



# Guideline for the Management of Infant of **Mother with Thyroid Disease**

Main Author(s):	Christine Burren, Consultant Paediatric Endocrinologist (UHB) Agreed with: Paediatric Endocrine and Neonatal Consultants	
Ratifying Committee:	South West Neonatal Network Guideline Working Group	
Date Ratified:	Jan 2016	
Review Date:	Jan 2019	
Version:	03	
KEYWORDS:	WORDS: Thyroid function tests, thyrotoxicosis	

The South West Neonatal Network comprises of NHS Trust Neonatal Units in the following locations:

Southmead (Bristol), St Michael's (Bristol), Yeovil, Gloucester, Bath, Barnstaple, Plymouth, Torbay, Truro, Exeter, Taunton, Swindon.

Title: Guideline for the Management of Infant of Mother with Thyroid Disease Author: Christine Burren Date: Jan 2016

Version: 01 Review Date: Jan 2019 Page 1 of 5



### **Guideline for the Management of Infant of Mother with Thyroid Disease**

Contents		Page
1	Scope of the Guideline	2
2	Definition of Terms	2
3	Overview	3
4	Guideline for the Management of Infant of Mother with Thyroid Disease Normal Ranges in Infants Drug Therapy Options Prognosis	4
5	Progress and Monitoring	5
6	Associated Documents	5
7	References	5

### 1. Scope of the Guideline

The Guideline applies to all Units within the South West Neonatal Network and has been agreed with the Paediatric Endocrinologists.

### 2. Definition of Terms

TFTs	Thyroid Function Test

Title: Guideline for the Management of Infant of Mother with Thyroid Disease Author: Christine Burren

Version: 01 Date: Jan 2016 Review Date: Jan 2019



# 3. Overview – FLOWCHART FOR MANAGEMENT OF BABIES OF MOTHER WITH THYROID DISEASE

#### Antenatal: Type of Mother's Thyroid Disease To clarify whether mother has Hypothyroidism/Hyperthyroidism **Hypothyroidism Hyperthyroidism** and hence whether screening of = underactive thyroid = overactive thyroid infant is required, often useful to = Thyrotoxicosis ask about other diagnostic labels = Graves' disease and treatment details. Are you sure this is the diagnosis? If any of: If any of: Only treatment is (and has No • Currently on carbimazole / Family history of activating ever been) one medication TSH receptor mutations type ie thyroxine? propylthiouracil • Has had these medications Clinical Thyrotoxicosis in mother in 3rd trimester in the past (ask if multiple different tablet types ie Signs of Foetal Thyrotoxicosis Yes thyroxine + another thyroid • If TSH-Rab status known and medication) strongly positive thyroid surgery Preferably inform Neonatologists • radio-iodine antenatally as baby is at high risk of Neonatal Thyrotoxicosis Hyperthyroidism **Hyperthyroidism Hypothyroidism** (High Risk) Medium Risk High Risk (Rare) Low Risk Neonatal Team to review baby Postnatal referral to Neonatal Postnatal referral to Neonatal At Postnatal discharge arrange: Staff Staff not required • Day 5 – 7: Baby to have TFTs (Occurrence of very small risk At Postnatal discharge arrange: and examination of Hypothyroidism in the baby • Day 10 - 14 • Day 10 – 14: Baby to have will be picked up by routine Baby to come back TFTs and examination Guthrie testing) for TFTs & examination Where high level of suspicion of Thyrotoxicosis advise parents to watch for poor feeding, panting for breath, excessive wakefulness

Title: Guideline for the Management of Infant of Mother with Thyroid Disease

Author: Christine Burren

Version: 01

Date: Jan 2016

Review Date: Jan 2019

Screening of Infant

**Postnatal** 

Page 3 of 5



### 4. Management of Infant of Mother with Thyroid Disease

## Be aware that normal ranges in first weeks differ from older children and differ with prematurity

The following is a guide. For more detail refer to Reference 2 and local laboratory standards.

