PREMATURITY
&
In utero growth restriction (IUGR)

Dr Shabna Rajapaksa
Consultant Paediatrician
2013

This tute covers:

- Key definitions
- Risk factors for prematurity & IUGR
- Common complications of prematurity & IUGR

- Define the following terms:
  - Term
  - Preterm
  - Post term
  - Low birth weight
  - Very low birth weight
  - Extremely low birth weight
  - AGA (appropriate for gestation)
  - SGA (small for gestational age)
  - LGA (large for gestational age)

Qs

- What percentage of babies are born prematurely in Australia?

- Approximately what percentage of preterm deliveries are due to known risk factors?

Answers

- 8%
- 10-20%

List at least 10 risk factors that are associated with preterm birth

Risk Factors

- MATERNAL
  - Previous preterm
  - Extremes maternal age
  - Low pregnancy weight
  - Acute illness
  - Uterine complications
  - Cervical incompetence
  - Pre eclampsia/ eclampsia
  - Prev TOP/ miscarriage
  - infertility
- FETAL
  - Multi gestation
  - Fetal anomalies
  - Polyhydraminos
  - Fetal demise
  - 1st trimester threatened abortion

RISK FACTORS

- PLACENTA & MEMBRANES
  - Placenta praevia
  - Placental abruption
  - PROM
  - chorioamnionitis
- SOCIAL
  - Low socioeconomic status
  - Smoking
  - Alcohol abuse
  - Illicit Drug use
  - Heavy physical work
  - Psychological stress

Scenario

You & your registrar are asked to counsel an expectant couple who will deliver at 32 weeks gestation

- What other information would you like to know before the consultation?

- How would you approach this conversation?

- The couple want to know the following:
  - What are the complications of prematurity (short and long term)?
  - What are the survival rates at 32 weeks?
  - What are the survival rates at 24 weeks?

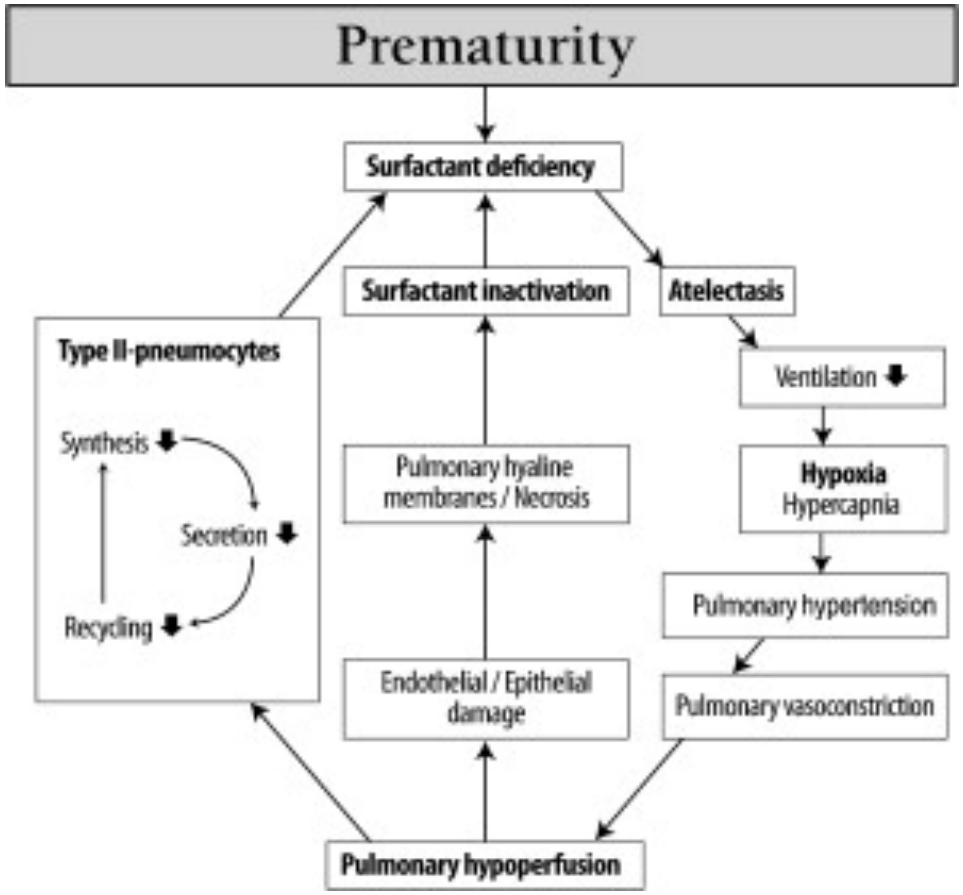
Complications of prematurity

- What does this Xray show?
- What is done to reduce the incidence of this complication?
- How is it treated?

RESPIRATORY DISTRESS SYNDROME -

- Primary deficiency of lung surfactant due to prematurity
- It is the clinical entity of HMD (hyaline membrane disease)
- CXR has classic “ground glass” appearance
- Not to be confused with neonatal respiratory distress which can be caused by many things – of which RDS is one

RDS – Respiratory Distress Syndrome



REDUCE:

Try to reduce by delivering as clos to term as possible

Role of antenatal steroids ? Up to 37 weeks

TREAT:

