UNIVERSITY HOSPITAL WISHAW
WOMEN'S SERVICES DIRECTORATE

The use of intravenous oxytocin for induction and augmentation of uterine activity

Contents

Section 1 – Abbreviations

CEFM	continuous electronic fetal monitoring
CPD	cephalopelvic disproportion
CTG	cardiotocography
FBS	fetal blood sampling
FHR	fetal heart rate
iu	international units
IV	intravenous
ml	millilitres
NaCl	sodium chloride
PET	pre-eclampsia
PROM	premature rupture of membranes
VE	vaginal examination

Section 2 – Introduction

Oxytocin is a potentially dangerous drug. As it is so commonly used, this fact may not be respected or understood. Misuse of oxytocin is a common cause for obstetric litigation.

Section 3 – Aims

- to provide a standard care pathway for women for whom oxytocin has been prescribed.
- to provide all maternity staff with guidance on the indications for its use and avoidance.
- to prevent inappropriate use of oxytocin.

Section 4 – monitoring for fetal heart rate changes

- Oxytocin has no direct drug effect on the fetal heart rate (FHR).
- Its indirect effects are due to increased frequency, duration and/or amplitude of uterine contractions causing compression of the umbilical cord and fetal head and a reduction in the retroplacental pool of blood.
- Continuous electronic fetal monitoring (CEFM) is mandatory for all patients being infused with oxytocin.
- If there are any cardiotocographic (CTG) concerns prior to commencement or during the infusion of oxytocin, the situation must be reviewed immediately by either the maternity coordinator or medical staff.
- If the CTG is normal, oxytocin should be titrated upwards (see below) until the woman is contracting 3-4 times in 10 minutes.
- Oxytocin should be reduced if contractions occur more frequently than this or if there is poor resting tone.
- Avoid routine reducing or stopping oxytocin in such cases prior to medical review unless the CTG is pathological/bradycardic.
- Consider the following measures in cases whereby there are CTG concerns whilst the woman is receiving an oxytocin infusion:
    - reduce/stop the infusion
    - consider short-term
    - oxygen o tocolysis
    - fetal blood sampling (FBS)
- The uterus becomes more sensitive to oxytocin with progressive labour. In the late 1st stage and throughout the 2nd stage, there is additional uterine activity due to Ferguson's reflex.

Section 5 – precautions with the use of an oxytocin infusion

5.1 *Contraindications*

- Allergy to any product constituents.
- Placenta praevia/abnormally-invasive placenta.
- Vasa praevia.
- Placental abruption.
- Cord presentation/prolapse.
- Hyperstimulation.
- Fetal compromise.
- Fetal malpresentation.
- Known cephalopelvic disproportion (CPD).
- Within 6 hours of vaginal prostaglandin administration.

5.2 *Potential adverse reactions*

- Administration of excessive doses resulting in uterine hyperstimulation (can cause fetal distress, hypertonicity, tetanic contractions, soft tissue damage or uterine rupture).
- nausea and vomiting.
- headache.
- Rash.
- Cardiac arrhythmias
- Anaphylactoid reactions
- Rapid IV administration and subsequent hypotension
- Fluid overload
    - Can occur due to prolonged administration with large fluid volumes.
    - Can cause hyponatraemia due to its antidiuretic effect.
    - To avoid this, ensure the following:
        - Administer oxytocin in 0.9% sodium chloride (NaCl)
        - Restrict fluid intake to isotonic drinks and Plasma-Lyte IV 6-hourly.
        - See 'Nutrition and hydration in labour' guideline.

5.3 *Special circumstances*

- presence of uterine scar (see section below).
- parous patients with secondary arrest of labour (see section below).
- multiple and higher-order pregnancies (see section below).

- severe pre-eclampsia (PET) or severe gestational hypertension.
- severe cardiovascular disorders.
- severe renal impairment (can result in fluid overload, impaired secretion and accumulation of oxytocin).
- long QT syndrome
- patients taking medications which may prolong the QT interval.
- If any of the above circumstances apply, the decision to use oxytocin should be made by the consultant obstetrician.

Section 6 – administration of oxytocin

6.1 *General principles*

- Ensure membranes are ruptured prior to commencing an oxytocin infusion either spontaneously or amniotomy.
- Oxytocin should be prescribed prior to its use.
- The following should be documented on Badger prior to its use:
  - indication.
  - discussion with medical staff (registrar or consultant).
  - subsequent plan for vaginal examination.

