Adverse events: 3x patients had intestinal perforation and 1x haemorrhage

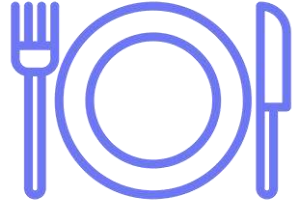
### Conclusions

- Effective therapy in neonatal and pediatric populations
- However, standardised delivery methods are required to improve intervention and minimise adverse events

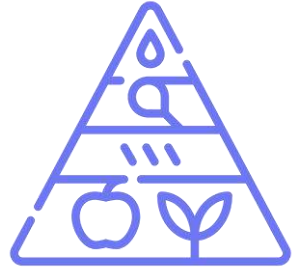
### Study demographics

- 289 patients
  - 120 males
  - 118 females
- 26-37 weeks gestational age
- 20 studies
- Aetiologies necessitating double barrel enterostomy
  - NEC (n = 117)
  - Atresia (n = 76)
  - Perforation (n = 48)
  - Meconium ileus (n = 29)
  - Volvulus (n = 11)
  - Malrotation (n = 8)

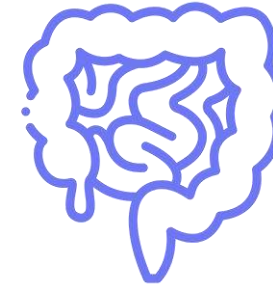
# Further Benefits



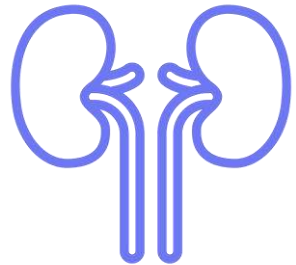
Early Return  
to Oral  
Feeding



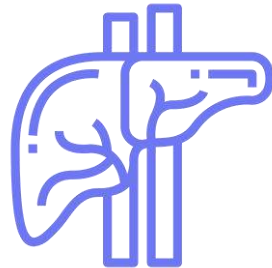
Improved  
Nutritional  
Outcome



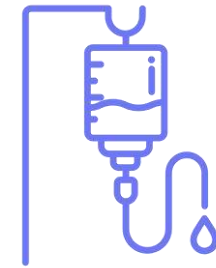
Restoration  
of Gut Function  
and Microbiome



Improved  
Renal  
Function



Improved  
Liver  
Function



Wean-Off  
Supplementary  
Nutrition



Improved  
Post-  
Operative  
Outcomes



# Indications for Chyme Reinfusion Therapy

- Management of high output double lumen enterostomy's that have an output over 1 litre in 24 hours
- Management of high output EAF's that have an output over 1 litre in 24 hours
- Rehabilitation of distal intestine before consideration of reversal of enterostomy
- Testing faecal continence before consideration of reversal of enterostomy



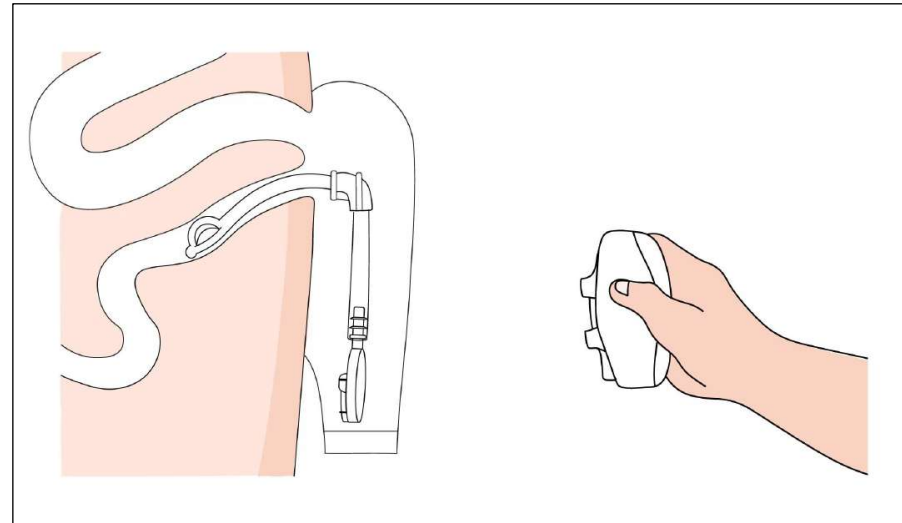
\*Alemanno, G., et al. Use of a novel chyme reinfusion device during damage control surgery to improve nutritional status in a patient with a proximal ileostomy: A video vignette. *Colorectal Dis.* 2022. 24(10), 1255-1256. doi: 10.1111/codi.16166.

