Northern Health

Western Health

the women's
the royal women's hospital
victoria australia

Mercy Health
Care first

phn
NORTH WESTERN MELBOURNE
An Australian Government Initiative

Shared Maternity Care Collaborative Workshop 2023: Session 1

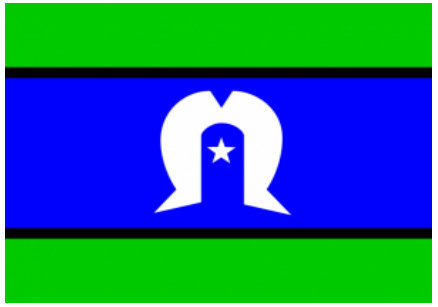
Monday 27 November 2023

The content in this session is valid at date of presentation

Acknowledgement of Country

North Western Melbourne Primary Health Network, RWH, NH, WH and Mercy Health would like to acknowledge the Traditional Custodians of the land on which our work takes place, The Wurundjeri Woi Wurrung People, The Boon Wurrung People and The Wathaurong People.

We pay respects to Elders past, present and emerging as well as pay respects to any Aboriginal and Torres Strait Islander people in the session with us today.



Housekeeping – Zoom Webinar

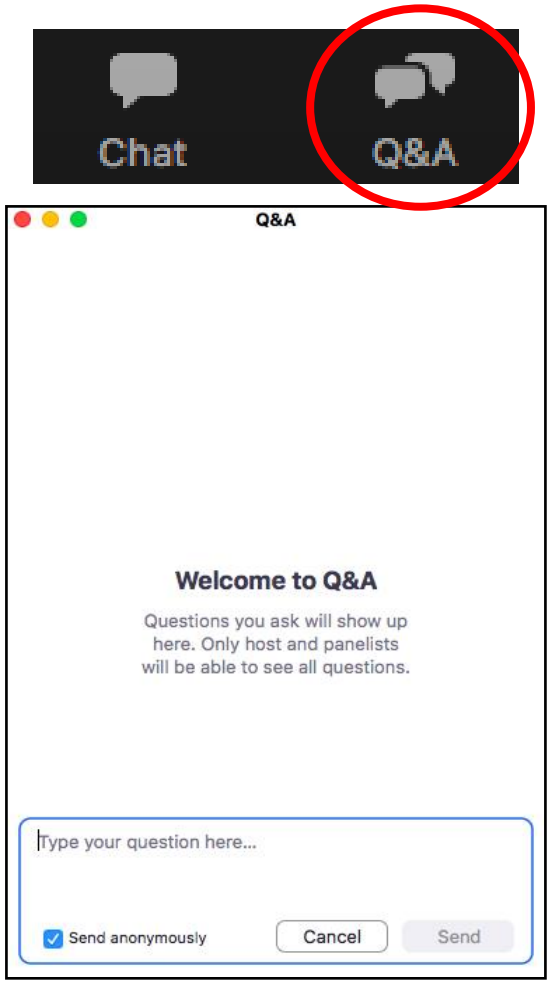
All attendees are muted

Please ask questions via the Q&A box only

Q&A will be at the end of the presentation

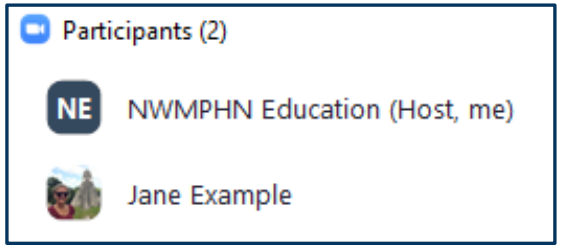
This session is being recorded, you will receive a link to this recording and copy of slides in post session correspondence.

Questions will be asked anonymously to protect your privacy



Housekeeping – Zoom Webinar

Please ensure you have joined the session using the same name as your event registration (or phone number, if you have dialled in)



NWMPHN uses Zoom's participant list to mark attendance and certificates and CPD will not be issued if we cannot confirm your attendance.

If you are not sure if your name matches, please send a Chat message to 'NWMPHN Education' to identify yourself.

Shared Maternity Care Collaborative

Northern Health

Primary Care Liaison officer Kirra McGaw – nh-primarycareliaison@nh.org.au
GP Liaison officer Richard Sia – nh-primarycareliaison@nh.org.au

Mercy Health

Primary Care Liaison manager Caitlin Shaw – primarycare@mercy.com.au
Primary Care Liaison officer Sharon Tijssen – primarycare@mercy.com.au

The Royal Women's Hospital

Head of GP Liaison unit A/Prof Ines Rio – gp.liaison@thewomens.org.au
Primary Care Liaison officer Emily Lawson – gp.liaison@thewomens.org.au

Western Health

GP Advisor Jo Silva – gp@wh.org.au

Hospital Updates

Mercy Health

Mercy Health is now accepting HealthLink eReferrals.

Benefits of eReferral via HealthLink:

- eReferrals via HealthLink are already embedded into most GP practice software, making the transition simple and cost-free for most general practices.
- eReferral will auto-populate important patient data such as demographics, medical history and medications from the GP practice management software and guide them through the referral process, ensuring compliance to the Victorian state-wide referral criteria for each specialty.
- Referrers are sent a notification when their referral is received by Mercy Health.

For more information visit our Refer a patient website

Hospital Updates

Northern Health

Northern Health is now sending digital discharge summaries via HealthLink. Please ensure all your details are up to date with the National Health Services Directory (NHSD).

Northern Health's Medical Community Virtual Consult (MCVC) service provides Victorian GPs and Nurse Practitioners access to hospital-based specialist expertise to discuss complex patient management in the community. Specialties available include Paediatrics, Endocrinology and Rheumatology. More information is available at https://mcvc.nh.org.au/

Hospital Updates

The Royal Women's Hospital

The Public Fertility Care Service has opened across the state under guidance from The Royal Women's Hospital. For more information on our clinic please go to the website.

Tomorrow, Tuesday 28th November 2023 6:30 PM – 8:00 PM there will be a webinar:
Supporting patients with infertility through the Public Fertility Care Service.
Please register via the PHN website: https://nwmphn.org.au/event-detail/supporting-patients-dealing-with-infertility-and-new-public-fertility-care-service-update/a08Mo000007zFfgIAE/

Moderator

A/Prof Ines Rio – The Royal Women's Hospital

- A/Prof Ines has extensive experience in many facets of health care.
- Ines is a Chairperson for the North Western Melbourne PHN, Director of Sexual Health Victoria, Head of the General Practice Liaison Unit and GP Obstetrician at The Royal Women's Hospital, General Practitioner North Richmond Community Health, member of the TGA advisory committee on vaccines, and newly appointment as Chief Medical Officer at Monash University and as member of the National Women's Health Advisory Council.
- Ines is committed to quality, effective, efficient, equitable and integrated health care services and the central importance and role of general practice and primary care in this provision.

Speakers

Dr Sarah McClusky – Western Health

- Dr Sarah McClusky is an obstetrics and gynaecology specialist working at Western Health.
- She specialises in care for pregnant women and unborn children, including looking after women's sexual and reproductive health.

Dr Ekaterina Jovic – Northern Health

- Dr Ekaterina Jovic finished her fellowship at the Royal Australian and New Zealand College of Obstetricians and Gynaecologists last year after completing extensive training in Canberra and the Royal Women's Hospital in Melbourne.
- She is currently working as a consultant obstetrician and gynaecologist with Northern Health and chairs the C-section audit meetings, and perinatal loss review committee.
- She has also been appointed as a senior lecturer at the University of Melbourne's Northern Clinical School.