Adequate resus at delivery

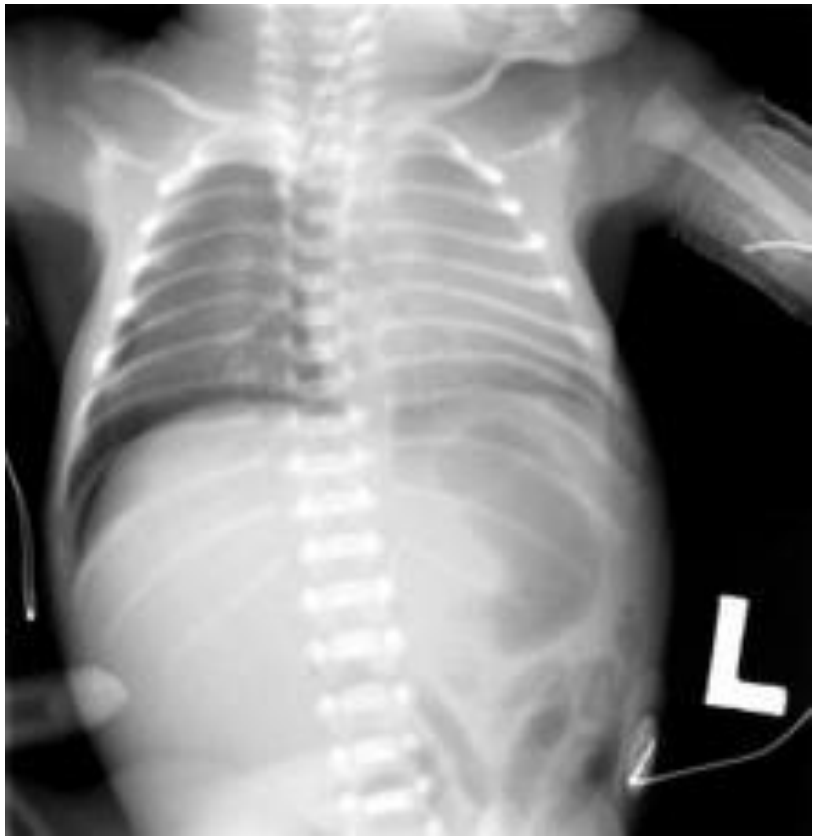
Supportive respiratory measures

Surfactant

- NCPAP

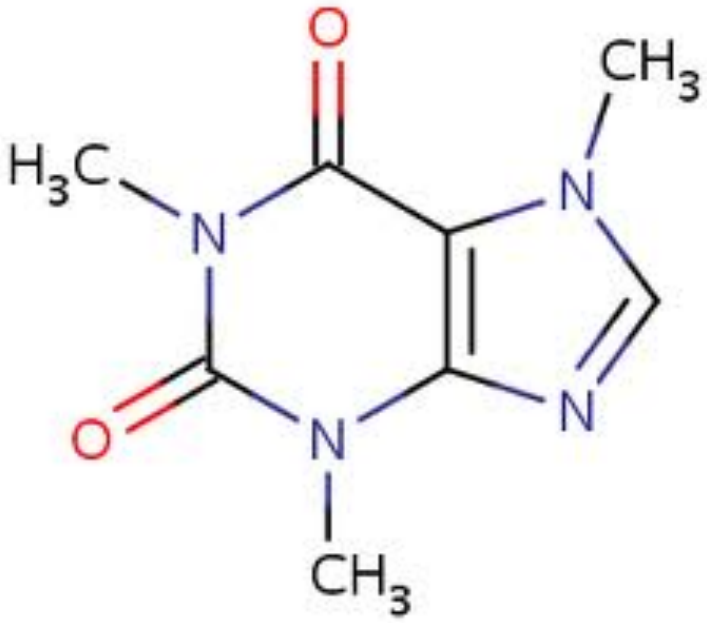
- VENTILATOR

What do these show?



- Right pneumothorax
- Right upper lobe collapse and consolidation due to ETT being inserted too far

What is the role of this compound in neonatology?



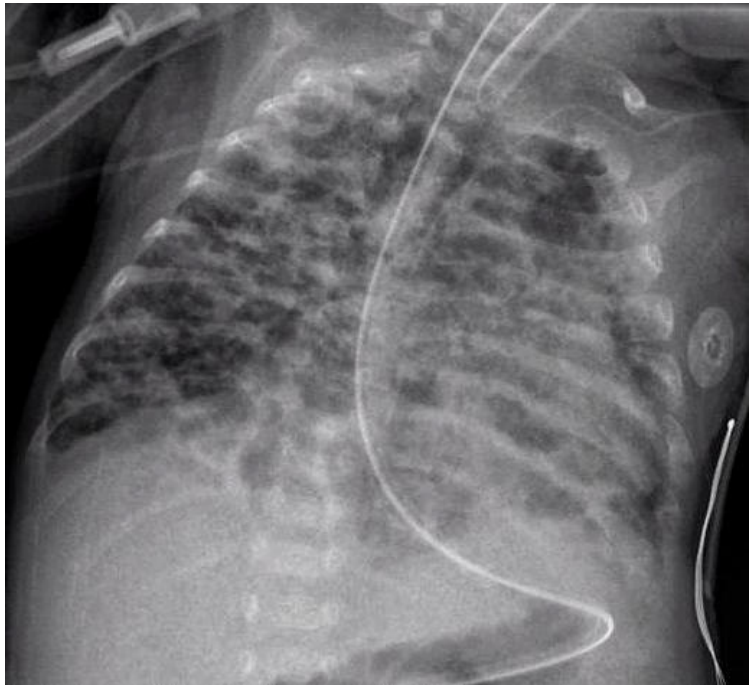
Caffeine

- Treatment (occasionally used a prophylaxis for apnoea of prematurity)
- Also used to treat the frequent bradycardias and desats related to hypopnoea of prematurity
- What else can cause APNOEA in babies (pause in breathing> 20 seconds)?

Apnoea

- Prematurity < 34 weeks
- Respiratory causes
  - RDS
  - Infection
  - Pneumothorax
- Sepsis
- Cranial pathology
  - Bleed
  - Seizures
  - HIE
- Cardiac eg failure
- NEC

What do these show?



