Guidance on the Management of Adult Patients with a High Output Stoma

This guidance covers the management of adult patients over 18 years old with a high output ileostomy, jejunostomy or colostomy.

High output stoma (HOS) management can be challenging and requires a multidisciplinary approach to aid management as each patient is different. Diagnosis, remaining bowel length/function will vary in each patient.

Stoma output volumes greater than 1500ml in 24 hours for more than 3 days should be treated as a high output.

- **AIM:** stoma output approximately 1000ml **and** able to maintain own hydration / fluid and electrolyte balance with PO intake.

- **Newly formed stoma** – seek advice from senior clinician / surgeon. Usually after surgery the stoma output volume begins to settle. However, this adaptation in bowel function occurs over days to months and is individual for every patient.

If high output persists 3 days after introduction of diet then follow pathway A below.

- **Bowel length** - Knowledge of remaining bowel length from duodeno-jejunal flexure (DJ flexure) and position of stoma is **essential in the management of HOS.**

- In patients **with short bowel syndrome** (bowel length less than 200cm from DJ flexure or continued high output despite conservative measures), continued dietetic input will be needed to meet enteral requirements and fibre is unlikely to be tolerated.

Start the management strategies in pathway A below.

Please note: these patients will need escalation to pathway B very quickly.

There may be a need for referral to a tertiary intestinal failure specialist centre for long-term management and long-term parenteral nutrition in short bowel patients. Please ensure a referral is made to the Nutrition Support Team to facilitate this.

Nutrition Support e-REFER: https://intranet.gloshospitals.nhs.uk/departments/corporate-division/erefer/

- **Stoma Care Specialists Nurses** – ensure there is a referral to stoma care nurses for stoma products review.

Stoma Care Services: https://www.gloshospitals.nhs.uk/our-services/services-we-offer/stoma-care/

A INITIAL 48 hour management of HOS

AIM: stoma output approximately 1000ml **and** able to maintain own hydration, fluid and electrolyte balance with PO intake.

Review medicines.
STOP laxatives and prokinetcs e.g. metoclopramide.

Review diet.
Foods high in **fibre** can be difficult to digest and can increase output. **Low fibre diet** should be encouraged until stable stoma output has been established. Fibre intake can then safely be reintroduced as tolerated. Refer to Dietitians if there are dietary concerns / for low fibre diet advice.

There is no need to introduce hypertonic drinks or fluid restrictions at this stage.

There is no indication or recommendation for high dose oral gelatine, such as Jelly Babies® or marshmallows – these are high in sugar and calories and have no proven benefit in management of high output stomas(5).

Consider other causes(8).

Consider if intra abdominal collection / sepsis could be conbtributing to HOS.

Check stool sample for if *C.Diff* infection could be causing increased output.

Suspected pancreatic exocrine insufficiency (PEI) from patient history.

Patients with diarrhoea or HOS post chemo / radiotherapy or suspected chemo / radiotherapy related adverse effect on the bowel (bowel colitis).

Background of IBD: consider the prescence of active disease / inflammation in remaining bowel.

Assess and support.
Keep STRICT daily fluid balance charts - especially stoma output volumes.

Ensure adequate IV fluid support.
- Prescribe IV fluids (sodium chloride 0.9% or Hartmanns) to rehydrate, match stoma losses and maintain fluid balance.
- Routine maintenance fluid = 25-30ml/kg/day + replacement fluid volume based on HOS losses(9).
- NB: Take note of any IV drug volumes that contribute to total daily IV fluid intake.

Monitor U+Es and renal function.
Correct electrolyte imbalances as per GHT guidelines.

GI absorption is likely to be reduced due to increased transit time. Consider IV electrolyte replacement.

Start medicines to slow GI transit time(8).

Start Loperamide TABLETS.
Start dose at 2mg FOUR times a day, 30mins before main meals. Dose can be **titrated up by 2mg QDS every 24-48 hours if needed.**

Prescribing Considerations
LOPERAMIDE TABLETS
INDICATION: Slow GI transit, allow for better absorption(3).
NOTE: Use tablets in HOS as gelatin capsules do not break down quickly.
DOSE: UNLICENSED 2mg to 20mg QDS, 30 mins before meals(13).
- Note: Doses above 12-16mg QDS have a large tablet burden.
NOTE: the patient can be asked to self-administer their own loperamide where possible, after assessment by a pharmacist, to allow the doses to be taken 30minutes before meals(4).
- As the stoma volume is better controlled and small bowel function adaptation occurs, the dose will have to be reduced.
- Patients should be encouraged to alter the dose according to output and consistency once discharged.
CAUTION: check MHRA warnings and BAPEN advice when prescribing.
CAUTION: with higher doses in renal impairment; do not exceed 12mg total/day if CrCl <15ml/min(2).

MHRA AND BAPEN ADVICE – LOPERAMIDE
Reports of cardiac events associated with very high doses of loperamide(7).
- Use caution in patients with a pre-existing cardiac history (especially QT prolongation / abnormalities in rhythm).
- Baseline ECG for all patients with HOS before starting high dose loperamide (>4mg QDS), after and if any concerns. Repeat every 3 years if long-term treatment.
- Rationalise any other medicines known to cause cardiac dysrhythmia, (e.g. QT prolongation).
- Keep daily dose of loperamide <80mg.
- Consider loperamide as the cause if there are unexplained cardiac dysrhythmias – STOP TREATMENT.