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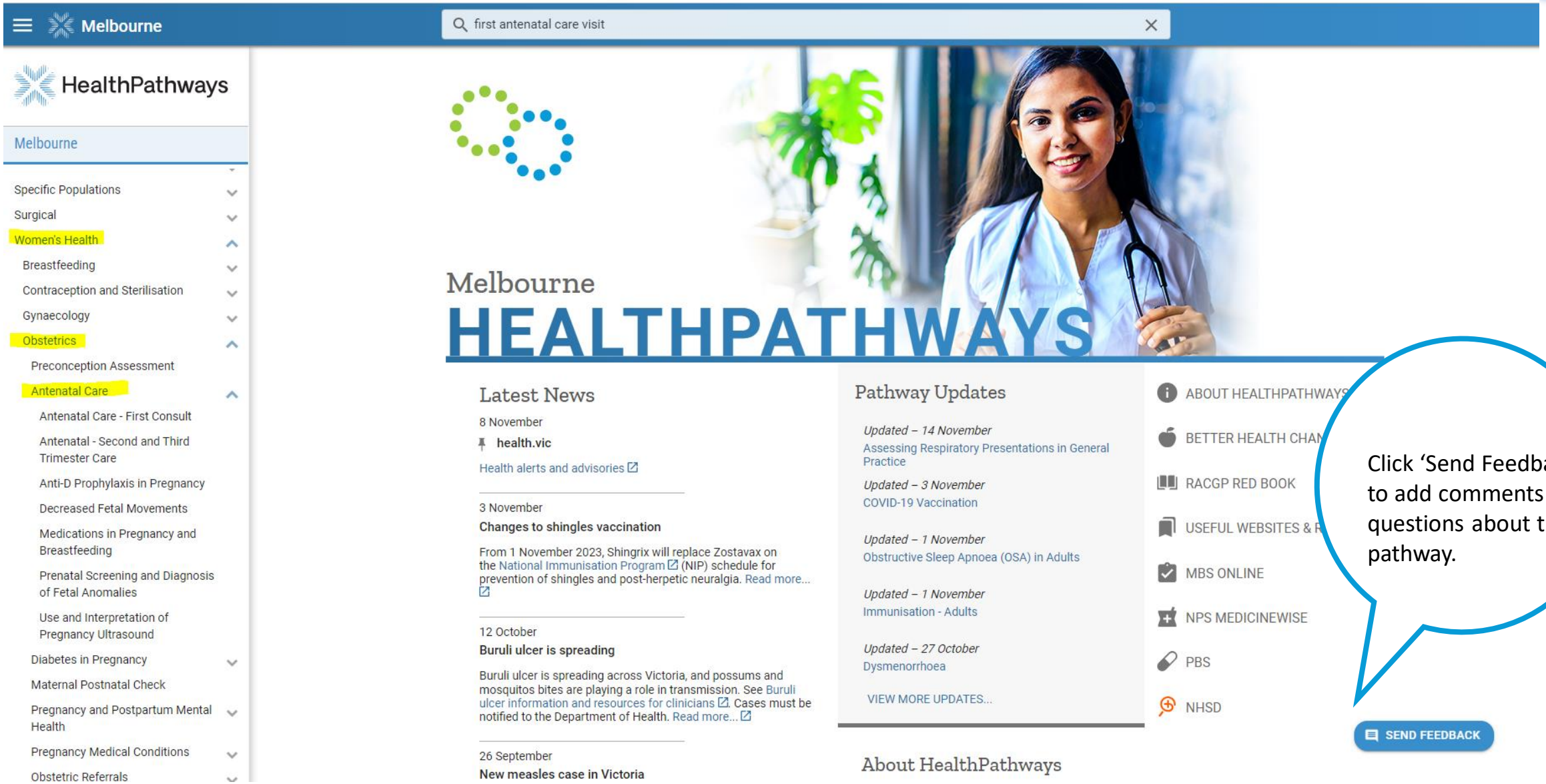
HealthPathways

Pathways are written by GP clinical editors with support from local GPs, hospital-based specialists and other subject matter experts

- clear and concise, evidence-based medical advice
- Reduce variation in care
- how to refer to the most appropriate hospital, community health service or allied health provider.
- what services are available to my patients

HealthPathways – Shared Maternity Care



Navigating HealthPathways – Shared Maternity Care

Shared Maternity Care Pathways Resources and Referral pages

Obstetrics

Preconception Assessment
Antenatal Care
Antenatal Care - First Consult
Antenatal - Second and Third Trimester Care
Early Pregnancy Bleeding
Pregnancy Bleeding
Recurrent Pregnancy Loss

Referrals and Resources

Acute Obstetric Referral or Admission (Same-day)
Non-acute Obstetric Referral (> 24 hours)
Early Pregnancy Assessment Service (EPAS) Pregnancy Booking
Fertility Specialised Referral
Acute Gynaecology Referral or Admission (Same-day)
Non-acute Gynaecology Referral (> 24 hours)
Pregnancy Booking
Radiology Services and Advice
Pregnancy Genetics
Prenatal Screening and Diagnosis of Fetal Anomalies
Genetic Laboratory Testing
Genetic Health Advice and Referrals

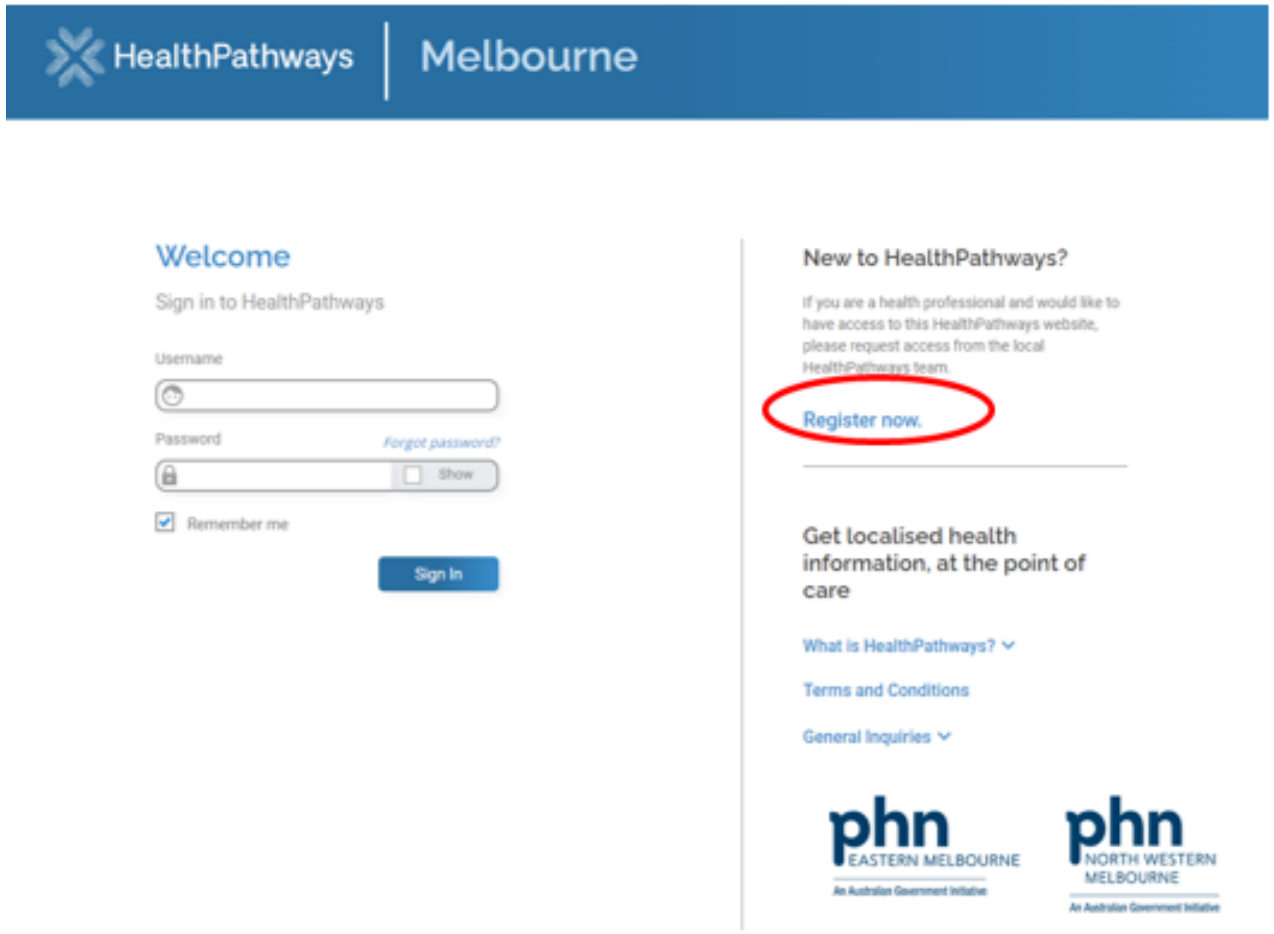
Pregnancy Medical Conditions

Anaemia in Pregnancy
Asthma in Pregnancy
Pregnancy Bleeding
Hypertension in Pregnancy and Postpartum
Nausea and Vomiting in Pregnancy
Obesity in Pregnancy and Pre-pregnancy
Skin Conditions (Rash and Itch) in Pregnancy
Thyroid Disease in Pregnancy
UTI and Asymptomatic Bacteriuria in Pregnancy
Varicella and Pregnancy
Diabetes in Pregnancy
  Hyperglycaemia in Pregnancy
  Pre-pregnancy Planning for Type 1 and Type 2 Diabetes
  Type 1 and Type 2 Diabetes and Pregnancy

Related and relevant LGBTIQA+ pages

LGBTIQA+ Fertility, Parenting, and Children
LGBTIQA+ Friendly Clinics
LGBTIQA+ Resources
Transgender Health and Gender Diversity Referral

Accessing HealthPathways: Go to melbourne.healthpathways.org.au



Register via QR code

info@healthpathwaysmelbourne.org.au

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Early antenatal care. Identifying the higher risk pregnancy.