Chronic lung disease

- Defined as ongoing oxygen/ ventilatory requirement for >28 days or > corrected age of 36 weeks
- CXR shows the significant changes in lung fields
- Some babies are discharged home on oxygen
- These children have an even higher risk of respiratory illness and complications in the early years of life

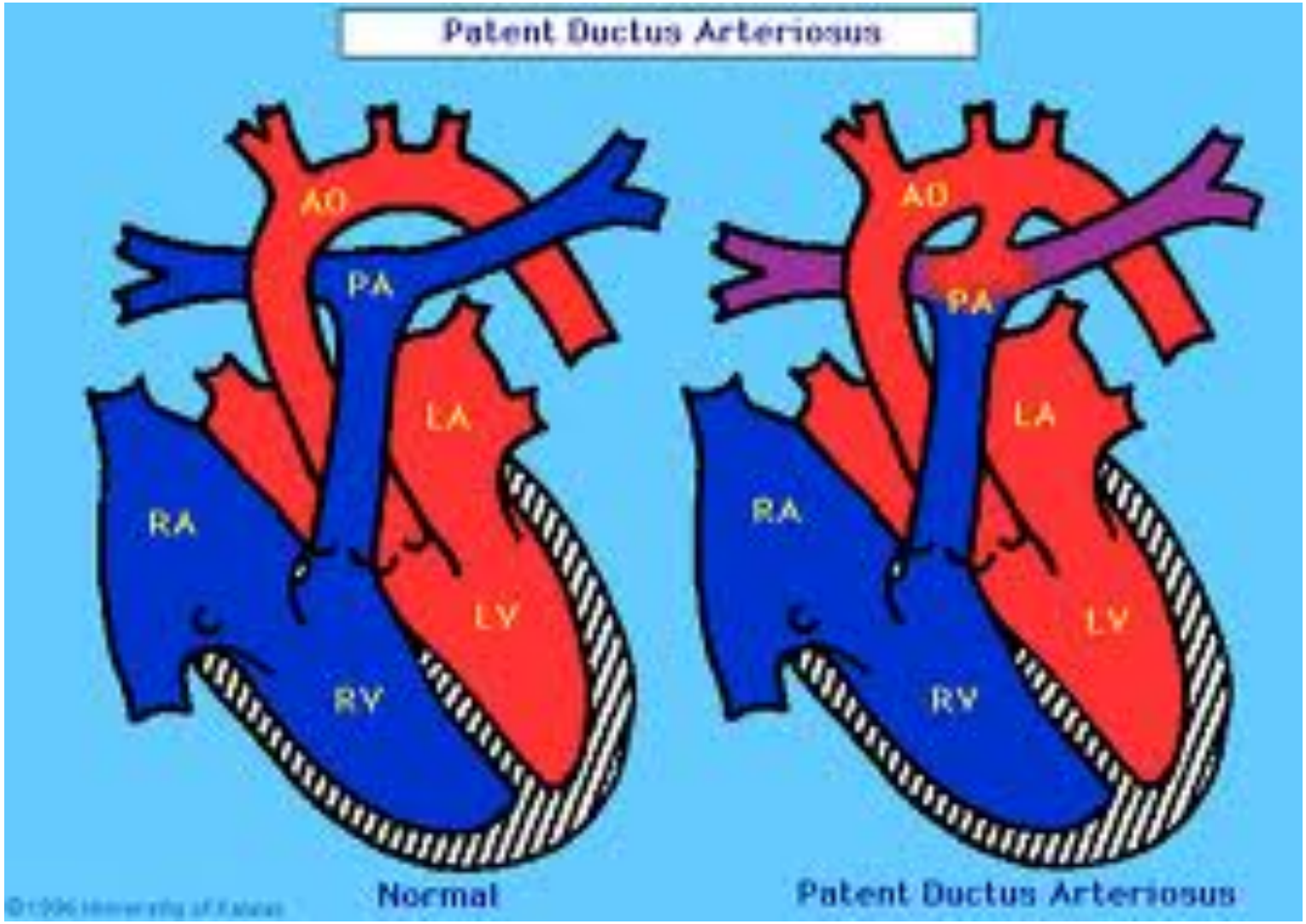
PDA

- What is the clinical presentation of a patent ductus arteriosus (PDA) in the preterm?
- Draw the anatomy of the PDA
- What treatments are available?

