National Hauora Coalition

Clinical Decision Support Best Start Pregnancy Tool

Gen2040

Best Start background

Best Start Pregnancy Kōwae (modules) provides tools which enable consistent comprehensive best practice assessment of health and wellbeing needs of a hāpū māmā and her pēpī throughout the pregnancy utilising appropriate enquiry, investigations, management and referral to support services.

The Best Start Pregnancy tool has been constructed by considering what constitutes best practice care in pregnancy care in New Zealand and consolidates this in one tool. The content has been sourced from:

- National or international evidence-based guidelines; Ministry of Health, Midwifery College, Royal Australian and New Zealand College of Obstetricians and Gynaecologists
- Section 88 non-LMC first trimester care requirements
- Recommendations of the national Perinatal Morbidity and Mortality Review Group
- Subject matter expert opinion- where there is no guideline or consensus statement

The point of difference for the Best Start Pregnancy Tool is the built-in decision support, enabling identification of issues and early intervention, which ultimately will improve health and wellbeing outcomes for hāpū māmā and pēpī.

The data input into the Best Start Pregnancy Tool is coded consistent with the HISO 10050.2:2020 Maternity Care Summary Standard, January 2020.

> *This standard is designed to ensure that information related to maternity care is consistently recorded and contributes to high-quality care of women and babies. The data set can be shared to support continuity of care between providers and communication with whānau and family. The structured and coded information enables meaningful benchmarking of services and other analytics* (Ministry of Health 2020).

The Best Start Clinical Decision Support document summarises the justification and evidence for information, and triggers that set support and recommendations, and provides expert opinion when there is an evidence gap.

The decision support logic is displayed as follows:

Legend	
Grey	i-field – provides clinical support information for the question
Blue	Decision support information
Green	Identified equity gains
Red	Areas which require careful implementation to avoid widening disparities
Purple	HealthPathway links
Aqua	Recommended best practice – trigger for Action Summary
Blue and Red	Medication
Hyperlinks	Direct reader to reference table

Abbreviation	Description
EDD	Estimated Date of Delivery
Gen2040	Generation 20240 Equity Project
LMP	Last Menstrual Period
NHC	National Hauora Coalition
IUGR	Intra uterine growth restriction
SGA	Small for Gestational Age
API	Application Programming Interface
PMS	Practice Management System
PHO	Primary Healthcare Organisation

Document Control

1.1 Version history

The table below lists the major changes for each distributed version of the document.

Ver.	Date	Author	Description
0.1	2020.02.10	Dr Christine McIntosh	Initial draft
0.2	2020.02.12	Penny Elliot	Review
0.3	2020.02.14	Bronnie Farnell	Review
0.5	2020.02.25	Rawiri Jansen	Review
0.6	2020.04.24	Dr Christine McIntosh	Updated
0.6	2020.05.15	Bronnie Farnell	Review

1.2 Distribution list

Name	Role / Unit
Christine McIntosh	Clinical Advisor
Dr Rawiri McKree Jansen	Clinical Director
PHO	

Project	Generation 2040
Project Executive	Rawiri McKree Jansen
Document status	Published
Document control	V0.3 2020.02.12

Contents

New Pregnancy

Confirmation of pregnancy

A positive pregnancy test is required to confirm eligibility for Section 88 funding, and Gen 2040 requires both a positive test and identification of pēpī Māori for NHC incentive claims.

Asssisted pregnancy

Assisted pregnancy is associated with specific risks. For example, oocyte donation is associated with a high risk of hypertension and pre-eclampsia, sperm donation is a risk factor for pre-eclampsia and IVF increases risk of premature birth.

The positive response to assisted pregnancy contributes to decision support for Pre-Eclampsia. Women who fall into the assisted pregnancy category are likely to be under specialist care, and may not present in the first trimester of pregnancy.

i. e.g. IVF, sperm donation, oocyte donation, ovulation induction

Decision support
Assisted pregnancies increase risk for pre-eclampsia.

Pregnancy dates

Last menstrual period (LMP) is used to calculate expected date of delivery (EDD). LMP may not be known because pregnancy has occurred following previous pregnancy, without an interval menstrual period, or pregnancy has occurred while on contraception, or LMP is potentially inaccurate because of irregular menstrual periods.