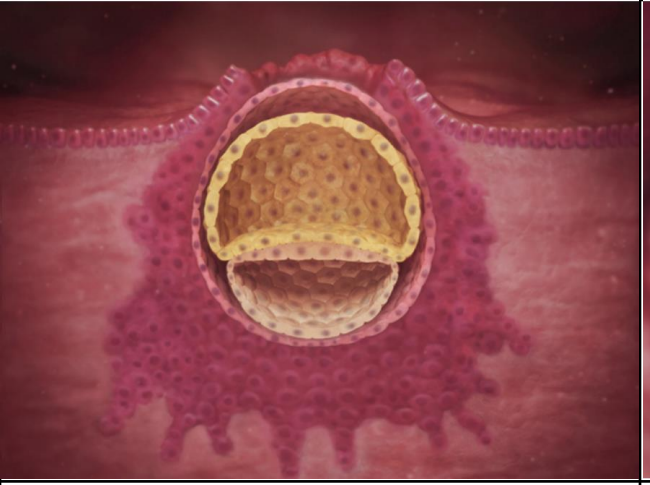
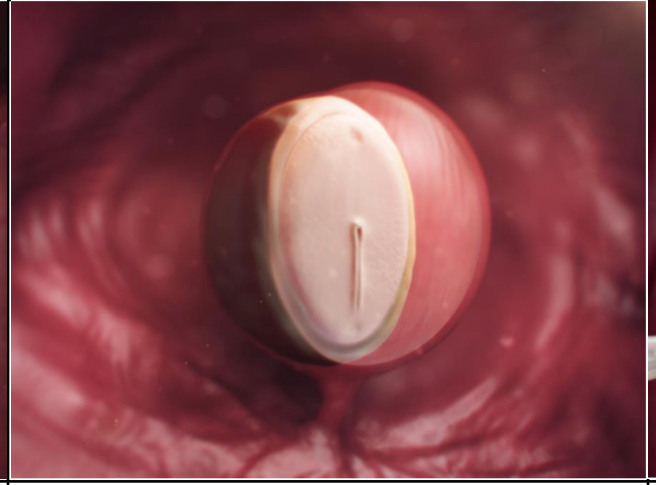
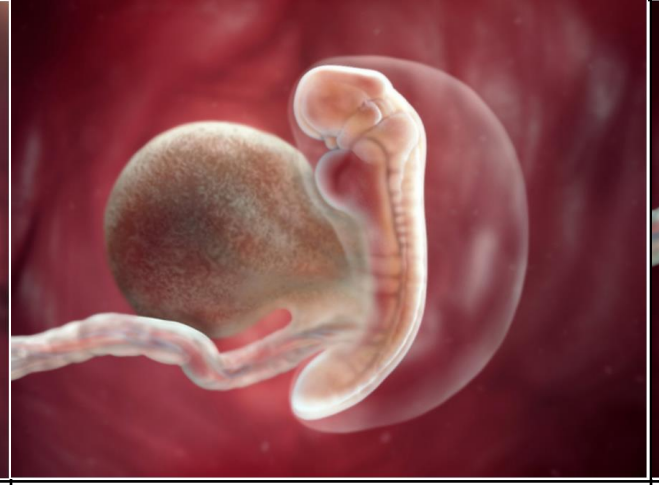
Dr Sarah McClusky
Obstetrician and Gynaecologist
JKWC, Sunshine Hospital

Embryology

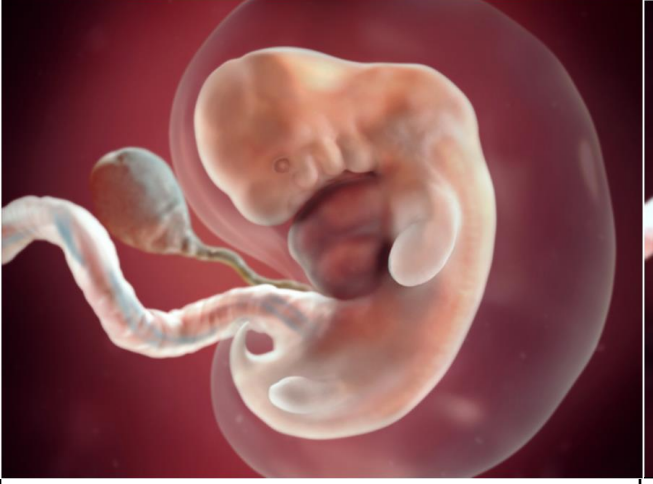
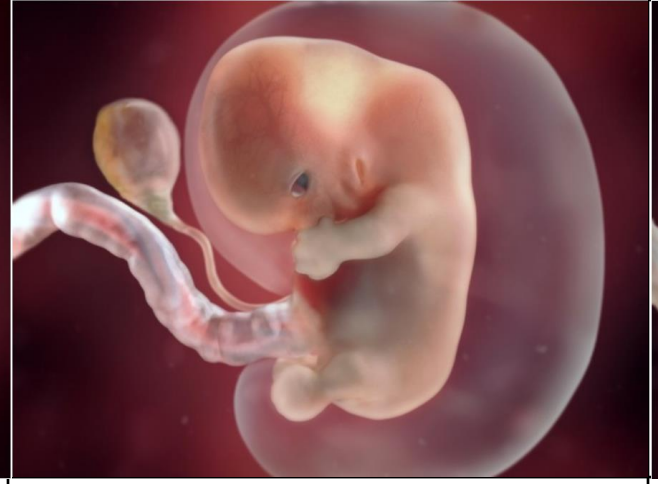
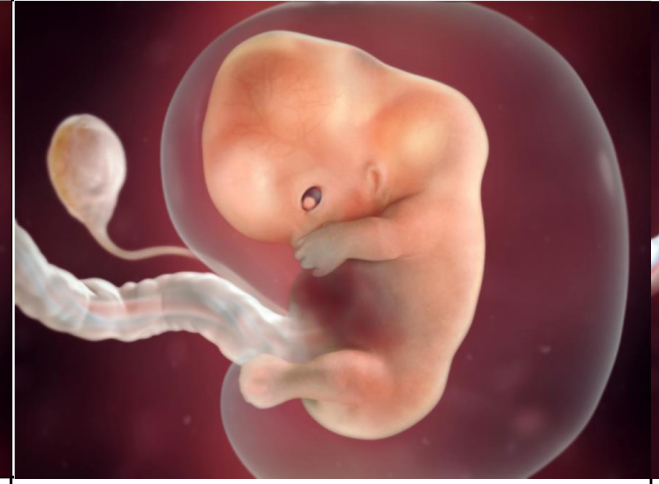
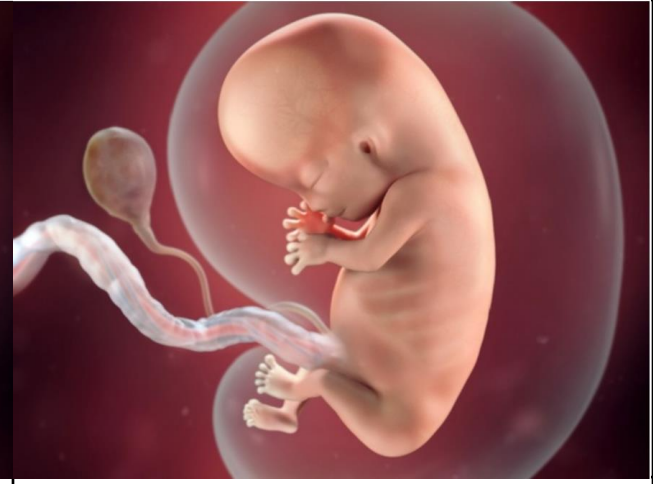
- Gestational Age refers to time from last normal menstrual period (LNMP)
- 1-2 weeks: pre pregnancy: For women with a 28 day cycle, ovulation occurs on approximately day 14
- GA 5-10 weeks: most critical period of organogenesis when developing organ systems are most susceptible to birth defects

Fetal Development Chart

Developmental stage	Embryonic Stage										Fetal Stage					
Gestational Age (weeks)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	20	40
Conceptual Age (weeks)	0	0	1	2	3	4	5	6	7	8	9	10	11	12	18	38

			
Gestational Age 3 weeks Implantation of the blastocyst	Gestational Age 4 weeks Bilaminar disc becomes trilaminar	Gestational Age 5 weeks Brain, spine and heart have begun to form	Gestational Age 6 weeks Eyes, nostrils and arms begin to form

Development during the first 10 weeks
Perinatology.com/Reference/Fetal%20development.htm
Babycenter.com/your-baby/fetal-development-week-by-week_10406730

			
Gestational age 7 weeks Hands, feet, mouth and face form Trachea and bronchi develop	Gestational age 8 weeks Nerve cells are branching out Fingers and toes are developing Physiological gut herniation and rotation	Gestational age 9 weeks Baby has tiny earlobes Embryonic tail has disappeared	Gestational age 10 week Majority of organogenesis has occurred Now considered a fetus

Development during the first 10 weeks

Perinatology.com/Reference/Fetal%20development.htm

Babycenter.com/your-baby/fetal-development-week-by-week_10406730

Fetal Development Chart

Developmental stage	Embryonic Stage										Fetal Stage					
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Conceptual Age (weeks)	0	0	1	2	3	4	5	6	7	8	9	10	11	12	18	38
Developing Organ(s)																
Central Nervous System																
Heart																
Ear																
Eyes																
Limbs																
Lip																
Palate																
Teeth																
External genitals																

The red bars in the table show the gestational age when different organ systems are most sensitive to major birth defects in that organ system. The pink bars show the gestational age when different organ systems are sensitive to functional defects and minor malformations.

