

## Constipation in Critically Ill Patients: Still an Unresolved Problem

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### Abstract

Constipation remains an important and poorly recognised problem in patients admitted to a critical care unit. In this study, we present our data from large, University teaching hospital unit and demonstrate that the prevalence of constipation was high. Among the 24 non-ventilated and 21 ventilated patients audited, 67% and 57% respectively were constipated. There appeared to be an impact on weaning from respiratory support. We discuss reasons why despite efforts to highlight this condition, implementation of guidance remains poor.

**Keywords:** Critical care; Constipation; Implementation

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### Introduction

Constipation is a common problem in critical care settings [1] although often neglected in the literature. Constipation leads to a host of problems for patients admitted to critical care; it contributes to failure to feed [2], delayed weaning from mechanical ventilation [2] and longer hospital stay [2,3]. These problems can increase mortality [3] through obstruction, intestinal perforation [4,5], and aspiration pneumonia [2,6].

However, studies of constipation specifically in critical care have been hampered by a lack of a definition of the clinical state. A recent consensus definition from Europe has been agreed [7] as “the inability of the bowel to pass stool due to impaired peristalsis”. The group also recommended that absence of stool for three or more consecutive days should be present and mechanical obstruction excluded. The presence or absence of bowel sounds was not thought to be important in the context of critical care.

A previous survey of 48 critical care patients at our university teaching hospital showed a high incidence (83%) of constipation leading to problems such as failure to wean from mechanical ventilation (42.5% vs 0%  $p < 0.05$ ), increased length of stay and increased rate of failure to feed enterally [2]. As a result a bowel protocol was introduced to standardise the management of constipation.

In this article, we describe our most recent data and discuss how this poorly recognized critical care problem may be addressed to benefit patients.

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### Aims

The primary aim of this study was to examine the adherence to bowel protocol in our critical care units we aimed to revisit the issue since the introduction of the bowel protocol. The aims of this audit were to check compliance with the protocol and also to investigate whether the effects of feeding and constipation on weaning from mechanical ventilation were still important after over a decade as critical care management has moved on.

### Method

For the purpose of this study, constipation was defined as a failure of the bowels to open for 3 consecutive days, and adherent to the current European definition. [7].

### Patient profile

All patients who stayed on critical care for more than 3 days were included except for patients after bowel surgery and patients with encephalopathy.

As this study was designed as an audit, we aimed to include 20 patients in two groups: those that received mechanical ventilation of the lungs (V) and those that breathed spontaneously (NV). There was, therefore, no attempt to power the study, as one would do with a research protocol. We finally audited the case notes of 24 spontaneously breathing (non-ventilated, NV) patients and 21 mechanically ventilated (ventilated, V) patients prospectively to assess compliance with the bowel protocol and the incidence of constipation. These patients were selected randomly from our high dependency (HDU) or intensive care (ICU) areas of the critical care units.

The following information was noted: age, sex, APACHE II score, diagnosis, length of stay, number of days on continuous positive airway pressure (CPAP) or high flow oxygen (as applicable) or mechanical ventilation. We also noted the number of days that a patient required nasogastric feeding (NG) or total parenteral nutrition (TPN).

Failure to feed was defined as repeated vomiting or having to stop a patient's NG feed due to high aspirates. Also noted were duration of constipation, compliance with bowel protocol, episodes of colonic pseudo-obstruction, bowel perforation and gastroenterologist or surgical involvement.

### Benchmark protocol for audit

The institutional bowel protocol for critical care asks the health care provider to start prophylactic treatment on admission or alternatively start treatment if bowels have not opened for 3 days after admission [2]. The management plan states that if the enteral route is available a patient should firstly be prescribed oral laxatives like senna (17.6 mg twice a day) or lactulose (15 ml twice daily). If stool is present on rectal digital examination the patient could receive a glycerine suppository (4g, as required) or a bisacodyl suppository or tablet (10 mg once daily). In suitable cases Micralax™ enema (5 ml, once) may also be used. Secondly, if the enteral feeding target is not met, drugs to increase gut motility such as metoclopramide (10 mg three times a day) or erythromycin (125 mg three times a day) is considered, once mechanical obstruction of the gut is ruled out.