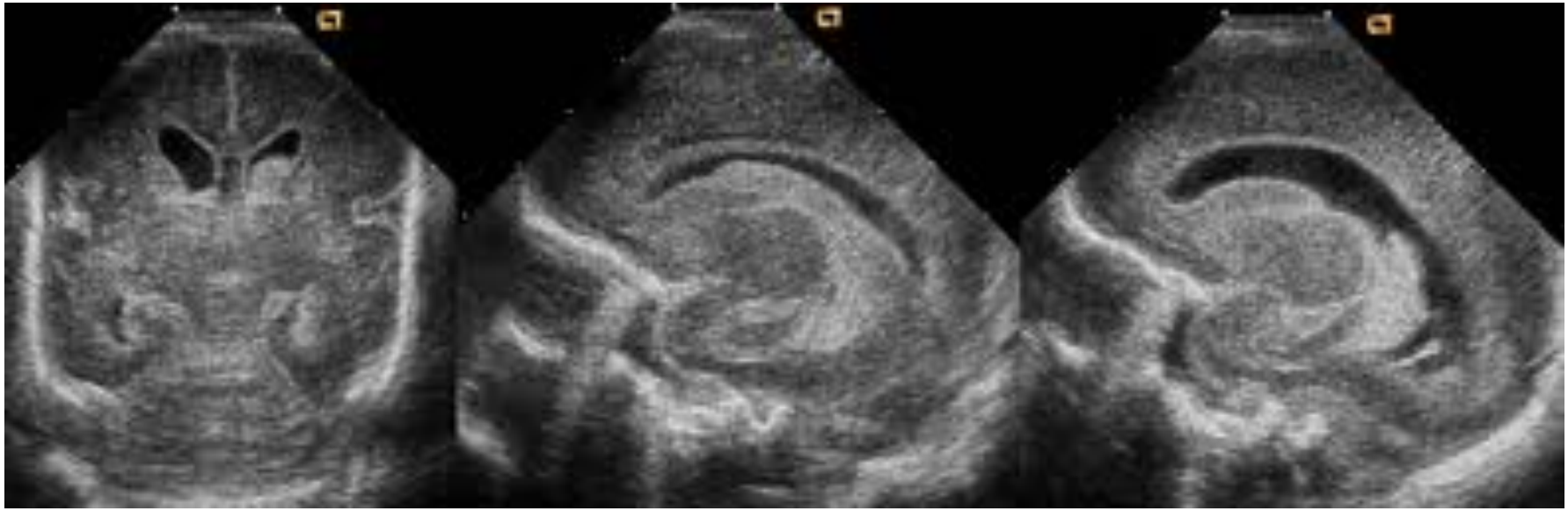
PDA

- Asymptomatic: only noted on examination
- Symptomatic (generally large left to right shunt): Apnoea; breathlessness, poor feeding/ feeding intolerance etc

- Signs: larve volume bounding pulses; large pulse pressure; signs of cardiac failure with respiratory distress; sign of cardiovascular compromise eg NEC

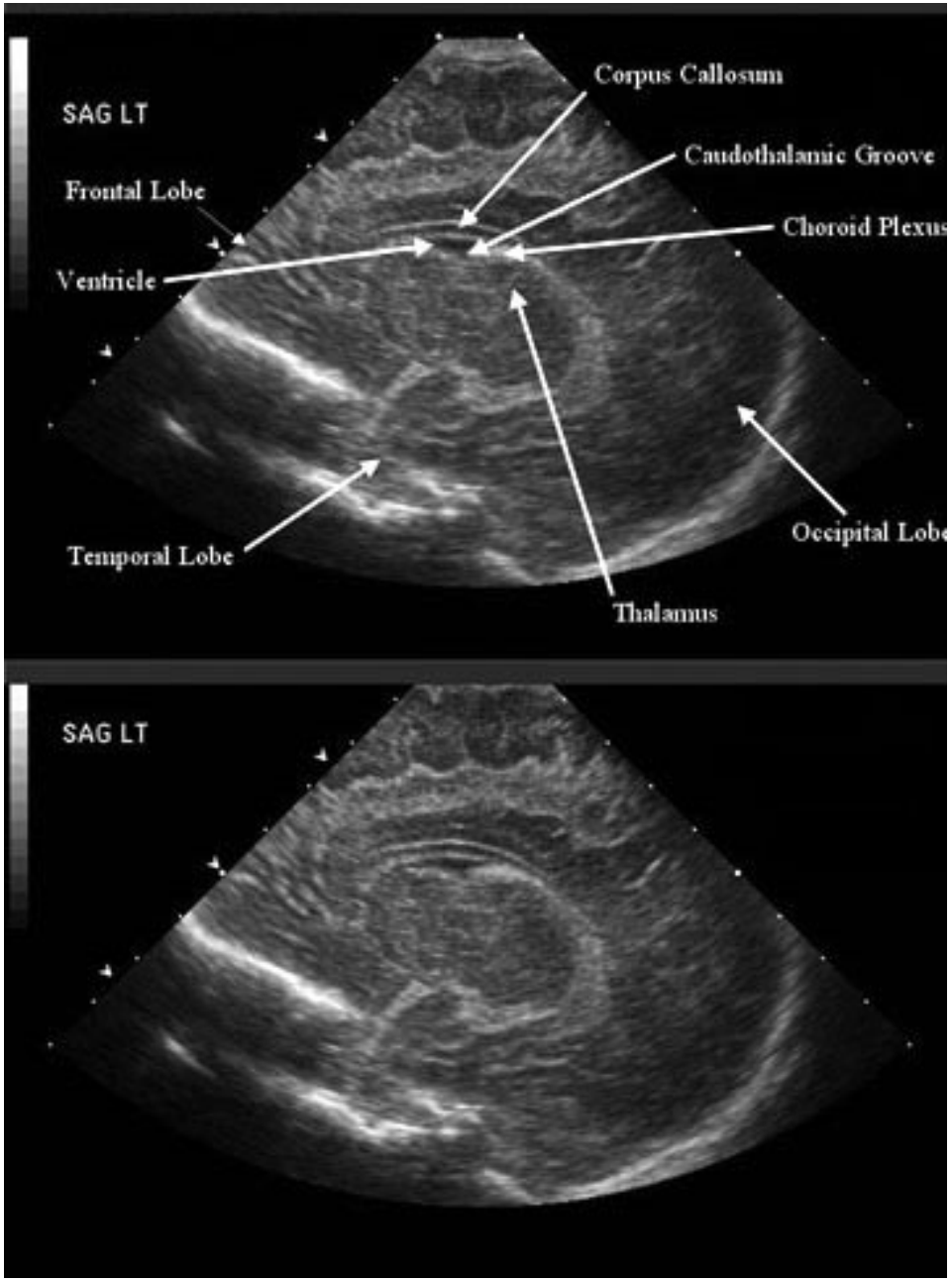

Patent Ductus Arteriosus
AO
PA
LA
RA
LV
RV
Normal
AO
PA
LA
RA
LV
RV
Patent Ductus Arteriosus

What does these pictures show?