Perinatology.com/Reference/Fetal%20development.htm

Maternal physiological changes of pregnancy

- Cardiovascular: peripheral vasodilatation leads to fall in systemic vascular resistance. Cardiac output increases by approx. 40% via increase in stroke volume and heart rate.
- Respiratory: 40-50% increase in minute ventilation largely due to increased tidal volume
- Haematological: Plasma volume increases by 50%. Red cell mass also increases but disproportionately leading to dilutional anaemia. Increase in coagulation factors: Factors VIII, IX, X and fibrinogen. Endogenous anticoagulants (anti thrombin and protein S) fall. Albumin concentrations fall.
- Renal: GFR increased

Maternal physiological changes of pregnancy

- Gastrointestinal: decreased lower oesophageal pressure, delayed gastric emptying, inhibited motility.
- Endocrine: 1st trimester: insulin sensitivity increases. 2nd-3rd: progressive insulin resistance (hPL, glucagon and cortisol from placenta)
- Thyroid: hCG is structurally very similar to TSH and may have TSH like activity leading to increase in free T4 and suppressed TSH

Implications for mother

- Gastro oesophageal reflux , hyperemesis gravidarum, constipation
- Low blood pressure/fainting
- Oedema
- Increased venous thromboembolism risk
- Decompensation of chronic disease: cardiac disease
- Complications of chronic disease related to physiological changes: diabetes with brittle control
- Increased volume of distribution and clearance of medications

Importance of early antenatal period

- Period of organogenesis for fetus
- Time of significant physiological change for mother
- Developmental Origin of Health and Disease
- Fetal programming: Intrauterine environment lays the foundation for health in later life
- Women are motivated to make positive lifestyle changes
- Time of significant stress especially for women experiencing disadvantage, mental health challenges and domestic violence
- Opportunity for interventions that significantly improve outcomes

Interventions in early pregnancy that improve pregnancy outcomes

- Folic acid to reduce the risk of neural tube defects (NTD)
- Iodine for normal fetal thyroid and central nervous system development
- Healthy diet, exercise and gestational weight gain: reduce development of Gestational Diabetes, Large for Gestational Age babies and Hypertensive Disorders in Pregnancy (HDIP)
- Low dose aspirin (LDA) and calcium: reduce HDIP and Intrauterine Growth Restriction (IUGR) in women identified to be higher risk
- Cervical surveillance, progesterone and cervical cerclage: reduce premature birth in women identified to be higher risk
- Improved glycaemic control: reduce incidence of congenital abnormalities and later pregnancy complications in women with type 1 and 2 diabetes mellitus
- Using medications with the lowest risk profile in pregnancy

Not all pregnancies will continue

- Approximately 1 in 5 pregnancies will result in miscarriage in the 1st trimester
- Not all pregnancies are wanted
- Termination for congenital abnormalities, genetic and chromosomal abnormalities
- Complex and sensitive discussions

Aims of antenatal care

- Identify women, babies and families at higher risk of poor outcomes
- Institute interventions that improve outcomes
- Optimise health in pregnancy and postpartum period to lay foundation for optimal future health for mother and child

Ideally couple are seen together ***prior*** to pregnancy however only 50% of pregnancies are planned

- When seeing women of reproductive age in clinic ask about family planning
- Identify and optimise any current health issues (CST, breast check, BP, BMI, vaccination status)
- Consider carrier screening for genetic conditions
- Optimise nutrition, exercise and supplements
- Identify and avoid teratogens (medications, substances, occupational exposures, infections: consider vaccination)
- Psychosocial screening including mental health issues and screening for domestic violence if safe to do so
- May be appropriate to advise delay pregnancy until other issues addressed

Early antenatal care

- Prior to 10 weeks
- Over several encounters
  - Multiple investigations, extensive history collection, complex and sensitive discussions and large amount of health information to convey
- Checklists are helpful
- Information handouts
- Apps can be a useful aid for conveying information “Eve”
- Health Pathways
- https://melbourne.communityhealthpathways.org/37932.htm

Early Antenatal Care
Part 1: Information: gathering and giving

- Confirm viability, EDD and intentions regarding pregnancy
- Identify and address early pregnancy complications (bleeding, N&V)
- Screen for exposures that may be problematic in 1st trimester (medications, substances, hyperglycaemia, environmental and occupational)
- Perform all routine antenatal investigations
- Review obstetric history
- Screen for risk factors for premature birth, preeclampsia and IUGR
- Assessment medical/surgical history
- Psychosocial screen for mental illness and domestic violence

Bleeding and pain: confirm viability

https://melbourne.communityhealthpathways.org/12527.htm

- Differential diagnosis: miscarriage, (missed, threatened, incomplete) or ectopic pregnancy
- Ensure haemodynamically stable
- FBE, Group and screen and quantitative bHCG
- US
- Speculum examination
- Check most recent CST (can perform in pregnancy however be aware may cause contact bleeding)
- STI screen
- Anti D if indicated

Nausea and vomiting

https://melbourne.communityhealthpathways.org/25368.htm

- Ask about severity and perception of intake
- If concerned perform FWT, BP lying and sitting
- Dietary changes: small frequent meals, avoid triggers (strong smelling foods, hot foods etc)
- Use of ginger, vitamin B6 and proton pump inhibitors
- Consider anti emetics: doxylamine or promethazine at night (sedating)
- Metoclopramide/prochlorperazine daytime use
- Ondansetron wafers

Nausea and vomiting

https://melbourne.communityhealthpathways.org/25368.htm

- For refractory nausea and vomiting: investigate with FBE, CUE, LFTs and TSH and urine MCS. US to confirm SLIUP. FWT ? Ketones.
- Consider admission for hydration, B group vitamins, steroids
- Ensure vitamin supplements: prioritise folic acid and iodine (smaller is better)
- Consider referral dietician

Routine investigations

- Blood group and antibody screen
- FBE and film
- Urine MCS
- Serology for syphilis, Hep B, C, HIV, Rubella
- ***Ferritin***
- ***Hb electrophoresis for 1st pregnancy: follow with DNA studies if indicated***
- ***TSH***

Additional investigations

- ***B12: History malabsorption, gastric surgery or dietary restrictions***
- ***Dating scan if unsure of LNMP***
- Cervical screening
- Chlamydia: under 25 or from high prevalence communities (areas of high prevalence including outer regional and remote areas)
- Gonorrhoea: known risk factors or high prevalence communities

Information giving

- Folic acid, iodine and vitamin D supplementation
- Advice regarding exercise, healthy diet and gestational weight gain
- Food safety and hand hygiene (listeria, salmonella, toxoplasma, mercury and caffeine)
- CMV, parvovirus and varicella
- Carrier screening for genetic conditions
- Screening for chromosomal and structural abnormalities
- Screening for increased risk of preeclampsia/IUGR
- Prevention premature birth

Folic Acid

Prevention of neural tube defects
500mcg folic acid daily four weeks prior to conception and for the 1st 12 weeks
High risk (previous NTD, anticonvulsant medications, diabetes, BMI >30kg/m2, malabsorption) 5 mg daily for four weeks prior to conception and for the 1st 12 weeks

Iodine

Necessary for maternal thyroid hormone production and development of fetal CNS
150mcg daily required during pregnancy and breastfeeding

Vitamin D

Don't test in pregnancy
Give everyone 400IU per day (RANZCOG consensus)

Iron

For women with iron deficiency
Oral supplements 60mg elemental iron daily
GI side effects common: trial double dose second daily
Liquid iron better tolerated than tablets but lower dose
Consider iron infusion for IDA with inability to tolerate GI SEs

Vitamin B12

Vegans/vegetarians: oral supplements 2.6 mcg/day
Malabsorptions: 1000mcg IM

Calcium

For women with inadequate dietary intake (<1000mg daily)
This is equivalent to 3 serves of dairy per day

Assess weight, height, diet and exercise

- Measurement of BMI
- Advice regarding healthy diet
- Recognise the limitations of BMI and significant variation between populations
- <18 and >35 consider referral to dietician
- Advise 150 minutes exercise per week (30 mins most days)
- Advice regarding healthy gestational weight gain

Handouts for women

- https://thewomens.r.worldssl.net/images/uploads/fact-sheets/Weight-gain-during-pregnancy_2021.pdf
- https://thewomens.r.worldssl.net/images/uploads/fact-sheets/Food-safety-during-pregnancy_2021.pdf

Carrier screening

- Not a routine test
- History: Known genetic conditions, history of intellectual disability, multiple pregnancy losses, stillbirth, children with congenital abnormalities, consanguinity
- Consider referral to Genetics

Carrier screening

- Now available on Medicare: Prepair carrier screening through VCGS
- Buccal swab
- 2/52 turnover
- Tests for cystic fibrosis, SMA and fragile X (buccal swabs)
- 5% of Australians are carriers for one or more of these conditions. 1 in 240 couples: both partners are carriers.
- https://www.vcgs.org.au/prepair-carrier-screening/

Prenatal testing

- Not a routine test
- Screening to detect chance a pregnancy is affected by chromosomal abnormality or neural tube defect or other serious congenital malformation
- Pretest counselling
- Trisomy 21 or Down's Syndrome is the most common (1 in 400 pregnancies) and the chance of an affected pregnancy increases with maternal age. Trisomy 18 Edwards and Trisomy 13 Pataus are less common and much more severe.

Combined first trimester screen

- Combined first trimester screening 11-13+6/40
- Maternal age
- NT
- Serum PAPP-A and bHCG
- High sensitivity and specificity
- Cost
- No risk to pregnancy
- Screening not diagnostic
- Results may be affected by maternal age, smoking, BMI and IVF. Ensure accurate referral details. Also additional information regarding other pregnancy complications.

