Oxford Health
NHS Foundation Trust

Protocol for the Safe Administration, Disposal, and Risk Assessment of Potassium Permanganate (Permitabs tablets)

Potassium Permanganate is supplied as Permitab soak tablets which should be dissolved as per manufacturer directions found on the medication package insert, in large volumes of water and used as a soak for the skin. They **should not be swallowed** and are only used diluted on the skin, take steps to understand the risk in the care setting to ensure that no person on the premises could inadvertently ingest the tablets or a solution.

Before use

Print off and complete risk assessment (appendix 1), retain this in the patient record.

This product should be **prescribed for a named patient** following guidance from a specialist team such as Tissue Viability or Dermatology and/or following the Oxford Health Varicose Eczema Pathway. Treatment should be supported by a clear care plan that reflects the instructions given within this clinical protocol. This should be available within the patients notes.

There should be relevant documentation to support medicine administration.

A documented clinical risk assessment and management plan relating to safe administration and excess tablet disposal should be available in the patient's notes. (See appendix 1). Always seek informed consent prior to administration and **ensure all patients are supplied with a patient information leaflet** (accessed here https://www.bad.org.uk/patient-information-leaflets/potassium-permanganate-solution-soaks).

Why would we use Potassium Permanganate?

Potassium permanganate appears on the acute element of the Oxford Health Varicose Eczema Pathway (https://www.oxfordhealth.nhs.uk/wp-content/uploads/2022/01/Varicose-Eczema-Pathway-V7-FINAL18JAN2021.pdf) and is used on the skin as an astringent which helps to reduce exudate levels. For example, dilute solutions are used to treat ulcers, mild pompholyx, dermatitis, eczema and fungal infections of the hands or feet.

What are the potential risks and side effects?
Potassium permanganate is safe when diluted appropriately and is used as a short-term therapy on the skin in accordance with medical instructions. However, it can be **hazardous if swallowed or not adequately diluted** when used on the skin. If not diluted sufficiently it can cause irritation, redness, pain and burns to the skin. Undiluted tablets should be handled wearing gloves.

A solution of potassium permanganate can also cause staining of the skin and clothes. This is an important consideration, particularly in relation to soft furnishings and ceramic bathroom facilities.

What are the expected benefits of treatment?
Potassium permanganate soaks help to treat weeping or blistering skin conditions such as Varicose Eczema.

What should I do before using these soaks?
You should read any information provided in the care plan and manufacturer instructions before using the soaks. Each soak tablet should be thoroughly diluted in water before use. Usually each 400mg (1:1,000) tablet is diluted in four litres of water to give a dilution of 1:10,000 (0.01%) (DermNet Nz, accessed 07/07/2022; British Association of Dermatologists (BAD), accessed; 07/07/2022).

If the weeping area is more localised, Potassium Permanganate can be applied on a gauze soaked in the appropriately diluted product. Gently squeeze out excess solution and apply to the affected area for 20minutes (DermNet NZ, accessed 07/07/2022).

Ensure you store the Permitab soak tablets in a safe place out of the reach of children or vulnerable adults and in a place where they will not be mistaken for oral medication. Do not leave the diluted product unattended and dispose of it immediately after use.

Check Containers for Leakage or Damage
Potassium permanganate is a hazardous substance, whether it's in powdered form or mixed in with water. A damaged container can allow traces of this chemical to leak out, which can be dangerous in higher quantities.

Avoid Skin Contact during product preparation
Potassium permanganate is a strong oxidizer, which means it accepts electrons from other substances. That also means it is highly irritating when in contact with unaffected skin and can also stain it. Even small amounts of potassium permanganate mixed in with water can leave a brown stain on your skin.

Protect Your Face
Potassium permanganate will also irritate your eyes and nose if it encounters them. It would be wise to wear a visor or safety glasses to avoid splashing. Avoid breathing in any chemical fumes. To further protect your face, wear a face mask.

Work In a well-ventilated Area
Potassium permanganate fumes are harmful if inhaled in high quantities, so make sure you aren't trapping these fumes in your work area. Try working next to a window or a vent if you aren't sure if your workspace is well-ventilated and take breaks while working to air out the room and get some fresh air.