## Results

The prevalence of constipation was high. Among the 24 non-ventilated (NV) and 21 ventilated (V) patients audited, 67% and 57% respectively were constipated. Median duration of constipation in NV patients was 4.9 days and on V patients 4.7 days. Laxatives were prescribed for constipated patients in 25% if they were from HDU and 75% if from ICU.

Constipated patients required mechanical ventilation for an average of 6.8 days and non-constipated for 4.3 days. However, in this audit's sample size, a statistical significance was not seen, and indeed, it was not the primary aim of this work. There was no such trend relationship between constipation and weaning from CPAP or high flow oxygen in NV patients.

The majority of critical care patients were fed using the NG route. Failure to feed was observed at least once in 58% constipated and 44% non-constipated ICU patients and 19% constipated and 12.5% non-constipated HDU patients. Also 25% of constipated ICU patients required TPN while non-constipated ICU patients did not.

The relationship to feeding and respiratory support was assessed taking into consideration the median age, APACHE II score and length of stay; constipated and non-constipated patients were similar.

It is worth noting that none of the constipated patients developed bowel perforation or colonic pseudo-obstruction and that gastroenterologist/surgeons did not have to be involved in managing their constipation.

### Discussion

We have demonstrated, in a UK critical care unit environment that constipation in critical care remains an un-resolved problem, with impact on the recovery of patients.

The primary aim of this study was to examine the adherence to bowel protocol in our critical care units, which was one of the first units worldwide to highlight this issue [2]. Hence the sample size was not powered to analyse statistical significance in this audit. This can be considered to be a weakness of this study. However, it is clear that there was a high prevalence of constipation among critical care patients with poor adherence to the bowel protocol.

Although the incidence of constipation was lower in this study (67% in NV and 57% in V patients) compared to our previous report (83%) [2], it was still a cause for concern.

Duration of mechanical ventilation was greater in constipated than non-constipated patients, 6.8 days and 4.3 days respectively. This is in keeping with our own unit's experience reported previously [2].

There was a correlation between failure to feed and constipation in HDU and ICU patients but further studies are needed to determine the significance of this trend.

However, we would like to use our work to highlight not only the fact that constipation remains a significant clinical factor that impacts on critical care patient well-being, but that even in units, such as ours, which produced some of the earliest international data on this subject, the implementation of a standard protocol remains poor. An interim audit that had been carried out after our initial data was published, and following the establishment of a unit protocol supported by education, had shown that the incidence of constipation had been reduced from 83% to 40% [8].

It is possible that as the specific management of constipation may not form part of care bundles that have become commoner in critical care practice, nurses may not always pick this up in the technologically rich environment of critical care medicine [8].

We feel that based on the paucity of studies on this subject, the problem of recognizing constipation as a problem in critical care medicine practice still remains. However, the main issue now maybe that of a failure of implementing and following guidance. It is becoming clear that care bundles work better than single issue guidelines and also those innovations in implementation result in positive outcomes, especially when they are critical care nurse led [9].

The issue of constipation has now become more significant as it is being shown not only to impact on nutrition and respiratory function, but also may be an independent risk factor [10]. This, and similar findings, may allow constipation in critical care, an important but often neglected area, to become part of a bundle of care, thereby allowing a smoother implementation.

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### Conclusion

We recommend further work that examines the implementation of pathways to alleviate constipation in critically ill patients, preferably incorporating this within existing care bundles. Any future work will also have to account for the variable definition of constipation [11], which make comparisons and the literature harder to evaluate.

### Declaration

Some data from this work was presented at the 33<sup>rd</sup> International Symposium on Intensive Care and Emergency Medicine, Brussels, 2013.

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