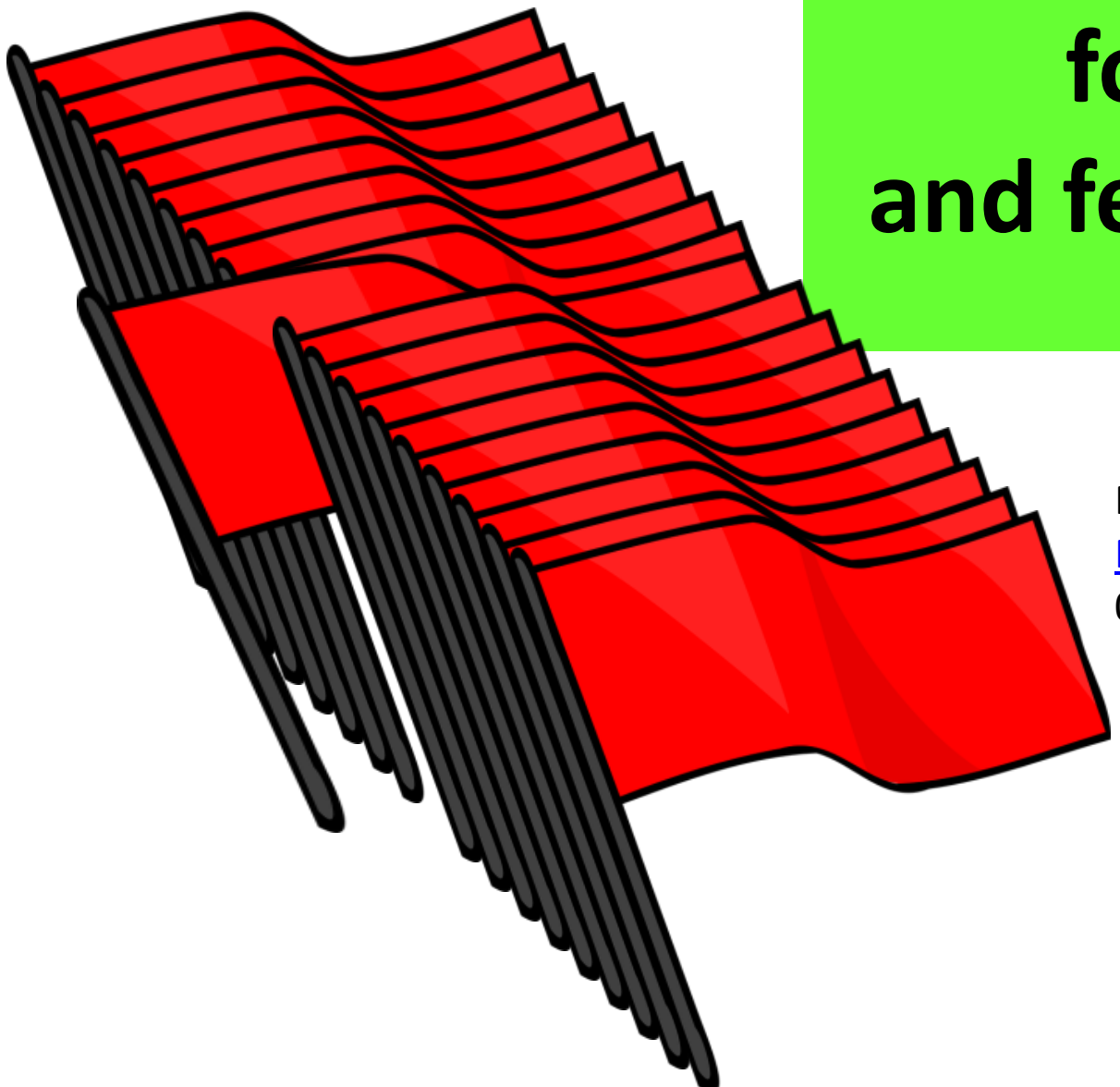
Maternal Medicine for MW's and few Red Flags