Deciding the timing for Combined Serum Screening, anatomy scanning, deciding when a pregnancy is post-dates and induction is indicated, and deciding if pre-delivery steroids are required for foetal lung maturation in premature delivery are all examples of why reasonably accurate pregnancy dates are important. At the same time, it is important to avoid early pregnancy scanning without a clear clinical indication because it, does not improve outcomes and creates unnecessary waste of resource.

The information from the pregnancy dates response in the tool is used to determine the recommendation for a scan for the purposes of determining accurate pregnancy dates. There is no national guideline for determining when pregnancy dates are sufficiently uncertain as to need an early pregnancy scan. This is not included in the New Zealand Obstetric Ultrasound Guidelines Dec 2019, although the guideline clearly states that “souvenir scanning” should be avoided (Ministry of Health 2019a). We have worked with the authors who have provided advice on appropriate decision support for uncertain dates.

i. Irregular menstruation is when the length of the menstrual cycle has varied by more than 20 days in the last 12 months.

Equity Gain
Inappropriate referral for ultrasound in early pregnancy is common and leads to unnecessary cost to the health system.

Decision support

Indications for early pregnancy scans (less than 12 weeks)

Indications include:

- *bleeding or pain in early pregnancy, or concern about pregnancy loss (section 88 codes TA and EP)[1]*
- *consideration of termination of pregnancy (section 88 code CT)*
- *unknown dates* (section 88 code BA)*
- *hyperemesis gravidarum*
- *trauma*
- *pregnancy with an intrauterine contraceptive device (IUCD) in situ*
- *previous ectopic pregnancy (section 88 code EP)*
- *complex medical conditions where a change of medication may be indicated such as warfarin.*

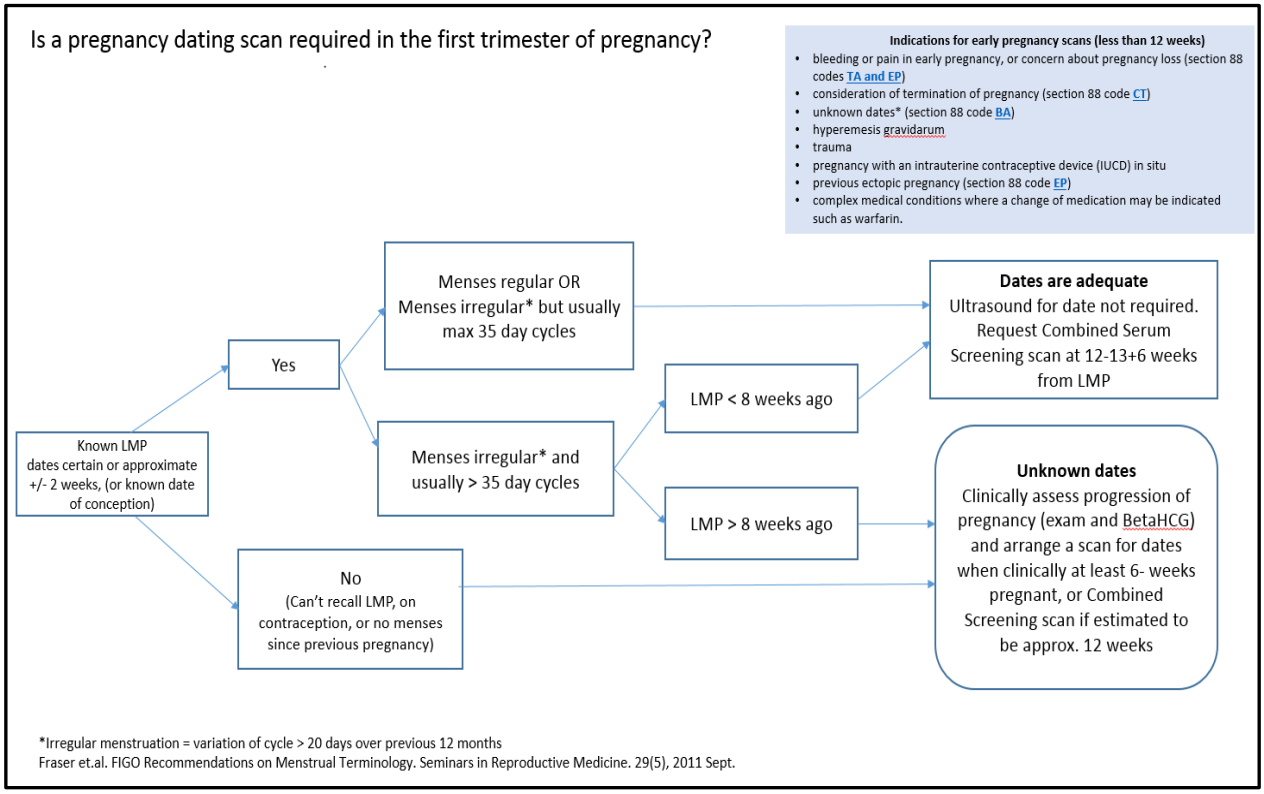
**Please note: Confirmation of dates by ultrasound is not routinely required before the 12-week scan.*

