

Handheld Indirect Calorimetry in the Burns Unit: a feasibility study

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Study background

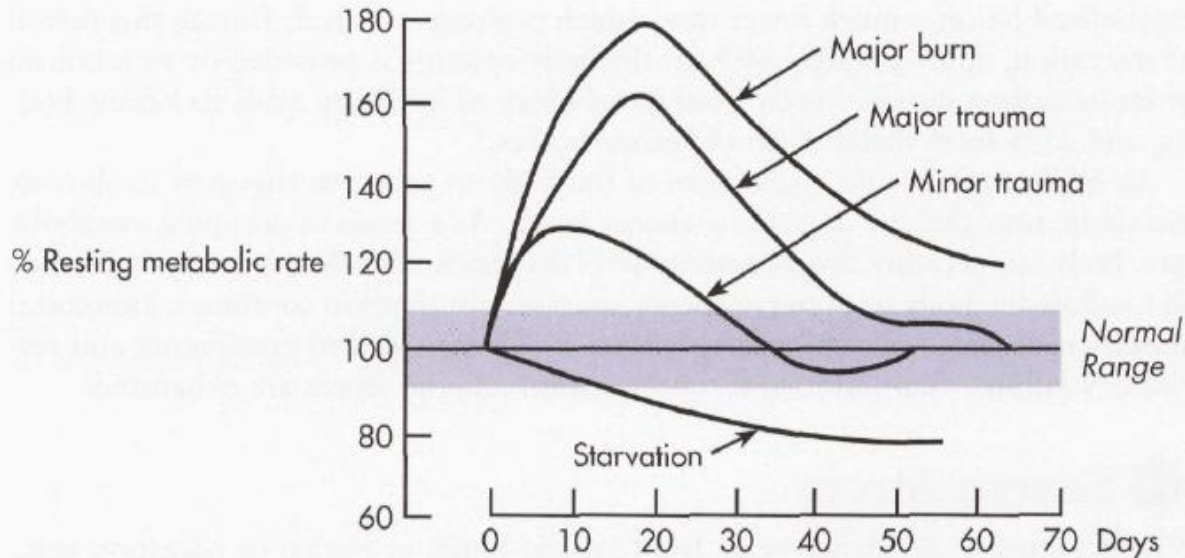
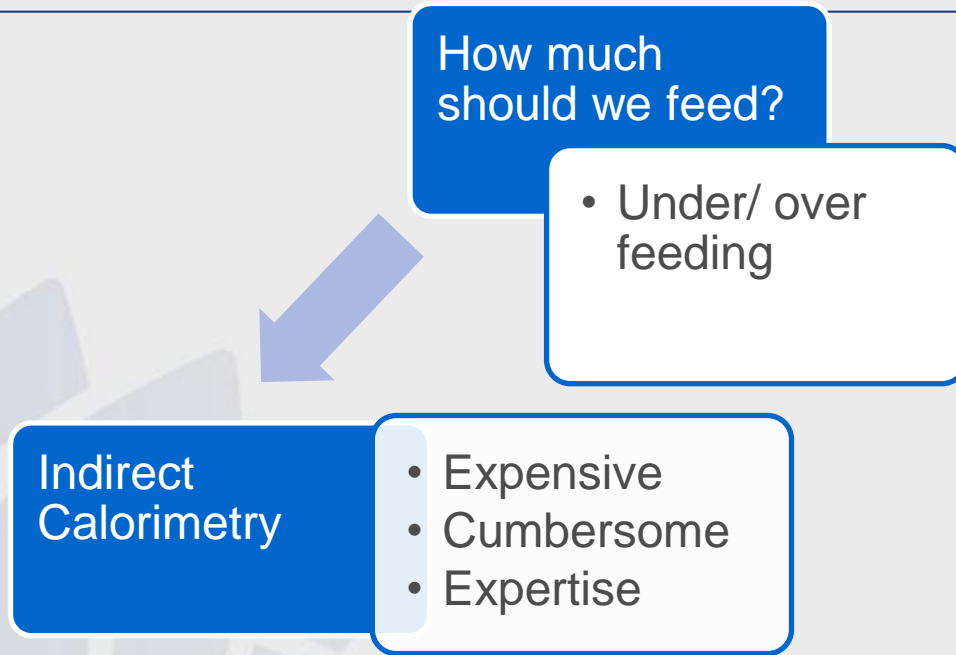


Figure 15-1 Percent resting metabolic rate. (From Kinney JM et al.: *Nutrition and metabolism in patient care*, Philadelphia, 1988, WB Saunders.)