Normal Ranges in infants	TSH (mU/L)	Free T4 (pmol/L)	Free T3 (pmol/L)
Term: Cord blood – 48	3 –	16.7 – 48.3	2.5 - 9.3
hours	120		
Term: at 4-10 days	0.3 –	13.7 – 28	2.8 - 5.7
postnatally	6		
28-36 weeks: Cord blood	0.7–	11.3 – 24	1.2 - 7.3
– 48 hours	27		
28-36 weeks: 4-10 days	0.7–	10 - 30	1.2 – 4.9
postnatally	27		

It is common to find TSH and free T4 are **both** raised in the first few days of life. This is a normal acute phase response and is **not** hyperthyroidism. Thyrotoxicosis features **suppressed** TSH.

One in 70 babies whose mother has Graves' disease develops Neonatal Thyrotoxicosis, but there can be significant morbidity and risk of mortality. The decision of whether to treat is complex. All cases where treatment is considered must be discussed with a Paediatric Endocrinologist.

- 1. <u>Infants with raised fT4 and suppressed TSH</u>: Significant biochemical abnormalities indicate Thyrotoxicosis but depending on whether clinical signs are present treatment may be required (carbimazole alone).
- Infants with abnormal biochemistry and adrenergic clinical signs: Tachycardia, wakefulness, tachypnoea should be treated with carbimazole and propranolol. Consider referral as below.
- Infants with evidence of actual of incipient cardiac failure: Should be referred to St
  Michael's Hospital to facilitate clinical review by Paediatric Endocrinology Team. As well
  as carbimazole and propranolol, consideration should be given to Lugol's iodine and
  rarely prednisolone.

### **Drug Therapy Options for above**

- Carbimazole: 250 micrograms/kg 3 times daily. (Severe thyrotoxic crisis may require higher dose). Blocks thyroid hormone synthesis by preventing organification and coupling of iodothyronine residues, but doesn't inhibit the release of preformed thyroid hormones.
- **Propanolol:** 250–500 micrograms/kg every 8 hours. Helps control symptoms due to adrenergic stimulation and inhibits T4 to T3 deiodination.
- **Lugol's lodine solution:** (Rare) 1 drop 3 times daily. Usual duration 3 days, max 7. Promptly blocks preformed thyroid hormone release and reduces thyroid hormone synthesis.
- **Prednisolone:** 2mg/kg/day. (Rare). Inhibits thyroid hormone release and inhibits peripheral conversion of T4 to T3.

Title: Guideline for the Management of Infant of Mother with Thyroid Disease

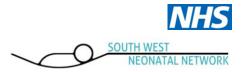
Author: Christine Burren

Version: 01

Date: Jan 2016

Review Date: Jan 2019

Page 4 of 5



### **Prognosis**

Excessively high dose of prolonged use of antithyroid treatment can lead to subsequent period of thyroid suppression ie hypothyroidism. Ensure 2 normal TFTs after withdrawal of treatment.

Rarely (if severe / prolonged duration of many months), there is a risk of craniosynostosis and developmental delay, so monitor head circumference growth and development in those cases.

### 5. Progress and Monitoring

- Aim is to abolish Hyperthyroidism without causing <u>Hypo</u>thyroidism.
- Titrate treatment against clinical response. Stop propanolol once clinically euthyroid.
- Measure TFTs fortnightly. If fT4 in normal range, then reduce carbimazole dose by 25%.
- (TSH suppression often shows a 2-3 week lag, so don't wait for that in order to reduce dose).
- Continue this consideration of dose reduction according to TFTs fortnightly.
- Maternal antibodies have approximately 6 week half-life. Treatment may be needed for 8-12 weeks.
- FBC should be performed if clinical evidence of infection, not routinely. (Carbimazole may cause agranulocytosis in 0.03% of patients).

#### 6. Associated Documents

List any other relevant Network/National documents which should be read in conjunction with this Guideline.

### 7. References

- 1. Neonatal thyroid disorders. Arch Dis Child Fetal Neonatal Edition 2002:87;F165.
- 2. Ogilvy-Stuart and Midgley. Practical Neonatal Endocrinology, Cambridge University Press 2006.
- 3. BNF for Children (2010-2011).
- 4. A Neonatal Vade Mecum, Third Edition: Chapter 3.
- 5. Roberton and Rennie. Textbook of Neonatology, Edition 3.

Title: Guideline for the Management of Infant of Mother with Thyroid Disease

Author: Christine Burren

Version: 01

Date: Jan 2016

Review Date: Jan 2019

Page 5 of 5