Obstetrics

Contraception

- In the UK - 25% of women use COCP; 25% rely on condoms
- Hormonal contraceptives act by suppressing LH / FSH thereby limiting ovulation
  - also thicken cervical mucous, inhibit endometrial implantation
- COCP - 20-40 micrograms of oestrogen combined with progesterone
  - taken for 21 days with 7 day break causing withdrawal bleed (avoid by ‘back-to-back’)
  - protects against benign breast disease, ovarian cysts, ovarian / endometrial ca., PID
  - risks - VTE, MI, stroke (esp. if smokes, HTN); migraine, breast / cervical ca.
  - if 1 missed pill - take immediately; if 2 missed pills - use condoms for 7 days
  - if vomiting within 2hrs - retake; beware enzyme inhibitors; stop 4wks pre major surgery
- POP - taken every day at same time; suitable in breast-feeding; may induce ovarian cysts
  - narrow effective window - if missed by > 3hrs (12hrs for Cerazette) then unprotected
- Depot - slow-release progesterone taken every 12 weeks
  - risks - irregular menstruation, weight gain, delayed return of fertility; possibly depression
- Implant (Nexplanon - etonogestrel) - lasts for 3 years; ‘instantly’ reversible on removal
  - risks - irregular menstruation (first year), weight gain, headache, acne
- IUCDs - copper device induces uterine inflammation inhibiting fertilisation / implantation
  - risks - IMB, menorrhagia, dysmenorrhoea, expulsion (5%), ectopics
    - PID may occur in first 20 days if pre-existing STI - screen before insertion
  - Mirena - progesterone-containing; limits menstruation; lasts for 5 years

Sterilisation

- Vasectomy - 30 x more effective and 20 x fewer complications than female sterilisation
  - day case under LA; failure rate 0.3%; requires 2 negative sperm counts at 4 and 8wks
  - complications - epididymitis (1%), bleeding (0.25%), granuloma, chronic pain (0.1%)
- Female sterilisation - occlusive tubal implants / Filshie clips / tubal diathermy
  - performed laparscopically / hysteroscopically / open; failure rate around 0.5%
  - increased risk of ectopic pregnancy if conception occurs

Emergency contraception

- Progestogen-only (levonorgestrel: LNG) - single dose, 85% effective within 72hrs of sex
  - available OTC; may cause nausea / vomiting; does not have abortifacient properties
- SPRM (ulipristal acetate) - inhibits ovulation; 98% effective within 120hrs of sex
  - should not be given in suspected pregnancy, uncontrolled asthma
- IUCD (copper) - inhibits fertilisation; highest efficacy; 99% effective within 5 days of sex
  - risk of PID - test for STIs, consider prophylactic antibiotics
Subfertility

- Failure to conceive after **1 year of regular unprotected coitus**
  - *unexplained* (25%) or factors of ovulatory (25%), tubal (20%), male (30%), uterine (10%)
  - lifestyle - obesity, smoking, alcohol all reduce fertility
- Male factors - impotence, prematurity, oligospermia, poor sperm motility
  - normal sperm count - semen > 2 ml, > 15 million / ml, 50% motile, > 10% normal forms
  - oligospermia associated with **high FSH**; consider *testicular biopsy* / sperm retrieval
- Female factors - ovulatory (PCOS, hyperprolactinaemia, anorexia), tubal (PID), uterine

Assisted conception

- Includes intrauterine insemination (IUI), intracytoplasmic sperm injection (ICSI), IVF, GIFT
- IUI - if intercourse problems, donor sperm, ‘sperm washing’ e.g. for HIV
- ICSI - if severe sperm abnormalities, failed IVF
- IVF - 3 cycles if aged < 40; give 3 wks GnRH agonist, then 2 wks of SC LH / FSH
  - collect ova transvaginally with US, implant 5 days later, progesterone / hCG for 4-8 wks
- **Ovarian hyper-stimulation syndrome** (OHSS) - abdominal pain, nausea, diarrhoea
  - risks - PCOS, young women, high oestrogen levels, GnRH agonists
  - investigations - USS, FBC (haemoconcentration), U&Es, CRP (high), oestrogen (high)