Matthew Coleman
Matthew.coleman@uhs.nhs.uk
07393680290

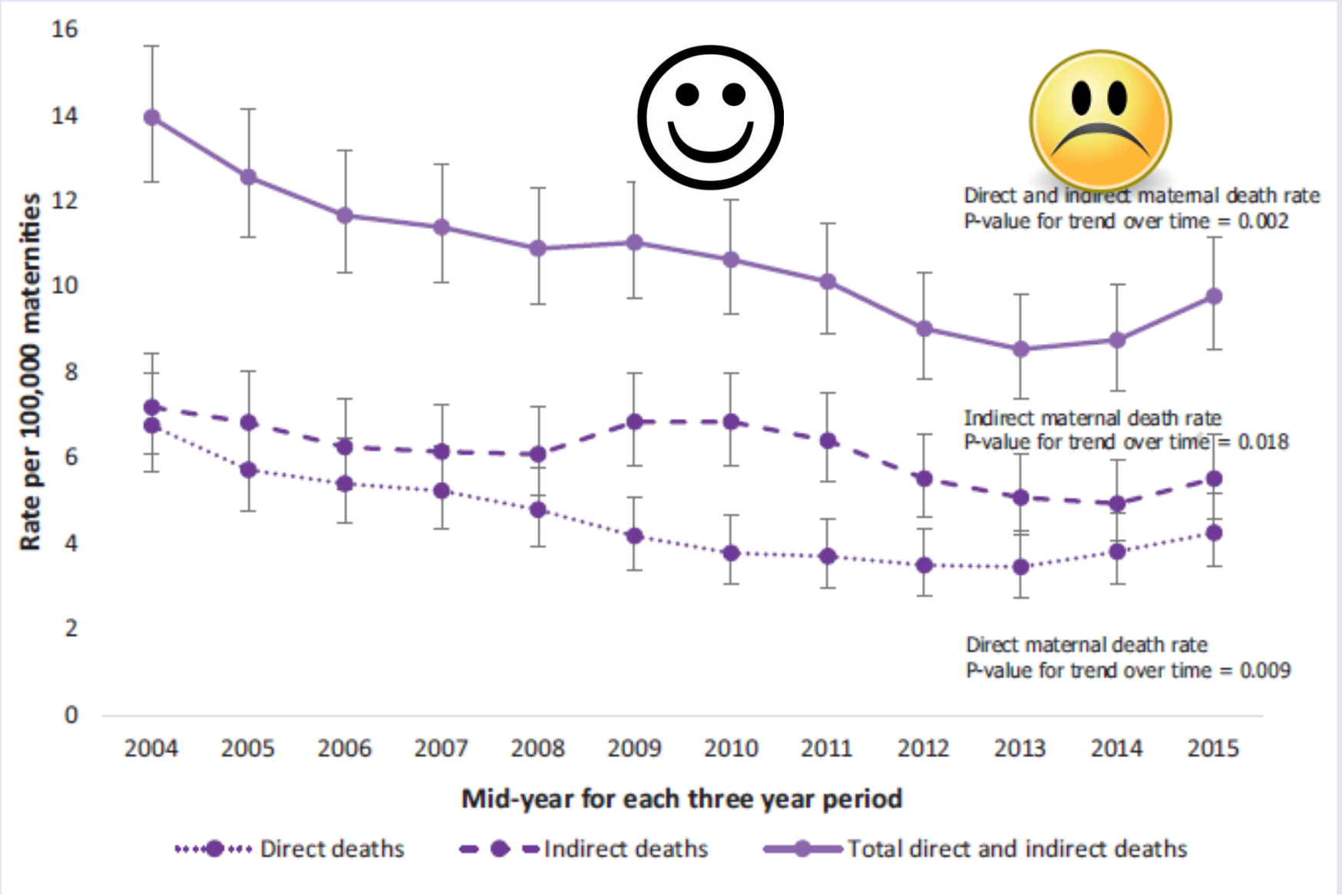
Today

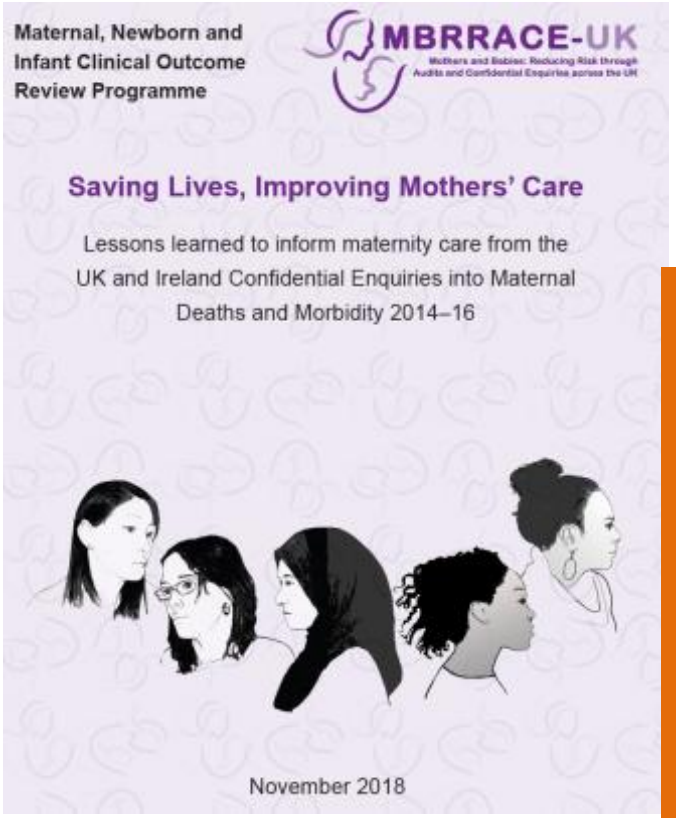
- Your questions and thinking (very very important)
- Maternal medicine disease and red flags
- Think more like a Dr
- Bias and thinking
- Quiz

Why are we here

- **Over two-thirds of all maternal deaths** in the UK are due to **non-obstetric, medical problems** in pregnancy and postpartum.
- This may be linked with increasing maternal age and obesity.
- BUT **might also be linked to HOW we think and our understanding of medical disease** in pregnancy
- And of course our biases

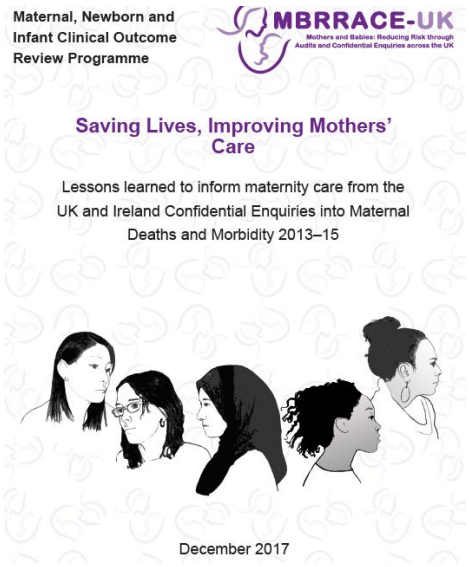
Figure 2.1: Direct and indirect maternal mortality rates per 100,000 maternities using ICD-MM and Previous UK classification systems; rolling three year average rates 2003–2016