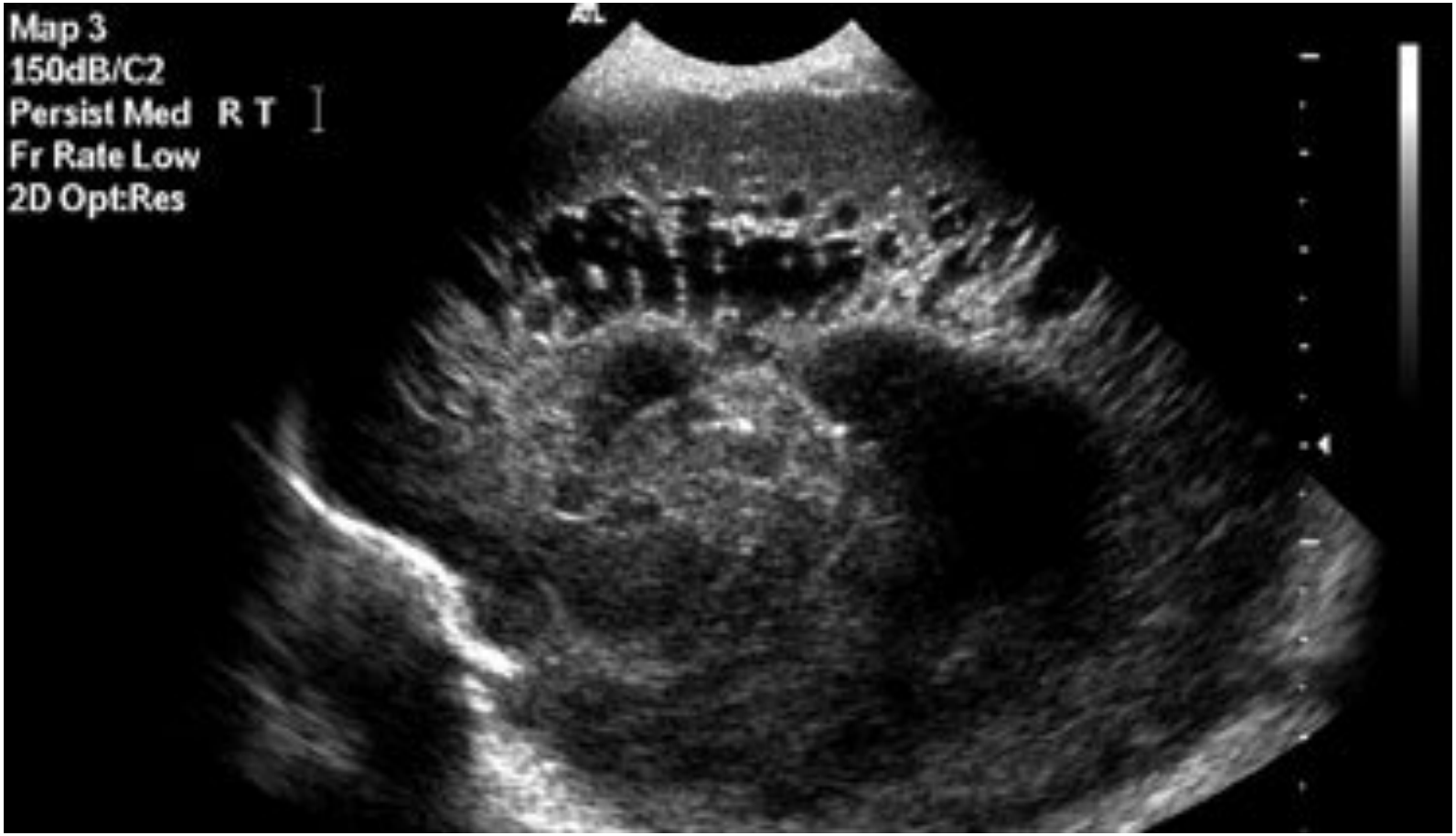


INTRAVENTRICULAR BLEEDS

Causes:Asphyxia, prematurity, rapid changes in BP and rapid changes fluid infusions


SAG LT
Corpus Callosum
Caudothalamic Groove
Frontal Lobe
Choroid Plexus
Ventricle
Temporal Lobe
Occipital Lobe
Thalamus
SAG LT

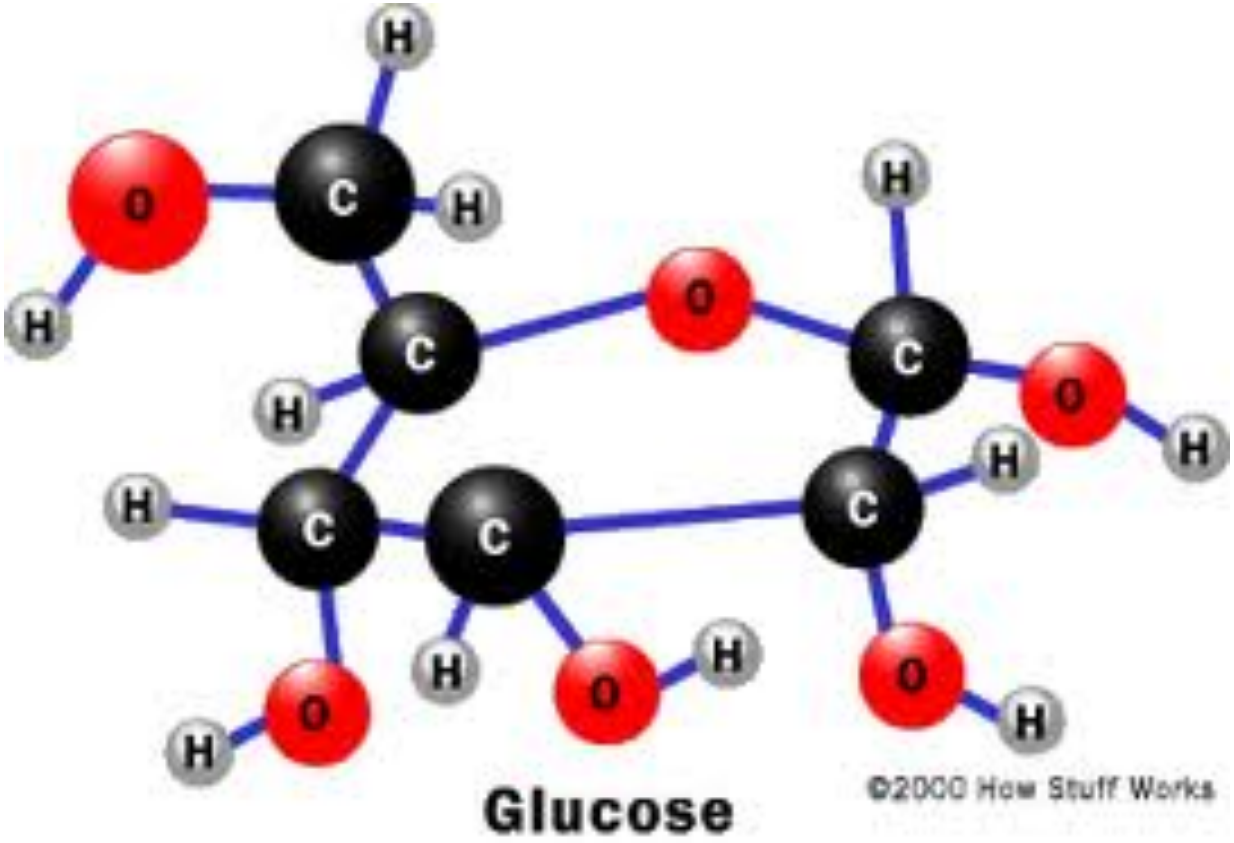
What is this?