# How Chyme Reinfusion Therapy is performed

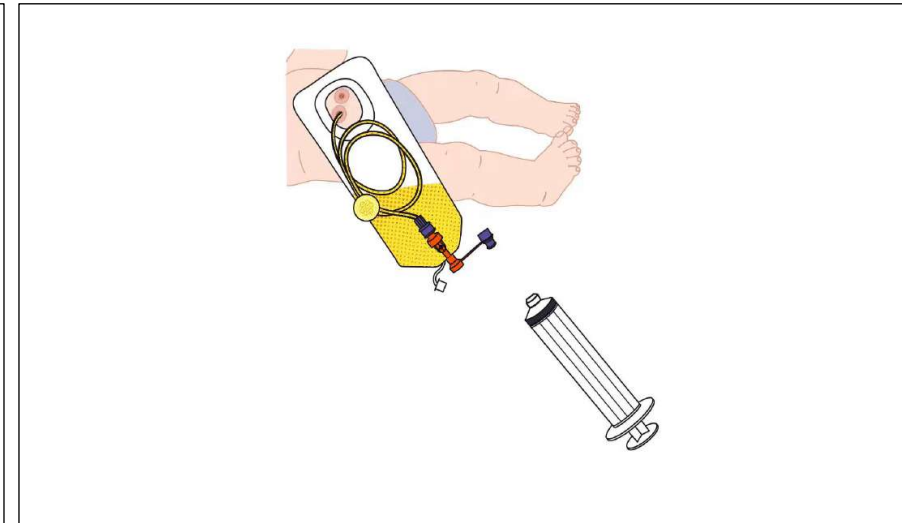
## Manual Chyme Reinfusion



## Automated Chyme Reinfusion



The Insides® System



The Insides® Neo

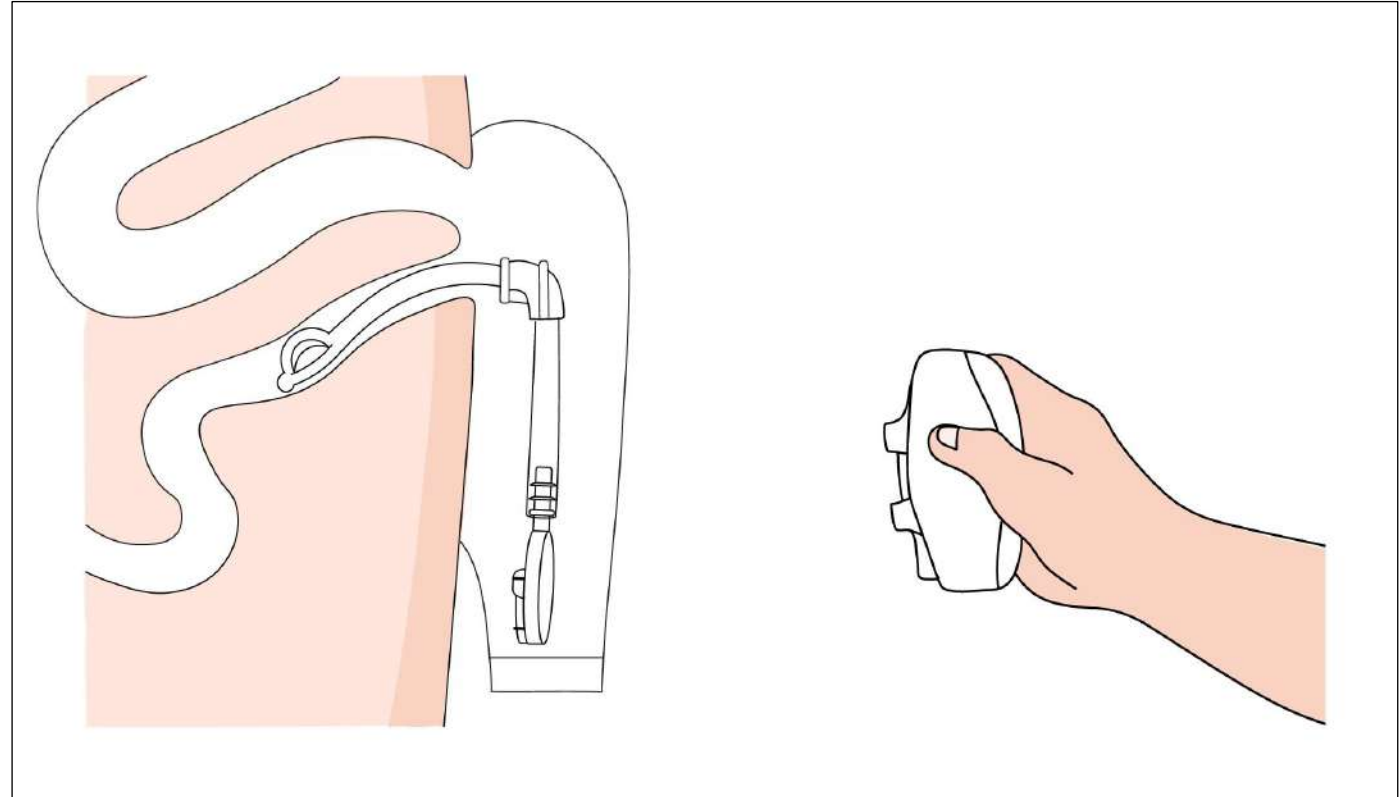
# The Insides<sup>®</sup> System

## The Health Care Professional:

- When the patient sits up, ensure the Tube does not become pressed into the end of the ostomy appliance
- Assess for pain
- Assess viscosity of chyme and educate patient on suitable range of viscosity that works well with the Pump

## The Patient:

- Position themselves either on the edge of the bed with feet flat on the ground or standing with a straight torso
- Ensure the Tube is straight in the ostomy appliance, and they can see the Tube
- Find a comfortable position to hold the Driver and support the back of the ostomy appliance for successful refeeding
- Use gravity and manipulate chyme to ensure Pump is entirely submerged
- Manipulate the bottom of the ostomy appliance to reinfuse the last few ml's of chyme
- Remove any excess gas and refeed 1/3 – 1/2 full ostomy appliance only



# The Insides<sup>®</sup> Neo

## Efficient refeeding:

- Allow the ostomy appliance to fill up for 4 to 6 hours so that the **Housing** is completely submerged.
- Decouple the extension set from the **Adapter** and withdraw chyme into the syringe. Recouple the extension set.
- Place the syringe into the syringe infusion pump and set feed rate. For example:

$$\text{Volume that has passed in the last 4 hours} \div 4 = \text{Refeeding rate (ml/hour)}$$

- This process is completed continuously over 24 hours

