Management of Uterine Hyperstimulation

Approved by:	Clinical Guideline Group & Antenatal/Labour Forum
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Document No:	1

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Management of Uterine Hyperstimulation

1.0 Definition

Hyperstimulation is defined as **either**:

- > 5 contractions in ten minutes over a 30 minute period [2]

OR

- Contractions lasting more than 2 minutes in duration

AND

- Resulting in fetal heart rate changes

NB: For women who have any increased uterine activity (frequency, duration or strength) associated with CTG changes hyperstimulation should be considered and the same process followed.
Remember, some fetuses will have limited reserve to cope with even minimal uterine activity.

Uterine Tachysystole is defined as:

- > 5 contractions in 10 minutes over a 30-minute period

AND

- The CTG remains 'Normal' 1

Excessive uterine activity is the most frequent cause of fetal hypoxia/acidosis[1], and must therefore be identified early on and managed effectively. In the presence of uterine tachysystole, consider tocolysis even where there are no current fetal heart rate concerns.

A CTG is unable to identify the strength or character of uterine activity and should not be relied upon to assess these features. The tocodynometer will pick up any increases in intra-abdominal pressure, including maternal position change or breathing movements. In order to diagnose hyperstimulation the midwife or doctor must assess the contractions by palpating uterine activity over 10 minutes, recording in the notes the length, strength and frequency of contractions.

Hyperstimulation may occur naturally, although more rarely. Where contractions are >5 in 10 minutes over a 30-minute period during active labour a CTG is required to assess fetal wellbeing. The Normal Labour Care Pathway must be exited in this situation [4]

2.0 Causes:

- Over-stimulation or hyper-sensitivity to oxytocin
- Hyper-sensitivity to Prostaglandins
- Hyper-stimulation of uterus due to build up effect of oxytocin by previously administered prostaglandin
- Spontaneous or syntocinon induced labours, particularly in multiparae, it may be a consequence of fetal malpresentation or malposition or cephalopelivc disproportion.
- Frequent, low amplitude, uterine contractions are observed with abruption of the placenta and may be associated with FHR changes and vaginal bleeding. May also be seen in chorioamnionitis.

Consideration must be given to the **whole clinical picture**, including existing risk of hyperstimulation i.e. use of prostaglandins, PV bleeding. For women who have had a previous caesarean section, the likelihood of uterine rupture is increased and therefore a full assessment including a lower threshold for invention considered.

3.0 Management:

3.1 Induction of labour

If uterine hyperstimulation occurs during induction of labour, request obstetric review and:

- Perform a fetal assessment using a CTG
- Position into left lateral (or right if more comfortable for the woman)
- Remove Propess (if applicable)
- Consider Terbutaline, particularly if there are fetal heart rate concerns (See Appendix 1)

Do not discontinue the CTG until you can classify it as 'normal'

Pharmacological methods of induction can cause hyperstimulation. Consideration should be given to the use of mechanical forms of induction e.g. a balloon catheter, in women or babies at higher risk i.e. previous caesarean section, growth <10th centile or abnormal dopplers (NICE, 2021).

Mechanical methods are less likely to cause hyperstimulation (NICE, 2021) and should be considered where hyperstimulation has already occurred.

National guidelines4 recommend that:

'In the presence of abnormal FHR patterns and uterine hyper contractility not secondary to oxytocin infusion, tocolysis should be considered. If the FHR trace is normal, oxytocin may be continued until the woman is experiencing 4 or 5 contractions every 10 minutes. Oxytocin should be reduced if contractions occur more frequently than 5 contractions in 10 minutes. If the FHR trace is classified as abnormal, oxytocin should be stopped and a full assessment of

the fetal condition undertaken by an obstetrician before oxytocin is recommenced.'

3.2 In Labour

Where uterine hyperstimulation is identified immediate resuscitative action must be taken to improve utero-placental oxygenation, particularly in the presence of

- Acute hypoxia i.e. prolonged deceleration (follow the 'Rule of 3s')
- Sub-acute hypoxia i.e. persistent decelerations >50% of the time below the baseline rate

Management

Request urgent obstetric review, and:

- Advise/continue continuous CTG monitoring
- Stop/reduce oxytocin infusion (depending on clinical assessment of fetal wellbeing/compensatory response)
- Position into left lateral (or right if more comfortable for woman)
- Consider acute tocolysis e.g. Terbutaline early (See Appendix 1)
- Ensure the woman is kept fully informed of concerns and actions
- In community settings where hyperstimulation is suspected arrange emergency transfer as per the transfer guideline, position the woman laterally and administer 1st dose of acute tocolysis

Consider restarting oxytocin infusion only if necessary for the progress of the labour, and once the fetus is no longer needing to compensate. This decision must be made and documented by an Obstetrician BEFORE oxytocin is recommenced.