Ectopic pregnancy

- Occurs in around 1% of pregnancies, most commonly in the *fallopian tubes*
- Risks - fertility treatment, IUCD, PID, adhesions, smoking
- Symptoms - **abdominal / pelvic pain**, missed period, PV bleed
  - also dizziness, collapse, breast tenderness, shoulder pain, urinary symptoms, vomiting
- Investigations - TVUS, serial hCG, FBC, cross-match
- Management - **methotrexate** if small, un-ruptured, no foetal heartbeat (FHB), hCG < 1500
  - surgery (e.g. salpingectomy/otomy) if substantial pain, large, FHB, hCG > 5000
- Complications - **rupture** (mass haemorrhage, shock, DIC), further ectopics (up to 20%)

Miscarriage

- Spontaneous pregnancy loss before **24 wks’ gestation**
  - 20% of recognised pregnancies; 85% occur within 1st trimester (< 12 wks)
- Causes - genetic / foetal / uterine abnormality, placental failure, autoimmunity, infection
- Risks - maternal age > **30**, multiparity, smoking / alcohol / substance misuse, SLE, APS, DM
- May be **complete** (cervical os closed) or **incomplete** (cervical os open)
  - threatened - mild bleeding, little pain, cervical os closed; 25% miscarry
  - inevitable - heavy bleeding, pain, cervical os open
  - missed - retained dead foetus, SGA, cervical os closed; may be brown PV discharge
Investigations - **TVUS**, hCG (exclude ectopic), progesterone

**Management (incomplete or missed)** - **conservative** if first trimester and low risk
  - **medical** - PV / PO **misoprostol**; consider IM ergometrine if severe bleeding
  - if bleeding resolves - pregnancy test after 3wks; review if positive
  - if bleeding persists - repeat TVUS after 7-14 days
  - **surgical** - **vacuum aspiration** (LA; risk of perforation, adhesions) or laparotomy (GA)

Complications - infection / sepsis, haemorrhage, further miscarriages

**Recurrent miscarriage**

- 3 or more **consecutive** spontaneous miscarriages with the **same partner**
  - affects 1% of couples; 40% further risk of miscarriage after 3; many idiopathic

Aetiology - maternal genetic abnormality, PCOS, bacterial vaginosis, thrombophilia
  - uterine - arcuate / septate, fibroids, cervical incompetence
  - **APS** - screen for autoantibodies; manage with antenatal **aspirin** and **clopidogrel**

**Termination of pregnancy (TOP)**

- Commonest around aged 20; **90%** at < **13wks**, 80% at < **10wks**; 50% medical
  - 1967 Abortion Act - risk to woman’s life / physical / mental health, serious handicap
    - assessment within 5 days of referral; TOP within 5 days of decision to proceed

Management - **chlamydia screen** (prevent salpingitis); consider anti-D, contraception
  - offer antibiotic prophylaxis - metronidazole 1g PR stat with doxycycline / azithromycin
  - **medical** - mifepristone 200mg PO; after 2-3 days - misoprostol 800mcg PV / buccal / SL
  - **surgical** - **suction** (7-15wks, preferably under LA) or **dilatation / evacuation**

Complications - infection, cervical trauma, haemorrhage, uterine perforation
  - failure rate 0.2% surgical, 0.6% medical

**Antenatal care**

- **Gestation** - days since LMP; **conception** occurs roughly 2 weeks after LMP (at ovulation)
  - **EDD** - 40wks after LMP; **Nägle’s rule** - subtract 3 months, add 1 year, add 7 days
    - by **USS** - **crown-rump length** at 7-14wks; **head circumference** / femur length up to 20wks

- **Gravidity** (total pregnancies) and **parity** (total pregnancies / deliveries beyond 24wks)
  - **nulliparity** - risk of **pre-eclampsia**, delayed 1st stage of labour, dystocia
  - **multiparity** - risk of abnormal presentation, placenta praevia, uterine rupture, PPH
  - 10 routine antenatal appointments recommended for nullips / 7 for multips