6.2 *Standard regime*

- Add 10 international units (iu) of oxytocin to 500ml of 0.9% NaCl.
- The infusion should be commenced and increased as follows:

Infusion rate (ml/hr)	Time after starting (min)	Oxytocin dose at current rate (milliunits/min)
10	0	3
20	30	7
40	60	13
60	90	20
80	120	27
99	150	33

- The infusion rate should be titrated against uterine activity and increased every 30 minutes if needed.
- Not all women will need titration to the maximum dose to achieve adequate uterine activity.

- Please note that the maximum licenced dose is 20 milliunits/minute but in practice, higher doses are used.
- The escalation/de-escalation process requires to be reviewed in accordance with clinical judgement of the midwife and obstetrician caring for the patient.
- If the infusion is stopped for up to 30 minutes and the decision has been made to re- start, it should start at half the dose being infused at the time the infusion was stopped.
- If the infusion is stopped for more than 30 minutes, restart at 10ml/hr.
- Ensure that the infusion rate AND doses are recorded on Badger.

6.3 *Primigravida*

6.3.1 *Induction of labour (IOL)*

- The above standard regime should be used following amniotomy.
- The woman should be re-examined after 4 hours of regular uterine activity to ensure progress.
- If there is no change in the cervix after this examination and the uterine activity is adequate, oxytocin should be considered for a further 4 hours.
- If there is no change in the cervix after 8 hours of oxytocin despite adequate uterine activity, consideration should be given to caesarean section and discussion with the consultant obstetrician.
- Oxytocin should not be administered for more than 12 hours without evidence of definite progress.

6.3.2 *Spontaneous labour*

- If uterine activity and/or progress in labour is inadequate, commence oxytocin as per guidance above.
- Vaginal examination should be performed 4 hours later and managed as above.

6.4 *Parous women*

6.4.1 *Induction of labour*

- The above standard regime should be used following amniotomy.
- However, consideration should be given to commencement of oxytocin 1-2 hours after amniotomy. This decision should be made depending on the indication for amniotomy, clinical judgement and the woman's preference.
- The woman should be re-examined after 4 hours of regular uterine activity to ensure progress.

- If there is no change in the cervix after this examination and the uterine activity is adequate, consideration should be given to caesarean section and discussion with the consultant obstetrician.
- The dose can often be reduced and sometimes stopped once the parous woman is established in labour.

6.4.2 *Spontaneous labour*

- Parous women in spontaneous labour with evidence of failure to progress in the 1st stage represent a **deviation from normal**.
- There is a risk of uterine rupture which may be further increased with administration of oxytocin in the following:
    - malposition.
    - malpresentation.
    - CPD.
- If oxytocin is being considered, the following must be done:
    - Accurate assessment of uterine activity.
    - Medical staff must perform a vaginal examination (VE) to exclude malpresentation or evidence of CPD.
    - The oxytocin infusion must be prescribed prior to it being commenced.
    - The consultant must be informed and verbally agree.
- Once commenced, a VE should be performed after 1 hour of adequate uterine activity.
- If there is inadequate progress, further management must be discussed with the consultant as caesarean section is usually indicated.

6.5 *Special circumstances*

6.5.1 *Uterine hyperstimulation*

- The infusion should be reduced/stopped in the following:
    - Contraction frequency persistently ≥6:10.
    - Uterine tachysystole with poor resting tone.
    - Single contractions lasting ≥ 2 minutes.
- If the above abnormalities do not resolve after the infusion is reduced/stopped, consideration should be given to administration of a tocolytic bolus of terbutaline 500 micrograms subcutaneously.
- Terbutaline can be given by the midwife upon verbal instruction from an obstetrician but it must be prescribed at the earliest available opportunity.
- The infusion can be re-commenced after 15 minutes (see guidance above for doses) assuming the indication for discontinuing oxytocin has resolved.

6.5.2 *Intact membranes*

- If membranes are found to be inadvertently intact (such as in augmentation for term premature rupture of the membranes (PROM)), the oxytocin may need reduced following amniotomy.
- For parous women, it should be halved and re-escalated according to the above regime.