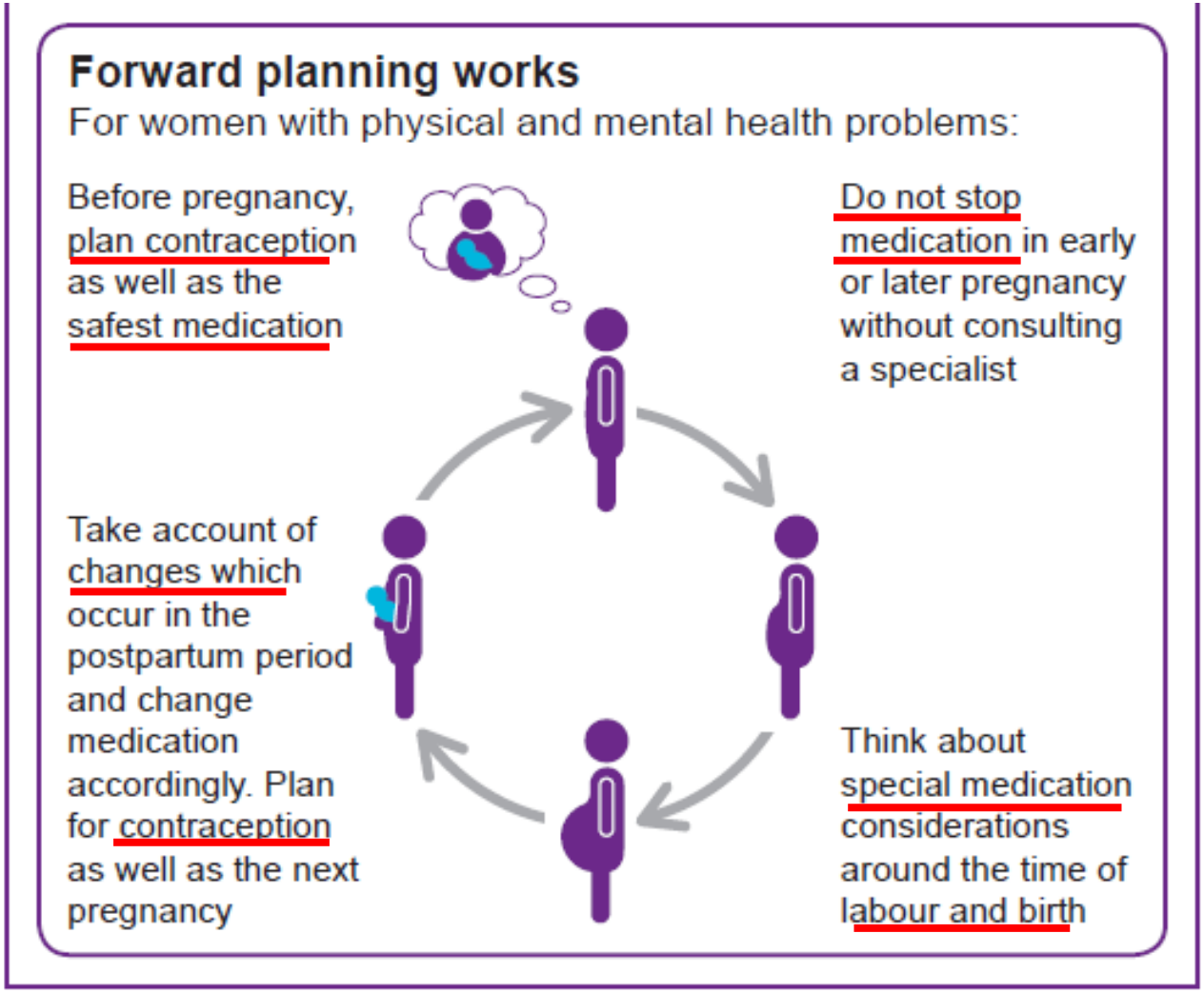
BIG MESSAGES

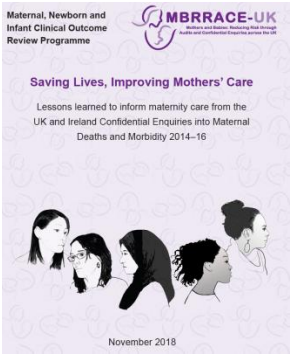
- Slow progress
- Mental health
- **Working together**
- Vulnerable women
- Ethnicity counts
- **Human factors and decisions**
- Capacity
- **PLANNING WORKS**



PLANNING WORKS

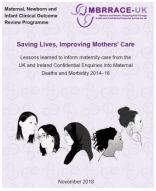
- Before
- During
- Birth
- After
- Next one





1. Challenge OUR assumptions (biases)

- **Symptoms relate to normal pregnancy**
  - even if concerning and persistent,
  - hence leading to **delay in diagnosis**
  - Red flags
- **too many or complex problems to be helped**
- **stopping medication** is appropriate ***without*** balancing benefits and risks.



2. Continuity of care, shared record keeping important

- **So that women are**
  - **heard** and **develop trusting and supportive relationships**
  - **able** to **disclose and discuss their concerns** (domestic violence etc)
- **Enabling**
  - **Right specialist care**
  - **Right communication**
  - **Rapid referral PRN**

World wide 137 women / day are killed by their partner or family member

UNODC 2018

3. Training for non-specialists - needs to be better

"It is striking that these are two areas where we seem to be MAKING LITTLE IMPACT"

What MW's do

- Booking appointment at 8-12 weeks - Screening +++
- Later pregnancy screening mother and baby ++
  - 1st line for symptoms of pregnancy
- Domestic violence
- Education and parenting
- Risk assess and BIRTH planning
- Post natal health mother and baby
- Numerous contacts and appointments with mothers
- Normality bias ??
- NO TRAINING IN MEDICAL RED FLAGS

What Drs do

- Review if high risk or new symptoms
- Diagnostic, exclude disease, see disease everywhere
  - 2nd line for symptoms of pregnancy
- Little involvement
  - Domestic Violence process
  - Education and parenting
- Risk assess and BIRTH planning if disease+ve
- Post natal health mother and baby
- Major Disease bias (type 1 thinking and loss aversion)
- NO TRAINING IN WHAT NORMALITY LOOKS LIKE

Royal College of Physicians

sam
THE SOCIETY FOR ACUTE MEDICINE

Acute care toolkit 15

Managing acute medical problems in pregnancy Nov 2019

Acute care toolkit 15

Managing acute medical problems in pregnancy Nov 2019

Chest pain cause

- Reflux- most common, throughout pregnancy, and post partum
- VTE PE- throughout pregnancy, highest risk post partum
- Acute coronary syndrome
- Biliary disease (gall stones or infection)
- Pneumomediastinum (vomiting and post partum)
- Aortic dissection

Chest pain

- Any cause of chest pain can occur at any gestation.
- Management = non-pregnant patients.
- RED FLAGS
  - Pain requiring opioids
  - Pain radiating to arm, shoulder, back or jaw
  - Sudden-onset, tearing or exertional chest pain
  - Associated with haemoptysis, breathlessness, syncope or abnormal neurology
  - Abnormal observations

Cardiomyopathy of pregnancy

- Rare type of heart muscle disease
- Pregnancy end or few months PP
- heart dilated and weakened
- Reduced function
- Heart failure
- Serious,
  - 70% of women recover by 1 year following diagnosis (based on their ejection fraction, rather than their symptoms).