Study background



Nevin et al. Feasibility and acceptability of implementing indirect calorimetry into routine clinical care of patients with a spinal cord injury. *Top Spinal Cord Inj Rehabil* 2016; 22 (4):269-276

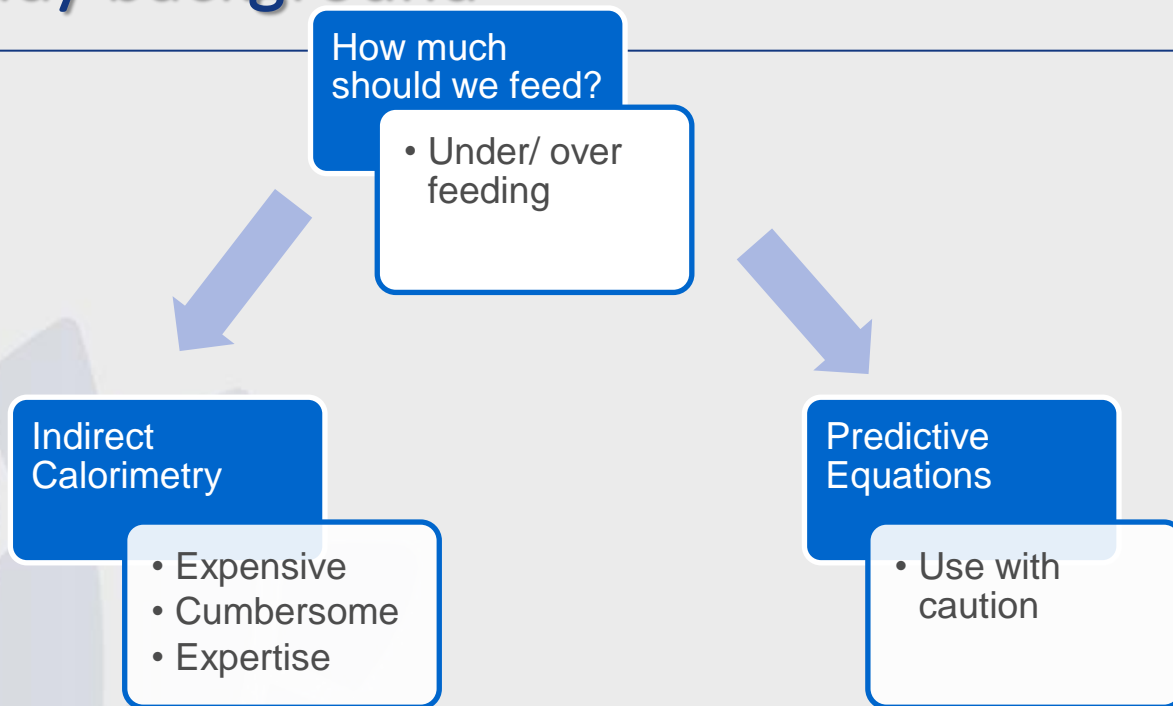
Rattanachaiwong S, Singer P. Indirect calorimetry as point of care testing. *Clinical Nutrition*. <https://doi.org/10.1016/j.clnu.2018.12.035>

Wise AK et al. Energy expenditure and protein requirements following burn Injury. *Nutr Clin Pract*. 2019;34:673-680



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Study background



Rousseau et al. ESPEN endorsed recommendation: Nutrition therapy in major burns. *Clin Nutr* 2013;32:497-502
Leung J et al. Predictive energy equations are inaccurate for determining energy expenditure in adult burn injury: a retrospective observational study. *ANZ J Surg* 2019;89:578-583



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Predictive equations in burn injured patients

- Studies comparing the predictive equations in burns injured patients with IC all recommend different equations

0149-0012/02/2601-0017\$03.00/0
JOURNAL OF PARENTERAL AND ENTERAL NUTRITION
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Vol. 26, No. 1
Printed in U.S.A.