Required clinical details

- *Last menstrual period (LMP)*
- *Woman's symptoms*
- *Beta human chorionic gonadotropin (βhCG) if available*
- *Previous relevant history*
- *Appropriate section 88 code*
- *Previous caesarean section.*

Figure 1 shows a proposed algorithm to assist in recommending scanning when dates are uncertain. This has been developed for the Best Start Pregnancy tool in consultation with subject matter experts.

Figure 1: Proposed pregnancy scanning algorithm



There is proposed decision support to enable appropriate request for pregnancy dating scans in the first trimester

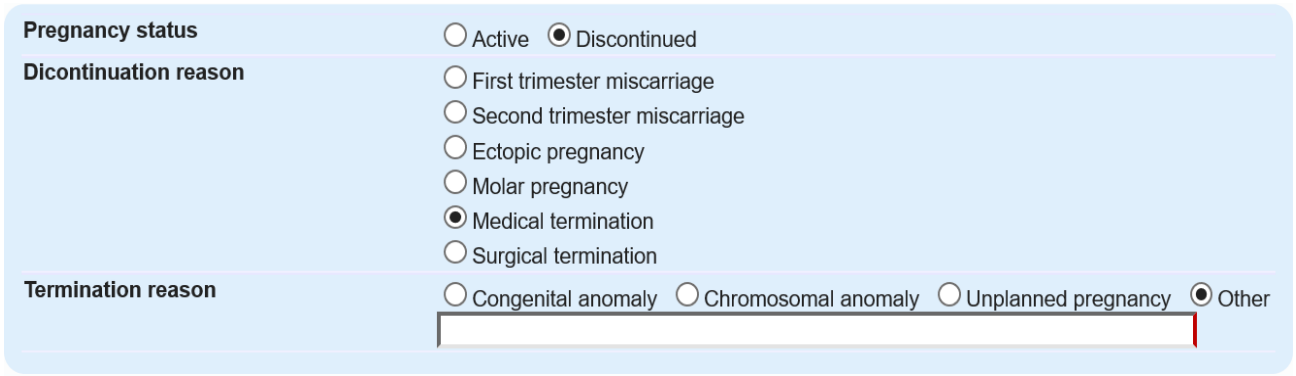
Response to pregnancy

A hāpū māmā's response to her pregnancy news is important to set the priorities for the consultation, as her immediate needs may require a modified approach and identification of support pathways and recommendations or information for referral to other health professionals.

HealthPathways: ***information on adoption and ToP***

Pregnancy Status

Pregnancy status is used to determine if a pregnancy is ongoing or, in the case of pregnancy discontinuing (miscarriage or termination of pregnancy), the record can be completed and the reason for discontinuation documented.



Ethnicity

The Best Start Pregnancy tool asks for the ethnicity of the pēpī. As per MoH data standards up to six ethnicities can be recorded, and, if confirmed pēpī (baby) is Māori, up to three iwi can be recorded.

Decision support

Maternal Māori, Pacific, African, Indian, ethnicities are minor genetic risk factors for pre-eclampsia.

Equity Gain

Generation 2040 funds assessment for mothers of Māori infants.

