



## BDA Critical Care Specialist Group COVID-19 Best Practice Guidance: Enteral Feeding in Prone Position

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### Introduction

Prone positioning is an intervention used in Acute Respiratory Distress Syndrome to help improve oxygenation, prevent ventilator associated lung injury and in combination with a protective ventilation strategy has been shown to decrease mortality<sup>1</sup>. Proning is a strategy being used with frequency for patients with COVID-19<sup>2</sup>.

Whilst there is little published evidence regarding enteral feeding in the prone position it has historically been thought to carry risks. These beliefs can make adequate provision of nutrition a particular challenge in proned patients, on top of the usual challenges in providing adequate nutrition in critically ill patients. In addition to this, patients who are placed in prone position may have decreased enteral feeding tolerance compared to patients in the supine position<sup>3</sup>.

## **Summary of Published Studies Used to Inform Recommendations**

A literature search was performed to inform this guideline. Six studies published in English language were identified. All studies identified had small sample sizes, with primarily observational study designs, therefore the quality of the available evidence is low and should be interpreted with these limitations in mind. Where evidence is lacking the experience and usual practice of experienced critical care dietitians within the British Dietetic Association Critical Care Specialist Group was used to make recommendations.

### **Route of Delivery**

Only one study was found which compared gastric and post-pyloric tube feeding. The study compared the incidence of microaspiration, defined by the presence of pepsin in endotracheal tube aspirates. No difference in microaspiration between those with post-pyloric and gastric feeding tubes were found<sup>4</sup> however patients with overt feed intolerance were removed from the study thereby limiting conclusions in patients where this is present. All other studies found used gastric feeding tubes, and no increase in ventilator associated pneumonia was found in comparison to those in the supine position<sup>3,5</sup>.

### **Gastric Residual Volumes**

Published studies have used a variety of gastric residual volume (GRV) cut offs, ranging from 150-500 ml every 3-6 hours<sup>6,7</sup>. Most commonly a GRV of 250 ml has been used<sup>3,5,8</sup> however this appears to be an arbitrary choice likely related to local feeding practices. There were no published studies identified which compared the risk of aspiration based on different GRV thresholds. Most studies found no significant difference<sup>5-7</sup> or a difference which was not clinically significant<sup>8</sup> in GRVs in prone position compared to supine. Whilst one study reported higher GRVs in prone position<sup>3</sup>, this is likely related to the difference in care including head of the bed not elevated and a lower use of prokinetics compared to other studies. Four of the six studies stated that gastric aspirates were returned to the patient up to a maximum of 100 ml<sup>6</sup> or 250 ml<sup>3,5,8</sup>, whilst other studies did not specify.

### **Enteral Feeding Regimens**

All studies used feed delivery via pumps, however it is acknowledged that during the COVID-19 pandemic many hospitals are having to consider alternative feed administration options including gravity and bolus feeds.

The maximum feed rate used in the studies ranged from 65 ml/hr<sup>3</sup> to 85 ml/hr<sup>5</sup>. The rate of feed increase was from 25 ml/hr, increasing by 25 ml/hr every six hours to target<sup>5</sup>, to 30 ml/hr and increase by 30 ml/hr every 24 hours<sup>3</sup>, to a 25% of target at day one increasing by 25% a day to reach target at day 4<sup>7</sup>. This is reflective of the ranges in practice seen in enteral feeding in critical care, however it should be noted that one study found that an accelerated rate of enteral feed increase (increasing by 25 ml/hr every six hours) was well tolerated, and in conjunction with prophylactic prokinetics and a raised head of bed resulted in increased feed administration without increased tolerance issues<sup>5</sup>.

No studies compared different enteral feed types or energy densities on enteral feeding tolerance in the prone position.

## **Aims**

This document aims to provide guidance on how to deliver enteral nutrition safely whilst mechanically ventilated patients are in a prone position.

## **Best Practice Recommendations**

This guidance is designed to be general enough to apply to a range of usual practices and circumstances. When applied it is essential to consider the specific circumstances of each critical care unit, which may change over the course of the COVID-19 pandemic.

### **1. Tube position**

- In the first instance enteral feed should be delivered by a naso-gastric tube (NGT).
- NGT insertion should only occur when the patient is supine.
- If established local practice is for Naso-jejunal tube (NJT) feeding in proned patients this can continue if it is practical to do so.
- NJT insertion should only occur when the patient is supine.

### **2. Feed Delivery**

- Continuous enteral feeding via a feeding pump is considered best practice.
- Evidence suggests it is safe to feed at a maximum rate of 65-85mls/hr and we do not recommend higher than this during proning.
- Gravity feeding should be avoided where possible, however could be considered if no feeding pumps are available.
- Bolus feeding should not be attempted in patients whilst they are in the prone position.

### **3. Choice of feed**

- In the first instance a 1.3-1.5kcal/ml feed should be utilised, this should facilitate the balance between optimal feed tolerance and fluid management.
- Where strict fluid restrictions are in place a 1.5-2kcal/ml feed may be considered with extra care given to the vigilant monitoring of gastric tolerance.