Original Communications

Accuracy of Predictive Methods to Estimate Resting Energy Expenditure of Thermally-Injured Patients*

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Determination of Resting Energy Expenditure After Severe Burn

Beth A. Shields, MS, RD,* Kevin A. Doty, MS,* Kevin K. Chung, MD,*
Charles E. Wade, PhD,*† James K. Aden, PhD,* Steven E. Wolf, MD*‡

(J Burn Care Res 2013;34:e22-e28)



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Contents lists available at ScienceDirect

Clinical Nutrition

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



Original article

Reliability of resting energy expenditure in major burns: Comparison between measured and predictive equations

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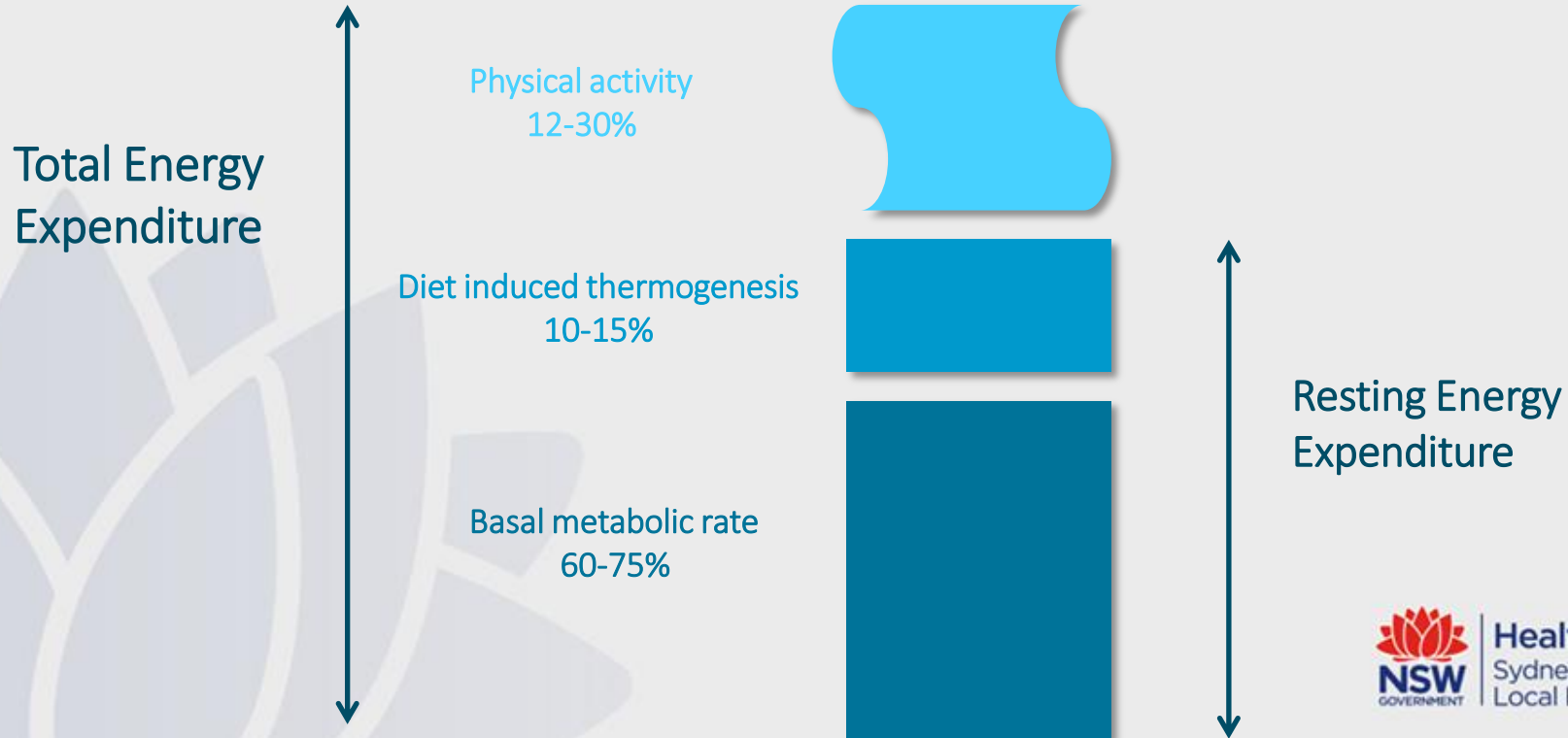
Indirect Calorimetry

- Machine which measures the volume of expired gas and the inhaled and exhaled concentrations of O_2 and CO_2
- Resting energy expenditure (REE) determined by
 - O_2 consumption
 - CO_2 production
- Only assesses the EE for that particular time.