Periventricular leucomalacia

- Associated with prematurity, rapid changes in BP and rapid changes fluid infusions
- The brain then forms these fluid filled spaces that can result in hydrocephalus
- Associated with the development of cerebral palsyc

What complications can occur?



Hypoglycaemia

- See neonatal hypoglycaemia

- High risk re: premature; limited glycogen stores; high metabolic rate; other prem complications eg sepsi

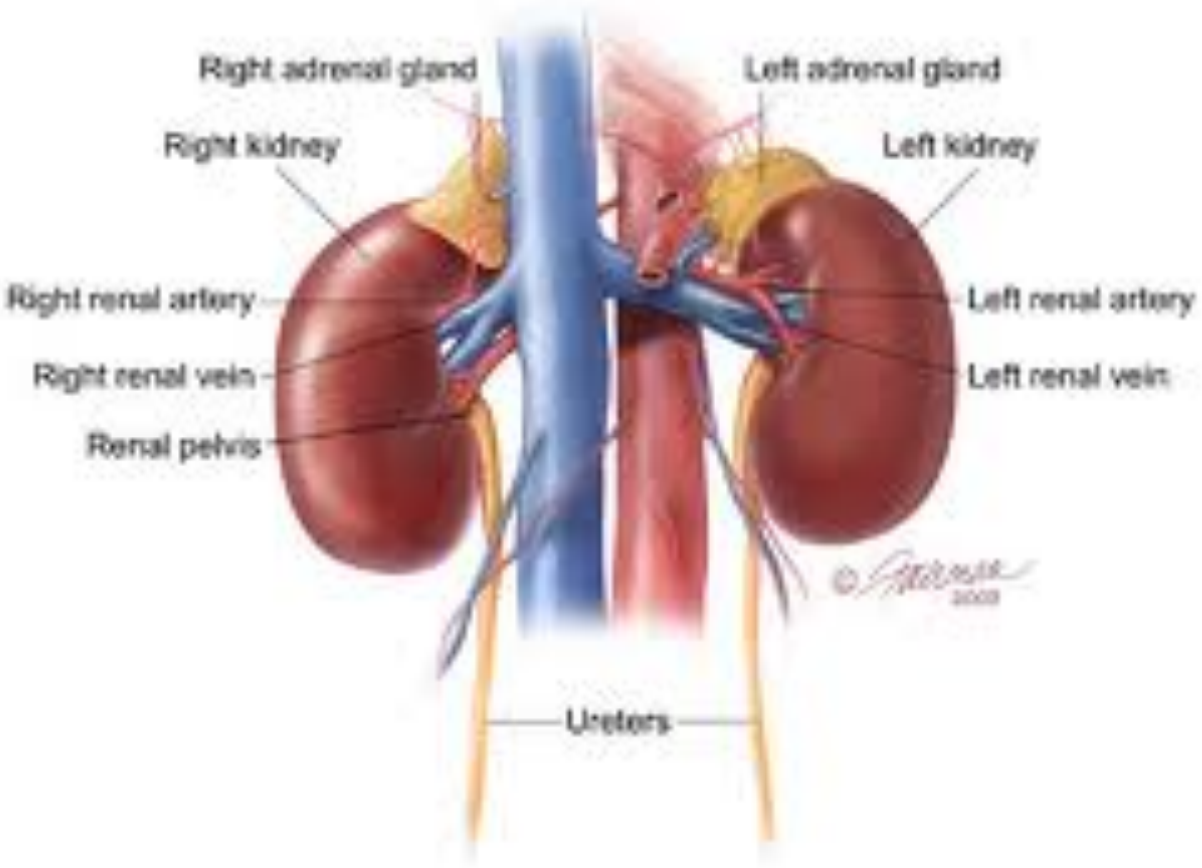
What is being treated?

Neonatal jaundice

- See neonatal jaundice

- High risk re: prem; higher red cell turnover; risk of bleeds eg IVH; higher metabolic rate

What complications occur?



Metabolic complications

- Hypo/ hypernatraemia/kalaemia
  - Immature kidneys etc
- Metabolic acidosis
- Dehydration
  - Greater insensible losses

What is this? How does it present?

NEC – Necrotising Enterocolitis

- The following are implicated:
  - Disordere blood flow (eg end diastolic flow issues), feeding practices (rapid changes in feed upgrades), hypotension, hypoxia, infection

- Higher risk – more prem and Low birth weight; babies where asphyxia has occurred/ poor gut perfusion eg PDA

When can feeding start?
What problems can occur?