- Folic acid - **400mcg** from **attempting to conceive to end of 1st trimester** (12wks)
  - **5mg** if high risk e.g. previous / FH of NTD, coeliac, **anti-epileptics**, obesity, **DM**

- Smoking in pregnancy - risk of IUGR, miscarriage, stillbirth, prematurity, placental problems

- Diet - avoid uncooked meat / fish / eggs, unpasteurised milk, soft cheese, wash fruit
  - **vitamin D supplements** if at risk e.g. south Asian, housebound, vegan, obesity
Routine appointments

- **Booking (< 12wks)** - offer screening for anaemia, rhesus, hep. B, HIV, syphilis
- 16wks - review test results; consider iron supplementation if Hb < 110
- 25wks (nullips) - begin SFH measurement
- 28wks - offer screening for anaemia, rhesus; offer **anti-D** if RhD -ve; offer **pertussis vaccine**
- 31wks (nullips) - review test results
- 34wks - review test results; offer **anti-D** if RhD -ve
- 36wks - check *foetal lie*; offer **external cephalic version** if breech
- 38wks, 40wks (nullips), 41wks - at the lattermost offer IOL
- USS - *dating / nuchal translucency* at 10-14wks; *foetal anomaly scan* at 18-20wks
  - anomalies identified - anencephaly, spina bifida, gastroschisis, Edward’s, Patau’s

Maternal comorbidity

- If high risk for pre-eclampsia (previous pre-eclampsia, CKD, SLE, DM) - **aspirin** from 12wks
- **Diabetes** - risk of PIH, VTE, prematurity, miscarriage, macrosomia, *shoulder dystocia*, RDS
  - insulin demands increased - risk of DKA, hypoglycaemia, progression of complications
  - preconception - aim for **HbA1c < 43** (6.1%); **metformin** safe but stop any others
- **Epilepsy** - risk of NTDs; avoid sodium valproate; 5mg folic acid throughout pregnancy
- **Hypothyroidism** - risk of retardation, pre-eclampsia; increase thyroxine; TSH every 6wks
- **Hyperthyroidism** - risk of neonatal thyrotoxicosis; consider propylthiouracil in 1st trimester
- **Hypertension** - ‘pre-existing’ if before 20wks; PIH / pre-eclampsia thereafter

Down’s screening

- Risks - 1 in 1500 aged 20 years; **1 in 250 aged 35**; 1 in 100 aged 40; 1 in 50 aged 45
- **Diagnostic testing** offered if screening suggests a risk of at least **1 in 150**
  - **triple** (combined) test (10-14wks) - hCG (high), PAPP-A (low), nuchal translucency
  - **quadruple test** (14-20wks) - hCG, AFP (low), inhibin-A (high), estriol (uE3, low)

Prenatal diagnosis

- **Chorionic villus sampling** (11-13wks) - detects *chromosomal / single-gene mutations*
  - US-guided trans-abdominal needle or trans-cervical biopsy forceps; results within 2wks
  - around 98% accurate due to *placental mosaicism*; up to 10% unsuccessful
  - complications - **miscarriage** (2%), PV bleed (7%), amniotic leak (< 1%)
- **Amniocentesis** (12-14wks / 16-18wks) - detects as for CVS but also NTDs, IEMs
  - US-guided trans-abdominal needle, up to 20ml of amniotic aspirate; results within 2wks
  - complications - **miscarriage** (1%), PV bleed (2%), uterine cramping
- **PCR** or **FISH** techniques allow rapid genetic results in < 48hrs
  - Also fetoscopy (18-20wks), cordocentesis (3% miscarriage risk), AFP (15-22wks, for NTDs)
Multiple pregnancy

- Twins in > 1% of pregnancies, triplets in < 0.1%; IVF significantly increasing incidence
- May be monozygotic (one ovum, identical twins) / dizygotic (two ova, non-identical twins)
- Monozygotic twins may have single or separate placentas, amniotic sacs, chorions:
  - diamniotic (majority) - dichorionic (< 3 days, 30%) or monochorionic (4-8 days, 70%)
  - monoamniotic - monochorionic (9-13 days) or incomplete (conjoined)
- Maternal complications - hyperemesis, pre-eclampsia, GDM, anaemia, PPH
- Foetal complications - congenital abnormalities, miscarriage (esp. MC), IUGR, prematurity

