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Pre-operative Care of Infants with Pyloric Stenosis

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Does this document replace or revise an existing document? If so please state existing document(s)

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Flowchart

Please download the Flowchart template from PIER website

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1.1 Introduction

Classic presentation of a child with pyloric stenosis is as follows

- Age of presentation – commonest 4-6 weeks but range of a few days to five months.
- Initially the baby feeds normally, but then starts vomiting, non-bilious in nature, increasing in frequency and force until 'projectile' vomiting.
- Weight loss.
- Constipation and fewer wet nappies.
- Jaundice in 10% (unconjugated) – resolves after surgery.
- Haematemesis in 10% due to oesophagitis.

Metabolic changes in Pyloric Stenosis

Significant vomiting induces a loss of chloride as well as hydrogen ions, this leads to hypochloraemic metabolic alkalosis.

Na^+ re-absorption is one of the major functions of the kidney; Na^+ is actively re-absorbed in preference to H^+ and K^+.
The increased H^+ loss results in acidic urine, an increased metabolic alkalosis and increased K^+ loss (on top of the K^+ loss due to vomiting). Hypokalaemia is not seen initially because of K^+ shift from intracellular fluid to the ECF and dehydration.
If K^+ level are low before fluid replacement begins, then hypokalaemia will become worse if the rehydration fluid does not contain K^+. Cardiac arrhythmias have occurred secondary to hypokalaemia in pyloric stenosis

1.2 Scope

This guideline has been developed to guide all staff involved in the pre-operative care and management in an infant with pyloric stenosis.

1.3 Purpose

It aims to provide best practice guidelines to ensure that, whenever an infant with pyloric stenosis is admitted, common standards are maintained.

1.4 Definitions

Pyloric stenosis - narrowing (stenosis) of the opening from the stomach to the first part of the small bowel (duodenum), due to enlargement (hypertrophy) of the pylorus.

2 Care of an infant with Pyloric Stenosis

Referral Process

- Referrals should be made when there is a confirmed diagnosis of pyloric stenosis. This is to avoid unnecessary transfers as far as possible. The diagnosis may be made clinically (strongly suspected on history with palpable pyloric mass) or with positive ultrasound.
- Referral should be made to Southampton Children's Hospital on-call paediatric surgical registrar (bleep 2798) or via switchboard out of hours
- Referrals should be made using the STOPP (safe transfer of Paediatric Patients) Tool.
- When diagnosis is confirmed the baby should be transferred as soon as there is a bed available.
- The baby will not have any surgery until the blood biochemistry is normalised.
- Prior to transfer, all babies should:
    - Be made Nil By Mouth
    - Have a nasogastric tube (at least 8fr) inserted and left on free drainage
    - Have IV access established
    - Start IV fluids (see section - Fluid Regimen and Electrolyte Correction)

The STOPP tool (Safe Transfer of Paediatric Patient) must be completed before surgical referral to ensure a safe transfer process (available on the PIER website).

Initial Treatment

- Insert a nasogastric tube (NGT) (following local guidelines)
    - Size 8Fr
    - On free drainage at all times
    - Plus two-hourly aspiration of the NGT

Fluid Regimen and Electrolyte Correction

- Correct hypovolaemia: if the referring clinician considers that the infant has clinical signs of dehydration.
    - Rehydrate with 0.9% sodium chloride, using boluses of 10ml/kg.
    - Monitor central and peripheral capillary return (normal less than 2 seconds).
- Maintenance fluids
    - **Serum bicarbonate >25 mmol/l** - Use 0.9% sodium chloride / 5% Dextrose + 10 mmol potassium chloride per 500ml bag. Run at a rate of 150 ml/kg/day
    - **Serum bicarbonate ≤ 25 mmol/l** - Use 0.9% sodium chloride / 5% Dextrose + 10 mmol potassium chloride per 500ml bag. Run at a rate of 100 ml/kg/day
    - In infants less than 44 post-conceptual weeks, 10% dextrose may be required.
- Replace NG losses
    - Every 1 ml of gastric losses must be replaced with 1 ml of **either**:
        - 0.9% sodium chloride + 13.5 mmol potassium chloride per 500ml bag.
        - 0.9% sodium chloride + 10 mmol potassium chloride per 500ml bag.

Examinations

- Assess for dehydration
- Test feed: looking for visible peristalsis from left to right
- Abdominal palpitation: to feel for a palpable mass.

Investigations

- Bloods – FBC, U&E, Bicarbonate and Chloride.
- Blood gases – 6 hourly until serum bicarbonate <25mmol/l (then daily until surgery)
- Urinalysis
- Ultrasound Scan – if pyloric stenosis not confirmed clinically.

Observations and Nursing considerations

- Weight on admission, recorded as baseline
- Blood pressure (at least a baseline recording)
- 2 Hourly Aspiration of NGT
- 4 Hourly observations (or as clinical needs dictate)
    - Temperature

    - Heart rate
    - Respiratory rate
- 6 hourly monitoring of blood sugar while on IV fluids
- The patient is to remain Nil-By-Mouth
- The patient is to be nursed with an apnoea monitor
- Monitor cannula as per local guidelines

3 Implementation

Training and dissemination will be via the Wessex Surgical Network and the PIER website.

4 Process for Monitoring Effectiveness

Effectiveness and adherence to the guideline will be monitored by audit of practice.

Documentation of regional consultation:

Trust	Name of person consulted* (print)	Designation	Signature
Chichester	Dr Mike Linney	Consultant Paediatrician	Confirmation be email
Dorchester	Dr Julie Doherty	Consultant Paediatrician	Confirmation be email
Basingstoke	Dr Nick Ward	Consultant Paediatrician	Confirmation be email
Winchester	Dr Lucinda Winckworth	Consultant Paediatrician	Confirmation be email
Poole	Dr Madhavi Velpula	Consultant Paediatrician	Confirmation be email
Portsmouth	Dr Judith Scanlan	Consultant Paediatrician	Confirmation be email
Salisbury	Dr Jim Baird	Consultant Paediatrician	Confirmation be email
Southampto n	Mr Nigel Hall	Consultant Surgeon	Confirmation be email
IOW	Dr Christopher Magier	Consultant Paediatrician	Confirmation be email
Jersey	Dr Tim Malpas	Consultant Surgeon	Confirmation be email
Guernsey	Dr Sandie Bohin	Consultant Surgeon	Confirmation be email

*this person agrees they have read the guidelines, consulted with relevant colleagues and members of MDT, managers and patients, young people & their families as appropriate. Any queries raised during consultation and review process should be documented with responses and any changes made to the guideline.