

**DOCUMENT CONTROL PAGE**

<b>Title:</b>	Thyroid blockade with oral aqueous Iodine (Lugol's Iodine) or intravenous sodium perchlorate prior to iodine-123-metaiodobenzylguanidine (MIBG) diagnostic tracer scans in paediatric patients.
<b>Version:</b>	2
<b>Supersedes:</b>	Version 1
<b>Application:</b>	RMCH / MCS

<b>Originated / Modified By:</b>	Rosie Foster <sup>1</sup> , Abbey Forster <sup>2</sup> , Bernadette Brennan <sup>3</sup> , Noor Barotchi <sup>4</sup>
<b>Designation:</b>	<sup>1</sup> Women and Children's Pharmacist, <sup>2</sup> Highly Specialist Pharmacist - Paediatric Haematology/Oncology, <sup>3</sup> Paediatric Oncology Consultant, <sup>4</sup> Highly Specialist Pharmacist - Paediatric Haematology/Oncology
<b>Ratified by:</b>	RMCH / MCS Policies and Guidelines Group
<b>Date of Ratification:</b>	September 2025

<b>Issue / Circulation Date:</b>	September 2025
<b>Circulated by:</b>	MFT Policy Hub
<b>Dissemination and Implementation:</b>	Available via the Policy Hub
<b>Date placed on the Intranet:</b>	October 2025

<b>Planned Review Date:</b>	September 2028
<b>Responsibility of:</b>	Paediatric Oncology Consultants/Pharmacists

<b>Minor Amendment (If applicable) Notified To:</b>	
<b>Date notified:</b>	

<b>EqIA Registration Number:</b>	2021-103
----------------------------------	----------

## Table of Contents

---

1	Introduction .....	3
1.1	Allergies .....	3
2	Iodine .....	3
2.1	Prescription of Iodine Solution.....	4
2.2	Administration of iodine solution.....	4
2.3	Missed doses of iodine solution.....	5
3	Sodium Perchlorate Injection .....	5
3.1	Prescription of Sodium Perchlorate .....	5
3.2	Administration of Sodium Perchlorate .....	5
4	Equality Impact Assessment .....	5
5	Bibliography .....	6

# 1 Introduction

An iodine-123-metaiodobenzylguanidine (MIBG) scan is a diagnostic test used to look for specific types of tumour cell affecting nervous tissue, predominantly neuroblastoma (90% specificity) and phaeochromocytoma. A radioactive isotope, to which MIBG is attached, is given by intravenous injection and a scan is subsequently performed which takes images, highlighting the areas that have tumour cells present.

Thyroid glands actively absorb iodine; thus, the uptake of radioiodine by the thyroid gland could lead to irradiation and cause hypothyroidism and thyroid damage. To mitigate this risk, medication for thyroid blockage is given to inhibit the uptake of I-123 by the thyroid gland (and thus reduce the radiation dose).

The MIBG scan process usually occurs over two days. The isotope is injected on day 0 and the scan is performed on the following day.

Oral Iodine is used as a thyroid blocker and is given prior to an MIBG scan to protect the thyroid gland against the uptake of free radioactive iodine that has dissociated from the MIBG molecule. This guideline is to support the prescription and administration of iodine as appropriate prior to MIBG scan. Prescriptions should be under the instruction of a paediatric oncology consultant.

**This guideline is intended for isotope I-123 only. Most patients having MIBG diagnostic tracer scans receive injections of the radioisotope, I-123.**

## 1.1 Allergies

Patients with a documented allergy to iodine must be referred to the patient's responsible consultant for discussion. Patients will be assessed prior to a referral for an MIBG scan, on a case-by-case basis. Patients with an iodine allergy who undergo an MIBG scan should use sodium perchlorate as an alternative thyroid blocking agent (subject to availability). Dosing and administration information can be found in **Section 3**.

## 2 Iodine

Oral iodine solution is the first line thyroid blocker used in paediatric patients. The preparation available for prescribing at RMCH is **Lugol's iodine** (containing iodine 5% W/V and potassium Iodide 10% W/V) in 50mL and 100mL bottles. Please note oral iodine is unlicensed in paediatrics for this indication.