Indirect Calorimetry



What makes up energy expenditure



Study Aims

- feasibility of implementing regular use of the handheld calorimeter (FitMate[®]) into regular dietetic practice in the Burns Unit
- how the results compare with the predictive equations currently in use

Methods

- All patients ≥ 75 yo with any burn size and patients ≥ 18 yo with a burn injury $\geq 10\%$
- Resting energy expenditure measured by the FitMate
 - Goal of 5-10mins steady state



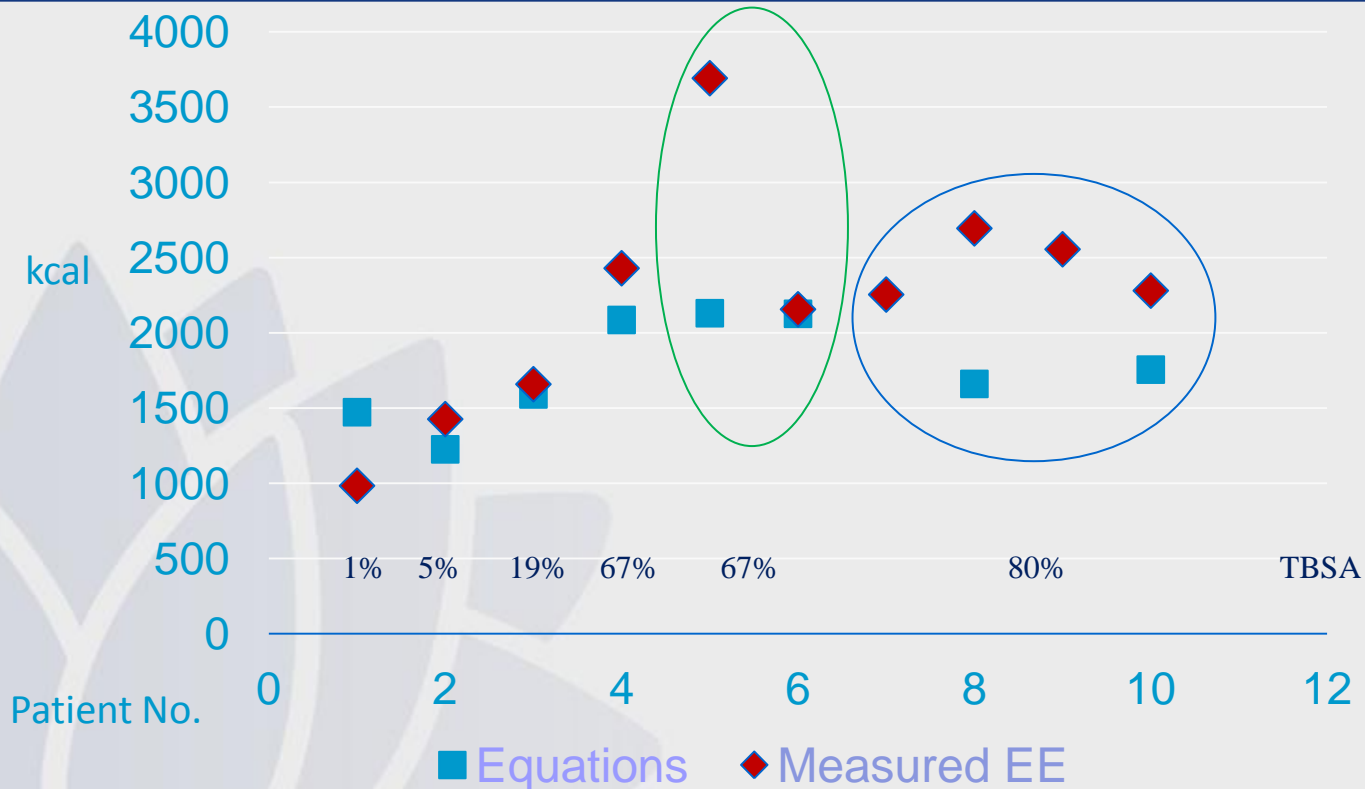