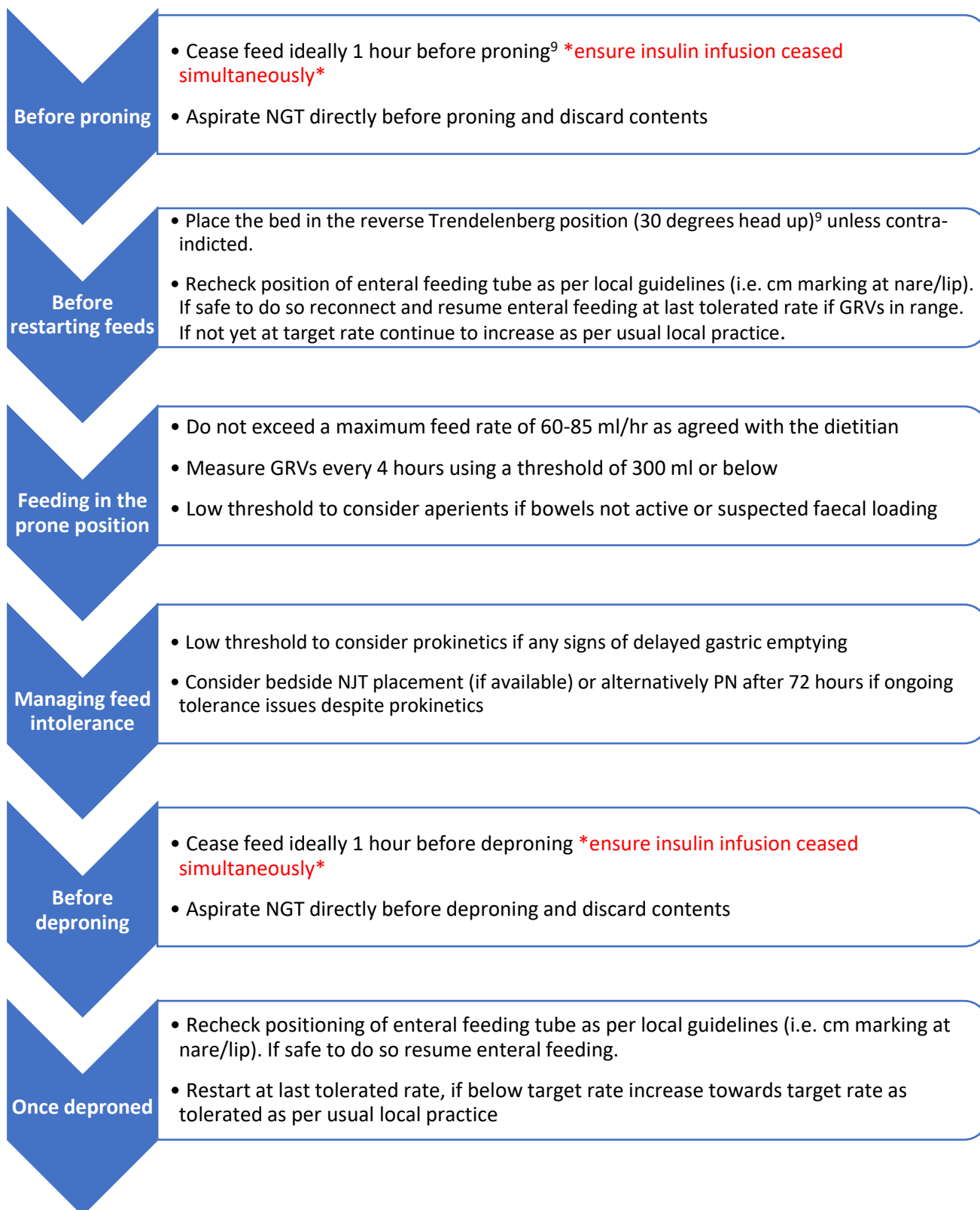
### **4. Monitoring feed tolerance**

- NGTs should be aspirated every 4-6 hours to check GRVs, as staffing ratio allows.
- It is recommended that in all proned patients a maximum GRV of 300 ml should be used unless a lower GRV threshold is already established practice.
- It is recommended that up to 250 ml of GRVs are returned to the patient and the remainder are discarded, unless a more conservative practice is already locally established.

## **5. Managing Feed Intolerance**

- If a GRV exceeds threshold at any time, commencing prokinetics in accordance with local guidelines is recommended
- If gastric aspirates remain above threshold after 12-24 hours of prokinetic use, a second line of feeding should be considered:
  - Ideally where possible bedside placement of NJT should be considered when the patient is turned back to supine, especially if it is expected that the patient will require further proning sessions over the next 48 hours or more.
  - If an NJT cannot be placed or has not improved feed tolerance parenteral nutrition (PN) should be considered after 72 hours.

## Flowsheet of best practice recommendations for enteral feeding in the prone position



## References

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