First aid
Treat any splashing that causes irritation by flushing off the chemical by running cold water on the irritated area for around 10 minutes. If the irritation flares up again, run cold water on the injury for several minutes and cover. If the burn is deep or covers an area larger than 3 inches in diameter, seek medical attention immediately.

If your eyes encounter this chemical, splash your eyes with cold water and seek medical help immediately. Rinse your eyes for around thirty minutes, while also making sure to splash water under your eyelids.

The symptoms of potassium permanganate inhalation include a burning sensation, sore throat, cough, difficulty in breathing, and shortness of breath. If any of these symptoms do arise, get some fresh air and sit in an upright position. Seek medical help immediately and report the incident in Ulysses at the first opportunity.

Highly dangerous if ingested
Potassium permanganate is **highly dangerous if ingested** and can cause damage to the gastrointestinal tract.
Symptoms of potassium permanganate ingestion include a burning sensation, nausea, abdominal pain, diarrhoea, vomiting, and collapse.

If any of these symptoms arise, do not induce vomiting. Rinse your mouth, sit or lie down, and seek medical attention immediately.

How to use Potassium Permanganate soaks

Equipment: use a deep bucket (a washing bowl will not be adequate to submerge the entire limb), bin liner, (white to visualise colour of solution), and see-through vessel like a jug or plastic cup to dissolve the tablet, disposable apron and gloves.

Dissolve the tablet completely before use. NOTE: this will take some time so factor this into your preparation. You can mix the solution to help facilitate dilution or to dissolve the table. Use gloves to protect skin (DermNet NZ, 2022).

The final solution should be a light pink colour.

Wash your hands (see standard infection prevention and control policy)

Wear non-sterile examination gloves to prevent contact of tablet with your skin, consider use of eye protection goggles.

Line a deep bucket (for full immersion of the lower limb) with a white bin liner and fill with 4 litres of warm tap water.

NOTE: Tablets take a while to dissolve so you will need to factor this into your preparation. Do not dissolve the tablet in the bucket of water. Placing a patient's foot into water where the tablet is still dissolving and/or has not fully dispersed will cause concentrated burns to the foot (BAD, 2022). Therefore, dissolve one tablet into a separate container such as a disposable translucent plastic cup/jug/jam jar so you can see when the tablet has completely dissolved.

At all times protect your own and patient unaffected skin from direct contact with the dissolving tablet.

Once the tablet has dissolved, the fluid in the container will be a very dark purple. Carefully titrate this into the 4 litres of warm water until the resultant colour in the bowl is transparent rose pink/purple and NOT DARK PURPLE. NOTE: you may not need to use all the diluted solution to achieve this.

If the resultant solution is too dark in colour, discard some solution and add more tap water.

Immerse the limb in the solution for 10 minutes.

How to dispose of small amounts of potassium permanganate

This chemical can be unsafe if improperly handled and can cause damage to the environment if it isn't disposed of properly.

Small amounts of potassium permanganate are easier to dispose of since they don't pose much of an environmental or safety risk.

You can dispose of unused/undissolved tablets in a sharp's container with a blue lid or return to a pharmacy for disposal.

When disposing of potassium permanganate down a domestic drain or toilet you will need to dilute it to a very pale pink colour to avoid environmental contamination (BAD, 2022). If pouring into a toilet flush and then flush again with the lid down to avoid aerosol inhalation. NOTE: Undissolved tablets do not flush and will badly stain the bottom of the pan!

References:

British Association of Dermatologists (BAD) (2022). Guidance on minimising risk of harm from Potassium Permanganate Soaks. Available at: https://cdn.bad.org.uk/uploads/2022/05/04163130/Guidance-for-safe-use-of-potassium-permanganate-soaks-FINAL-for-website.pdf (accessed 07/07/2022).

Coulson I (2022). *Potassium Permanganate*. DermNet NZ Available at: https://dermnetnz.org/topics/potassium-permanganate (accessed 7/7/2022)

Appendix 1 Risk assessment for use of potassium permanganate in the residential setting.