Thyroid blockade with oral aqueous Iodine (Lugol's Iodine) or intravenous sodium perchlorate prior to iodine-123-metaiodobenzylguanidine (MIBG) diagnostic tracer scans in paediatric patients.	Page 3 of 6
<i>See the Intranet for the latest version</i>	Version Number: 2

## 2.1 Prescription of Iodine Solution

All children who are injected with isotope I-123 should receive a 4-day course of oral iodine. The dose is banded according to age, following the schedule below:

Day -1:	Dose 1 the day before I-123 injection
Day 0:	Dose 2 on the day of the injection
Day +1:	Dose 3 one day post injection (day of scan)
Day +2:	Dose 4 two days post injection

1mL of Lugol's iodine contains 130mg of iodine. An oral dose equivalent of approximately 100mg iodine will reduce thyroid uptake to less than 1% of normal in adults. In paediatrics, dosing is proportional to what adults receive based on age, to be consistent with advice given in relation to thyroid blockade in the event of a nuclear accident. See table below for recommendations:

Age	Dose	Frequency
Neonates	0.2mL	ONCE daily for 4 days (starting the day before I-123 injection)
1 month – <3 years	0.2mL	
3 – <12 years	0.4mL	
≥12 years	0.8mL	

### Contraindications:

allergy to iodine or oral route unavailable. Patients with a documented allergy to iodine **must** be referred to the consultant for documented discussion prior to referral for MIBG scan. These patients should receive intravenous sodium perchlorate (subject to availability). Dosing and administration can be found in **Section 3**.

## 2.2 Administration of iodine solution

All patients/carers should be counselled on when they should start to take/administer iodine solution according to the date of their MIBG scan. It is critical that the iodine is started on the day **BEFORE** the isotope injection is planned. The oral iodine solution should be drawn up using a 1mL oral syringe and **must** be diluted prior to administration to avoid gastric irritation and vomiting.

The iodine solution should be diluted with approximately 50-100mL of strong-tasting juice, milk, or tea (or an alternate drink that the patient finds more palatable) before it is administered.

## 2.3 Missed doses of iodine solution

If a patient arrives for isotope injection/scan and has not received a dose of iodine solution the previous day, the patient's consultant should be notified to determine if the scan should be rebooked for a later date or if the scan can proceed by giving a dose Lugol's iodine solution 30-60 minutes before the MIBG injection. This is estimated to block approximately 80-90% of the thyroid uptake of the radioiodine administration. Continue administering subsequent doses to complete 4 days total.

## 3 Sodium Perchlorate Injection

Sodium perchlorate can be used as alternative if the oral route is unavailable, or the patient has an allergy to iodine, subject to availability.

If sodium perchlorate is required, Pharmacy should be notified ahead of the patient requiring it, as it is an unlicensed special that would need advance ordering.

Sodium perchlorate should not be used in conjunction with iodine solution.

### 3.1 Prescription of Sodium Perchlorate

The following formula is used to calculate the dose of sodium perchlorate required, to a maximum of 200mg.

$$\text{Dose (milligrams)} = \frac{\text{Childs weight (kg)} \times 200}{70}$$

The dose of sodium perchlorate should be rounded to nearest whole milligram to aid administration.

The preparation of sodium perchlorate available at Royal Manchester Children's Hospital is sodium perchlorate 100mg/mL 2mL injection ampoules (Tayside). Please note that sodium perchlorate is unlicensed in paediatrics.

### 3.2 Administration of Sodium Perchlorate

Sodium perchlorate should be administered 30 minutes prior to the radioactive iodine injection as an IV **bolus**. Further dilution of the vials is not required. Gloves and an apron should be worn when administering and handling sodium perchlorate.

## 4 Equality Impact Assessment

This guideline has undergone an EqIA assessment, see document control page for reference number.

Thyroid blockade with oral aqueous iodine (Lugol's Iodine) or intravenous sodium perchlorate prior to iodine-123-metaiodobenzylguanidine (MIBG) diagnostic tracer scans in paediatric patients.	Page 5 of 6
See the Intranet for the latest version	Version Number: 2

## 5 Bibliography

Administration of Radioactive Substances Advisory Committee, 2025. Notes for guidance on the clinical administration of radiopharmaceuticals of radiopharmaceuticals and use of sealed radioactive sources. [Online]. Available at: [Notes for guidance on the clinical administration of radiopharmaceuticals and use of sealed radioactive sources](#) [Accessed 6<sup>th</sup> August 2025].

Aindow, A., 2016. Sodium perchlorate injection. [email].

Cosgriff P S, Ltd, T. & R., 2021. Aqueous Iodine Oral Solution BP. [Online] Available at: <https://www.medicines.org.uk/emc/medicine/25154#gref>

National Radiological Protection Board, 'Stable Iodine Prophylaxis'. Doc NRPB, 12, number 3, 2001

Royal Liverpool and Broadgreen Univeristy Hospitals NHS trust, 2011. Thyroid blocking agents. s.l.:Radiopharmacy Department .

Thyroid blockade with oral aqueous iodine (Lugol's iodine) or intravenous sodium perchlorate prior to iodine-123-metaiodobenzylguanidine (MIBG) diagnostic tracer scans in paediatric patients.	Page 6 of 6
<i>See the Intranet for the latest version</i>	Version Number: 2