Cardiomyopathy of pregnancy

- Symptoms
  - Fatigue
  - Palpitations
  - Nocturia
  - Shortness of breath with activity and **when lying flat**
  - Peripheral oedema
  - Swollen neck veins
  - Low blood pressure, or reduction on standing

Palpitations

- Common physiological symptom during pregnancy.
- Differential diagnoses
  - Arrhythmia (rare)
  - Physiological
  - Hypovolaemic states
  - Anaemia
  - Thyrotoxicosis
  - Sepsis
  - Pulmonary embolism
  - Phaeochromocytoma (very rare)

- **Supraventricular tachycardias (SVT)** more common in pregnancy.
  - Same management.
  - Vagotonic manoeuvres, adenosine,
  - Calcium channel blockers and ß-blockers safe.
  - DC cardioversion OK with fetal monitoring and anaesthetic input.

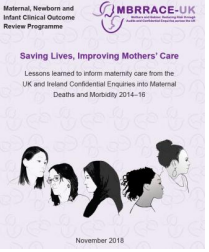
Palpitations RED FLAGS

- **Palpitations in a woman with a family history of sudden cardiac death**
- **Palpitations in a woman who has structural heart disease or previous cardiac surgery**
- **Palpitations with symptoms**
  - **syncope**
  - **chest pain**
- **Persistent, severe tachycardia**

Indications for ECG

- Chest pain
- Unexplained hypotension
- Post unexpected collapse
- Dizzy spells with LOC

- NOT tachycardia unless >140



Fluid balance

A woman with a BMI of 21kg/m^2 gave birth rapidly after an antepartum haemorrhage and hyperstimulation after augmentation. She bled a total of 4 litres following a third degree tear. She received 10 units of red cells, 10 units of FFP, 2 units of cryoprecipitate and a unit of platelets. Her fluid balance was poorly recorded and although she also received crystalloids, the volumes are unclear. She developed pulmonary oedema, requiring CPAP followed by a two day stay in intensive care.

- Careful fluid balance **in PET eliminated pulmonary oedema**
- **Over-replacement as important as under-replacement**
- Use **blood products,** avoid over reliance on crystalloids
- Reassess progress and monitor fluid balance

Normal daily fluid and electrolyte requirements

- NICE 2016 (non pregnant)
- **Water** 25–30 ml/kg/d
  - 80kgs = 2000-2400mls/24 hours
- **Na^+/ K^+ / Cl^- = 1 mmol/kg/day**
  - **80kgs = 80mmol= 500mls NaCl or Hartmans**
- **Glucose =** 50–100 g/day glucose
  - 1000mls of 5% glucose = 50 grams glucose
  - glucose 5% contains 5 g/100ml

Breathlessness

- Physiological breathlessness common (75% of women).
- Onset can be in early pregnancy; not always due to bulky uterus.
- Women with **physiological breathlessness** often describe an ‘air hunger’, worse at rest or talking and relieved by mild exertion.
- **Peripartum cardiomyopathy** can occur in the third trimester or postpartum;
- **Pre-existing and undiagnosed heart disease** may deteriorate from the second trimester onwards.

Breathlessness- causes

- Physiological
- Anaemia - common, gradual and subtle
- Asthma - NB history unless acute allergy
- VTE (PE) - subtle, other symptoms
- Infection- pneumonia etc - other infection symptoms
- Cardiomyopathy
- Pneumothorax - sudden, vaginal birth
- Hyperventilation- anxiety provoked

Breathlessness /Dyspnoea

- Sudden-onset
- Orthopnoea (lying flat)
- Chest pain or syncope
- Respiratory rate >20 breaths per minute
- Oxygen saturation <94% or <94% on exertion
- Associated tachycardia
- Other symptoms (unexplained)

Dyspnoea cases

1. 44 years, 12 weeks, BMI+, single swollen leg
2. Case 1 now with dyspnoea
3. 38 years, 36 weeks, 3rd baby, MWLC, gradual onset worsening dyspnoea with chest pain, smoker,
4. 39 years 38 weeks, nocturnal dyspnea and non productive cough
5. 21 years with anxiety and fluoxitiene, SOB in chair at home watching master chef, dry cough
6. 22 years, 36 weeks, T1DM x 20 years
7. 44 years, 30 weeks, reflux++, weight loss+

Headaches

- Common
- Challenge is distinguishing primary headaches from potentially life-threatening causes
  - sub arachnoid, stroke / CVA, infection, raised intra cranial pressure etc
- Primary headaches
  - more common in the first trimester.
  - Other causes are more common in the third trimester and postpartum period.

Headaches- common causes

- **PET**
- **Migraine**
- **Post dural puncture**
- **Cerebral venous thrombosis**
- **Sub arachnoid haemorrhage**

- Cluster
- Intra cranial hypertension
- Stroke CVA

Headache red flags

- Sudden-onset
  - thunderclap /or worst ever / cresendo <1 minute
- Severity - New onset severe (XS opioids)
- Aura
- Triggers; cough, valsalva, exercise, posture
- Duration; longer than usual; >48 hours
- Associated symptoms;
  - fever, seizures, focal neurology, photophobia, diplopia, visual disturbance
- Recent trauma - head/neck < 3months

Box 1. Red flag symptoms associated with headache in pregnancy[50]

Red flag symptoms

Sudden-onset headache reaching maximal intensity in <1 minute
New onset of severe headache
Significant change in chronic headaches
Headache ± fever, meningism
Headaches triggered by cough, valsalva, sneezing or exercise
Orthostatic headache
New-onset focal neurological deficit, cognitive dysfunction or seizure
Head or neck trauma (within last 3 months)
Headache with aura including motor weakness (lasting >1 hour)
Worsening headache (weeks or months)
Visual disturbances/visual field defects

Other considerations

Patient blood pressure
Past history of neurological conditions
Pituitary disease
Immunocompromise (HIV infection, immunosuppression)
Malignancy
Conditions associated with procoaguable state (thrombophilia, antiphospholipid syndrome, etc.)
Current medication (medication overuse/abuse)
Family history