Continuous CTG monitoring is recommended with the use of Oxytocin (NICE, 2017).

3.3 Tocolysis

1) Terbutaline (Bricanyl) *(See Appendix 1)*

Dose: 0.25mg (250mcg) administered by subcutaneous injection

Instructions: A Bricanyl vial comes in a preparation of 0.5mg/ml (A 1ml volume is in the vial). Draw up 0.5ml and administer under the skin (arm/stomach).

This dose can be repeated once after 15 minutes in the presence of ongoing concerns with fetal wellbeing. The first dose can be administered by a midwife using the PGD.

2) Glyceryl trinitrate (GTN) administered as 200mcg IV bolus or as 400mcg as sublingual spray.

NB: The above drugs are not licensed for use for this indication. NICE recommends informed consent should be obtained and documented.

Improvement usually begins within 5 minutes as utero-placental perfusion is restored due to the relaxation of the smooth uterine muscle. Side effects may include transient maternal tachycardia, flushing of skin and headache.

4.0 References:

1. International Federation of Obstetricians and Gynaecologists. (2015). FIGO Consensus guidelines on intrapartum fetal monitoring: cardiotocograph*. International journal of Obstetrics & Gynaecology*. **doi.org/10.1016/j.ijgo.2015.06.020**

2. National Institute for Health and Care Excellence. (2017). *Intrapartum Care for healthy women and babies*. Available at https://www.nice.org.uk/guidance/cg190

3. National Institute for Health and Care Excellence. (2021). *Inducing Labour*. Available at https://www.nice.org.uk/guidance/ng207/chapter/Recommendations

4. All Wales Clinical Pathway for Normal Labour. (2021). *Maternity Network Guideline*. Available at file:///C:/Users/ca180114/Downloads/Final%20All%20Wales%20Clinical%20Pathway%20parts%202%20and%203%20Dec2020%20(002).pdf

5.0 Appendix 1 – Administration of subcutaneous Terbutaline PGD

GIG CYMRU NHS WALES
Bwrdd Iechyd Prifysgol Bae Abertawe
Swansea Bay University Health Board

This Patient Group Direction (PGD) must only be used by registered healthcare professionals who have been named and authorised by their organisation to practice under it. The most recent and in date final signed version of the PGD should be used.

PATIENT GROUP DIRECTION (PGD)

Administration of subcutaneous terbutaline sulfate for the reduction of contraction frequency in individuals in labour in Swansea Bay University Health Board

Version Number 1.0

Change History	
Version and Date	**Change details**
Version 1 August 2023	New template

Valid from: November 2023
Review date: April 2026
Expiry date: November 2026

PGD DEVELOPMENT GROUP

Date PGD template comes into effect:	November 2023
Review date	April 2026
Expiry date:	November 2026

This PGD template has been peer reviewed by the NHSEI Preventative Medicines in Pregnancy Programme PGDs Short Life Working Group in accordance with their Terms of Reference. It has been reviewed by the Royal College of Obstetrics and Gynaecology (RCOG) and endorsed by Dr Matthew Jolly, National Clinical Director for Maternity and Women's Health NHS England and NHS Improvement.

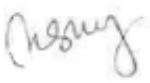
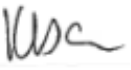
This section MUST REMAIN when a PGD is adopted by an organisation.