6.5.3 *Epidural insertion*

- It is appropriate to reduce or stop the infusion to allow safe insertion of the epidural catheter if required.
- In this scenario, CEFM is vital.
- Once analgesia is effective, oxytocin should be recommenced at the previous dose and subsequently re-escalated as per the above guidance.

6.5.4 *Twin pregnancies*

- Labour and delivery of twin 1 should be managed as in a singleton pregnancy.
- If twin 2 has a longitudinal lie, cephalic presentation and satisfactory fetal monitoring, allow twin 2 to descend into the pelvis. Once engaged, amniotomy should be performed +/- a fetal scalp electrode (FSE) applied.
- If uterine activity is considered inadequate or infrequent, commence an oxytocin infusion as per the regime above.
- Delivery should then proceed as per a singleton pregnancy.
- If the lie is not longitudinal, attempt correction to (ideally) a cephalic presentation or breech by external version.
- If cephalic, proceed as above.
- If breech and uterine activity has diminished, discuss with the consultant regarding the use of oxytocin and commence if instructed.
- If the woman is already receiving an oxytocin infusion, double the current infusion rate.
- The above does not apply to higher order pregnancies and the intrapartum care for these women including use of oxytocin should be at the discretion of the consultant obstetrician.

6.6 *De-escalation of oxytocin*

- After delivery, the infusion should be reduced at 15-minute intervals from 99 to 80 to 40 to 20 and 10ml/hr.
- It may take up to 1 hour to discontinue oxytocin.

Section 7 – administration of oxytocin in patients with previous caesarean section

- Women should be informed of:
  - the two to three-fold increased risk of uterine rupture and
  - the 1.5-fold increased risk of caesarean section in induced/augmented labours compared with spontaneous labour.
- There should be serial cervical assessments, preferably by the same person, for both augmented to ensure adequate cervical progress.
- A consultant obstetrician should make the following decisions in formulating a plan for intrapartum care of someone aiming for VBAC:
  - Decision to induce.
  - Method of induction.
  - Decision to augment with oxytocin.
  - Time intervals for serial vaginal examination.
  - Selected parameters of progress that would necessitate discontinuing VBAC attempts.
- If oxytocin is required, a 'half-dose' should be used.
- Dilute 5 international units of oxytocin (5ml) in 500ml normal saline and escalate as per the following table:

Infusion rate (ml/hr)	Time after starting (min)	Oxytocin dose at current rate (milliunits/min)
10	0	1.6
20	30	3.3
40	60	6.7
60	90	10
80	120	13.3
99	150	16.5

- The above regime should be prescribed.
- A VE should be performed by the designated midwife 4 hours after commencing an oxytocin infusion.
- If there has been no evidence of progressive cervical dilatation, further management should be discussed with consultant.
- If there has been some change but not sufficient enough to conform adequate progress, further management should be discussed with the consultant.
- If progress is being made, the above regime should be continued and titrated against uterine activity.
- It may be possible to reduce the infusion rate further, particularly if the woman labored in her previous pregnancy.

- The use of an oxytocin in women with a previous section in spontaneous labour is a consultant decision only and each case should be tailored to the individual patient/situation.
- The use of oxytocin in someone with ≥ 2 previous sections is a consultant decision and again should be tailored to the individual patient/situation.

References

British National Formulary.

Irons DW, Thornton S, Davison JM, Baylis PH. Oxytocin infusion regmes: time for standardization> Br J Obstet & Gynaecol. 1993;100:786-7.

Lazor, Philipson EH, Ingardia CJ, Kobetisch ES, Curry SL. A randomized comparison of 15 and 40 minute dosing protocols for labour augmentation and induction. Obstet & Gynaecol. 1993; 82:1009-12.

NICE Clinical Guideline CG70 – Inducing labour, 2008.

NICE Clinical Guideline CG190 – Intrapartum Care for Healthy Women and Babies, 2014.

Orhue AA. A randomised trial of 30-min and 15-min oxytocin infusion regimen for induction of labor at term in women of low parity. Int J Gynaecol Obstet 1993; 40: 219-25.

Orhue AA. A randomised trial of 45 minutes and 15 minutes incremental oxytocin infusion regimes for the induction of labour in women of high parity. Br J Obstet & Gynaecol 1993, 100: 126-9.

Royal College of Obstetricians and Gynaecologists. Birth after previous caesarean section birth. Green-top Guideline No. 45. London; RCOG: 2015.

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