Early Pregnancy problems

Identification of problems which may require urgent attention and change the priorities of the consultation

Early pregnancy problems	☐ Vaginal bleeding ☐ Low abdominal pain ☐ Nausea/Vomiting ☐ UTI ☐ Trauma ☐ IUCD In Situ
Comments	

Decision support

"Vaginal bleeding" or "Low abdominal pain" ticked:	***Always consider an ectopic pregnancy if positive pregnancy test, and abdominal pain or bleeding. [Link to HealthPathway on miscarriage and ectopic pregnancy.]***
"Nausea/Vomiting" ticked:	***See HealthPathway for Nausea and Vomiting in Pregnancy. [Link to HealthPathway on Nausea and Vomiting and Pregnancy.]***
"UTI" ticked:	***See HealthPathway for UTI in Pregnancy. [Link to HealthPathway UTIs in Pregnancy.]***
"Trauma" ticked:	***Consider whether ultrasound is indicated for trauma.***
Request ultrasound for IUCD in situ	***Request ultrasound for IUCD in situ***

Obstetric History

Gravida

i *How many pregnancies have you had including this one (include stillbirth and miscarriage)*

Parity

i *Number of births >20 weeks gestation*

Is this the first pregnancy you have had with your current partner?

i *Question assumes this is the mother's current partner*

Details of previous miscarriage, termination of pregnancy and molar pregnancies are all important and relevant to the current pregnancy and may contribute to risk (e.g. preterm birth risk with history of surgical termination or miscarriage) which requires surveillance.

Decision support

Had 3 or more consecutive first-trimester miscarriages with the same partner or 2 or more consecutive 2nd trimester miscarriages with the same partner	***Recurrent miscarriage*** • ***Increased risk of spontaneous preterm birth.*** • ***Consider testing for: Parental karyotype, Activated protein C resistance, Anticardiolipin antibodies, Lupus anticoagulant, prothrombin ratio, thyroid function tests.***

Previous births

This section records the details of previous births and includes information which contributes to decision support for gestational diabetes, preterm birth risk, and small for gestational age risk.

Disparity risk

There is a risk of disparity created if the history of previous births is not completed well, for example for women who may not recall details or for women of higher parity. Particular attention is required to encourage healthcare professionals to take a careful history and obtain information from a woman's past obstetric record if required, to complete the full history. Once completed, the tool will retain the information for subsequent pregnancies.

Small for Gestational Age (SGA)

Infants are defined as small for gestational age if their birthweight is less than the 10th centile for their specific ethnicity population growth standard. Most SGA infants have not reached their biological growth potential because of foetal growth restriction caused by placental dysfunction. SGA infants account for 28-45% of non-anomalous stillbirths and have a higher risk of sudden unexpected death in infancy (SUDI), neurodevelopmental delay, childhood and adult obesity, and metabolic disease. The majority of small-for-gestational-age babies are not recognised before birth (McCowan et al 2017).

The maternal factors that contribute to an infant being born SGA include; smoking, hypertension, pre-eclampsia, poorly controlled diabetes, obesity and poor nutrition.

- The first version of Best Start Pregnancy Tool will require inputting information on previous SGA births which will require maternal recall, and good review of past obstetric notes.
- We plan to introduce the GROW algorithm (gestation.net) which will enable the Best Start Pregnancy tool to calculate whether a previous baby was SGA according to ethnicity and maternal BMI (see **Figure 2**). Access to GROW will be via an Application Programming Interface (API).

