History

> Pregnancy
  • Medical problems of mother
  • Antenatal testing including ultrasound

> Labour

> Drugs and alcohol use in pregnancy

> Family History of disease
2 & 6 week post natal check

- **History:** birthing, feeding, sleeping, development, social, parental concerns

- **Measurements:** Wt, Lt, HC

- **Examination:** “top to toe” (patience, gentleness, flexibility)

- **Tools:** ophthalmoscope, tape measure, digital baby scales, stadiometer, stethoscope, tongue depressor, percentile charts

- Immunisations, newborn hearing screen

- **Resources-** CAFHS, Paediatrician
General Appearance

Before touching the baby observe:

- Skin colour
- Position
- Cry
- Skin pigments/skin lesions
- Perfusion
- State of alertness
<table>
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Examine me, please?!
Examination of the head

> **Head Size:**
  - Usual head circumference plotted on percentile chart for child’s corrected gestation.
  - Consider possible problems if <3rd percentile or > 97th percentile.

> **Head shape:**
  - May be affected by labour
    - “moulding” – sutures may overlap and this self corrects over a few days.
  - Premature fusion of sutures usually associated with ridging of sutures and no movement at suture felt if pressure placed on either side of suture.
Examination of the head

> **Anterior fontanelle** should be felt for size:
  - too big / bulging ? Hydrocephalus / raised intracranial pressure
  - too small  ? premature sutural fusion
  - Usually closes at ~ 18 months.

> **Posterior fontanelle:**
  - usually closes at 6-12 weeks.

> **“Third fontanelle”** between the other two may be felt in Trisomy 21 or other syndromes.
Layers of Scalp:

1. **S** - Skin
2. **C** - Close connective tissue
3. **A** - Galea Aponeurotica
4. **L** - Loose connective tissue
5. **P** - Periosteum
Clinical Examination - Head
Examination of the Head

> Swellings
  - Caput succedaneum
  - Cephalhaematoma
  - Chignon
  - Subgaleal Haematoma
Head swellings

- **Caput succedaneum** is oedematous skin and subcutaneous tissue at the presenting part - may last 48 hours.
Caput succedaneum
Head swellings

- Cephalhaematoma is a subperiosteal haemorrhage at the site of presenting part.
- Limited by sutures.
- May last weeks and can calcify around base in 1-2% newborns.
- May enlarge after birth due to osmotic effect of breaking down blood.
- Often fluctuant.
- 5% have underlying linear fracture.
Cephalhaematoma
Head Swellings

- **Chignon** is oedema under scalp from Vacuum extractor.
- It is an iatrogenic *caput succedaneum*.
- This may take as little as 2 hours or as long as 2 weeks to resolve.
- A chignon is associated with a higher incidence of neonatal jaundice.
Head Swellings

- **Subgaleal haematoma** is blood under galea aponeurotica.
- Can represent large blood loss so baby may be shocked.
- Collection is fluctuant and crosses sutures.
- Due to shearing of emissary veins from scalp to dural sinuses.
- Estimated blood loss 40 mL/cm increase in head circumference (blood volume 80 mls/kg).
Subgaleal
Subgaleal
Subgaleal
Subgaleal Video

video of sub galeal.MTS
Face presentation
Heads – Plagiocephaly

Shape

Before

After

Plagiocephaly.
Treatment of Plagiocephaly
Tummy Time!!!!
Treatment of Plagiocephaly Helmets
Heads Normal Anatomy

Normal Skull of the Newborn

- Frontal Bones
- Anterior Fontanelle
- Sagittal Suture
- Parietal Bones
- Posterior Fontanelle
- Occipital Bone
- Lambdoid Suture
- Metopic Suture
- Coronal Suture
Craniosynostosis
Craniosynostosis

A - Sagittal Craniosynostosis = Scaphocephaly
C + D - Coronal Craniosynostosis = Brachycephaly
B - Metopic Craniosynostosis = Trigoncephaly
Lambdoid Craniosynostosis = Plagiocephaly
Sagittal Synostosis is the commonest (60%) and is not usually syndromic.
Sagittal and Metopic Craniosynostosis
Sagittal and Metopic Craniosynostosis - Post operatively
Scaphocephaly
(Sagittal and Metopic)
Sagittal Craniosynostosis

- The most common type of single suture fusion.
- The head becomes elongated and narrowed and takes on the shape of a boat, scaphocephaly.
Bilateral Coronal Craniosynostosis
Coronal Craniosynostosis

Coronal craniosynostosis
Unilateral Coronal Craniosynostosis
Coronal Craniosynostosis

> When one coronal suture is fused, the orbit is pulled back and upward, while the opposite side grows down and forward to compensate. Also known as frontal plagiocephaly.