Name	Designation
Andrew Radley	Consultant in Public Health Pharmacy, NHS Tayside
Barbara Strawbridge	Lead Midwife Northern Health and Social Care Trust
Christina Nurmahi*	Women & Newborn Care Group Lead Pharmacist, University Hospital Southampton NHS Foundation Trust
Emma Luhr*	Director of Midwifery, Frimley Health NHS Foundation Trust
George Attilakos*	Consultant in Fetal Medicine and Obstetrics in UCLH, Clinical Lead for Obstetrics and RCOG Council member
Jacqueline Lambert	Professional Advisor Midwifery & Perinatal Care, Chief Nursing Office's Directorate (CNOD) & Directorate for Children and Families (DCAF), Scottish Government
Jo Jenkins* (Working and core Group Co-ordinator)	Specialist Pharmacist PGDs Specialist Pharmacy Service
Karen Todd	Head of Maternity and Neonatal NHS Quality, Safety and Investigations, Department of Health and Social Care
Katherine Oldridge*	GP Clinical Lead for Bath, Swindon and Wiltshire-NHS Bath and North East Somerset, Swindon and Wiltshire CCG
Lisa Byers*	Pharmaceutical Officer, Medicines Regulatory Group, Department of Health, Northern Ireland
Richard Goodman	Regional Chief Pharmacist, NHS England & NHS Improvement (London Region)
Sandra Richards*	BSW Local Maternity System Midwife, NHS Bath and North East Somerset, Swindon and Wiltshire Clinical Commissioning Group

*Core group member

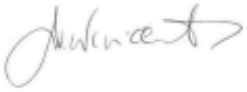
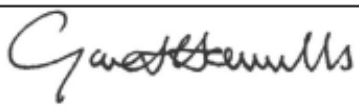
Valid from: November 2023
Review date: April 2026

PGD development

Role	Name and Job title	Signature	Date
Lead Doctor	Dr Madhu Dey, Consultant Obstetrician & Gynaecologist, Singleton Hospital,		31/10/23
Lead Nurse	Tracey Edey, Lead Midwife for Intrapartum Services, Singleton Hospital,		31/10/23
Lead Pharmacist	Anne Katherine Wilson, Pharmacist, Singleton Hospital		01/11/23

PGD authorisation

This PGD has been approved on behalf of Swansea Bay University Health Board by:

Name	Job title and organisation	Signature	Date
Senior doctor	**Marsham Moselhi** Clinical Director for Obstetrics and Gynaecology, Singleton Hospital, Swansea Bay UHB		01/11/23
Senior pharmacist	**Judith Vincent,** Clinical Director for Integrated Pharmacy and Medicines Management		14/11/23
Senior representative of professional group using the PGD	**Gareth Howells,** Executive Director of Nursing		14/11/23
Person signing on behalf of SBUHB	**Dr Raj Krishnan** Interim Executive Medical Director		15/11/23

Characteristics of staff

Qualifications and professional registration	Midwives currently registered with the Nursing and Midwifery Council (NMC)
Additional Requirements	Practitioners must: • be employed by, or providing services on behalf of Swansea Bay University Health Board. This includes hospital or community midwives in a hospital or community setting • be authorised by name as an approved practitioner under the current terms of this Patient Group Direction before working to it • must have access to the patient group direction and associated online resources
Initial training	The registered healthcare professional authorised to operate under this PGD must have undertaken appropriate education and training and successfully completed the competencies to undertake clinical assessment of patients ensuring safe provision of the medicines listed in accordance with local policy. Recommended requirement for training would be: • Successful completion of a relevant module/course accredited or endorsed by a university, Royal College of Midwives (RCM) accredited learning, or locally developed training. • Familiar with the British National Formulary (BNF) and Summary of Product Characteristics (SmPC) entries for this product • Recognises the adverse drug reactions associated with Terbutaline Sulfate 0.25mg given subcutaneously • Aware of the contra-indications for the use of Terbutaline Sulfate 0.25mg subcutaneous in pregnancy • Completion of the eLfH PGD e-learning module or in-house training
Competency assessment	• Individuals operating under this PGD must be assessed as competent or complete a self-declaration of competence to operate under this PGD • Staff operating under this PGD are encouraged to review their competency using the NICE Competency Framework for health professionals using patient group directions
Ongoing training and competency	• Individuals operating under this PGD are personally responsible for ensuring they remain up to date with the use of all medicines and guidance included in the PGD - if any training needs are identified these should be addressed and further training provided as required. • Organisational PGD and/or medication training as required by employing Trust/organisation.
The decision to supply any medication rests with the individual registered health professional who must abide by the PGD and any associated organisational policies.	