Maternal pregnancy complications

Group B streptococcal infection

- Affects up to 25% of pregnant women; associated with prematurity and foetal infection
- Consider screening women with intrapartum pyrexia, preterm labour, PROM
- Treat confirmed maternal infection with IV penicillin

Gestational diabetes (GDM)

- New onset IGT during pregnancy i.e. glucose > 7.8 2hrs post-OGTT
  - relative gestational insulin resistance normal; GD when insufficient compensatory insulin
- Risks - previous GD / macrosomic baby / stillbirth, FH of DM, obesity, PCOS, smoking
- Management - initially diet / physical activity / weight loss; consider metformin, insulin
- Maternal complications - pre-eclampsia, UTI, endometritis, postnatal DM
- Foetal complications - macrosomia, congenital abnormalities, prematurity, birth trauma
  - risk of hypoglycaemia immediately post-delivery; monitor for 24hrs, encourage feeds

Hyperemesis gravidarum

- Severe nausea, persistent vomiting, ketonuria, malnutrition, weight loss (5% pre-pregnancy)
  - gestational nausea / vomiting normally self-limiting by end of 1st trimester
- Risks - hyperthyroidism, DM, asthma, previous molar pregnancy, multiple pregnancy
- Management - IVT, anti-emetics (esp. ondansetron), vitamin B supplementation
- Complications - vitamin B1/6/12 deficiency, Mallory-Weiss tear, possibly prematurity

Obstetric cholestasis

- Affects < 1% of pregnancies; typically intense pruritis in absence of overt jaundice
  - esp. palms, soles; worse at night, disturbs sleep; may be pale stool / dark urine
- Risks - previous / FH of obstetric cholestasis, multiple pregnancy, gallstones, hep. C
- Investigations - USS (rule out steatosis), LFTs (all high; bilirubin often normal), bile acid
- Management - topical emollients, UDCA, vitamin K from 36wks; consider IOL after 37wks
  - follow-up maternal LFTs 6wks post-delivery
- Complications - foetal distress, MAS, stillbirth, prematurity
Pre-eclampsia / eclampsia

- In 2nd trimester - gestational **hypertension** BP > **140 / 90** with **proteinuria** > **0.3g / 24hrs**
  - placental origin; vascular endothelial damage, inflammation, vasospasm, permeability
- Risks - nulliparity, new partner, previous / FH, age > 40, obesity, HTN, DM, twin pregnancy
- Symptoms - **headache**, **oedema**, epigastric pain, vomiting, visual disturbance, clonus
- Investigations - urinalysis (exclude UTI), FBC, LFTs, U&Es, urate, LDH, clotting; foetal USS
  - **protein : creatinine ratio** of > **30mg/nmol** equivalent to proteinuria threshold
- Management - **labetolol** / nifedipine / hydralazine if BP > 160 / 110 (requires CTG)
  - in eclampsia / seizures - **IV magnesium sulphate** (causes respiratory depression)
- Foetal complications - **IUGR**, low birthweight, prematurity, RDS, placental abruption
- Maternal complications - **seizures**, HELLP, DIC, haemorrhagic stroke, renal failure, ARDS
- **HELLP** - triad of haemolysis, elevated liver enzymes, low platelets; may cause liver failure

Rhesus alloimmunisation

- Multiple linked alleles - c / C, d / D, e / E; **RhD +ve** when Dd or DD
  - RhD -ve mother with RhD +ve father - risk of **sensitisation** if RhD +ve baby
- **Sensitisation** - foetal RBCs enter maternal circulation, **anti-RhD antibodies** produced
  - may occur in miscarriage, TOP, ectopic, APH, amniocentesis / CVS, ECV, delivery
  - subsequent RhD +ve foetus at risk of **haemolysis**, hydrops fetalis, jaundice, kernicterus
- Management - **anti-D prophylaxis** if **anti-RhD negative** (Coombs’ test at first antenatal visit)
  - offer at 28 / 34wks, within 72hrs **post-sensitisation**, after delivery if baby RhD +ve

