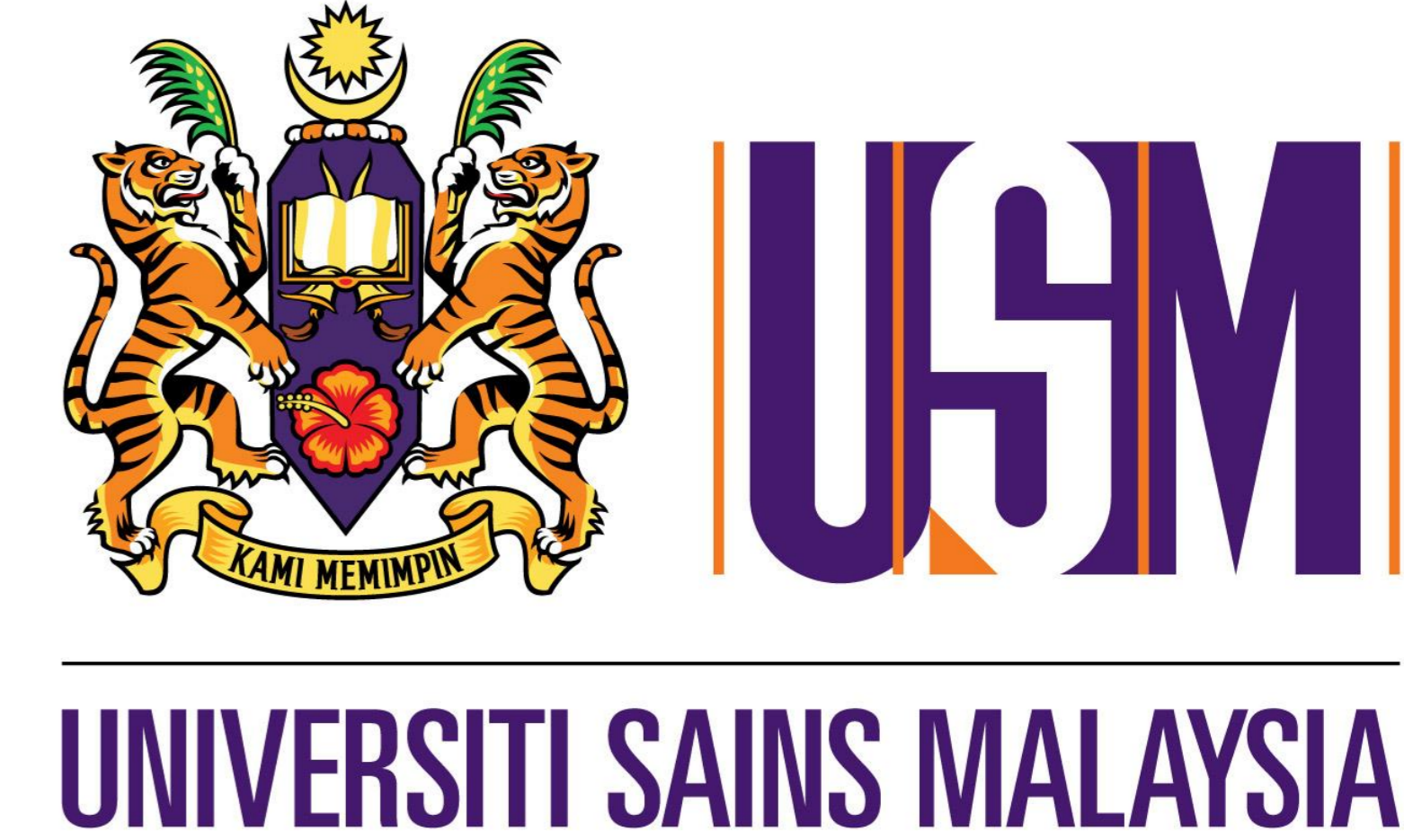


# An Observation on the Effect of Semi-Elemental Oral Nutritional Supplements on the Reduction of Small Bowel Ostomy Output



Wong M.P.K.<sup>1</sup>, Mohd Nizam MH<sup>2</sup>, Hasmah H<sup>1</sup>, Andee D.Z<sup>2</sup>,  
W. Zainira<sup>2</sup>, Zaidi Z<sup>2</sup>, S. Hassan<sup>2</sup>  
<sup>1</sup> Advanced Medical and Dental Institute, Universiti Sains Malaysia,  
Malaysia  
<sup>2</sup> Hospital Universiti Sains Malaysia, Universiti Sains Malaysia, Malaysia