Methods

- Feasibility of implementing IC
 - Patient questionnaire about their experience
 - Impact on nutrition management and dietitian time
- Comparison of measured REE with predictive equations
 - Toronto Equation
 - Modified Schofield with injury factors

Preliminary Findings

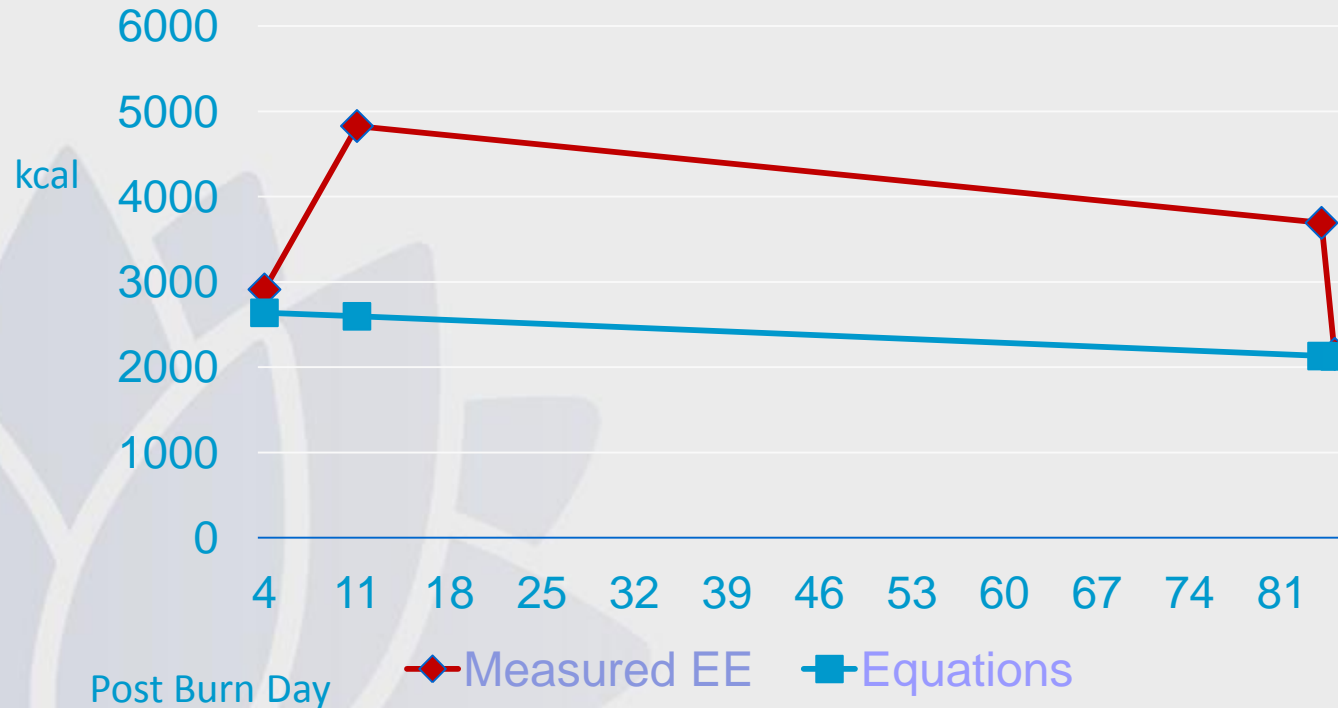
- 6 patients met the criteria
 - 3 female
 - 19-89yo
 - 1-80% TBSA (flame, scald, electrocution)
 - 2 patients had multiple measurements
- 3 questionnaires completed