B CONTINUED management of HOS: patients who continue to have HOS despite escalating loperamide doses.

AIM: stoma output approximately 1000ml **and** able to maintain own hydration, fluid and electrolyte balance with PO intake.

Continue medicines to slow GI transit time(10).

Continue to titrate up dose of loperamide tablets.

Start low dose **codeine** if loperamide has been titrated to 8mg QDS and HOS persists.

Prescribing Considerations
CODEINE TABLETS
INDICATION: UNLICENSED slow GI motility.
DOSE: 15-60mg QDS.
Start low dose and titrate to max tolerated dose, depending on age and renal function.
CAUTION: start with low dose 15mg QDS if >65 years or if CrCl <30ml/min(2). Increase dose if tolerated; no side effects, resp rate >10 and easily rousable.
MONITOR: renal function and monitor for adverse effects of codeine e.g. drowsiness or nausea.
NOTE: counsel patient and annotate drug chart prescription to say codeine is for stoma output, NOT for pain, to ensure doses are not missed.

Start additional medicines to reduce secretions.

If HOS continues after introducing/ increasing Loperamide - start a once a day proton pump inhibitor (PPI) e.g. **omeprazole.**

Prescribing Considerations
OMEPRAZOLE CAPSULES
INDICATION: UNLICENSED reduce gastric secretions and net stoma output.
DOSE:
- Start 40mg OD to BD. After 48 hours increase omeprazole to max BD dose if stoma output still >1500ml.
CAUTION: 20mg per day dose in moderate/severe liver impairment.
MONITOR: for hyponatremia and hypomagnesaemia.

If a dissolvable PPI is needed - use **Lansoprazole orodispersible** tablets 30mg OD-BD.

If an alternative to PPIs are needed - use H2 antagonist **Famotidine** 20-40mg BD.

NOTE: counsel patient and annotate drug chart prescription to say PPI/ famotidine is for stoma output, NOT for indigestion.

Assess and support.
Keep STRICT daily fluid balance charts - especially stoma output volumes

Ensure adequate IV fluid support.
- Prescribe IV fluids (sodium chloride 0.9% or Hartmanns) to rehydrate, match stoma losses and maintain fluid balance.
- Routine maintenance fluid = 25-30ml/kg/day + replacement fluid volume based on HOS losses(9).
- NB: Take note of any IV drug volumes that contribute to total daily IV fluid intake.

Once IV fluids are stopped, check random urine sodium (aim >20mmol/l) to check for adequate hydration.

Monitor U+Es and renal function.
Correct electrolyte imbalances as per GHT guidelines

GI absorption is likely to be reduced due to increased transit time. Consider IV electrolyte replacemnt.

Review PO fluid intake.
Ensure STRICT fluid balance is kept of PO fluid intake.

Review diet.
- Continue low fibre diet.
- Sprinkle salt on meals / have salty snacks.
- Try to develop a regular eating pattern.
- Smaller but more frequent meals may be better.
- Take time over meals and chew foods well.
- Avoid heavy meals or snacks before bedtime.
- Avoid alcohol and caffeinated drinks before bedtime e.g. coffee, tea, cola.
- Opt for decaffeinated drinks where possible.

Refer to Dietitians if there are dietary concerns / for low fibre diet advice.

Monitoring requirements.

- **Weight:** twice weekly
- **U+E:** on daily bloods
- **Magnesium:** on daily bloods
- **Adherence to medicines:** daily or at every dose titration.

C CONTINUED ESCALATION of management of HOS.

AIM: stoma output approximately 1000ml **and** able to maintain own hydration, fluid and electrolyte balance with PO intake.

Fluid restriction + St Mark's oral rehydration solution(10).
- Oral rehydration solutions (ORS) have a high salt content (sodium ≥90mmol/L), e.g. St Mark's Solution and Dioralyte 'double strength'(1).

Introduce St Mark's ORS 1000ml per day and restrict PO intake of other fluids to 1000ml per day.

Review compliance with fluid restriction daily. Review effectiveness of fluid restriction after 48 hours.

If further PO fluid restriction needed:
- Max St Mark's fluid restriction to 1500ml per day.
- Min restriction of other PO fluids to 500ml per day.

If St Mark's ORS not tolerated due to palatability or errors in mixing – try **Dioralyte 'double strength'** (NOTE: see potassium content below).

Prescribing consideration
ST MARKS ORAL SOLUTION(1)
INDICATION: UNLICENSED ORS, 1000-1500ml per day with an oral restriction of other fluids.
RECIPE: Information for mixing St Mark's can be found at https://www.gloshospitals.nhs.uk/your-visit/patient-information-leaflets/st-marks-formula-electrolyte-drink/

Prescribing consideration
DOUBLE STRENGTH DIORALYTE ORAL SOLUTION
INDICATION: UNLICENSED dosing ORS. To drink 1000-1500ml per day as part of an oral restriction of other fluids.
RECIPE: 10 sachets dissolved in 1000ml of water.
CAUTION: when assessing suitability for patient, note that each 1000ml contains **40mmol potassium.**
MONITOIR: U+Es and renal function.