## Abstract

Semi-elemental oral nutritional supplements are also referred to the oligomeric, hydrolyzed or peptide formula, the nitrogen source of the formulae derived from hydrolyzed oligopeptide of shorter lengths such as the dipeptides and tripeptides. The ingredient of casein and lactalbumin hydrolysates in this formula are believed to be capable of stimulating the jejunal absorption of water and electrolytes. The postulated stimulation of improves absorption increased our curiosity on its effect on those patient with high output ostomy. We understand that this formula is more costly compared to the other polymeric formula available in the market. We would like to share an observation of two ostomies output that are managed conservatively along with the supplementation of a semi-elemental formula. We retrospectively review the case notes of two patients with small bowel ostomies and graphs were plotted to demonstrate the relationship between the output and the intake of the semi-elemental formula. We observed an interesting pattern of the ostomy output in relationship to intake volume. The ostomy output decreases as the patients increase the intake of the semi-elemental formula. From our observation, we concluded that semi-elemental formula improved clinical nutrition outcome and also quality of life in terms of stoma output reduction, making the stoma care more manageable. However, we hope that through our observation case studies, we would encourage more researchers to conduct a larger prospective and clinical study to explore the true clinical effects and also cost-effectiveness of this formula.

## Introduction

High Stoma output is defined as persistent stoma output of more than 1500mls per day. The strict definition does not confer to the clinical problems that they cause. In our centre, we are vigorous in monitoring closely the patients who have daily small bowel ostomy output of more than 500mls and with background history of poor oral intake due to the nature of the disease. Absorption of electrolytes occurs mainly in the small bowel while the majority of fluids are absorbed at the large bowel. A small bowel ostomy with high output will cause electrolyte imbalance and dehydration. If not detected early with intervention, it could lead to catastrophic consequences.

We comprehend the benefit of semi-elemental formulas in their superiority of easy absorption by the gut in the effort of nutrition therapy. Hence, we carry this observation and observed that oral nutritional support (ONS) with semi-elemental formula may help in the reduction of small bowel ostomy output.

## Discussion

Enteral formulas and Oral Nutrition Supplements are categorized broadly into Elemental, Semi-Elemental, Polymeric and Special Formulas. Elemental formulas contains oligosaccharides, oligopeptides, amino acids and medium-chain triglycerides and low-chain triglycerides which is at their near or simplest form hence was believed to be readily absorbed without further modification via hydrolysis by the pancreatic enzymes<sup>1</sup>. Semi-elemental formulas are occasionally referred to as oligomeric, hydrolysed or peptide formula as the nitrogen source of the formulas derived from hydrolyzed oligopeptides of shorter lengths i.e. dipeptides and tripeptides<sup>2</sup>. The casein and lactalbumin hydrolysates in the semi-elemental formulas are believed to stimulate the jejunal absorption of water and electrolytes<sup>3</sup>. This content are lacking in both elemental and polymeric formulas.

From our observation of our patients with small bowel ostomy, we believed that initiation of semi-elemental formulas will enhance the nutrition supplements, does not contribute to the net water and electrolyte loss and is tolerable among critically ill and palliation. However, a larger prospective study is recommended to see the significant benefits in terms of outcome of ostomy output reduction.

## Conclusion

The effect of the semi-elemental formula improves not only the clinical outcome but also improves quality of life in terms of reduction in the stoma output, making it more manageable by the patient and family. This is clearly demonstrated in our case scenarios. However, a larger prospective study is recommended to see the significant benefits in terms of outcome of ostomy output reduction.

## Reference

- Atkinson, M. & Worthley, L. I. (2003). Nutrition in the critically ill patient: part III. Enteral nutrition. *Crit Care Resusc*, 5 (3), 207-15.
- Makola, D. (2005). Elemental and Semi-Elemental Formulas: Are They Superior to Polymeric Formulas? *Practical Gastroenterology*, (Series #34), 59-72.
- Silk, D. B., Fairclough, P. D., Clark, M. L., Hegarty, J. E., Marrs, T. C., Addison, J. M., Burston, D., Clegg, K. M. & Matthews, D. M. (1980). Use of a peptide rather than free amino acid nitrogen source in chemically defined "elemental" diets. *JPEN J Parenter Enteral Nutr*, 4 (6), 548-53.