Intrauterine pregnancy complications

Gestational trophoblastic disease (GTD)

- Persistent elevation of **hCG** - 3 expert centres (Dundee, Sheffield, London)
- **Hydatidiform mole** - predominantly placental development; little foetal growth
  - 0.3% of pregnancies; mostly affects **extremes of maternal age**; 10% become malignant
  - complete (diploid, androgenic, duplicated sperm) or **incomplete** (triploid, dispermic)
- Malignant disease may be locally **invasive** or metastatic (choriocarcinoma)
- Staging - I (uterine), II (genital), III (lungs), IV (distant mets)
- Symptoms - persistent **painless PV bleed**, **hyperemesis**, large-for-dates, thyrotoxicosis
- Investigations - **USS** (‘snowstorm’), CT (mets), POC **histology**
- Management - vacuum suction, hCG levels every 2wks for at least 6 months
  - if choriocarcinoma / mets - IM **methotrexate** if low risk; multichemotherapy otherwise

Hydrops fetalis

- Abnormal **fluid accumulation** in > 1 ‘foetal compartments’ e.g. ascites, effusion, oedema
- Causes - **isoimmunisation**, G6PD, congenital cardiac defect, TORCH, parvovirus B19
Intrauterine growth restriction (IUGR)

- Small for gestational age (SGA) - below the 10th centile for gestation e.g. term < 2.5kg
  - this includes foetuses that are ‘constitutionally small’ e.g. throughout pregnancy
  - likely if low maternal age / height / weight, nulliparity, female foetus, Asian ethnicity
- IUGR means failure to reach growth potential - slowed growth from initial projections
  - placental insufficiency tends to result in normal head circumference - ‘head sparing’
  - chromosomal abnormalities tend to result in global growth restriction
- Maternal causes - smoking, alcohol / substance misuse, HTN, renal disease, malnutrition
- Placental causes - pre-eclampsia, insufficiency
- Foetal causes - genetic abnormalities, infection, multiple pregnancy, congenital defects
- Investigations - USS (oligohydramnios, low estimated weight, reduced HC / AC), doppler
- Complications - stillbirth, prematurity, foetal distress / hypoxia / CP, MAS

Placenta praevia

- Placental implantation in lower segment of the uterus, of concern in 3rd trimester
  - placenta often ‘low-lying’ at 20wks, then normally migrates upwards
  - grade I (not to os), II (up to os), III (partial os occlusion), IV (total os occlusion)
- Risks - previous placenta praevia, advanced maternal age, multiparity, smoking, CS
- Symptoms - sudden profuse brief antepartum haemorrhage; abnormal lie on routine USS
- Management - if minor (I-II), follow-up USS at 36wks; if major (III-IV), follow-up at 32wks
  - consider CS at 38wks - high risk of severe haemorrhage
- Complications - breech / transverse lie, severe APH, prematurity
  - placenta accreta - invasion into uterus esp. post-CS

Placental abruption

- May be concealed (confined haemorrhage) or revealed (majority, cervical drainage)
- Risks - trauma, IUGR, pre-eclampsia, multiparity, CS, smoking, polyhydramnios
- Symptoms - painful APH, abdominal pain, contractions, premature labour
- Management - blood transfusion, CVP monitoring, ARM / CS (if foetal distress)
- Complications - foetal death, severe haemorrhage / PPH, DIC, renal failure

Haemorrhage

Antepartum (APH)

- Between 24wks - completion of second stage of labour; commonest in multiparous women
- Causes - placenta praevia / abruption, infection, trauma, vasa praevia, uterine rupture
- Management - resuscitation, urgent delivery if foetal compromise
Postpartum (PPH)
- **Primary** - blood loss > 500ml within 24hrs of delivery; **secondary** - from 24hrs to 6wks
- Causes - **uterine atony**, retained placenta, genital trauma / haematoma
  - secondary PPH - **endometritis** (esp. post-CS, PROM, long labour), RPOC
- Risks - APH, placenta praevia, multiple pregnancy, PIH, CS, operative delivery, macrosomia
- Management - resuscitation, uterine compression, oxytocin infusion, IM carboprost
  - secondary PPH - antibiotics (ampicillin / metronidazole), ERPOC

