1. Introduction
The National Patient Safety Agency (NPSA) has raised concern about the risk of harm, or even death, resulting from the use of oral bowel cleansing solutions. These solutions are commonly used prior to Radiological procedures. Their use is important to ensure a clean bowel and a good quality diagnostic examination. In most cases these solutions are safe. In some cases, however, electrolyte disturbances, dehydration or serious gastro-intestinal problems have been reported.

There needs to be a clear clinical responsibility for:

- Clinical assessment of the patient by the clinician ordering the investigation/procedure.
- Explanation on the safe use if the medicine is provided to the patient or carer.
- An advice leaflet must be given to the patient or carer when the solution is supplied.

2. What oral bowel cleansing solutions are used and when
The main oral bowel cleansing solution used within radiology is Picolax®.

Picolax® has both a stimulant effect to promote peristalsis and is hyperosmotic so draws large volumes of water into the colon which promotes evacuation of the colon.

Moviprep® is used for patients unable to take Picolax®, for example if they have previously taken it and experienced severe side effects. Moviprep® contains polyethylene glycols which are non-absorbable isosmotic solutions, when taken with large quantities of water they exert as osmotic action resulting in a laxative effect.

The Radiological investigations that require a bowel cleansing solution are: Barium enema, Barium small bowel enema and CT colonography.

3. Clinical Assessment of the patient
The assessment includes reviewing the contraindications and risks for Picolax® or Moviprep® against the patient (see appendix 1). The doctor must be fully aware of the patient’s past medical history. Ideally the clinician should have access to recent laboratory results to establish the patient’s current renal function and have a full list of current medication. This assessment will be documented on a specific oral bowel cleansing solution assessment screen as part of the PCIS pathway for ordering the investigation. These screens include a mandatory declaration that a clinical assessment of the patient has been taken and that it is considered safe for them to take an oral bowel cleansing solution. This assessment will be performed by the doctor requesting the procedure at the time the procedure is requested either on the ward (if an inpatient) or in outpatient clinic. The screen also includes a declaration that an explanation on why an oral bowel cleansing solution is needed has been
given to the patients. The investigation can only be ordered if these declarations have been completed.

4. Prescribing
The oral bowel cleansing solution may only be prescribed after an assessment has taken place and been documented. For inpatients oral bowel cleansing solutions are prescribed on the patient’s inpatient prescription chart (usually PCIS). This may be prescribed by a doctor other than the doctor who originally assessed the patient as long as the prescribing doctor has seen the completed assessment form in the patient’s notes confirming that they may receive an oral bowel cleansing solution. If the patient must take the oral bowel cleansing solution at home prior to the procedure, they will be supplied with Picolax® or Moviprep® against a PGD by a radiographer, as long as the supply has been authorised via the doctor’s assessment. Patients referred directly by their GP will be prescribed an oral bowel cleansing solution by their GP.

5. Explanation on use of the medicine
It is the responsibility of the clinician assessing the patient to ensure the patient receives a full explanation (verbal and written) regarding the use of the oral bowel cleansing solution. Where an oral bowel cleansing agent is being prescribed as an inpatient or outpatient the assessing clinician will provide this information. This verbal information is supplemented by written information leaflets. This information is to include:

- What the medicine is for
- How to take the medicine (see administration below)
- Any expected side-effects (see appendix 1)
- Medication which must be stopped around the time of taking the oral bowel cleansing solution (see appendix 1 – drug interactions)
- Importance of compliance with the medication

For those patients taking the oral bowel cleansing solution at home the following additional information must be provided:

- Guidance to enable the patient to decide if it is still safe to use the oral bowel cleansing solution just prior to administration if their clinical condition has changed since the investigation was ordered.
- A named person and telephone number for the patient to contact for advice if there are any problems, concerns or changes in condition.
- Dietary advice (see section below)

Inpatients will be given a copy of the manufacturers’ patient information leaflet, which is available from the box of medication. Outpatients will be also be given a copy of the manufacturers’ patient information leaflet and with Moviprep® an additional leaflet provided by the manufacturer which details how to administer the sachets. The appointment letter also contains detailed information about how to take the oral bowel cleansing solution, it also contains general information and includes a telephone contact number for if the patient has any concerns or queries. Outpatients will also receive an information leaflet about the procedure which includes some brief information about oral bowel cleansing solutions.
6. Supply

For inpatients the supply is from the Trust pharmacy or ward stock as per normal processes. Ward stock is stored in locked medicines cabinets in the ward and is supplied through the Trust pharmacy department. For outpatients the Picolax® or Moviprep® will be supplied against a PGD by a radiographer who has read, understood and signed the PGD. This will then be posted to the patient along with the manufacturer’s information leaflet and appointment letter. The stock of oral bowel cleansing solutions in Radiology is kept in a locked medicines cabinet. The oral bowel cleansing agent must be sent in the form of a pre labelled pack, the patient’s name should be written on to the label. The label includes the name of the Trust and brief instructions; this is required to show where the medication was supplied from. The supply must be documented in a book in Radiology. For patients referred by their GP, a supply will be obtained via a community pharmacy using a FP10 prescription issued by the GP.

It is the responsibility of the radiographer to check the investigation order and confirm that the patient has been assessed and that it is considered safe for them to receive an oral bowel cleansing solution. A supply may only be sent to the patient if the assessment has been completed and it is considered that they may receive an oral bowel cleansing agent.