Preliminary Findings



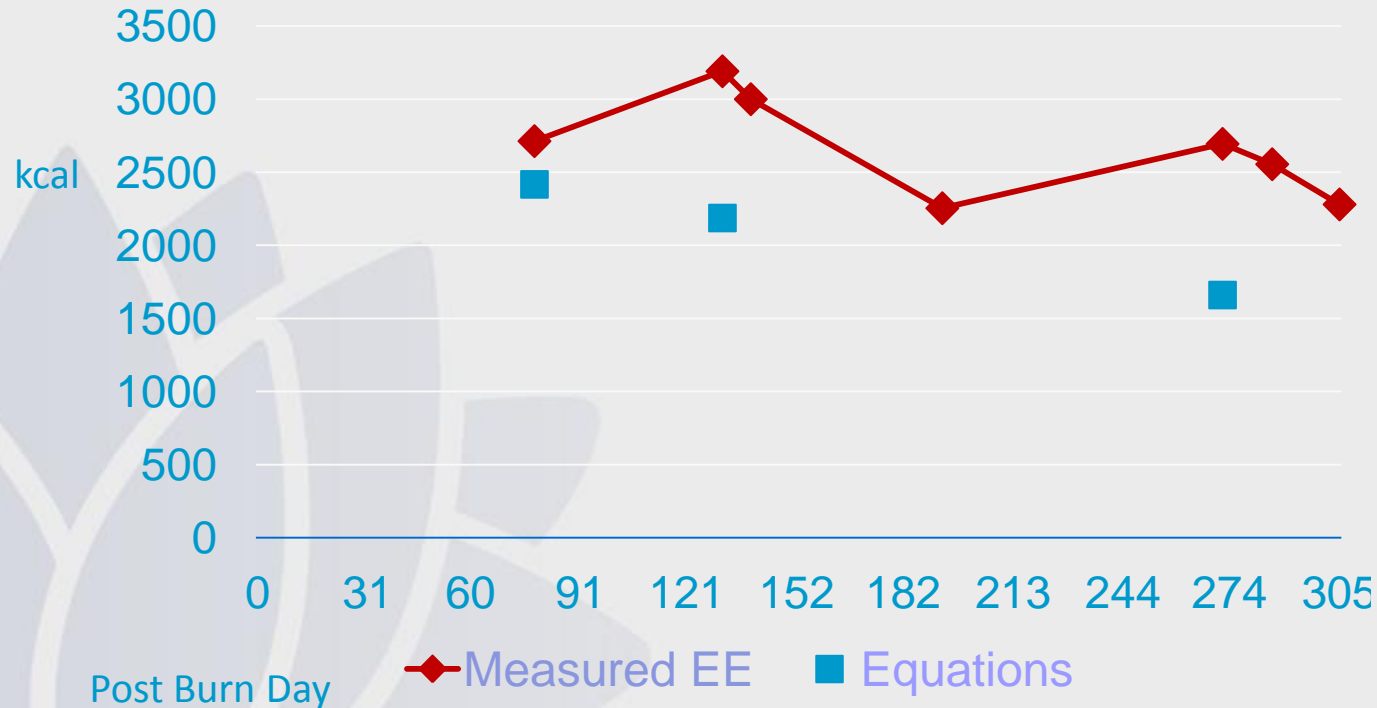
Preliminary Findings

Patient 5 – 67% TBSA



Preliminary Findings

Patient 6 – 80% TBSA



Preliminary Findings – Patient Questionnaire (n=3)

Instructions and information about IC

- Purpose and instructions “very clear” n=3

Comfort during procedure

- Comfortable, able to breathe, relax and remain still n=3
- Would repeat test n=3

IC results

- IC Results clear n=3
- Information motivating and useful n=3

Preliminary Findings – Nutritional Management

- Time taken per patient 50-120mins
- Enteral feeds and /or oral nutrition support increased in 3/6
- Nutrition support duration extended in 3/6 patients

Considerations

- Providing valuable information
- Impacting our nutritional management
- Potential to improve outcomes as nutrition management individualised
- Issues with timing of the procedure

Future Directions

- Complete the study as planned
- If results continue to provide value, ensure IC remains routine care
- Investigate impact on clinical outcomes

Acknowledgements

- Amelia Scott
- Concord Burns Unit MDT
- Cosmed
 - Conference sponsorship

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