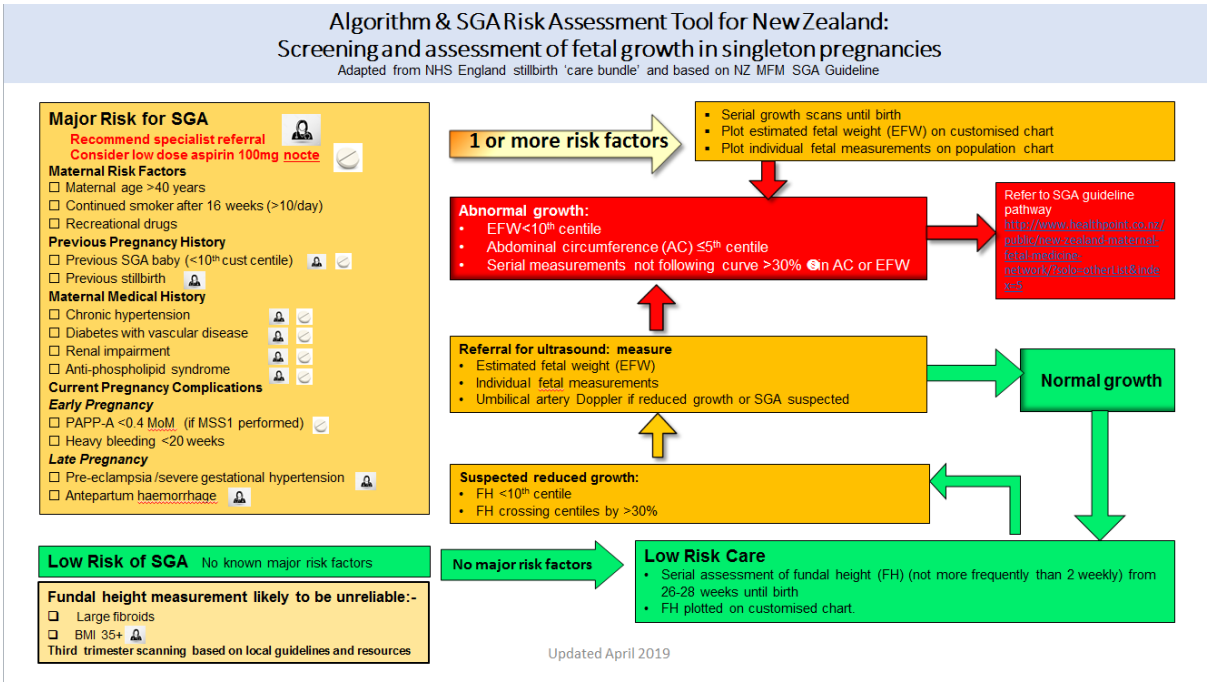
Equity Gain

As a population group, pregnant Māori women have higher prevalence of risk factors for SGA. Early and accurate identification of previous birth of a SGA baby will enable early initiation of aspirin in pregnancy, education and support around contributory risks, and planned surveillance of the growth of the foetus in the current pregnancy.

SGA weight varies by ethnicity. It is necessary to know the ethnicity of the infant to determine birth weight centile. Best Start Pregnancy Tool will eliminate system bias produced by non-ethnicity specific growth charts by incorporation of the GROW algorithm which will enable ethnicity specific calculation.

Decision support

Any of: • ***Chronic hypertension*** • ***Renal Disease*** • ***Previous still birth***	***At increased risk of SGA*** • ***Provide information on aspirin in pregnancy*** • ***Check for contraindications for Aspirin. If no contraindications start low dose aspirin 100mg in the evening*** • ***Request obstetric specialist review*** • ***LMC please consider Growth Scans according to local guidelines***
Any of: • ***No outcome recording for any previous baby*** • ***No weight recorded for any previous baby*** • ***Parity >0 and no previous babies*** • ***And no other evidence of SGA***	***Current information is insufficient to determine if risk factors for SGA*** • ***Recommended further review of past obstetric and maternal medical history by LMC***



Preterm Birth

Being born early carries significant immediate risk for survival and higher risk of lifelong impacts including chronic health problems, developmental and behavioural problems.

Eight percent of Māori infants are born prematurely which is higher than the rate for any other ethnicity group in Aotearoa, New Zealand (Ministry of Health 2019b).

> *More babies of Māori, Pacific and Indian mothers are born extremely preterm and so these ethnic groups are disproportionately affected by suboptimal care for mothers and babies at these gestations. This is compounded if there are also inequities in provision of care by ethnicity… inequities by ethnicity are increasingly found in health care both in New Zealand and overseas and are associated with implicit bias and racism (PMMRC 2018 p.8).*

The risks for pre-term delivery that are highly modifiable at the point of early pregnancy assessment and have good preventative interventions are incorporated into the Best Start Pregnancy Tool:

- Aspirin for foetal growth restriction (IUGR and SGA) and pre-eclampsia risk
- Cessation support for smoking and drug use
- Treatment of urinary tract infection (UTI) and asymptomatic bacteriuria and ongoing testing and treatment throughout pregnancy
- Screening and treatment for chlamydia
- Early identification and control medical conditions such as hypertension and diabetes.