NIPT

- cfDNA
- Highly sensitive 99%
- Should still have an ultrasound at 11-13+6/40 for NTD and other serious congenital malformation
- Performed after 10 weeks
- Approx 1 in 20 tests will not generate an answer (higher for multiple pregnancies)

Performance of screening tests for trisomy 21

Table 1: Screening tests for trisomy 21 currently in use in Australia and New Zealand

Test	Gestation for screening	Sensitivity	Specificity	Positive predictive value[#]
Combined first trimester screening: MA + NT + βhCG + PAPP-A	11^{+0}- 13^{+6} weeks	85%	95%	~7-10% [12]
Second trimester serum screening: MA + AFP + βhCG + UE3 +/- Inhibin	15 – 20 weeks	70-75%[13, 14]	93%	~2-3%
cfDNA- based screening*	> 10^{+} weeks	99%	99% [*]	~45%[15]

Other considerations arising from prenatal screening

- Low bHCG <0.4 associated with increased risk of IUGR
- Low PAPP-A <0.45 associated with increased risk of preeclampsia/IUGR
- Elevated NT >3.0mm associated with increased risk fetal abnormalities

Screening for risk of preeclampsia

- In past we have recommended LDA and calcium for women on the basis of risk factors for preeclampsia
- Recommendation from FIGO/Fetal Medicine Foundation: Screening with PlGF, uterine artery dopplers, mean arterial pressure and maternal risk factors at 11-13+6/40 in order to stratify risk prior to commencement of LDA
  however
- Large meta analysis has demonstrated serum PlGF biomarker can identify up to 75% of women who develop pre-term PE with delivery at <37 weeks' gestation and 90% of those with early PE at <32 weeks, at a screen-positive rate of 10%
- Available as part of cFTS or separately ($50)
- Advise LDA for women with low PlGF (and calcium if dietary insufficient)

Prevention of premature birth

- Higher risk premature birth associated with previous history, >3 D&C, previous cone biopsy or 2 previous LLETZ procedures, uterine anomalies (bicornuate, didelphys), fully dilated Csection
- Higher risk women should be referred to a cervical surveillance clinic from 14/40.
- All 18-22/40 morphology scans should include an assessment of the cervical length. If less than 35 mm on a TA scan a TV scan should be performed to recheck the length. All cervical lengths <25 mm should be referred for cervical surveillance and consideration of progesterone.
- ?Role of omega 3 supplements

Omega 3 supplementation for prevention of preterm birth

- Omega 3 fatty acids building blocks for developing fetal brain and retina
- Dietary source: seafood and oils
- Cochrane: reduced risk of PTB, slight increase in risk post term
- 500mg long chain omega 3 per day
- Most prenatal vitamins do not contain enough (200 mg)
- Difficult to obtain from dietary sources
- Fish oil: problems with quantifying and ensuring quality

Intermission

- A chance to reflect on information already received
- Opportunity for the couple to
  - Digest extensive health information
  - Consider pros and cons of non routine testing and
  - Consider preference regarding ongoing care

Part 2: Review and consolidate information

- Appropriate management of any abnormalities on routine investigations
- Assessment of risk? High risk GDM, preeclampsia, IUGR, congenital abnormalities, premature birth?
- Decision making regarding non routine tests and wishes regarding pregnancy care
- Plans for pregnancy care: Better Health Channel-Having a Baby in Victoria
- Referral cervical surveillance, MFM, Genetics other specialities as required

Probiotics

- Does not appear to reduce risk of gestational diabetes in overweight and obese women
- ? Increased risk of preeclampsia in overweight and obese women
- No observed benefit and possible harm therefore no recommendation for use in pregnancy

Diabetes: inclusive of type 1, type 2 and gestational diabetes

- 3% risk congenital malformation with HbA1c 6% compared with 6% risk with HbA1c 9% (Guerin et al)
- Reduction in adverse first trimester outcomes with decreasing HbA1c
- Switch medications: safe in pregnancy

Hypertension

- Check baseline renal functions: CUE and urinary PCR
- Switch medications to avoid teratogens
- Low dose aspirin from 12 weeks gestation

Hepatitis B&C

- LFTs
- Consider referral ID
- May need antivirals during pregnancy to reduce vertical transmission
- Pre pregnancy consider treatment for Hepatitis C

Epilepsy: 0.01%

- Medication review
- Neurology review
- 5mg folic acid

Mental Health disorder

- Risk benefit vs continuation of medications
- Additional folic acid

Cardiac disease

- Prevalence 0.2-4%
- Higher risk may advise to avoid pregnancy

VTE/thrombophilias

- 2 per 1000 pregnancy

Previous bariatric surgery

- Laparascopic band should be deflated in early pregnancy to prevent complications associated with hyperemesis
- Pregnancy is best avoided for 12-24 months after surgery to reduce risk of IUGR
- Nutritional deficiencies may arise and should be tested for
- Additional supplements required
- Dietician referral
- Consider PPI
- Do not perform GTT

Thyroid conditions

- Overt hypothyroidism 0.3-0.5%
- Subclinical hypothyroidism 2-3%
- Check for thyroid antibodies: high risk post partum thyroiditis
- Check TRAbs (Grave's disease)
- Maintain TSH <2.5 mIU/L in 1st trimester

3

Problems in the Third Trimester

Dr Ekaterina Jovic
O&G Specialist, Northern Health

Hyperglycemia in pregnancy

- Hyperglycemia in pregnancy is a major global health problem
- 1 in 6 births occur to women with some degree of hyperglycemia in pregnancy (84% due to GDM)
- Diabetes (and obesity) - a non communicable diseases pandemic (tripling of T2DM world wide over the last 30 years)
- Non communicable diseases are programmed and imprinted during pregnancy
- Diagnosis and management may help turn the tide of the diabetes

Maternal Health impacts NCD burden
Fetal Programming IUGR and macrosomia

Maternal UNDER nutrition
Malaria, anaemia, medical conditions

Barker's Hypothesis
Low Birth Weight

Predicts development of Type 2 diabetes, IGT and hypertension

Maternal Overweight, obesity, diabetes, excess weight gain during pregnancy

Pederson's Hypothesis
Macrosomia

GDM and adverse outcome

ORIGINAL ARTICLE

Hyperglycemia and Adverse Pregnancy Outcomes

The HAPO Study Cooperative Research Group*

May 8, 2008
N Engl J Med 2008; 358:1991-2002
DOI: 10.1056/NEJMoa0707943

Aim: To clarify the risks of adverse outcomes associated with various degrees of maternal glucose intolerance less severe than that in overt diabetes mellitus.

Method: Observational study (n=24,000)

Primary Outcomes:

1. Birth weight >90th centile
2. Cord blood C-peptide >90th centile

Associated with maternal glycaemia but ? physiological

3. Primary C/S
4. Clinical neonatal hypoglycaemia

Well recognised complications of pregnancies affected by diabetes

Hyperglycemia and Adverse Pregnancy Outcome Follow-up Study (HAPO FUS): Maternal Glycemia and Childhood Glucose Metabolism

The sequel: HAPO Follow-up Study: Adiposity

Lifestyle interventions for prevention of GDM

- Physical activity

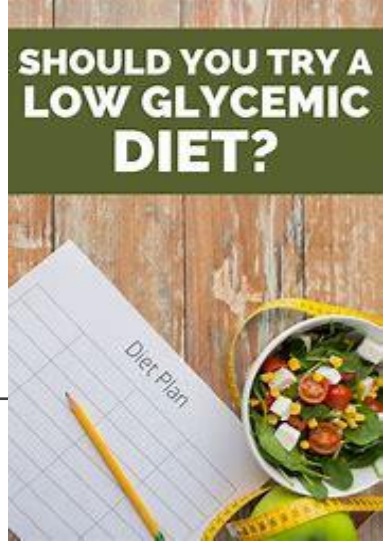
- Cochrane review (Han et al 2012) concluded that exercise program had no clear effect on preventing GDM

- RCT (Barakat at al 2013): physical activity intervention didn't reduce the risk

of healthy pregnant women developing GDM but reduced maternal weight gain,

risk of caesarean section and LGA

Lifestyle interventions for prevention of GDM



- Dietary intervention

- Systemic review of RCTs: a low glycaemic diet reduces the risk of LGA, any dietary counselling was effective in reducing the incidence of GDM compare to standard care (Oostdam et al 2011)

- RCT (Walsh et al 2012): low glycaemic diet during pregnancy did not reduce the risk of having high birth weight baby among women at risk of GDM but had beneficial effect on maternal weight gain and glucose intolerance

Lifestyle interventions for prevention of GDM

- Combine intervention

- RCT in dietary changes and physical activity – inconsistent results

- Current evidence-based recommendation is:

- Advise women that physical activity and healthy eating during pregnancy help to reduce excessive weight gain but do not appear to directly reduce the risk of diabetes in pregnancy

Diagnosis (ADIPS)

All women not previously known to have pre pregnancy diabetes or hyperglycemia in pregnancy should undergo a 75g OGTT at 24 – 28 weeks gestation

- Diabetes mellitus in pregnancy should be diagnosed by the 2006 WHO criteria for diabetes if one or more of the following criteria are met:
    - Fasting plasma glucose > =7.0 mmol/l ;
    - 2-h plasma glucose > =11.1 mmol/l following a 75 g oral glucose load;
    - Random glucose >11.1 in presence of DM symptoms
- Gestational diabetes mellitus:
    - Fasting plasma glucose 5.1–6.9 mmol/l ;
    - 1-h post 75 g oral glucose load > 10.0 mmol/l*;
    - 2-h post 75 g oral glucose load 8.5–11.0 mmol/l .

Other testing

- HbA1c –a level of ≥ 48mmol/mol (6.5%) is diagnostic of diabetes outside pregnancy and very likely represents previous undiagnosed type 2 diabetes

- HbA1c in New Zeland cohort (16,000 women), HbA1c>5.9 was associated with adverse outcome.
- No worldwide recommendation. .