Headaches- Management

- Like non-pregnant patients. Exclude nasty causes. Treat pain.
- Clinical pointers:
  - **Migraine**: NSAIDS are safe to take up to 32 weeks' gestation
  - **Meningitis/encephalitis:** *Streptococcus pneumoniae and Listeria monocytogenes are more common during pregnancy*
  - **Pre-eclampsia –**
  - **Posterior reversible encephalopathy syndrome (PRES**): treat hypertension, give intravenous magnesium sulphate as per NICE pre-eclampsia guidelines5
  - **Reversible cerebral vasoconstriction syndrome (RCVS):** self-limiting condition in pregnancy. Treat with nimodipine. Resolves within 1–3 months of onset
  - **Idiopathic intracranial hypertension**: can worsen as weight increases. Acetazolamide is safe in pregnancy
  - **Stroke**: no contraindication to thrombolysis, thrombectomy or stenting during pregnancy for ischaemic stroke

Headaches Rare causes

- **Posterior reversible encephalopathy syndrome** (PRES)
  - headache in the 3rd trimester.
  - associated with seizures and cortical blindness,
  - caused by vasogenic brain oedema.
- **Reversible cerebral vasoconstriction syndrome (RCVS)**
  - only occurs postpartum, associated severe hypertension and recurrent thunderclap headaches.
  - Hallmark is multifocal segmental cerebral artery vasoconstriction on cerebral angiography.
- **Cerebral vein thrombosis**
  - associated with hypercoagulopathy state of pregnancy,
  - most common 3rd trimester and postpartum.
  - thrombophilia

Dyspepsia

- Pain or discomfort in the upper abdomen usually described as a burning sensation, heaviness or an ache.
- Associated symptoms include a feeling of fullness, early satiety after meals, anorexia, bloating, belching, nausea and vomiting.
- Symptoms may be episodic, recurrent or chronic. Symptoms are often associated with eating, but this is not always the case.

Reflux red flags

- Iron deficiency anaemia
- Unintentional weight loss.
- Dysphagia (difficulty swallowing).
- Persistent vomiting
- Epigastric mass
- Chronic GI bleeding.
- (Over 55 years with unexplained and persistent dyspepsia).

Abnormal LFT's in pregnancy

- LFT's – **albumen, clotting (INR) and glucose**
- (NOT ALT or AST or gGT)

- Review medical history, previous pregnancy history and gestation of pregnancy when interpreting abnormal liver function tests in pregnancy.

LIVER- Clinical pointers

- Hypertension and proteinuria - consider PET / HELLP
- Pruritus - consider intrahepatic cholestasis of pregnancy
- Nausea vomiting early pregnancy - consider hyperemesis gravidarum
- New medication: think drug-induced liver injury
- Obstetric haemorrhage: think of ischaemic hepatitis

OBSTETRIC Fatty liver

- Rare, potentially fatal condition (mother and baby)
- Diagnosis sometimes delayed.
- 3rd timetester
- Sometimes multiple organ failure.
- Early diagnosis and prompt delivery mainstay of treatment.
- Referral to a specialist Liver unit or Intensive care may be required.
- Incidence 1:20 000 maternities

OBSTETRIC Fatty liver

Symptom	HELLP	AFLP
• Epigast Pain	+	+
• Hypertension	++	+
• Proteinuria	++	+
• Elevated ALT	+	++
• Hypoglycaemia	+/-	++
• Hyperuricaemia	+	++
• DIC	+	++
• Thrombocytopaenia	++	+/-
• Leucocytosis	+	++
• USS/CT	Normal	Bright Liver / Ascites
• Multiple Pregnancy	+	+
• Primiparous	++	+
• Male Fetus	50%	70% (M:F = 3:1)

OBSTETRIC Fatty liver

- Maternal Case fatality rate 2%
- Severe maternal morbidity 28%
- ICU admission 60%
- Specialist Liver Unit Admission 18%
- Mean Duration of stay 9 days
- Recurrence low
  - ? carriers ß fatty acid oxidation genetic # (LCHAD)
- PNM 104/1000 (10x)
- Stillbirth rate 9%
- Neonatal Case Fatality rate 2%

LFTS causes

- **Hyperemesis** – early pregnancy
- **Obstetric Fatty liver**
  - 3rd trimester (only)
  - Non obstetric fatty liver = BMI++
- **HELLP** – 3rd trimester, usually PET
- **Intrahepatic Cholestasis Pregnancy (ICP)**
  - 3rd trimester,
  - itching
  - rapid resolution at birth
  - benign

Acute kidney injury (AKI)

- International classifications (AKI) and eGFR not validated in pregnancy.
- Diagnosis – no clear guidance on thresholds.
  - Creatinine >77 µmol/L (??)
- Most no previous renal profile
  - some may have pre-existing chronic kidney disease.
- AKI more common 3rd trimester and postpartum.

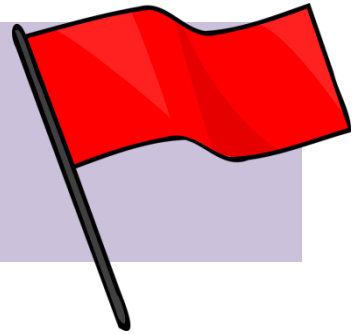
Medications

- **EULAR** and **BSR** (BUT SEE NEXT SLIDE)
- **Toxbase.org**
- **BUMPS** - Better Use of Medicines in Pregnancy
- **Lactmed.org**
- **UK Medicines Information**
- **UKTIS UK Teratology Information Service**