Labour
- When **painful uterine contractions** accompany **dilatation** and **effacement** of the cervix
  - stage 1 - cervical dilatation up to 10cm - **latent** (up to 3cm, slow) then **active** (1cm/hr)
  - stage 2 - from full cervical dilatation to delivery of foetus; should be < 1hr
  - stage 3 - from delivery of foetus to delivery of placenta; around 15m, up to 500ml blood
- **Powers** - uterine contractions normally up to 1m every 2-3m
- **Passage** - pelvic inlet wider transverse, outlet wider AP; **ischial spines** mid-cavity
  - **station** - level of foetal descent relative to ischial spines, from -2 (above) to 2cm (below)
  - **Passenger** - engages occipito-transverse, rotates 90º mid-cavity, delivers occipito-anterior
  - **attitude** - degree of flexion - vertex (maximal), extended, face (hyperextended, to CS)
  - **position** - degree of rotation - occipito-anterior (OA), occipito-posterior (OP, in 5%)

Abnormal lie
- Affects 1 in 200 births; lie is position of foetus in relation to **long axis** of the uterus
- Risks - polyhydramnios, high parity, foetal / uterine abnormalities, placenta praevia
- **Breech** - 3% of term / 25% of preterm births; risk of long-term neurological damage
- Management - **ECV** at 37wks (50% success rate); otherwise **CS**

Induction of labour (IOL)
- Indications - prolonged (41wks), DM (37wks), PROM, IUGR, pre-eclampsia
- Contraindications - placenta praevia major, transverse lie, Bishop’s score < 4
- Methods - membrane sweep, **prostaglandin pessary**, ARM / oxytocin
- Complications - uterine hyperstimulation / rupture, more likely to require operative / CS

Premature rupture of membranes (PROM)
- Membrane rupture before labour onset, affects 20% of pregnancies; **PPROM** if < 37wks
- Risks - **smoking**, previous preterm delivery, APH, UTI, chorioamnionitis
- Investigations - **sterile speculum** (liquor, cord prolapse), nitrazine / pH test (unreliable)
  - signs of infection - maternal pyrexia, foetal tachycardia, uterine tenderness
- Management - **steroids**, **erythromycin** 250mg qds. for 10 days; penicillin if GBS
- Complications - premature labour, sepsis, pulmonary hypoplasia, placental abruption
Premature labour

- Progressive contractions with cervical effacement before 37wks
- Risks - low SES, multiple pregnancy, UTI, BV, DM, PPROM, APH, incompetent cervix, APS
  - if high-risk - consider cervical cerclage (suture, at 12wks), progesterone suppositories
- Investigations - VE (not if ROM), vaginal swabs; screen with TVUS (cervical length)
- Management - nifedipine (tocolysis) to buy time, steroids if < 34wks, breastfeeding for all
  - vaginal delivery generally preferable; breech presentation more common - if so use CS
- Complications - mainly arise if < 34wks; 90% survival if birthweight > 800g, 50% if > 500g
  - immediate - hypothermia, hypoglycaemia, hypocalcaemia, RDS, jaundice, enterocolitis
  - chronic - CP, blindness (retinopathy of prematurity), deafness, disability, ADHD

Prolonged pregnancy

- More than 80% of women deliver by 42wks; beyond this the pregnancy is prolonged
- Risks - previous prolonged pregnancy, obesity, primigravidity, advanced maternal age
- Management - offer IOL at 41wks; continuous CTG may be required intrapartum
- Complications - foetal distress, stillbirth, MAS, neonatal hypoglycaemia, CP, macrosomia

Delivery

Retained placenta

- Prolonged third stage of labour for more than 1 hour
- Causes - placenta adherens (failed uterine contraction), trapped (closed os), accreta
- Management - assess for separation (rush of blood, high round fundus, lengthened cord)
  - if separated - massage uterus, consider IM oxytocin, controlled cord traction
  - if not separated - careful manual removal (LA), IM ergometrine (causes vomiting, HTN)
- Complications - PPH, endometritis