- In high risk group consider 2 weeks of BSL monitoring

NDSS

- Online certified registration – quick process time (patients receive the member number by text or email)
- Benefits whilst pregnant

  - Access to glucometer from local chemist

  - Access to subsidised glucose testing strips

  - Education video and reading material

  - Free access to insulin needles if needed

- Benefit after pregnancy

  - T2DM prevention screening reminder sent yearly (60% of GDM patient will develop T2DM in 10-20 years)

  - Baby steps program NDSS – interactive online learning program, healthy eating and exercise tracking with peer support discussion platform

- Benefits to health care services

  - Collection of national statistics on prevalence of GDM and insulin use in pregnancy

Treatment of GDM (evidence)

- ACHOIS Crowther NEJM 2005 - 409 treatment (dietary advice and insulin if required) vs 510 routine care

  Target FBSL<5.5 and 2 hours <7.0

  Treatment of GDM reduces adverse perinatal outcomes related to GDM from 4% to 1%, NNT 34

- NICHD Landon NEJM 2009 - 485 (Tx dietary advice + insulin as rerequired) 473 routine

  Target FBSL <5.3 and 2 hour <6.7

  Reduction in macrosomia, shoulder dystocia, caesarean delivery and fetal overgrowth

Pharmacological treatment

- It is recognised that glycaemic targets in the treatment of hyperglycaemia in pregnancy vary between centres and clinicians around Australia
- Around 40% diagnosed at 24-28 weeks with GDM will require pharmacological treatment
- 3 fasting or 3 postprandial above target in 1 week consider insulin
- Insulin (Novorapid, Humalog, Protaphane, Optisulin)
- Metformin – crosses placenta, but safe, may still need insulin

Patient prospective/counselling

- Confused
- Concerned
- Don’t understand why
- Anxious
- Rarely positive
- Counselling: reassuring, use of available resources, explaining extra monitoring in place, chance to improve outcome and reduce risk of T2DM in the future.

Monitoring/delivery

- Glycemic targets:

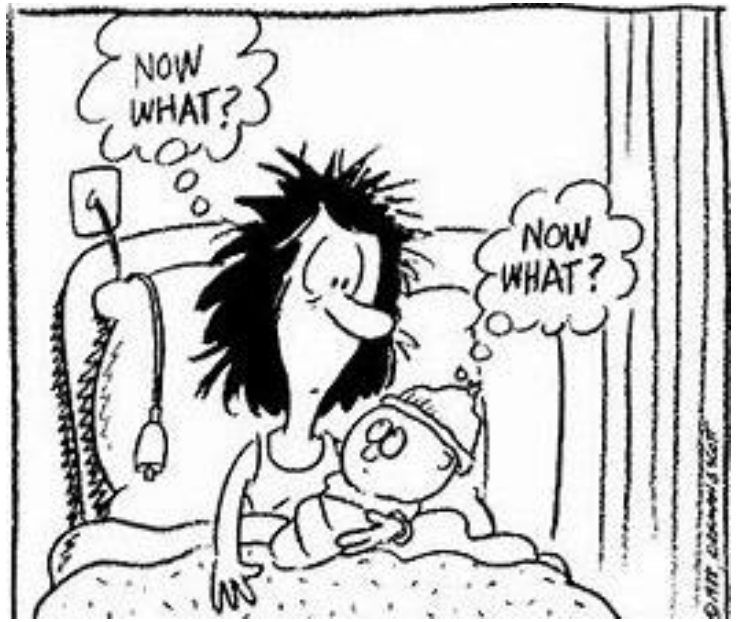
- FBSL<5.0

- Postprandial <6.7

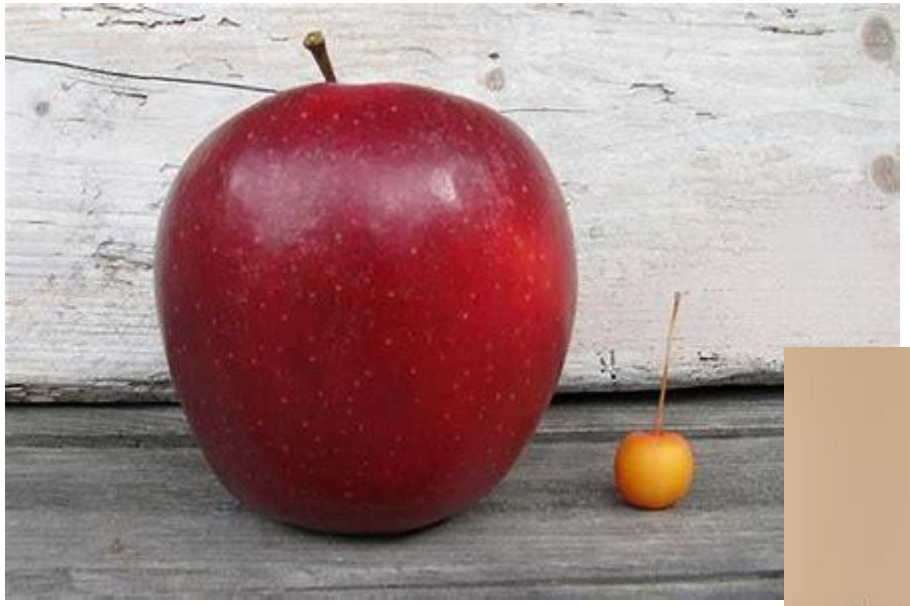
- If GDM diet consider US at 36 weeks - good control IOL >40 weeks
- GDM on insulin: growth US 28/32/36
- Good control no other risk factors IOL 39-40
- Poor control/macrosomia/large amount of insulin/other risk factors 38-39 weeks
- If predicted birth weight >4.5 kg -> delivery via caesarean section to reduce risk of SD (443 c/s to prevent 1 permanent brachial plexus injury)

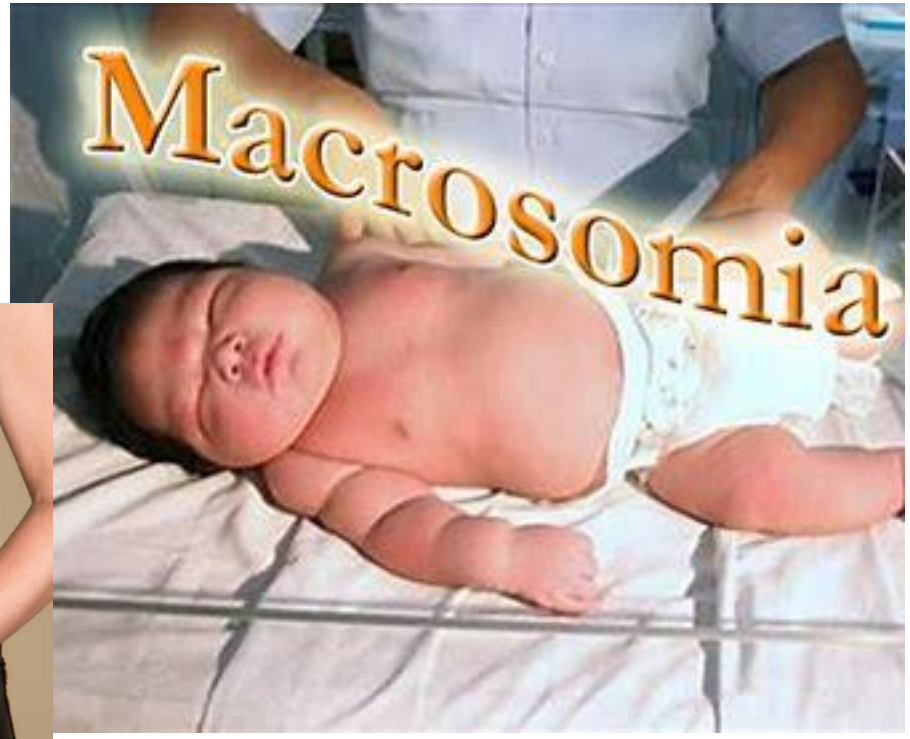
Postpartum

- OGTT 6-12 weeks postpartum
- 30% risk of recurrence in subsequent pregnancy
- Risk of developing type 2 DM ranging from 1.5-10% per year
  - annual OGTT if contemplating another pregnancy
- Not planning future pregnancy:
  - high risk for T2DM 3 yearly OGTT
  - low risk for T2DM fasting BSL or HbA1c every 1-2 year



Macrosomia





Large for gestational age (LGA)

- No standardized definition of LGA
- Birth weight >90th centile centile for gestational age (traditional)

  > 90% at term= 4000 g

  > 95% at term = 4500g

  > 99% at term =5000g

NB: we are better at picking up SGA than LGA

Issues

Neonatal:

- Shoulder dystocia (14% if 4.5 -4.750 and 21 % if 4750-5000 kg)
- 50% if mid cavity delivery
- Brachial plexus injury

  -17% resolved

  -27% permanent and severe

  -56% permanent and moderate
- Asphyxial cerebral injury
- Skull fracture/facial injuries
- Neonatal hypoglycaemia

Maternal:

- Operative delivery (20% instrumental birth for BW>4.5kg)
- Caesarean section (45% emergency cs for BW>4.5 kg)
- Genital tract trauma
- PPH/uterine rupture

Primary Prevention

1. Stop pregnant women being obese

Is bariatric surgery the answer?