Common medications used in acute medical conditions

- **Antibiotics**: avoid trimethoprim and tetracyclines, all others safe
- **Antiemetics**: all safe
- **Analgesia**: paracetamol safe, NSAIDs safe **except in third trimester**
- **Opiates**: generally safe, but risk of withdrawal in the baby. Rarely, breastfed babies have developed sedation, respiratory depression, and bradycardia –advise the mother of this;2 use dihydrocodeine3
- **Antihypertensive agents**: avoid ACE inhibitors (ACEIs) and angiotensin receptor blockers throughout pregnancy, enalapril has been shown to be safe postpartum if breastfeeding. Evidence is lacking for other ACEIs in breastfeeding
- **Antiarrhythmic agents:** adenosine, ß-blockers, flecainide and verapamil are all safe
- **Anticoagulants**: twice-daily dosing of low-molecular-weight heparins for VTE treatment in pregnancy, once daily postpartum. Warfarin is teratogenic, and only used in exceptional circumstances under expert supervision. It is safe in breastfeeding
- **Direct oral anticoagulants (DOACS):** There is insufficient evidence to support the use of DOACS in pregnancy and in breastfeeding
- **Antiepileptic agents**: sodium valproate contraindicated. For status epilepticus, intravenous benzodiazepines or levetiracetam safe
- **Bronchodilators**: all safe
- **Steroids**: all safe*

Psychiatric disorders



- Recent significant change in mental state or emergence of new symptoms
- New thoughts or acts of violent self-harm
- New and persistent expressions of incompetence as a mother or estrangement from the baby

Physiology of pregnancy

- Observations and laboratory measures different ranges in pregnancy.
- Use Modified Early Obstetric Warning Signs (MEOWS) scoring and not the National Early Warning Score (NEWS2) (not validated pregnancy).
- No nationally standardised MEOWS chart
- Use locally agreed MEOWS chart.

Normal for pregnancy

- **HR**
  - increased by 10-20, 3rd trimester+
- **BP**
  - down 10-15 by 20 weeks
  - Normal by 36 weeks
  - Higher after birth but normal by 1-2 weeks week PN
- **RR**
  - No change,
  - If >=20 think red flags
- **O_2 Saturation**
  - no change
  - <94% think red flag

Physiological changes pregnancy

- **D Dimer-** elevated in normal pregnancy, not used
- **Creatinine kinase** – 5 - 40iu/L lower
- **Cholesterol** - elevated not used
- **TFT's -** use local gestation based ranges
- **ECG -** ectopics more common
- **CXR -** Prominant vascular markings, raised diaphragm, flattened hemidiaphragm
- **PEFR -** unchanged
- **ABG -** mild, fully compensated respiratory alkalosis

Normal for pregnancy

- **FBC**
  - changes; Range Hb 105-140; WCC 6-16
- **Renal**
  - increased GFR,
  - creatinine down in 1st and 2nd trimester
  - normal creatinine is < 77
- **Liver -** Alk phos up x3-4
- **Treponin (cardiac heart attack enzyme)**
  - no change
  - Up in PET PE myocarditis / arrthymias / sepsis

Red Flag Quiz

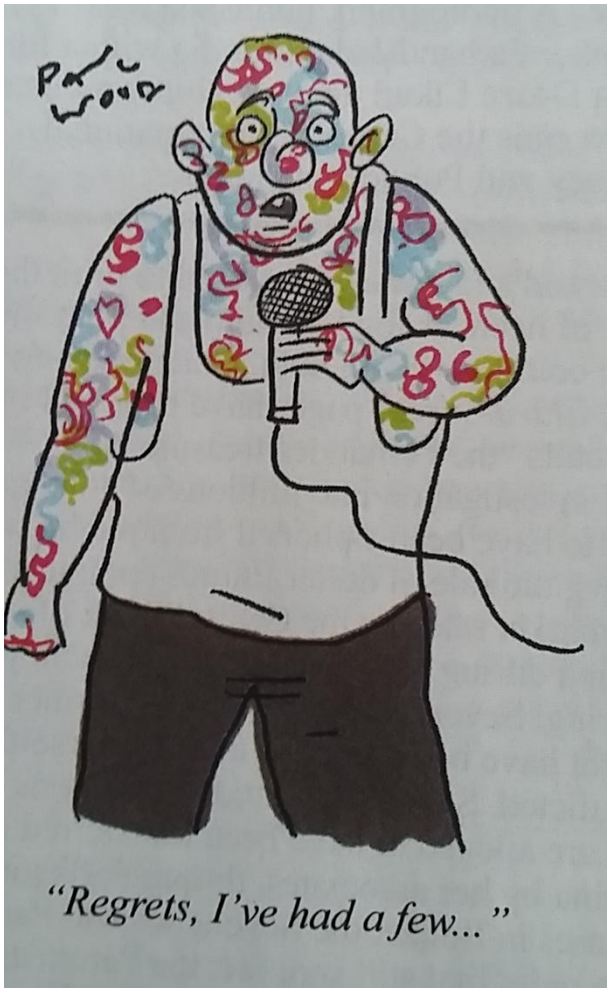
1. Names 3 types of human bias
2. Names the 2 types of human thinking and underline which is more likely to have associated bias and which to have unpredictable bias
3. 3 kidney red flags
4. When is an ECG helpful
5. 3 causes of headache in pregnancy excluding PET
6. 2 headache red flags
7. 2 types of treatments for headache and what gestation might this change (about)
8. What is a ‘stroke’
9. 2 red flags for palpitations
10. How much sodium do you need on average per day
11. How much fluid do you need on average per day
12. Name 2 liver function tests
13. 2 RF for reflux

How we learn

Recommendation

- Reflection with quality MDT review / root cause analysis
- On ALL other significant outcomes *including positives*
- *Positive feedback leads to more change*
- Remember to **SPIT**
  - What DIAGNOSIS is most
    - **Serious**
    - **Probable**
    - **Interesting**
    - **Treatable**

- *"For every **complex problem** there is an answer that is **clear, simple, and wrong**"*
  - H L Mencken



- **The end**

- **Thank you**

- **Matthew.coleman@uhs.nhs.uk**

- **07393 680290**

Radiological investigations in pregnancy

- **Chest pain or Dyspnoea**
  - 1st first-line or chest pain is a CXR.
  - NB – CXR Radiation equivalent to 1 week's exposure to background radiation in London

- **Scanning -** Ultrasound, CT scans of head and chest, and MRI are safe throughout pregnancy. Avoid gadolinium contrastz