Clinical condition or situation to which this PGD applies

Clinical condition or situation to which this PGD applies	An individual in labour, or during induction of labour, where there are any concerns about the baby's wellbeing (where cardiotocograph traces (CTG) or other fetal heart rate monitoring indicates non-reassuring or abnormal features) and a reduction in contraction frequency is considered appropriate as detailed in NICE guideline NG229 Fetal monitoring in labour | Guidance | NICE and NICE guideline NG207: Inducing labour and RCOG Green Top Guideline 50 Umbilical cord prolapse
Criteria for inclusion	• Informed consent gained • ≥37 weeks gestation • Individual in labour, or during induction of labour, where there are any concerns about the baby's wellbeing (where cardiotocograph traces (CTG) or other fetal heart rate monitoring indicates non-reassuring or abnormal features) and a reduction in contraction frequency is considered appropriate as detailed in NICE guideline NG229 Fetal monitoring in labour | Guidance | NICE and NICE guideline NG207: Inducing labour and RCOG Green Top Guideline 50 Umbilical cord prolapse
Criteria for exclusion	• Consent not given • Known hypersensitivity to terbutaline or any of its excipients • <37 weeks gestation • Intrauterine foetal death, known lethal congenital or lethal chromosomal malformation • Known pre-existing ischaemic heart disease or in individuals with significant risk factors for ischaemic heart disease • Known tachyarrhythmias, heart failure or valvular heart disease • Known pre-existing medical conditions with which a beta-mimetic would have an untoward effect e.g. pulmonary hypertension and cardiac disorders such as hypertrophic obstructive cardiomyopathy, or any type of obstruction of the left ventricular outflow tract such as aortic stenosis • Known hyperthyroidism/thyrotoxicosis • Hypotension • Concomitant digoxin prescribed - terbutaline is predicted to increase the risk of digoxin toxicity when given concomitantly • Vaginal bleeding resulting from placenta praevia • Suspected placental abruption • Suspected uterine rupture

Cautions including any relevant action to be taken	• Both terbutaline and the following classes of drugs can increase the risk of hypokalaemia:
	  ○ corticosteroids
	  ○ diuretics

	(seek advice from an appropriate clinician if required). • Discuss with appropriate clinician any medical condition or drug interaction of which the healthcare professional is unsure or uncertain.
Action to be taken if the individual is excluded or declines treatment	• **Refer immediately to an obstetrician** • Explain the reasons for exclusion to the individual and document in the consultation record. • Record reason for decline in the consultation record.

Description of treatment

Name, strength & formulation of drug	Terbutaline sulfate 500micrograms/ml solution for injection
Legal category	POM
Route of administration	Subcutaneous injection
Off label use	Best practice advice is given by the RCOG and NICE and is used for guidance in this PGD and may vary from the Summary of Product Characteristics (SPC). This PGD includes off-label use of terbutaline; manufacturer's licence is for tocolysis in preterm labour (22-37 weeks gestation) - this PGD includes use beyond 37 weeks and specifically to reduce contraction frequency in the presence of neonatal compromise. Medicines should be stored according to the conditions detailed in the Storage section below. However, in the event of an inadvertent or unavoidable deviation of these conditions the local pharmacy or Medicines Management team must be consulted. Where medicines have been assessed by pharmacy/Medicines Management in accordance with national or specific product recommendations as appropriate for continued use this would constitute off-label administration under this PGD. The responsibility for the decision to release the affected medicines for use lies with pharmacy/Medicines Management. Where a medicine is recommended off-label consider, as part of the consent process, informing the individual/parent/carer that the medicine is being offered in accordance with national guidance but that this is outside the product licence.
Dose and frequency of administration	250micrograms (0.5ml) as a single dose.
Duration of treatment	Single dose only. Repeated doses are not permitted under this PGD – only one dose per individual can be administered under this PGD per episode of care.
Storage	Medicines must be stored securely according to national guidelines.
Drug interactions	**All concurrent medications must be checked for interactions.** A detailed list of drug interactions is available in