> If both coronal sutures are involved, the entire forehead along with the orbital rims above the eyes are drawn backward (brachycephaly).

> Sometimes the head appears tall (turriacephaly).
Metopic Craniosynostosis

Before

After
Metopic Craniosynostosis
Metopic Craniosynostosis

- The forehead portion of the skull becomes triangular in shape and the eyes become closer together (trigonocephaly).
Lamboid Craniosynostosis
Lamboid Craniosynostosis
Lamboid Craniosynostosis

> The head becomes trapezoidal in shape. (posterior plagiocephaly)

> This is the rarest of the craniosynostoses, accounting for only about 4 percent of cases.
Clinical Examination - Head

In utero compression uterine septum
Clinical Examination - Head

Asymmetric lower jaw from in utero compression – look at hips, feet carefully e.g. TCV at right. Risk of sternomastoid tumour.
Which congenital abnormality does Sylvester Stallone have?
Congenital Absence of the Depressor Anguli Oris Muscle

Asymmetric crying facies – absence of depressor anguli oris – not VII palsy
Asymmetric crying facies – absence of depressor anguli oris – not VII palsy
Clinical Examination - Head

VII palsy
Spot the difference?
What does this baby have?
Pierre Robin Sequence
Eyes

- Eyes: Size, Separation, Coloboma, Red reflex, Pressure, Haemorrhage

- 20% of babies have subconjunctival haemorrhages.
- Eyes may be slanting in dysmorphic syndromes.
- Congenital glaucoma causes bupthalmos.
Congenital Cataracts
Subconjunctival Haemorrhage
Hypertelorism
Hypotelorism
Red Reflex
Gonococcal ophthalmia

Early (<24 hours).
Contrast with Chlamydia – occurs 7 – 10 days.
Ears

- **Ears:** Site
  - Size
  - Shape
  - Tags

- Cartilage

- Patency

- Pits

- Ears should be attached to the head above line from outer canthus of eye +/- 25% of ear should be above this line.

- Creases on external ear lobe seen in Beckwith-Wiedemann syndrome.

- Cartilage is one of sign of maturity.

- Problems with external auditory canal associated with malformation of inner ear.
Pre-auricular pit
Pre-auricular tags
Microtia
Low set ears
Beckwith-Wiedemann syndrome
What can pre-auricular skin tags associated with?
What can pre-auricular skin tags associated with?

- Chromosomal abnormalities
- Renal problems
- May not be associated with anything
Nose and Mouth

- **Nose:** Nasal Patency
- **Mouth:**
  - Cleft lip
  - Cleft palate
  - Tongue tie
  - Suck
  - Intra-oral cysts

- Common to have small mucous inclusion cysts in gums that resolve.
- Epstein’s pearls are mucous inclusion cysts at junction of hard and soft palate.
- If tongue tie limits tongue mobility, easily resected under sucrose sedation.

SA Health
Choanal atresia
Choanal Atresia
Cleft lip and Palate
Upper Lip Tie
Inclusion cyst and Epstein Pearls
Oral thrush and Natal teeth
Heart

- Colour
- Pulses – both arms and femorals
- Praecordial activity
- Murmurs
- Cyanotic lesions – most commonly TGA
- Left-sided obstructive lesions present when ductus closes – usually 48-72 hours. Sudden onset respiratory distress, poor perfusion.
Femoral Pulses

**DO NOT FORGET TO FEEL THE FEMORAL PULSES!**

You have to feel them on both sides!
Chest
Accessory nipples
Neonatal gynaecomastia

Breast enlargement.
This is true glandular tissue, not fat, and secretes milk (‘witch’s milk’) when compressed.
It occurs in both sexes, and is not present at birth – it is an activation of the baby’s pituitary gland just as the mother’s pituitary gland is activated after placental separation to stimulate lactation. Breast abscess can develop.
Natural history is to regress over a few weeks.
Can you spot the abnormality here?
Fractured clavicle

Associated with a difficult delivery.
Are you bored yet?
Abdominal Abnormalities

- Umbilical Granulomas
- Umbilical Hernias
- Gastroschisis
- Omphalocoeal
- Prune Belly Syndrome

> Don’t ever forget the Back!!
Umbilical Granuloma
Umbilical Hernia
Gastroschisis
Omphalocoeal
Prune Belly Syndrome
What are these?
Spina Bifida Occulta
Myelomeningocele
Sacral Dimples
Sacral dimples

> Sacral dimples are a commonly encountered finding on the physical exam. Most of these dimples are "simple dimples" and require no further evaluation.

> A simple dimple is one that is located within 2.5 cm of the anus, has a base that can be visualized and is not associated with other abnormalities on examination.