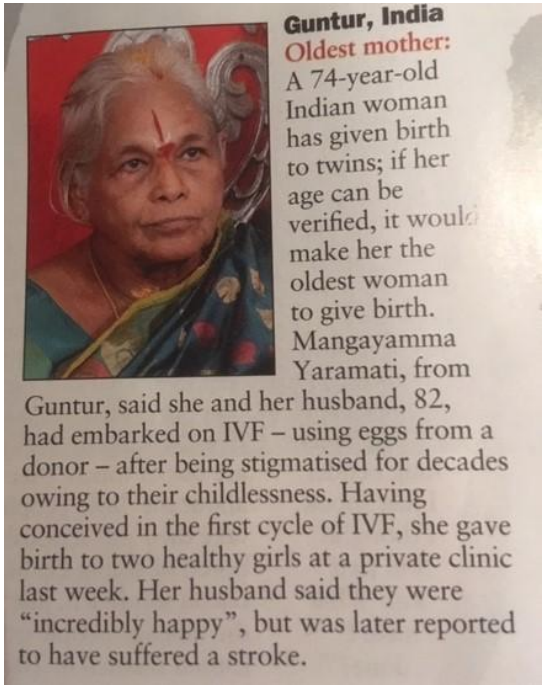
- **Suspected PE with normal CXR,**
  - do VQ in preference to CT pulmonary angiography (CTPA),
  - Lower radiation dose to maternal lung and breast tissue.

- **Recurrent presentations** or **readmission in** pregnancy =red flags Discuss with the obstetric and medical team.

RULE 1 –every age can be pregnant (Hypertension >= 140/90 – success! BUT)

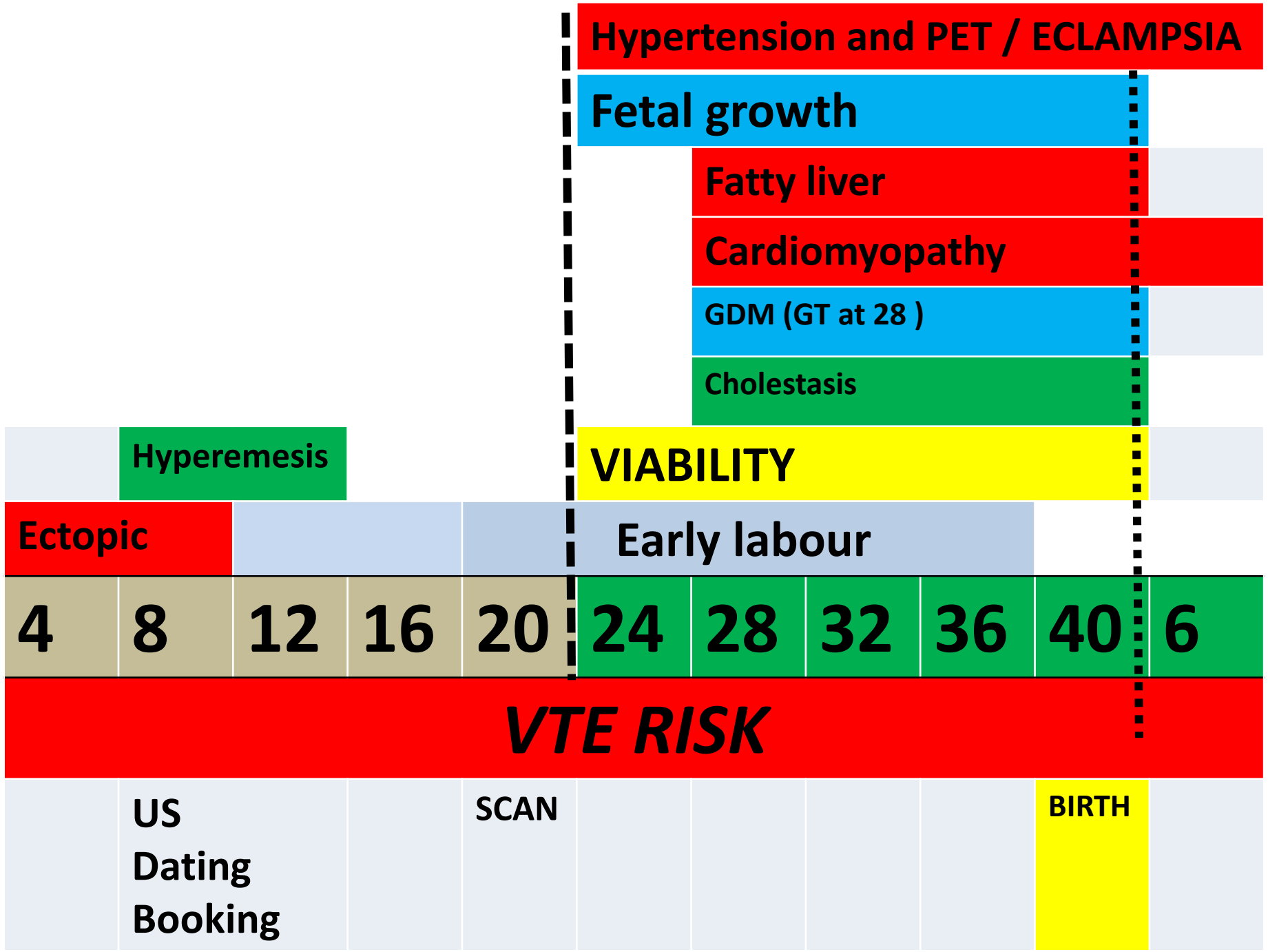
80/50?

160/100?



