

# Lactulose Works in the Large Bowel: But How Does it Improve Hepatic Encephalopathy in a Patient Without a Large Bowel?

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## Introduction

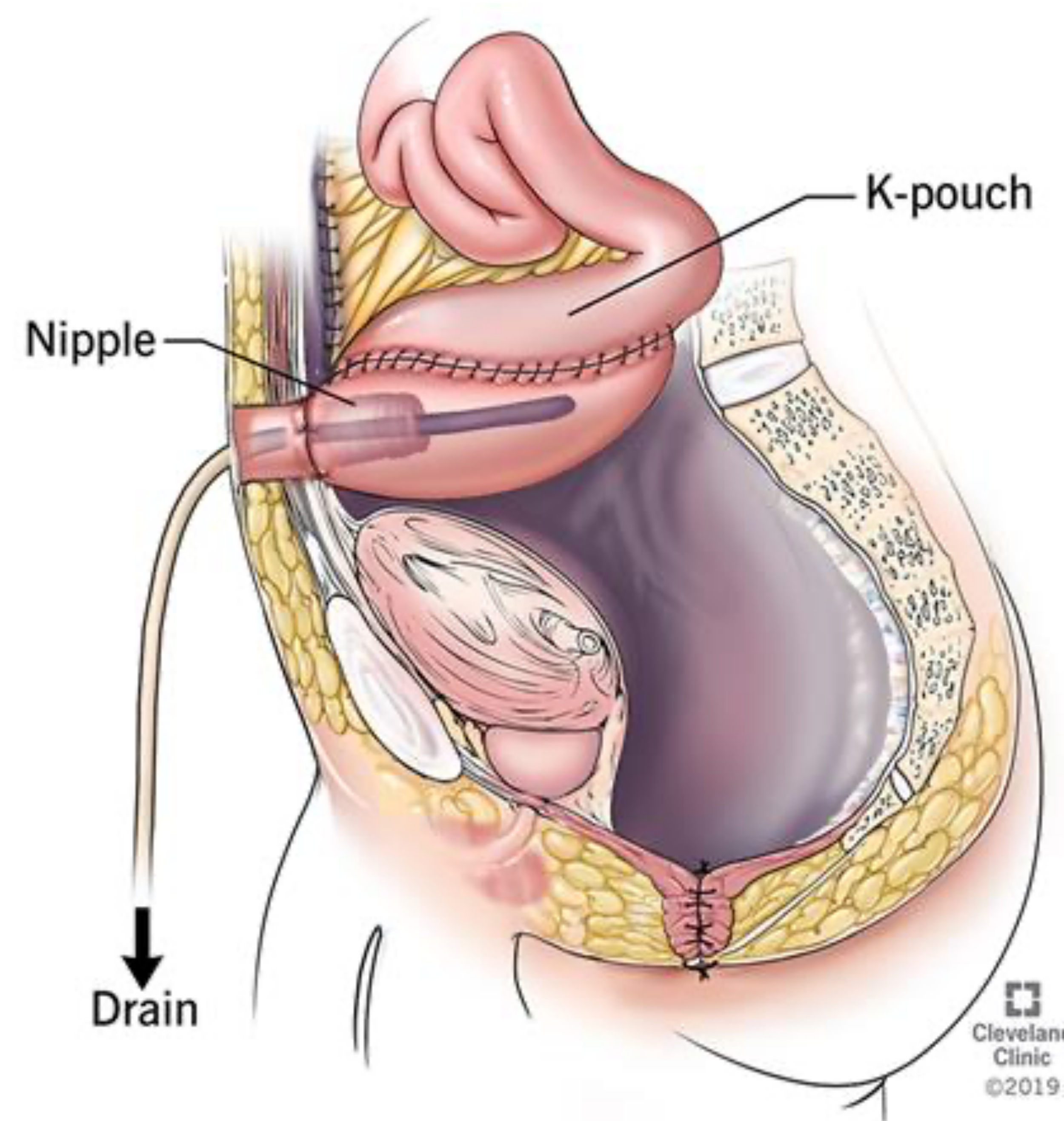
- Lactulose is a non-absorbable disaccharide which acts in the large bowel
- Lactulose is commonly used in the treatment of hepatic encephalopathy.
- We present a case of altered mental status due to hepatic encephalopathy successfully managed with lactulose in a patient with history of total colectomy.

## Case Presentation

- 67-year-old male with non-alcoholic cirrhosis and inflammatory bowel disease (IBD) post total proctocolectomy with a continent ileostomy known as a “Kock-pouch” (K-pouch), presented with flu like symptoms and altered mental status.
- He was subsequently found to be positive for COVID-19
- Patient was obtunded with an elevated ammonia level of 91 umol/L
- Colorectal surgery was consulted for malfunctioning K-pouch
- Catheterization with a Water’s tube yielded 400cc of effluent
- Nasogastric tube was placed and he was started on lactulose 30mg q8 hours.
- Patient’s mental status improved within 24 hours
- The patient ultimately underwent flexible pouchoscopy with endoscopic dilation and placement of a 22 French mushroom catheter for decompression of the K-pouch

## What is a K-Pouch?

- A K-Pouch, also known as a Kock-Pouch or continent ileostomy, is an alternative to a regular (end) ileostomy.
- K-pouch is used in cases of ulcerative colitis when the large intestine and rectum need to be removed because of disease and the anal sphincter muscles are weak, or because alternative pouches cannot be made.



## Discussion

- Lactulose is a non-absorbable disaccharide composed of galactose and fructose
- The small intestine does not have the enzymes required to breakdown lactulose
- In the large bowel, lactulose is metabolized by colonic bacteria into monosaccharides and then to volatile fatty acids, hydrogen and methane
- Lactulose decreases both the production and absorption of ammonia mainly through the presence of gut bacteria

### THE QUESTION THEN ARRIVES AS TO HOW LACTULOSE WORKED IN A PATIENT WITHOUT A LARGE BOWEL

- One proposed mechanism is the translocation of bacteria normally found in the large bowel to the small intestine
- Small Intestinal Bacterial Overgrowth (SIBO), is a condition causing an increased number of bacteria in the small intestine
- Patients with IBD and structural abnormalities are at increased risk of developing SIBO
- Lactulose is used in the diagnosis of SIBO through administration of lactulose and subsequent measurements of hydrogen and methane gas in expired air, proving that it can be broken down in the small intestine under the right conditions

## References

Ileal pouches. Cleveland Clinic. <https://my.clevelandclinic.org/health/treatments/15549-ileal-pouches>. Accessed October 5, 2022.

K-Pouch. Cleveland Clinic. <https://my.clevelandclinic.org/health/treatments/15549-ileal-pouches>. Published 10/19/2019. Accessed October 5, 2022

- Lactulose is a non-absorbable disaccharide composed of galactose and fructose. The small intestine does not have the enzymes required to breakdown lactulose so it reaches the large bowel in its original form.
- In the large bowel, lactulose is metabolized by colonic bacteria into monosaccharides and then to volatile fatty acids, hydrogen and methane.
- Lactulose decreases both the production and absorption of ammonia mainly through the presence of gut bacteria.
- The question arises as to how lactulose decreased ammonia levels in this patient without a large bowel. One proposed mechanism is the translocation of bacteria
- normally found in the large bowel to the small intestine