Name of Patient _____Date of Assessment_____

Risk Assessment		Yes	No	Control measures
General Medicines Storage Risks	1. Are there vulnerable persons in the home? (young children, persons with confusion or self-harm risks especially)			
	2. Are these persons left alone with possible access to the medicines at any time?			
	3. Is there a designated place for medicines storage?			
	4. Are medicines stored in a cupboard or drawer?			
	5. Is the medicines storage cupboard/shelf/area out of the reach of children/vulnerable adults			
	6. If fridge/freezer medicines; are medicines kept in a designated, labelled container that is separate to food?			
	7. Is there a pharmaceutical waste bin (blue lid)			
	8. Are there regular arrangements in place for the removal of medicines for disposal?			
	9. Are routine clinical and pharmaceutical waste collections set up at OHFT base?			
	10. If return to OHFT base, has budget holder agreed to waste costs?			

This risk assessment should be retained in the patient record.

Risk matrix factors

Response colour	Meaning
	Environmental risk area: check recommendation section for possible mitigation.
	Environmental risk is raised.
	Risk mitigated by current arrangements.

Appendix 2 NatPSA - Inadvertent Oral Administration of Potassium Permanganate April 2022

National Patient Safety Alert

BRITISH ASSOCIATION OF DERMATOLOGISTS HEALTHY SKIN FOR ALL

NHS

Inadvertent oral administration of potassium permanganate

Date of issue:	5 April 2022	Reference no:	NatPSA/2022/003/NHSPS

This alert is for action by: All acute trusts, trusts providing community services, mental health trusts and primary care, including general practice and community pharmacy.

This is a safety critical and complex National Patient Safety Alert. Implementation should be co-ordinated by an executive lead (or equivalent role in organisations without executive boards) and supported by clinical leaders in dermatology, nursing, and pharmacy.

Explanation of identified safety issue:

Potassium permanganate is routinely used in the NHS as a dilute solution to treat weeping and blistering skin conditions, such as acute weeping/ infected eczema and leg ulcers. It is not licensed as a medicine.

Supplied in concentrated forms, either as a 'tablet' or a solution, it requires dilution before it is used as a soak or in the bath. These concentrated forms resemble an oral tablet or juice drink and if ingested are highly toxic; causing rapid swelling and bleeding of the lips and tongue, gross oropharyngeal oedema, local tissue necrosis, stridor, and gastrointestinal ulceration. Ingestion can be fatal due to gastrointestinal haemorrhage, acute respiratory distress syndrome and/or multiorgan failure.[1] Even dilute solutions can be toxic if swallowed.

A Patient Safety Alert issued in 2014[2] highlighted incidents where patients had inadvertently ingested the concentrated form, and the risks in relation to terminology and presenting tablets or solution in receptacles that imply they are for oral ingestion, such as plastic cups or jugs.

A review of the National Reporting and Learning System over a two-year period identified that incidents of ingestion are still occurring. One report described an older patient dying from aspiration pneumonia and extensive laryngeal swelling after ingesting potassium permanganate tablets left by her bedside. Review of the other 34 incidents identified key themes:

- healthcare staff administering potassium permanganate orally
- patients taking potassium permanganate orally at home, or when left on a bedside locker
- potassium permanganate incorrectly prescribed as oral medication.

The British Association of Dermatologists (BAD) 'Recommendations to minimise risk of harm from potassium permanganate soaks',[3] includes advice on formulary management, prescribing, dispensing, storage, preparation and use, and waste.

Actions required

Actions to be completed by 04 Oct 2022

1. Review the overall use of potassium permanganate at trust/area drug and therapeutics committee to consider if the benefit outweighs the risk.[4]

2. Unless eliminating the use within the trust/locality, ensure procedures/guidelines for use of potassium permanganate align with all BAD recommendations,[3] including:

a) **In primary care:**
- patients are not on repeat prescriptions for potassium permanganate NOTE A
- prescriptions include clear instructions to dilute before use
- dispensing label includes the warning 'HARMFUL IF SWALLOWED'.