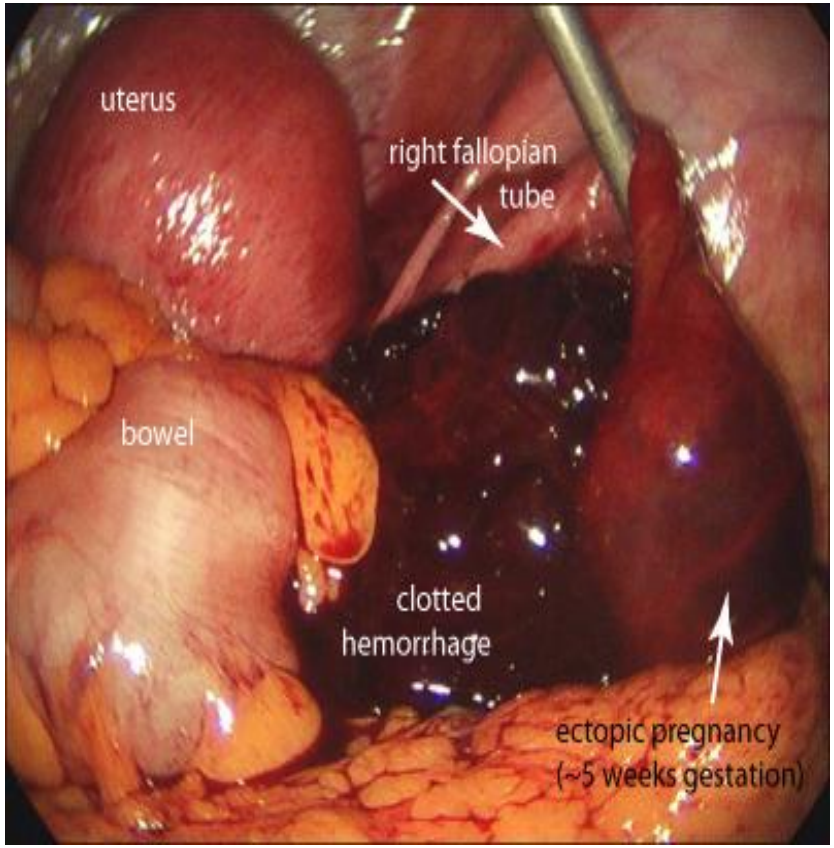
Guntur, India
Oldest mother: A 74-year-old Indian woman has given birth to twins; if her age can be verified, it would make her the oldest woman to give birth. Mangayamma Yaramati, from Guntur, said she and her husband, 82, had embarked on IVF – using eggs from a donor – after being stigmatised for decades owing to their childlessness. Having conceived in the first cycle of IVF, she gave birth to two healthy girls at a private clinic last week. Her husband said they were "incredibly happy", but was later reported to have suffered a stroke.

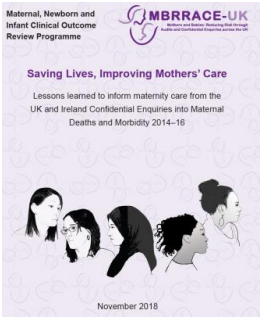
All women of *childbearing potential* presenting with acute medical conditions should have a pregnancy test.


Hypertension and PET / ECLAMPSIA
Fetal growth
Fatty liver
Cardiomyopathy
GDM (GT at 28)
Cholestasis
Hyperemesis
VIABILITY
Ectopic
Early labour
4
8
12
16
20
24
28
32
36
40
6
VTE RISK
US
Dating
Booking
SCAN
BIRTH

Rule 2 – Ectopic pregnancy

- **ECTOPIC** until proven
- Care with biases
  - MW vs DR !?
- Do an ultrasound
- 2 Q's early pregnancy
  - **Viable (alive) ?**
  - **Where (uterine or tube) ?**





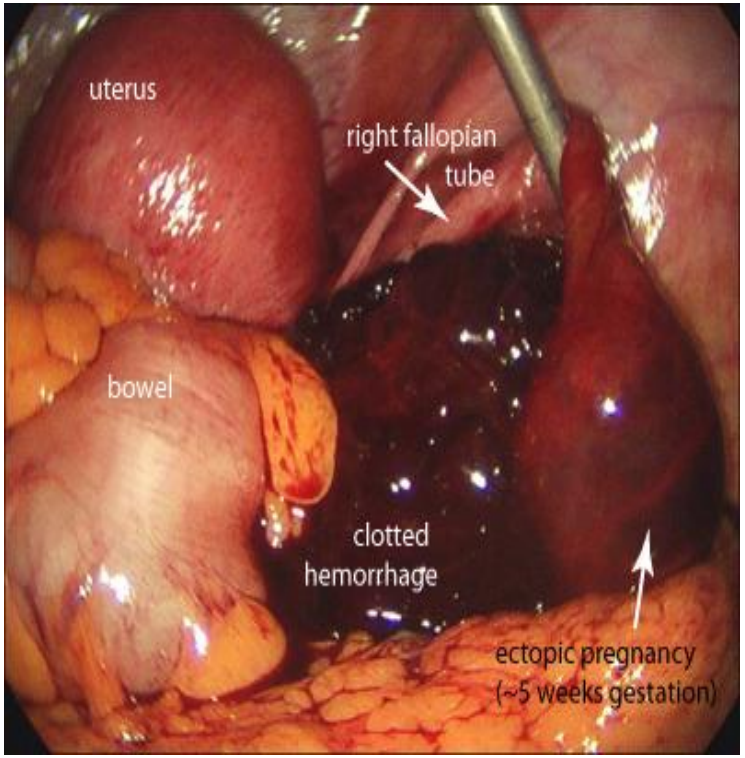
Hypertension in pregnancy

- Maternal mortality -Success!
- Maternal death from HT/ PET = 1:500,000
- Management
  - Treat nasty hypertension
  - Screen for complications
  - Timely birth
  - Mind fluids
  - (Future role for home BP monitoring)

Rule 2 – Ectopic pregnancy

- **ECTOPIC** until proven **NOT**
- Care with your biases

- Ultrasound
- 2 Q's early pregnancy
  - **Viable (alive) ?**
  - **Where (uterine or tube) ?**



Rule 3 - pre eclampsia until proven otherwise

- **PET- a multisystem disorder of later pregnancy *characterised* by HYPERTENSION and PROTEINURIA**

- **EXCLUDE BY**
  - **TAKE THE BP** - 140/90
  - **TEST URINE** – bedside and PCR

- **INTTERPRET** IN LIGHT OF HISTORY and SYMPTOMS

RULE 4- Pain is labour

- **Abdominal pain** = **labour** until proven
- (Beware other causes)

- **Beware the 'SMALL and or BREECH baby'**

- **Abdominal pain** = Check the cervix (VE)

Rule 5- Rare disease and your bias

- **You see what you want to see**
- Remember **rare but severe diseases**
  - **Fatty liver**
  - **Cardiomyopathy**
  - **VTE**
  - **(Sepsis)**
- And always **SPIT** daily