> When the skin lateral to the dimple is stretched, skin can be seen covering the entire dimpled area.

> If the base could not be seen, this would be called a coccygeal pit.

> Although fistulas above the gluteal cleft may be associated with spinal dysraphism, coccygeal pits are benign and do not need imaging.
Sacral skin tag
Sacral Tail
Sacral skin tags

> Skin tags in the sacral area are also potential indicators of spinal dysraphism. In some cases, the "tag" may in actuality be a residual tail.

> This skin tag was quite small and appeared to be very superficial, but spinal ultrasound was still done as a screening measure.
Butterfly Mark
Butterfly Mark

- Congenital midline vascular lesions usually raise questions about occult spinal dysraphism, but so far the literature is inconclusive.
- Some authors suggest isolated midline port wine stains and medial telangiectatic vascular nevi ("butterfly marks") are benign and do not require further evaluation.
- Occult dysraphism is much more likely if two markers are present, so this appearance in combination with another finding should lead to imaging.
- As an isolated finding, the need for evaluation is debatable.
Groin and Genitalia

- Hydrocooeal
- Undescended testis
- Testicular torsion
- Inguinal Hernias
- Hypospadias
Hydrocooeal
Undescended testis
Testicular Torsion
Bilateral Inguinal Hernias
Hypospadias
Hypospadias
Hypospadias
Video of Hip examination
YouTube video of Barlow and Ortolani testing

https://www.youtube.com/watch?feature=player_detailpage&v=imhl6PLtGLc#t=139
Limbs

- Hands
- Feet
- Arms
- Legs
Hands and arms

- Polydactyly
- Syndactyly
- Erb’s palsy
Polydactaly
What Is Polydactyly?

- Polydactyly is one of the most common hand conditions present at birth.

- The condition can appear as any form of an extra digit, anywhere from a small, raised area to a complete digit.

- The affected digit may also appear “split.”
What Causes Polydactyly?

- In some cases, polydactyly is genetic, but it can also accompany other hand conditions, such as syndactyly.
How Is Polydactyly Treated?

> Treatment for polydactyly varies in complexity.
> A minor procedure may correct small extra digits or those with a narrow base.
> However, when the base is broad or if the extra digit is rooted deeply in the hand, reconstructive surgery may be the best option when the child is old enough to safely undergo an elective procedure. Operating on the bone, joint, ligaments or tendons may be necessary to create the most functional hand possible for the child.
Syndactaly of the fingers
What Is Syndactyly?

> Syndactyly is a common condition in which a child's fingers or toes do not fully separate during development, causing “webbed” spaces.

> The spaces between two or more fingers or toes may be webbed.

> Sometimes it is only the skin that is joined, but in other cases the fingers can also share tendons, nerves, blood vessels and bone.
What Causes Syndactyly?

> During the early weeks of pregnancy, the child's fingers and toes form in a “mitten” of skin.
> By the end of the second month of pregnancy, the extra skin dissolves, and the fingers and toes should separate.
> Syndactyly occurs when the fingers and toes do not fully separate during development.
> Some forms of syndactyly are inherited, while others are sporadic, meaning the condition can occur even if it doesn't run in the family.
> Most cases of syndactyly are isolated and occur in an otherwise healthy child.
Some forms of mild syndactyly may not need treatment.

If a reconstructive operation is necessary, web spaces are created carefully to minimize scarring.

A small piece of skin from another area of the body, called a skin graft, will be needed to help cover the space between the fingers after they are separated.

Surgery is typically performed after a child is 2 years old, when growth of the hand has slowed.

About 50 percent of children who have a reconstructive operation will need a “touch-up” operation in their teen years when the hand reaches its full size.
Erb’s palsy

- Upper nerve roots of brachial plexus.
- C3-4-5 most commonly affected.
- Wrist and finger flexion usually intact.
- Look for Horner synd, diaphragmatic paralysis, fracture humerus / clavicle.
- S-mastoid tumour risk.
Feet

- Talipes
- Metatarsus Adductus
- Calcaneovalgus
- Polydactyly
- Syndactyly
Club foot or Talipes Equinovarus
Club foot

Normal  Clubfoot

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Club Foot (Talipes Equino Varus)

- Congenital deformity where one or both feet appear to rotate internally at the ankle.
- This makes walking extremely difficult, and corrective orthotic treatments can help prevent the need for surgery.
- Club foot occurs in approximately 0.1-0.3 percent of live births, and it may be more or less common depending on ethnicity.
Treatment of Club Foot

- As clubfoot is more severe than metatarsus adductus, more aggressive treatment may be necessary.