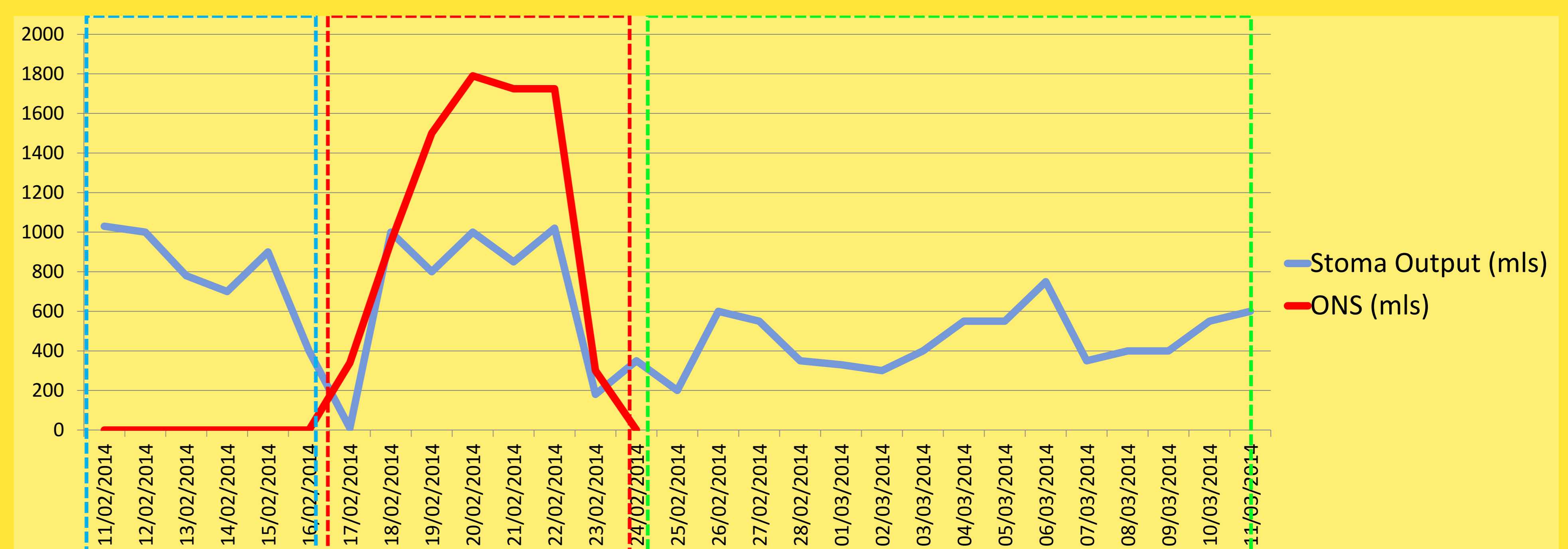
## Clinical Scenario 1: Semi-Elemental ONS and Critically Ill

A 61 year-old gentleman presented with obstructing rectosigmoid tumour. Emergency laparotomy and anterior resection was performed with a covering ileostomy on early February 2014. He develop persistent stoma output of more than 500mls started on Day 3 post operation period. We have started him on antispasmodic drug i.e. Loperamide 4mg BD.

He had laparotomy wound dehiscence secondary to surgical site infection. In view of the high risk of malnutrition, he was started on the semi-elemental formula ONS, aiming to reduce the stoma output and also to improve surgical nutrition in order to improve the overall clinical outcomes.

### Result

The graph below shows the comparison of the Stoma Output and the semi-elemental ONS given.



The blue box highlighted above is the 1<sup>st</sup> post operative period after the anterior resection with covering ileostomy whereby we restricted the ONS and allow only clear fluids as we are anticipating for anastomotic leakage due to unprepared bowel. Unfortunately, on 16<sup>th</sup> February, he had a faecal peritonitis secondary to anastomotic leakage and he had re-exploration and exteriorization of stoma at the leakage site. Post operatively, he was nursed in the intensive care unit and in view of the recent clinical turbulence and the high risk of malnutrition, we started him early on day 1 post operative period with continuous enteral feeding of semi-elemental ONS formula; as highlighted here in the red box. From this observation, we concluded that the semi-elemental formula is readily absorbed via enteral route and does not exarcebate or worsened the stoma output. The green box highlighted here indicates the stoma output when he has fully shifted to normal oral diet.