Instrumental / operative delivery

- Ventouse / forceps - head must be deeply engaged, station > -1, cervix fully dilated
  - forceps - non-rotational (e.g. Simpson's) if OA, rotational (e.g. Kielland's) otherwise
  - Ventouse less effective, more foetal trauma, less maternal trauma
- Caesarean section (CS) - elective (at 39wks), emergency - cat. 1 (< 30m), cat. 2 (< 75m)
  - indications - malpresentation, multiple pregnancy, foetal distress, failed IOL, HTN
  - spinal / epidural, consider prophylactic antibiotics, oxytocin slow IV infusion
- Joel Cohen incision (lower uterine segment) - 3cm above symphysis pubis
  - complications - haemorrhage / transfusion, endometritis, VTE, bladder / bowel damage

Shoulder dystocia

- Restitution - normally foetal head rotates to OT, posterior flexion delivers anterior shoulder
- Affects < 1% of births esp. in maternal DM, macrosomia, obesity, IOL, prolonged labour
• Sequence - McRobert’s (hip flexion), Rubin’s, Wood’s screw, Zavanelli (replacement)
• Complications - Erb’s palsy (‘waiter’s tip’, up to 15%), PPH, severe perineal tears

Puerperium
• 6wks post-partum - return to pre-pregnancy state; menstruation resumes after puerperium
  • may be perineal pain, urinary retention / incontinence, constipation, mastitis, backache
• Lactation - prolactin stimulates milk secretion; oxytocin stimulates milk ejection on suckling
  • oestrogen / progesterone potently antagonise prolactin, but decline in puerperium
  • initially colostrum - yellow; contains fats, IgA; normal content mostly carbohydrates
• Postnatal depression - non-psychotic depressive illness within 1 year post-partum
  • affects up to 10% esp. poor social support, poverty, domestic violence, adolescents
• Puerperal psychosis - affects 0.2%, rapid onset at 5-15 days, requires inpatient admission

Neonatal problems

APGAR score
• At birth / 5mins / 10mins - scored out of 10, NR > 7
  • appearance - blue, body pink, all pink
  • pulse - absent, < 100, > 100
  • grimace (plantar stimulation) - no response, grimace, cry
  • activity (muscle tone) - limp, some flexion, active motion
  • respiration - absent, hypoventilation, adequate breaths

Biliary atresia
• Uncommon obliterative inflammatory condition of extrahepatic bile ducts
  • associated with congenital cardiac and GI abnormalities, situs inversus, asplenia
• Symptoms (postpartum) - jaundice, pale stools, dark urine, FTT
• Investigations - LFTs (conjugated hyperbilirubinaemia), USS, liver biopsy
• Management - antibiotics, UDCA, vitamin supplementation (A, D, E, K)
  • surgery - Kasai portoenterostomy (jejunal anastomosis to hepatic hilum)
  • Complications - ascending cholangitis, cirrhosis, portal hypertension, HCC, osteomalacia

Neonatal infection
• TORCH - toxoplasmosis, rubella, CMV, herpes simplex; also syphilis, VZV, parvovirus B19
  • lead to prematurity, low birthweight, anaemia, thrombocytopenia, jaundice, FTT, seizures
• Rubella - early (first 10wks) maternal infection predisposes to congenital rubella syndrome
  • leads to IUGR, purpura, haemolysis, jaundice, encephalitis, deafness, mental retardation, DM, congenital heart disease, cataracts, ‘salt and pepper’ retinopathy
• HSV - early maternal infection associated with miscarriage, IUGR, prematurity
  • treat mothers acutely with aciclovir 400mg tds. and again from 36wks
- if primary infection after 30wks - recommend **caesarean section**
- **Neonatal HSV** (within 1 month of life) - vesicles, lethargy, reduced feeds, seizures
  - may lead to jaundice, hepatomegaly, DIC, encephalitis (HSV-2), death
- **VZV** - early maternal infection predisposes to prematurity and *congenital varicella syndrome*
  - leads to IUGR, microcephaly, limb hypoplasia, cataracts, scarring
  - neonatal VZV causes life-threatening pneumonia, fulminant hepatitis - give Ig / aciclovir
- **Syphilis** - causes rhinitis, osteitis, bullae; later abnormal teeth, interstitial keratitis, deafness
- **Ophthalmia neonatorum** - purulent conjunctivitis within first 28 days of life
  - causes - *chlamydia, gonorrhoea, Staph. aureus, Strep. pneumoniae*
  - treat chlamydial infection with *erythromycin syrup* (50mg/kg) for 14 days
  - treat gonorrhoeal infection with IV / IM *cefotaxime* (100mg/kg) stat with eyedrops
  - complications - scarring, **blindness**