- During the past few decades, conservative casting and strapping treatment of club foot have been shown to be an excellent option for long-term results with minimally-invasive intervention.
Metatarsus Adductus
Metatarsus Adductus

> Also known as Metatarsus Varus or MTA – is a congenital foot deformity that occurs in approximately 3 percent of births.

> When one sibling has the deformity, the incidence increases to 5 percent.

> This deformity causes the front half of the foot to turn inward due to an off-center deviation at the tarso-metatarsal joints (the midfoot, or middle part of the foot).

> While the cause of this condition is unknown, the fetus’ position while in the uterus plus family history are known to be contributing factors.
Treatment Options for Metatarsus Adductus

- The goal of treatment is to straighten the forefoot and the heel through stretching, casts and surgery.

- There are several clinical factors to consider when determining if treatment should begin with Metatarsus Adductus patients.

- These factors include:
  - The natural history of the deformity including the likelihood of it persisting without treatment.
  - Potential compensations for the adducted forefoot when the condition persists.
  - Significance of residual deformity as the child becomes an adult.
  - The reported increased incidence of deformity in the presence of underlying Metatarsus Adductus.
Calcaneovalgus foot deformity
Calcaneovalgus

- This is one of the most common foot deformities in children (problem with the shape of the foot) wherein the foot points upward and outward.
- In extreme cases, the top of the foot touches the front of the lower leg.
- The condition is congenital.
- It may affect one or both feet.
- Calcaneovalgus causes the baby no pain, and often goes away on its own.
Calcaneovalgus

- This foot defect, present at birth has no symptoms.

  - The foot is markedly dorsiflexed, with the dorsum of the foot resting against the anterior tibia.
  - The hindfoot is held in valgus and, occasionally, a contracture of the anterior muscles (dorsiflexors) is present.
  - The deformity usually is supple, and the foot can be passively plantarflexed easily.
Calcaneovalgus

- The main cause is thought to be squeezing of the foot due to the child's being "packed" in the uterus during the last few months of pregnancy.

- Calcaneovalgus runs in families, and more girls than boys have it.
Calcaneovalgus Treatment

> **Non Operative Treatment:**
> In most cases this foot abnormality resolves without treatment.
> Occasionally plantarflexion-inversion casting is used in infant if spontaneous resolution is not seen w/in first few months of life.
> Orthotics is of no proven benefit.
> When there is muscle imbalance resulting from paralytic conditions, ankle-foot orthotics can control foot while child is small.
> It is impossible to quantitate what constitutes flexible flat foot.
> No device has been developed that predictably alters growth, development, or final adult configuration of a flexible flat foot.
> It is difficult to determine how much pain or excessive shoe wear should be tolerated.
Calcaneovalgus Treatment

> **Surgical Treatment:**
> Results of surgery in the treatment of flexible flatfoot are extremely difficult to assess.
> It has not been proven that the mere presence of a flexible flatfoot or calcaneal valgus requires some form of treatment.
> Children may be candidates for tendon transfer (tibialis anterior to os calcis), & or hindfoot stabilization by subtalar fusion is needed.
> Older children may need a calcaneal elongation osteotomy in addition to tendon transfer & plantar fascia release.
> Children over 10 years of age may require triple arthrodesis.
Polydactyly of the feet

> Same as for hands.
Syndactyly of the feet

- Same as the hands.
Jaundice

Features to be alert for in term newborns with jaundice are:

- Jaundice which is obvious in the first 24 hours of life - measure a bilirubin level / investigate.
- ALWAYS THINK AGE in HOURS
- Positive Coombs’ test (now called Direct Antibody Test – DAT)
- O-A or O-B incompatibility
- Numbers to carry in your head to alert you to jaundice which is possibly not physiological and may need further investigation at various ages are:
  - 150 umol/L at 24 hours
  - 200 umol/L at 48 hours
  - 250 umol/L at 72 hours
  - 300 umol/L at any time
Jaundice

- Pathological
- Physiological
- Prolonged
- Treatment
Anus imperforation
Are these normal or abnormal? And where would you find these?

- Milia
- Harlequin line
- Petechiae
- Choanal atresia
- Torticollis
- Benign Pustular Melanosis of Infancy
- Hypertelorism/ Hypotelorism
Milia
Harlequin line
Petechial bleeds and bruising
Torticollis
Benign Pustular Melanosis of Infancy
What does this child & George W Bush have in common?
A smooth philtrum!

Which can be associated with fetal alcohol spectrum.
What does this baby, Robert De Niro and Tony Blair have in common?
Simian crease

But not always associated with a chromosomal abnormality.
Which abnormality has Megan Fox got?
Brachydactyly

> Shortness of the fingers and/or toes
Is this a common finding?
Yes

> Diastasis recti – abdominal muscle is parted & resolves spontaneously.
Where would you find Mongolian blue spots?
The End!