"Outcome of pregnancy after bariatric surgery" (Sweden study 2015)

- Reduced GDM (2% vs 7%)
- Reduced LGA (9% vs 22%)
- Shorter GA (mean GA 39 vs 39.5)
- Increased SGA (15% vs 8%)
- Increased perinatal mortality (1.7 vs 0.7%)

Primary Prevention

2. Stop women become more obese when pregnant - educate about appropriate weight gain

BMI (kg/m2) (WHO)19	Classification	Singleton pregnancy total weight gain range	Rates of weight gain in 2nd and 3rd Trimester (kg/week)
<18.5	Underweight	12.5-18kg	0.51 (0.44- 0.58)
18.5-24.9	Normal	11.5-16kg	0.42 (0.35- 0.50)
25-29.9	Overweight	6.8-11.3kg	0.28 (0.23-0.33)
≥30	Obese (includes all Obesity classes 1, 2 and 3); Obesity Class 1: BMI 30-34.9 Obesity Class 2: BMI 35-39.9 Obesity Class 3: BMI >40	5-9.1kg	0.22 (0.17-0.27)

Secondary Prevention

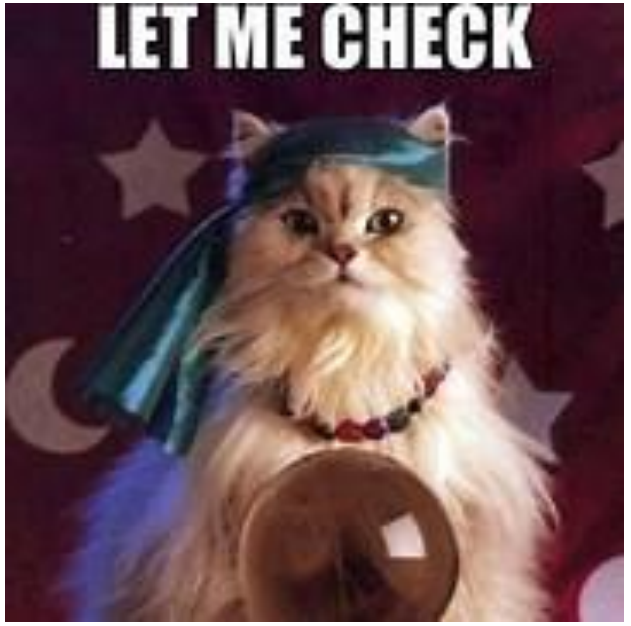
1. Identify LGA baby accurately

- Fundal height measurements will identify 1/3
- Often US is challenging (mistake +/- 10-15%)
- 50% detection rate for BW>4000 g PPV 50%

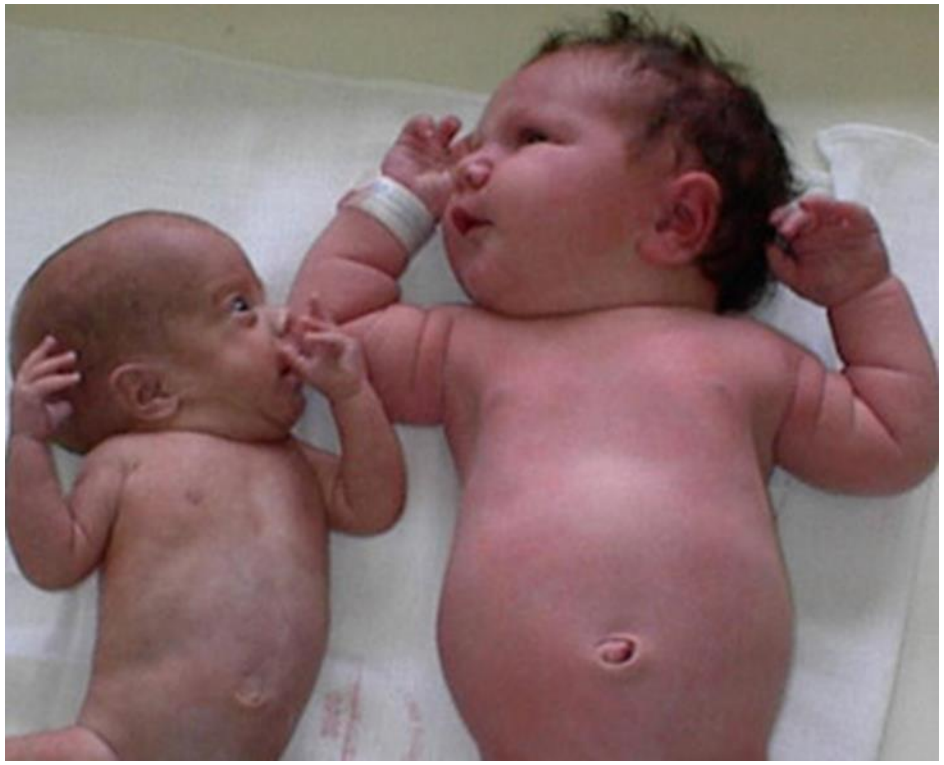
2. Do c/s or IOL earlier

Elective caesarean section:

- EFW >4.5 kg in diabetic women
- EFW >5 kg in women without diabetes
- IOL at 39 (Cheng 2012, Boulvain 2015)



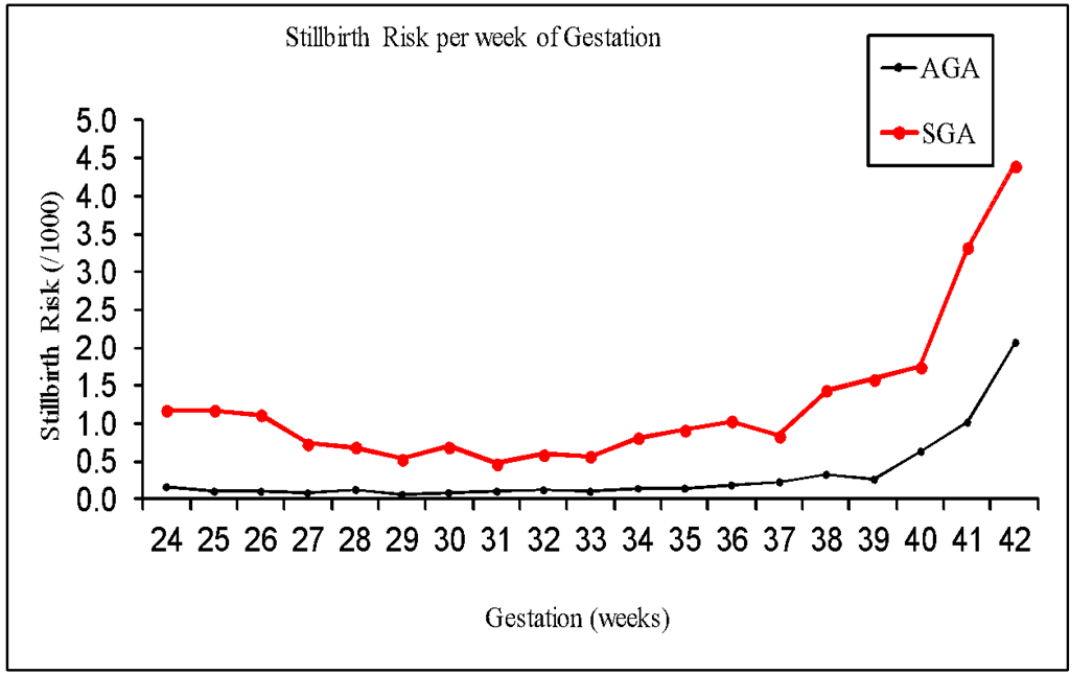
Small for gestational age



“If you are born small you keep dying all your life”

Why SGA is important

- Small for gestational age fetuses have a 3-4 fold increase in stillbirth risk
- Over half of the 3 millions stillbirths/year are growth restricted
- Improved detection of SGA fetuses is recognized as an important strategy to decrease the risk of stillbirth in late pregnancy
- More than 75% remain undetected before birth



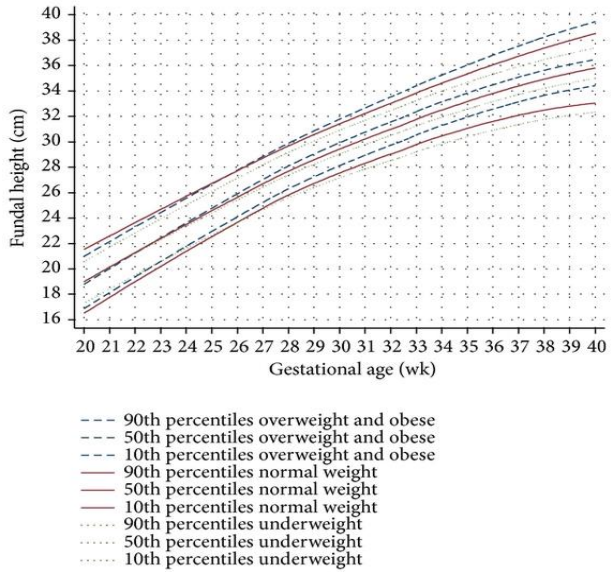
Vashevnik, Walker et al 2007

Fetal growth restriction and small for gestational age is same but different

- FGR is not synonymous with SGA.
- Growth restriction implies a pathological restriction of the genetic growth potential
- Some, but not all, growth restricted fetuses are SGA, while 50–70% of SGA fetuses are constitutionally small, with fetal growth appropriate for maternal size and ethnicity.
- The likelihood of FGR is higher in severe SGA infants.
- To differentiate – accurate measurement + functional assessment (AFI/Doppler/CTG)

How good is the measuring tape?