b) **In secondary care:**
- remove all stock supply (except for use within outpatient departments) and supply on a named patient basis only
- potassium permanganate is prescribed as 'potassium permanganate 0.01% topical solution' and the dispensing label must include the warning 'HARMFUL IF SWALLOWED'
- potassium permanganate is not stored with medicines for oral/internal use, including the ward drug trolley; dilution should occur away from the patient, and neither the concentrated form or the diluted form, should be left near the patient.

c) **All settings:**
- prescriptions are only issued by an appropriate prescriber – see recommendations
- if potassium permanganate is to be used in a patient's home, a risk assessment must be undertaken before prescribing
- all patients must be supplied with a patient information leaflet.[5]

For further detail, resources and supporting materials see: https://www.england.nhs.uk/2022/04/inadvertent-oral-administration-of-potassium-permanganate For any enquiries about this alert contact: patientsafety.enquiries@nhs.net 1/2

Failure to take the actions required under this National Patient Safety Alert may lead to CQC taking regulatory action

Additional information:

Notes

A. A retrospective risk assessment of primary care patients is not necessary if the action to eliminate repeat prescriptions is taken, but will be necessary when a new prescription is required.
B. Discussions are ongoing with manufacturers to improve labelling and packaging of potassium permanganate products and remove the use of the term 'tablet'.
C. The use of potassium permanganate in wound care has been identified as a strategic research need by the national patient safety team.[6]

Patient safety incident data

The NRLS was searched for incidents reported to have occurred on or after 01 January 2019 and uploaded to the NRLS by 29 December 2021 containing reference to 'potassium permanganate' or related terms. All incidents were reviewed; 35 identified incidents related to actual or potential inadvertent administration (reference PSI410). Of these, 15 reported staff had inadvertently administered potassium permanganate orally, while another nine reported patients taking potassium permanganate orally; 11 were near misses relating to accidental ingestion.

One report described an older patient who, following oral ingestion of potassium permanganate, developed aspiration pneumonia, black staining of her epiglottis and extensive laryngeal swelling, and died three days later. Another incident reported a patient who swallowed potassium permanganate at home; she spoke little English and did not understand the instructions on how to use them and developed a stomach ulcer and gastrointestinal bleeding requiring inpatient treatment.

Other issues identified included:

- incorrectly prescribed as oral route
- incorrectly dispensed/labelled
- incorrectly stored.

Most of the reports (29) relate to incidents in hospital, but five related to incidents occurring in the patient's home or care home.

References

1. National Poisons Information Service. Toxbase: Potassium permanganate monograph. www.toxbase.org
2. NHS England. Patient Safety Alert: Risk of death or serious harm from accidental ingestion of potassium permanganate preparations. 22 December 2014. www.england.nhs.uk/wp-content/uploads/2014/12/psa-potass-prmangant.pdf
3. British Association of Dermatologists. Recommendations to minimise risk of harm from potassium permanganate soaks. January 2022. https://www.bad.org.uk/healthcare-professionals/clinical-standards/
4. Specialist Pharmacy Service. Using potassium permanganate for skin conditions or wound care. November 2021 https://www.sps.nhs.uk/articles/using-potassium-permanganate-for-skin-conditions-or-wound-care/
5. British Association of Dermatologists. Patient information leaflet: Potassium permanganate. https://www.bad.org.uk/patient-information-leaflets/potassium-permanganate-solution-soaks
6. NHS England and NHS Improvement. National patient safety strategic research needs 2022/23. December 2021. https://www.england.nhs.uk/patient-safety/the-nhs-patient-safety-strategy/#safety-practices

Stakeholder engagement

- British Association of Dermatologists
- National Patient Safety Response Advisory Panel (for a list of members and organisations represented on the panel see https://www.england.nhs.uk/patient-safety/patient-safety-alerts)

Advice for Central Alerting System (CAS) officers and risk managers

This is a safety critical and complex National Patient Safety Alert (NatPSA); applicable to mental health trusts as this treatment may be used in this setting. In response to CHT/2019/001 your organisation should have developed new processes to ensure appropriate oversight and co-ordination of all NatPSAs. CAS officers should send this Alert to the executive lead nominated in their new process to co-ordinate implementation of safety critical and complex NatPSAs, copying in the leads identified on page 1.