	the individual product SPC, which is available from the electronic Medicines Compendium website www.medicines.org.uk the BNF www.bnf.org **Note specifically:** • Digoxin - terbutaline is predicted to increase the risk of digoxin toxicity when given with digoxin - see exclusions section for advice. • Both terbutaline and the following classes of drugs can increase the risk of hypokalaemia - see cautions section for advice: o corticosteroids o diuretics Where a clinically significant interaction is identified discuss with appropriate medical/independent non-medical prescriber.
Identification & management of adverse reactions	A detailed list of adverse reactions is available in the SPC, which is available from the electronic Medicines Compendium website: www.medicines.org.uk and BNF www.bnf.org The following possible adverse effects stated in the current BNF/SPC as **very commonly/commonly** reported with terbutaline sulfate injection (note this list does not reflect all reported adverse effects): o Arrhythmias o Headache o Hypotension o Hypokalaemia o Muscle spasms o Nasopharyngitis o Nausea o Palpitations o Rash o Tremor
Management of and reporting procedure for adverse reactions	• Any individual experiencing mild side effects should be assessed by a midwife in the first instance – where clinically necessary the midwife should refer to an obstetrician or anaesthetist for further advice. • Healthcare professionals and individuals/carers are encouraged to report suspected adverse reactions to the Medicines and Healthcare products Regulatory Agency (MHRA) using the Yellow Card reporting scheme on: http://yellowcard.mhra.gov.uk • Record all adverse drug reactions (ADRs) in the patient's medical record. • Report via organisation incident policy.
Advice/follow up treatment	• Explain mode of action, side effects, and benefits of the medicine. • Refer urgently to an obstetrician if the individual does not respond adequately to treatment or their condition worsens.
Records	**Record:** • The consent of the individual and if the individual is not competent to consent, record action taken • Name of individual, address, date of birth

	• Relevant past and present medical history, including medication and family history in handheld maternity records • Examination finding where relevant • Any known allergies • Name of registered health professional • Name of medication administered • Dose administered • Advice given, including advice given if excluded or declines treatment • Details of any adverse drug reactions and actions taken • Advice given about the medication including side effects, benefits, and when and what to do if any concerns • Any referral arrangements made • Any supply outside the terms of the product marketing authorisation • Recorded that supply is via Patient Group Direction (PGD) Records should be signed and dated (or a password controlled e-records) and securely kept for a defined period in line with local policy. All records should be clear, legible and contemporaneous. A record of all individuals receiving treatment under this PGD should also be kept for audit purposes in accordance with local policy.

Key references

Key references (accessed January 2023)	• Electronic Medicines Compendium http://www.medicines.org.uk/ • Electronic BNF https://bnf.nice.org.uk/ • NICE Medicines practice guideline "Patient Group Directions" https://www.nice.org.uk/guidance/mpg2 • NICE guideline NG207: Inducing labour https://www.nice.org.uk/guidance/ng207 • Fetal monitoring in labour (NG229) https://www.nice.org.uk/guidance/ng229/resources/fetal-monitoring-in-labour-pdf-66143844065221 • Umbilical Cord Prolapse (Green-top Guideline No. 50) https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/umbilical-cord-prolapse-green-top-guideline-no-50/

Appendix A - Registered health professional authorisation sheet (example – local versions/electronic systems may be used)

PGD Administration of subcutaneous terbutaline sulfate for the reduction of contraction frequency in individuals in labour in Swansea Bay University Health Board

Before signing this PGD, check that the document has had the necessary authorisations. Without these, this PGD is not lawfully valid.

Registered health professional

By signing this patient group direction you are indicating that you agree to its contents and that you will work within it.

Patient group directions do not remove inherent professional obligations or accountability.

It is the responsibility of each professional to practise only within the bounds of their own competence and professional code of conduct.

I confirm that I have read and understood the content of this Patient Group Direction and that I am willing and competent to work to it within my professional code of conduct.			
Name	**Designation**	**Signature**	**Date**

Authorising manager

I confirm that the registered health professionals named above have declared themselves suitably trained and competent to work under this PGD. I give authorisation on behalf of Swansea Bay University Health Board for the above named health care professionals who have signed the PGD to work under it.			
Name	**Designation**	**Signature**	**Date**

This authorisation sheet should be retained to serve as a record of those registered health professionals authorised to work under this PGD.

Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

Title of Guideline:	Protocol for the Management of Uterine Hyperstimulation
Name(s) of Author:	Louise-Emma Shaw
Chair of Group or Committee approving submission:	Antenatal and Labour Ward Forum
Brief outline giving reasons for document being submitted for ratification	To update current policy which has expired
Details of persons included in consultation process:	Consultant Obstetricians / Midwifery Staff
Name of Pharmacist (mandatory if drugs involved):	N/A
Issue / Version No:	4
Please list any policies/guidelines this document will supercede:	Protocol for the Management of Uterine Hyperstimulation – Dated 15th November 2021
Date approved by Group:	
Next Review / Guideline Expiry:	
Please indicate key words you wish to be linked to document	Hyperstimulation, Management of Uterine
File Name: Used to locate where file is stores on hard drive	