7. Administration

Each sachet of Picolax® should be reconstituted in a cup of water (approximately 150ml). The solution should be stirred for 2-3 minutes and then consumed. The adult dose is one sachet reconstituted in water as directed, taken before 8 am on the day before the procedure and a second sachet 6 to 8 hours later. Sachet A and sachet B of Moviprep® should be mixed together in one litre of water. This should be drunk over a period of 1 to 2 hours. This should then be repeated with a second litre of Moviprep®. The exact timing of administration is dependent on the time of the investigation.

8. Dietary advice

A low residue diet is recommended prior to the hospital procedure, for patients taking Picolax®. An information leaflet detailing the food that may be eaten will be posted to the patient along with the appointment letter. No solid food should be taken for at least 2 hours before taking an oral bowel cleansing solution. To avoid dehydration during treatment with Picolax® it is recommended to drink approximately 250ml per hour, of water or other clear fluid while the washout effect persists.

9. Further information:
Picolax® and Moviprep® summary of product characteristics for available from: www.emc.medicines.org.uk

NPSA website http://www.npsa.nhs.uk/
References

4. Norgine LTD. Summary of product characteristics, Moviprep®. 04/05/10. Available at www.medicines.org.uk

| Name and Designation of author(s) | Vincent Williamson  
Debbie Hughes Highly Specialist Pharmacist |
|-----------------------------------|--------------------------------------------------|
| Target audience                   | Radiographers, Referring Clinician – Hospital  
Consultant or GP, Radiology Clerical Staff |
Appendix 1: Prescribing Information

Side effects
Oral bowel cleansing solutions are expected to cause diarrhoea and likely to cause abdominal pain. Other common side effects include nausea, vomiting, headache, abdominal distension, flatulence and sleep disturbance\(^3\). Oral bowel cleansing solutions can also cause rash, urticaria, pruritis, purpura and rarely hypersensitivity or anaphylactoid reactions\(^3\).

Oral bowel cleansing solutions can cause electrolyte disturbance in particular hyponatraemia. This is more common with Picolax\(^\text{®}\) where the hyponatraemia has been associated with grand mal convulsion and convulsions. There have also been cases of seizures in the absence of hyponatraemia in patients known to have epilepsy\(^3\). Picolax\(^\text{®}\) can also cause confusional state and proctalgia. Picolax\(^\text{®}\) is associated with a risk of hypovolaemia and intravascular volume depletion, which can lead to complications such as syncope, myocardial ischaemia and acute kidney injury\(^2\).

The period of bowel cleansing should not exceed 24 hours due to an increased risk of fluid and electrolyte disturbance.

Contraindications
Oral bowel cleansing solutions are contraindicated in patients with\(^2,3\):

- bowel obstruction
- bowel perforation
- ileus
- acute intestinal or gastric ulceration
- severe acute inflammatory bowel disease or toxic megacolon
- reduced levels of consciousness
- hypersensitivity to any of the ingredients
- inability to swallow without aspiration
- ileostomy

Moviprep\(^\text{®}\) is also contraindicated in phenylketonuria due to the presence of aspartame and in disorders of gastric emptying\(^4\). Picolax\(^\text{®}\) is contraindicated in congestive cardiac failure and nausea and vomiting\(^3\).

Cautions
Oral bowel cleansing solutions should be used with caution in patients at risk of hypovolaemia, for example patients with\(^2\):

- Congestive heart disease
- Advanced liver cirrhosis
- Chronic diarrhoea
- Chronic kidney disease
- Taking high dose diuretics
- Hypovolaemia and electrolyte disturbances (these should be corrected prior to administration of an oral bowel cleansing solution)
Moviprep® should be used first line for patients with congestive cardiac failure and liver cirrhosis. It should also be used first line in patients with chronic kidney disease (CKD) stage 4 or 5 (eGFR less than 30ml/min) if they are able to tolerate the volume of fluid. Patients undergoing chronic haemodialysis may require admission to hospital if an oral bowel cleansing solution is required. Picolax® should be avoided in patients with severe renal impairment as accumulation of magnesium can occur. Picolax® should also be avoided in renal transplant patients.

**High risk patients**
Special caution should be exercised when administering oral bowel cleansing solutions to high-risk patients such as frail/debilitated patients, elderly patients or children.

Patients at high risk of hypovolaemia may require admission to hospital to monitor hydration.

Patients in whom alteration in the absorption of routine medicines might be catastrophic for example patients taking immunosuppressant medication following transplant may require admission to hospital to administer intravenous preparations.

Certain patients with diabetes mellitus may require admission to hospital for close supervision and management of blood glucose levels if required to remain nil by mouth for a long period.

**Drug interactions**
- **ACEI/ARB**
Patients taking angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) are predisposed to deterioration in renal function during hypovolaemia. Where possible these should be omitted on the day of administration of oral bowel cleansing solution and for 72 hours after the procedure.

- **Diuretics**
Diuretics will also predispose a patient to dehydration and unless there is a significant risk of pulmonary oedema, consideration should be given to omitting diuretics on the day of administration of oral bowel cleansing solution and for 72 hours after the procedure.

- **NSAIDs**
Non steroidal anti inflammatory drugs (NSAIDs) reduce renal perfusion and therefore may exacerbate the problem of hypovolaemia, consideration should be given to stopping NSAIDs on the day of administration of oral bowel cleansing solution and for 72 hours after the procedure.

- **Oral contraceptive pill**
Patients taking the oral contraceptive pill should be advised to use additional precautions during the week following administration of an oral bowel cleansing solution as the bioavailability of the pill may be affected.
Other regular medications should be taken as usual but patients should be advised not to take oral medicines **one hour before or after** administration of an oral bowel cleansing solution as absorption of the medicine may be impaired\(^2\)