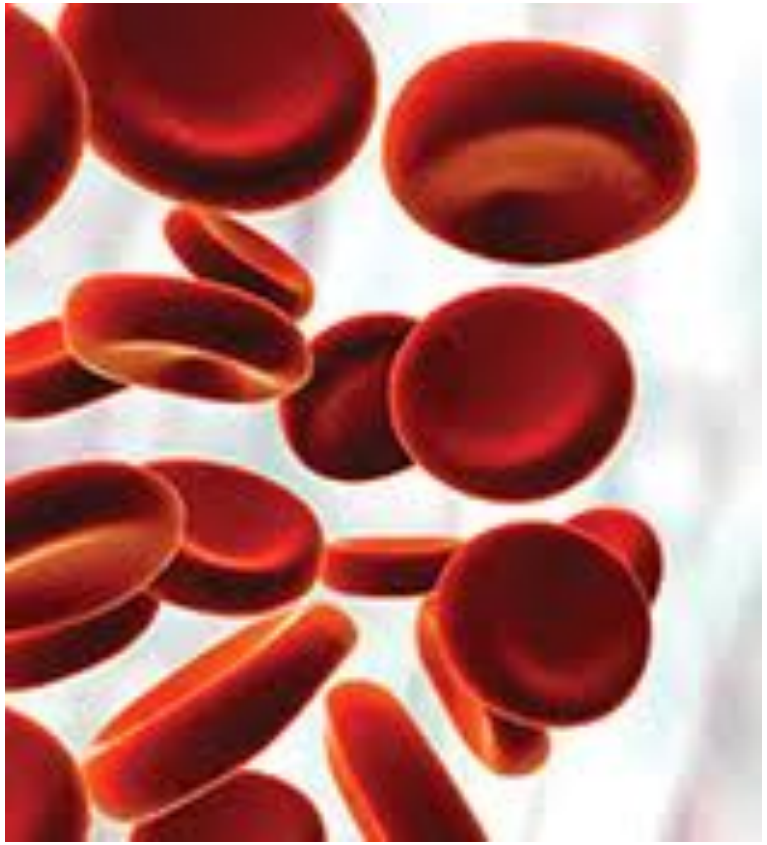
Feeding and related issues

- Suckling from 34 weeks
- Need for supplements in some prem babies as risk of metabolic bone disease
  - See neonatal nutrition tute
  - Role of fortification and preterm formulas
- Feed intolerance
- Gastro-oesophageal reflux

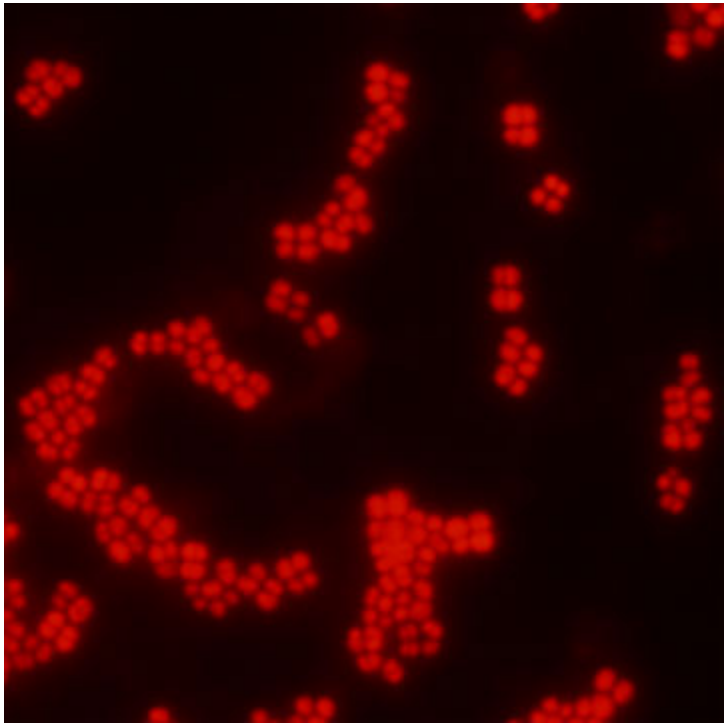
Anaemia

- Reduced iron stores, reduced red cell mass, rapid growth, reduced erythrpoesis, shorter life of RBC, venepucnture/ heel pricks

- Iron prophylaxis and treatment
- blood transfusion



What is this?
What are the signs of sepsis?



Sepsis

- Slide shows CONS – *using PNA moecular based testing*
- See Neonatal Sepsis tute
- Immunisations – important to ensure adquate cover – consider more in those especially at risk

How do this device help?

THERMOREGULATION

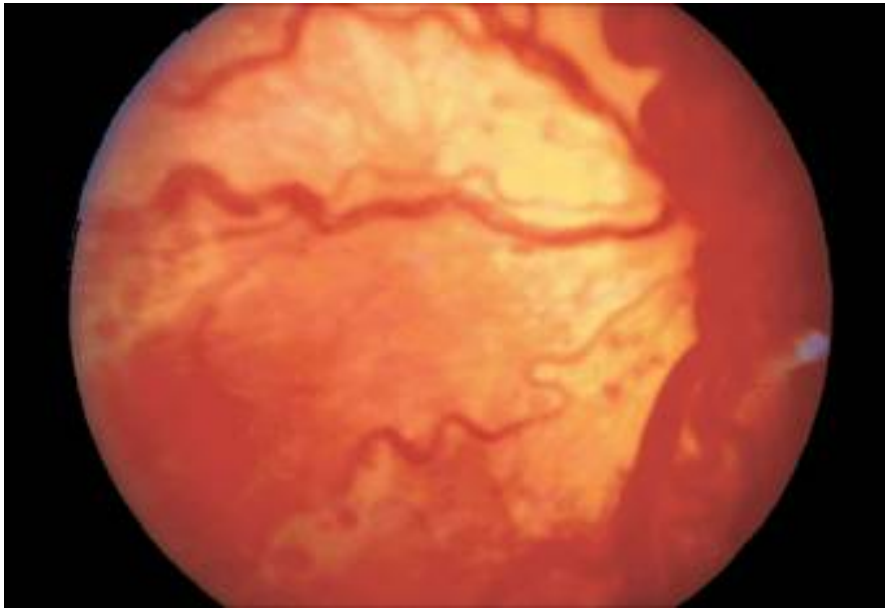
Consider importance of heath/ warmth

Wrapping babies

Ensuring humidification for smaller/ more prem

Generally can cope outside an isollete when >1.8-2kg

What is the connection?



