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

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| **Ratifying Committee:** | South West Neonatal Network Guideline Working Group |
| **Date Ratified:** | Jan 2016 |
| **Review Date:** | Jan 2019 |
| **Version:** | 03 |
| **KEYWORDS:** | 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.**

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



### 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

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|---|---|
| TFTs | Thyroid Function Test |

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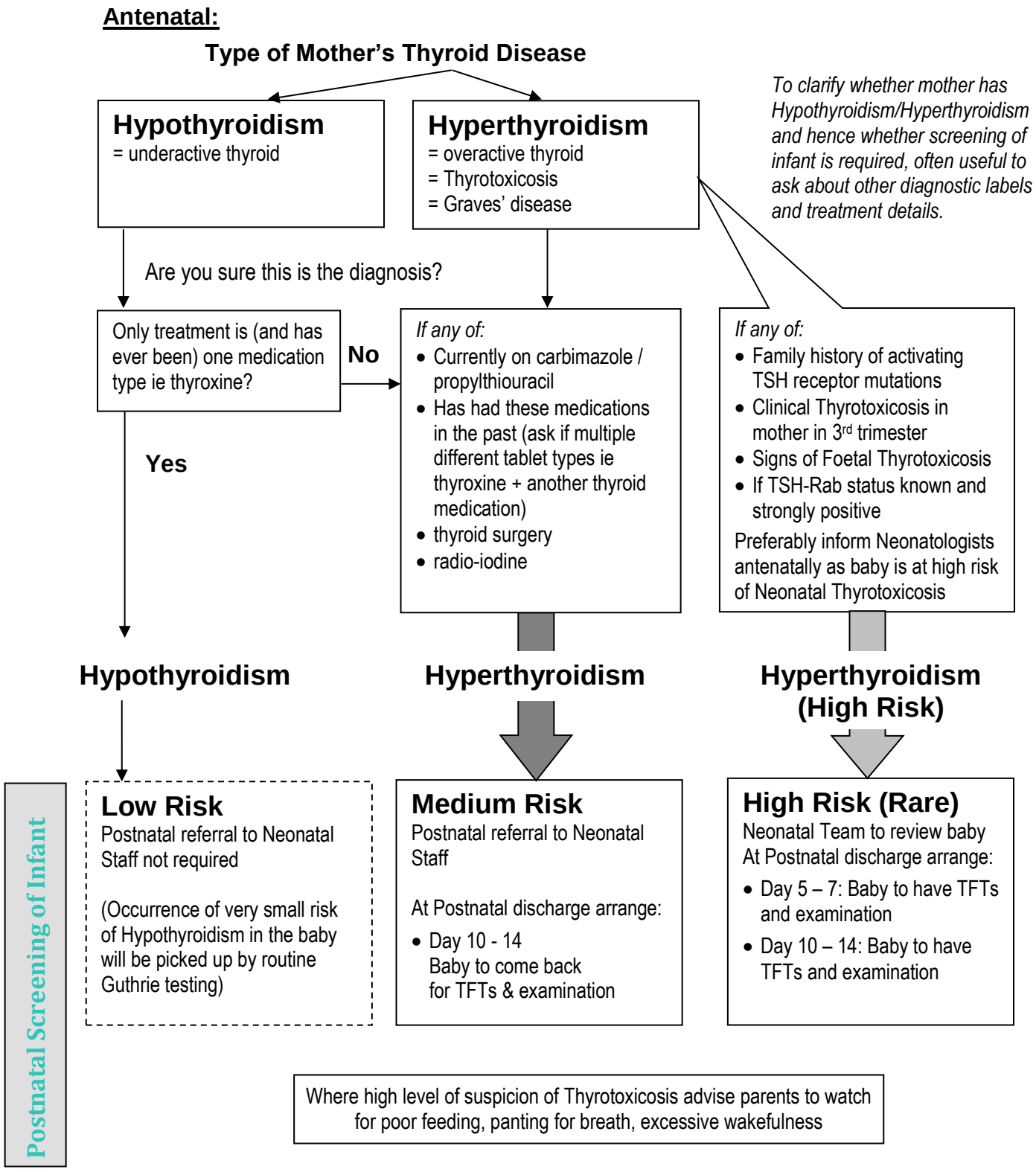
# 3. Overview – FLOWCHART FOR MANAGEMENT OF BABIES OF MOTHER WITH THYROID DISEASE



## 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 hours | 3 – 120 | 16.7 – 48.3 | 2.5 – 9.3 |
| Term: at 4-10 days postnatally | 0.3 – 6 | 13.7 – 28 | 2.8 – 5.7 |
| 28-36 weeks: Cord blood – 48 hours | 0.7– 27 | 11.3 – 24 | 1.2 – 7.3 |
| 28-36 weeks: 4-10 days postnatally | 0.7– 27 | 10 – 30 | 1.2 – 4.9 |

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. Infants with raised fT4 and suppressed TSH: Significant biochemical abnormalities indicate Thyrotoxicosis but depending on whether clinical signs are present treatment may be required (carbimazole alone).
2. Infants with abnormal biochemistry and adrenergic clinical signs: Tachycardia, wakefulness, tachypnoea should be treated with carbimazole and propranolol. Consider referral as below.
3. 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 Iodine 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.

**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 Hypothyroidism.
- 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.