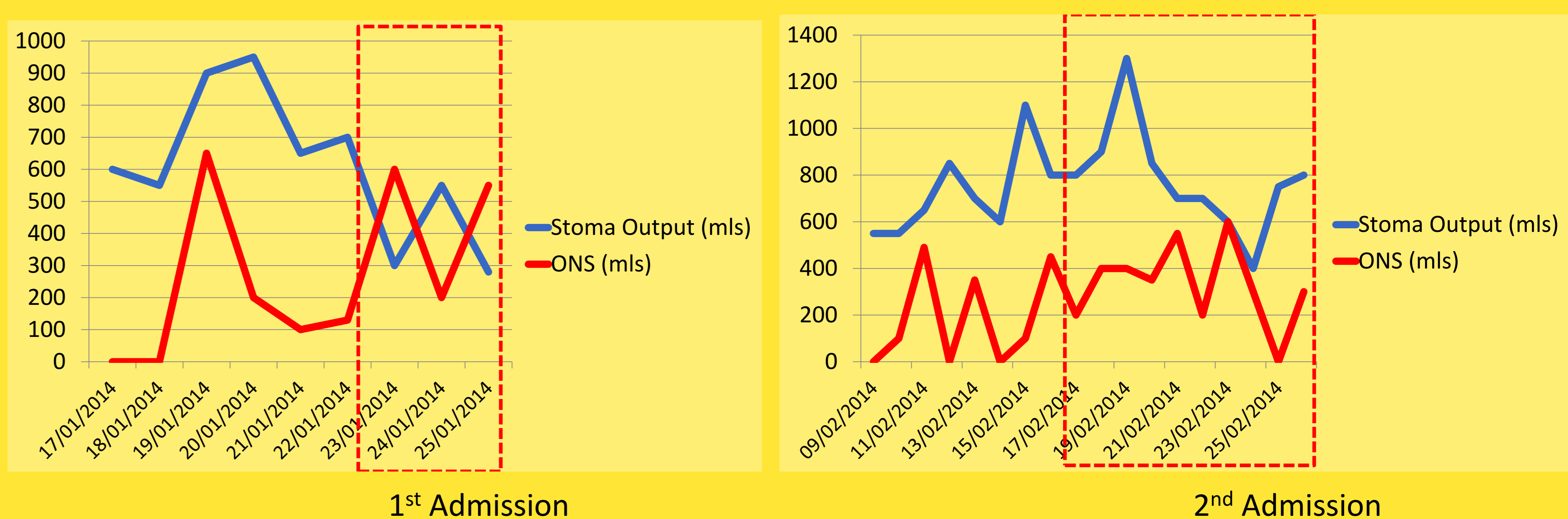
## Clinical Scenario 2: Semi-elemental ONS and Palliative Care

23 years old gentleman presented to us with intestinal obstruction. Emergency Laparotomy was carried out and Sigmoid Colectomy with Double Barrel Colostomy was performed for Sigmoid Cancer. Histopathological examinations reveals moderately differentiated adenocarcinoma and the staging CTscan shows distant metastasis to the lung and liver. He underwent chemotherapy and upon completion of 5<sup>th</sup> cycle of chemotherapy, against he presented to our unit with small bowel obstructions. Emergency Exploration was carried out in January 2014 and we found there is recurrence of tumour at the previous tumour bed posterior to the double barrel colostomy. The tumour is adhered to the jejunum, 180cm from the Duodenojejunal junction with complete encasement making it unresectable, hence the jejunum is brought out as an end jejunostomy.

Post operatively, he has persistent stoma output of more than 500 mls despite being started on antispasmodic drug, Loperamide 4mg TDS and had multiple readmission for poor oral intake leading to severe dehydration. In the process of palliation, we admitted him to the ward for hydration via intravenous drip. During admission, he refuses any form of solid diet that we serve, hence, we started him on semi-elemental ONS formula.

### Result

The graph below shows the comparison of the Stoma Output and the Semi-Elemental Formula ONS given as supplements at two consecutive admissions.



From these two separate admissions, we observed an interesting pattern of the stoma output in relationship to the amount of ONS given. As shown within the red box, we noticed that after we have given 6 to 8 days of ONS, the stoma output started to improve in response to the amount of ONS that he consumes. Increase intake of ONS reduces stoma output and vice-versa when it was reduced. It could be because we reinforce the supplementation of ONS at the ward and while at home, there is no direct supervision on the ONS from the caretaker. This is supported by the fact of short readmission duration from the 1<sup>st</sup> to 2<sup>nd</sup> admission.