Consider starting octreotide to further reduce secretions if HOS persists(11).
- Only start if initial management with first line anti-secretory/anti-motility medicines has been unsuccessful.
- Somatostatin analogues reduce output via a reduction in gastric, salivary, pancreatic and biliary secretions, while also delaying gastric emptying and slowing GI transit.
- Octreotide for HOS is unlicensed but can be a useful as a last line addition to the management of HOS if there is a large secretory output (PO fluid restriction is of minimal benefit)(12).

OCTREOTIDE SUBCUTANEOUS INJECTION
INDICATION: UNLICENSED - short acting somatostatin analogue to reduce net secretory output.
DOSE: Start at 50mcg s/c BD and titrate up to TDS after 24 hours. Can increase to 100mcg s/c TDS after a further 24 hours(6).
- Monitor for efficacy and increase dose by 50mcg TDS increments to max 200mcg s/c TDS, as tolerated.
EFFICACY: if no significant reduction in stoma output after 5-7 days at max tolerated dose, STOP octreotide.
Daily review by Surgical / Nutrition Support Team.
CAUTION:
- Monitor blood glucose BD-TDS whilst on octreotide as glucose regulation can be affected.
- Monitor heart rate - bradycardia has been reported; doses of any rate-controlling medicines may need to be adjusted. Monitor thyroid function and LFTs with prolonged use.
STOP: If severe abdominal pain / bilary colic develops. Acute pancreatitis and cholelithiasis / gall bladder events has been reported(6).
NOTE:
- Can cause stinging at injection site.
- Avoid abrupt withdrawal of treatment - wean dose to stop over 24-48 hours.
- Octreotide may affect absorption of dietary fats; faecal fat excretion may increase.

Discharging the patient on a somatostatin analogue.
- If somatostatin analogues are effective and required to continue on discharge, please discuss options with the Nutrition Support Team /ward pharmacist.
- Self administration of short acting octreotide pre-filled syringes or conversion to a long acting somatostatin analogue can be considered.
- Please note: a long acting preparation is not always possible as it requires patient specific local funding and communication with the GP.
- A change in formulation can destabilise current HOS control in the short term.

References

1. Ahmed Ismail 2018. UKMi Medicines Q&A: What is St Mark's Electrolyte Mix (solution)?

2. Ashley C, Dunleavy A. 2014. London Radcliffe Publishing. The Renal Drug Handbook. Available in online database format www.renaldrugdatabase.com.

3. BAPEN et al. 2019. The use of high dose loperamide in patients with intestinal failure.

4. Cipla EU Ltd (2019) *Loperamide 2 mg tablets - Summary of Product Characteristics (SmPC) - (emc)*. Available from: https://www.medicines.org.uk/emc/product/10287/smpc.

5. Clarebrough E, Guest G, Stupart D. Eating marshmallows reduces ileostomy output: a randomized crossover trial. Colorectal Dis. 2015 Dec;17(12):1100-3. doi: 10.1111/codi.12992. PMID: 25951410.

6. Hospira UK Ltd. Octreotide 200 micrograms/ml Solution for injection. 2012, updated 2021. www.medicines.org.uk/emc/product/375/smpc.

7. MHRA 2017. Loperamide (Imodium): reports of serious cardiac adverse reactions with high doses of loperamide associated with abuse or misuse.

8. Mountford, C.G. et al. 2014. A practical approach to the management of high-output stoma. *Frontline Gastroenterology* 5(3), pp. 203–207.

9. NICE CG174 2017. The National Institute for Health and Care Excellence Guidance: Intravenous fluid therapy in adults in hospital.

10. Nightingale, J. et al. 2006. British Society of Gastroenterology: Guidelines for management of patients with a short bowel. *Gut* 55(Suppl 4), pp. iv1–iv12.

11. Nightingale, Jeremy et al. 2011. British Intestinal Failure Alliance: Top tips for managing a high output stoma or fistula.

12. Nightingale JMD, et al.Octreotide (a somatostatin analogue) improves the quality of life in some patients with a short intestine.

13. Samantha Owen et al. 2016. UKMi Medicines Q&A: Can high dose loperamide be used to reduce stoma output. [1]

Author: Zein Zakir (NST Pharmacist), Adrian Tait (Clinical Pharmacist).

Approved by

Nutrition Support Team: Dr Alex Di Mambro (Consultant Gastroenterologist), Dr Mathangi Balasubramani (Consultant in Chemical Pathology), Sarah Price (NST Dietitian), Rob Cronin (DCC Dietitian), Margaret Collins (NST Specialist Nurse), Catherine Bienvenu (NST Pharmacist).
Pharmacy: Carys Hoskins (Senior Clinical Pharmacist – Surgery).
Stoma Care: Caroline Todd (Clinical Nurse Specialist).
Review date: March 2024