- The sensitivity of routine fundal height measurements for SGA infant:
  - 20%
- In overweight and obese women:
  - Sensitivity 13%
  - PPV 18%
- Better sensitivity if plotted on customised fundal heights chart
- If the symphysis-fundal height measurement in centimetres deviates by 3 or more from the gestational age in weeks or there is a plateau in symphysis-fundal height – organize growth US



Risk factors (maternal)

- **Major (OR > 2.0)**
  - Maternal age > 40 years
  - Smoker > 10 cigs/day
  - Illicit drug use
  - Chronic hypertension
  - Diabetes with vascular disease
  - Renal impairment
  - Antiphospholipid syndrome
  - Previous SGA or stillbirth
  - Vigorous daily exercise
  - Maternal/paternal SGA
- **Minor (OR < 2.0)**
  - Nulliparity
  - BMI > 30
  - IVF singleton
  - Smoking < 10 cigs
  - Pregnancy interval < 6m or > 5 years
  - Maternal diet (low fruit)
  - History of preeclampsia

Risk factors (placental and fetal)

- **Placental factors:**
  - Chronic abruption/APH
  - Uterine anomalies
  - Placental infarction
- **Fetal factors:**
  - Aneuploidy
  - Genetic syndromes
  - Congenital infections

Screening for FGR

- Assess all women for historical risk factors at the initial visit and continuously assess for the emergence of new risk factors during pregnancy
- Accurate dating
- Address modifiable risk factors – smoking, healthy weight gain, treatment of medical condition
- If one major risk factor or multiple minor factors: growth scan at 28-30 and 34-36 weeks

A few words about PET

- PET incidence 5-8% of pregnancy
- 0.5% preterm preeclampsia
- HTN in pregnancy systolic blood pressure greater than or equal to 140 mmHg and/or Diastolic blood pressure greater than or equal to 90 mmHg -> confirmed by repeated readings over several hours
- Preeclampsia is HTN + involvement of one or more other organ systems and/or the fetus (proteinuria is not mandatory to make diagnosis of PET)
- If blood pressure greater than or equal to 170mmHg systolic or 110mmHg diastolic constitute severe hypertension requiring urgent treatment.

What is new about PET?

- PERT – preeclamsia ratio test (sFlt1/PIGF)

  - Timing: 20-36+6 weeks

- Indications:

  - Women considered to be risk of PET

  - Women with clinical features suspicious of PET (but not already confirmed)

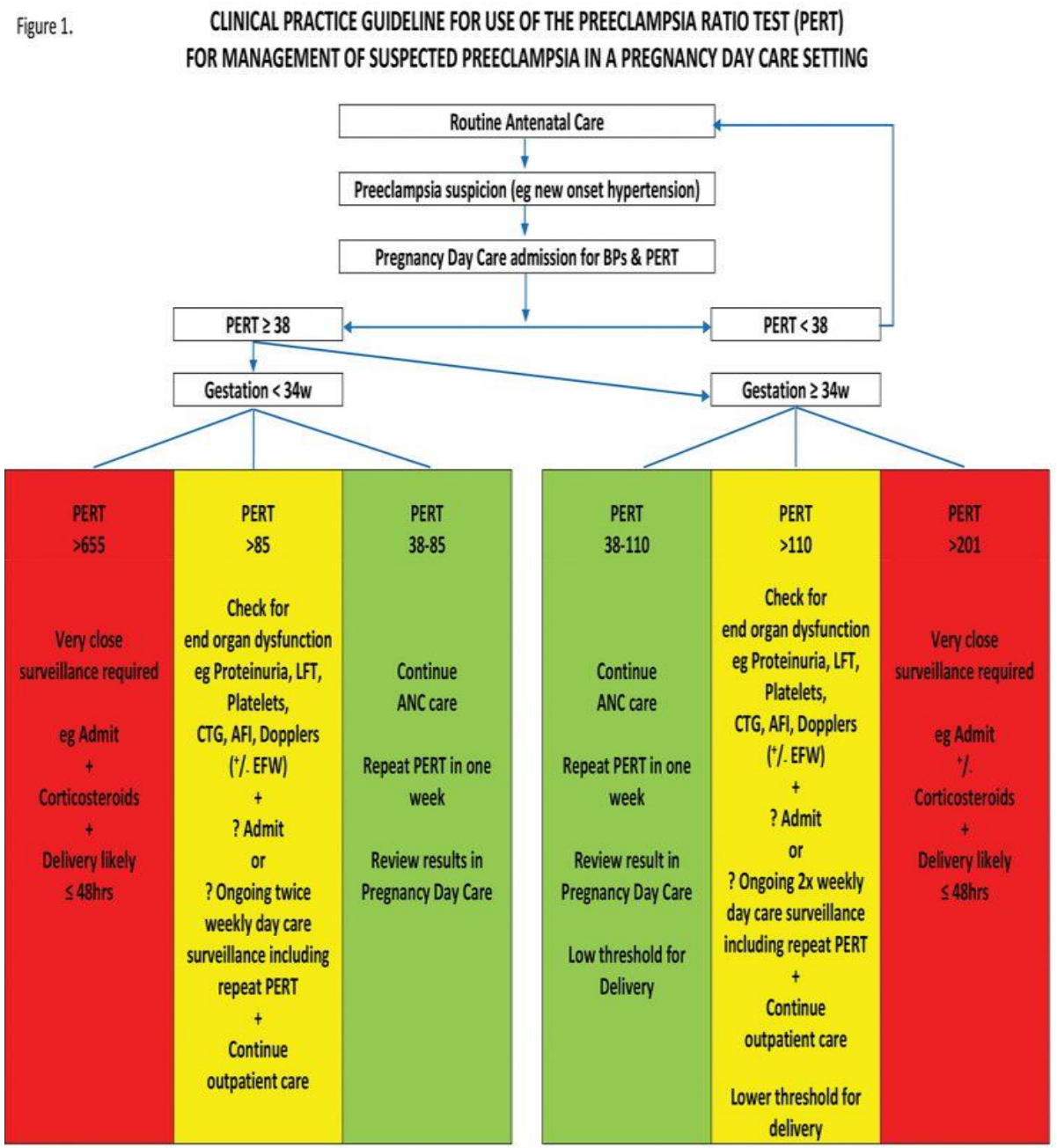
  - For management planning and decision making among the women with PET

  - To rule out conditions which mimic PET

Examples: lupus nephritis, diabetic nephropathy, chronic HTN, worsening migraines, obese patient with transaminitis secondary to fatty liver etc

PERT

PERT< 38 rules out PET within 1 week (NPV of 99.3%) and within 4 weeks (NPV 94.3%) (Prognosis study)



What is new about PET?

- Aspirin (<15 weeks) can prevent preterm PET

- 60% from baseline with 100 or 150 mg of Aspirin

- Aspirin can’t prevent term PET

- Aspirin can’t prevent FGR unless result of preterm PET

Duley at al Cochrane review, 2019

Fetal movements

Recent studies looked at increase women's awareness of FM and pregnancies outcomes:

- AFFIRM Lancet 2018
- My baby movements BJOG 2021
- Mindfetalness BJOG 2020

No statistically significant reduction in stillbirth, increase in intervention (AFFIRM) but some health benefit trend in reduction of SGA

When presented with RFM

- Always encourage presentation

- Auscultate FHR

- Comprehensive history: a review of the presence of other factors associated with an increased risk of stillbirth/FGR
- Reassure it is common presentation – but need follow up (CTG) -> review at MAC on the same day

Useful contacts for Northern Health

- Test results come to the practice and need attention within 2-4 days (abnormal GTT/low Hb) – place urgent referral
- More urgent test results: call antenatal clinic midwife in charge on 0437103097
- Elevated BP/RFM/abnormal US (reduced or increase DVP, abnormal Doppler(s), EFW < 10% or AC< 10%):

  - advise patient to present to maternity assessment centre for monitoring and planning

  - call MAC midwife in charge 8405 8330

- 24 hours BS/MAC 8405 2277 (all patients receive this number on booking)
- Need advice:

  - Obstetric registrar number: 8405 8408

  - Gynaecology registrar number: 840552521

Questions


giving birth wasn't so bad after all.
easy for you to say.
lizclimo.tumblr.com

4 *Session Conclusion*

Shared Maternity Care Workshop Session 2

Next Monday 4th December 7:00 PM – 9:00 PM

Topic 1: Prenatal screening and non-invasive prenatal tests (NIPT) - what is our current standard of care?

In this session, A/Prof Lisa Hui (Mercy Health), will outline the current state of prenatal screening in Victoria and discuss routine maternity care. She will also explain areas of uncertainty and debate, such as the role of expanded NIPT, as well as the role of ultrasound in the NIPT era.

Topic 2: Modes of delivery - what is a 'normal' birth?

In this session, Dr Vicki Carson (The Royal Women's Hospital), will outline the 6 main modes of delivery available in Australia. Including, the pros and cons for each, common misconceptions, and provide a framework for helping women understand risks and realistic expectations of labour and birth.

Sign up via the NWMPHN website: https://nwmphn.org.au/event-detail/shared-maternity-care-collaborative-workshop-session--1/a08Mo000008vyZFIAY/

You will receive a post session email within a week which will include slides and resources discussed during this session.

Attendance certificate will be received within 4-6 weeks.

RACGP CPD hours will be uploaded within 30 days.

To attend further education sessions, visit,

https://nwmphn.org.au/resources-events/events/

This session was recorded, and you will be able to view the recording at this link within the next week.

https://nwmphn.org.au/resources-events/resources/

We value your feedback, let us know your thoughts.

Scan this QR code