Retinopathy of prematurity

- Risk myopia, blindness, retinal detachment
- Associated with exposure to high levels of oxygen
- Importance of regular screening (eg Tuesday – need for eye drops)

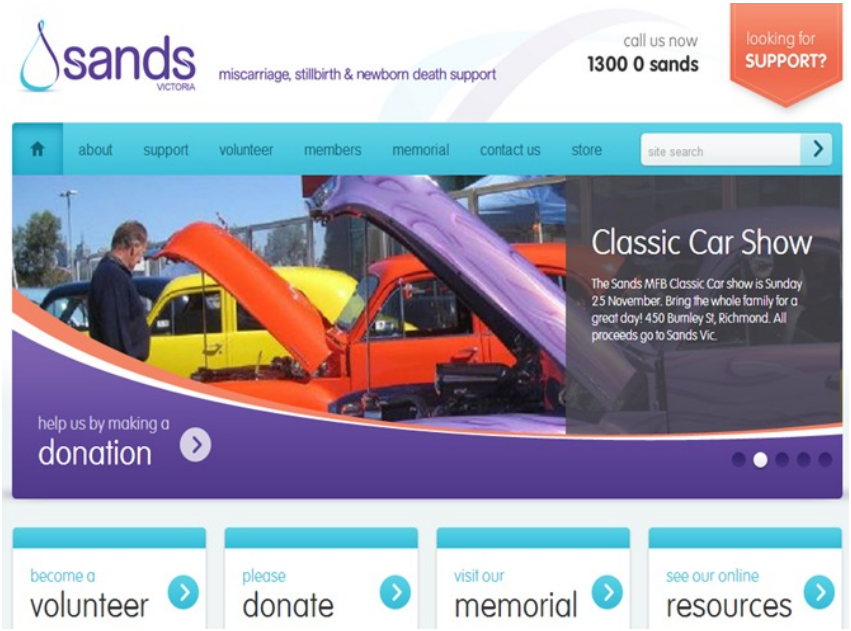
How is growth calcuated?

Growth

- Correct until the 1st year of life – steady catch up growth in 1st 2 years of life
- Prem babies don't grow much in 1st 2-3 weeks of life
- Most babies lose weight initially (aim for loss of <10%)
- Most babies grow 10g/kg/d

What are possible neurodevelopmental outcomes?

what are the Psychological and social factors?

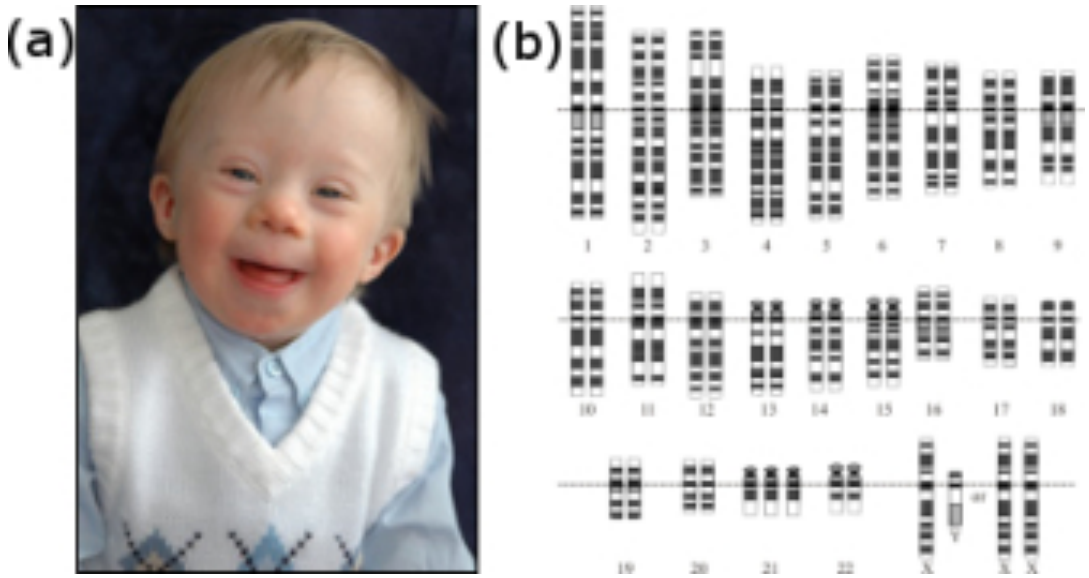


IUGR

IUGR

- May be difficult to distinguish from SGA
- What intrinsic and extrinsic fetal problems can result in IUGR?

Intrinsic



Extrinsic

- Reduced substrate in maternal blood
- Reduced uterine blood flow/ placental transfer
- Other e.g. smoking

What are the consequences?

- Growth (20% short adults)
- Neurodevelopment
- Adult disease – Cardiovascular complications, type 2 DM etc (Barker hypothesis)
- Mortality

summary

- Defined key term
- Discussed risk factors for prematurity
- Discussed the short and long term complications of prematurity
- Discussed risk factors for IUGR
- Discussed complications of IUGR