**Neonatal jaundice**
- Common - bilirubin > 85µmol/L in 60% term / 80% pre-term infants
- Risks - **prematurity**, low birthweight, DM, breastfeeding (*beta-glucuronidase*)
- Causes - *physiological* if occurs between days 2 and 10; *breast milk* up to 6 weeks
  - *early* (within 24hrs) - haemolysis (G6PD), hepatitis (toxoplasmosis, CMV), maternal SLE
  - *prolonged* (beyond 2wks) - infection (UTI), hypothyroidism, galactosaemia, biliary atresia
- Investigations (< 24hrs / > 10 days) - LFTs, TORCH screen, swabs, cultures, LP, blood film
- Management - **fluids**, phototherapy (causes dehydration, diarrhoea), exchange transfusion
- **Kernicterus** - *bilirubin encephalopathy* affecting basal ganglia, hippocampus, CNs
  - excessive *unconjugated* bilirubin (esp. G6PD) primarily in *premature* babies
  - symptoms - *high frequency hearing loss*, athetosis (upper limbs), upward gaze
  - phase I - lethargy, hypotonia, poor feeding
  - phase II - extensor hypertonia, retrocollis (neck spasm), opisthotonus (EP body spasm)
  - phase III - hypotonia, hyper-reflexia, dental enamel hypoplasia, delayed milestones

**Transient tachypnoea of the newborn (TTN)**
- Noninfectious benign *respiratory distress* due to delay in foetal lung liquid clearance
  - normally cortisol up-regulates ENaC channels increasing pulmonary fluid resorption
  - *early CS* may interfere with this process; tachypnoea generally self-limiting within 48hrs
- Investigations - ABG (normal CO2), CXR (perihilar streaking, fluid in fissures)
- Risks - **CS**, maternal asthma, maternal smoking, macrosomia, excessive maternal sedation
- Management - supportive; oxygen, consider fluids if cannot take oral feeds
- Complications - acidosis, respiratory failure, pneumothorax, *childhood asthma*
Meconium aspiration syndrome (MAS)

- **Meconium** - green liquid containing mucous and bile normally passed by the newborn baby
  - may be passed prematurely in utero into amniotic fluid - affects around 10% live births
- Risks - **foetal distress**, placental insufficiency, pre-eclampsia, oligohydramnios, smoking
- Aspiration causes *airway obstruction*, *surfactant dysfunction*, *pneumonitis*, *pulmonary HTN*
- Investigations - ABG (acidosis), U&E (SIADH), CXR (coarse streaking), ECG (shunting)
- Management - suction if thick, oxygen (nasal cannulae), surfactant lavage, inhaled NO
- Complications - cerebral hypoxia / long-term neurological damage, RDS, PDA

Haemolytic disease of the newborn

- Majority caused by **anti-RhD** antibodies; also ABO, Kell, Duffy, MNS (rare)
- Antenatal investigations - **USS, doppler** - detect hydrops fetalis, foetal anaemia
  - *foetal blood sampling* (up to 20% miscarriage) - anaemia, reticulocytosis, hypoglycaemia
- Management - **transfusion** (O-negative) at 18wks to umbilical vein (USS-guided)
- Complications - jaundice, kernicterus, late-onset anaemia, possibly schizophrenia