A history of previous preterm birth is an indication for specialist obstetric assessment, and importantly - interim early proactive management of conditions contributing to risk of premature birth (Ministry of Health 2012).

Equity Gain

Early proactive identification and management of modifiable risk for preterm delivery in early pregnancy is an obvious opportunity to "do better" thereby contributing to the elimination of disparity in preterm births for Māori infants.

Decision support

Any of: • ***Previous preterm birth <37 weeks*** • ***At risk of pre-eclampsia*** • ***At risk of small for gestational age*** • ***Previous cervix intervention; LLETZ, cone biopsy*** • ***Diabetes*** • ***Multiple pregnancy (current)*** • ***Fibroid uterus*** • ***Previous surgical management of miscarriage or TOP*** • ***UTI*** • ***Asymptomatic bacteriuria*** • ***Chlamydia infection*** • ***Smoking and drug use***	***At increased risk of preterm birth*** • ***Explain that she has past or current issues which increase the chance of this baby being born too early. Getting the right help early can prevent preterm birth.*** • ***Provide brief specific advice on the risk of smoking and drug use on preterm birth, support and encourage engaging with smoking and/or cessation support.*** • ***Actively manage pre-eclampsia and SGA risk.*** • ***Treat infection and make plan for who and how further testing and follow up will occur.*** • ***Consider requesting early obstetric specialist advice or assessment depending on the issue. See HealthPathway Antenatal First Assessment.***
Any of: • ***No outcome recorded for any previous baby*** • ***No gestation recorded for any previous baby And no other evidence of preterm birth risk factor***	***Current information is insufficient to determine if risk factors for preterm birth*** • ***Recommend further review of past obstetric and maternal medical history by LMC.***

Medical History

The tool auto-populates existing long-term condition classifications from the PMS using READ codes. Category check boxes enable identification of conditions, free text fields enable capture of detail.

A link to the HealthPathway for Pregnancy Medical Conditions provides guidance on specific health condition related care and guidelines on specialist referral.

An advantage of completing the Best Start Pregnancy Assessment in Primary Care is the access to the PMS record. Even if a woman is new to a practice her record from her previous GP can be requested, and additional information added once this electronic record is received. Health Practitioners should seek additional information via the DHB electronic record.

HealthPathways: ***Pregnancy Medical Conditions***

Disparity risk

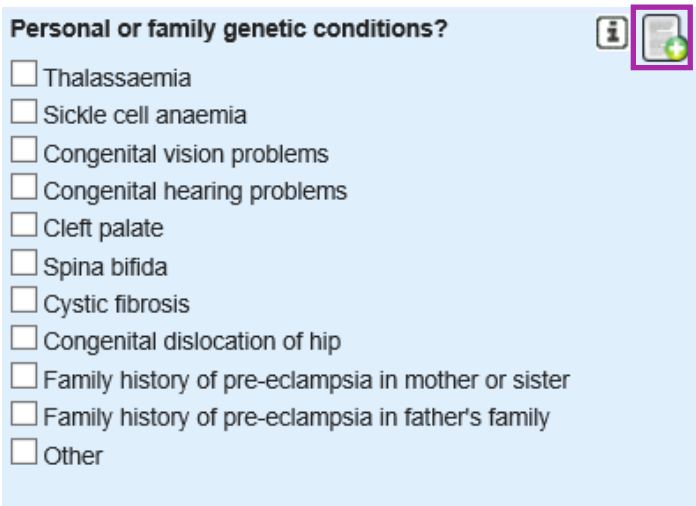
A potential risk of inequity may be created through system bias favouring women for whom a thorough past medical history is available. If a woman has moved through various DHBs and/or infrequently seen a GP (e.g. used urgent care to seek healthcare) clinical history may be incomplete.

Equity Gain

The Best Start Pregnancy Tool seeks to minimise this system bias by ensuring that health information for pregnancy is available and not dependant on whether the woman is enrolled in the practice or resident in the DHB or health facility location where she accesses care.

Personal or family genetic conditions

This section enables identification of any congenital conditions which are relevant to the current pregnancy and may require specific prophylaxis (e.g. high dose folic acid for neural tube defect, sickle cell anaemia) or surveillance (congenital dislocating hip, congenital hearing impairment). Additionally, there is decision support to pick up familial risk of pre-eclampsia.



HealthPathways*: 4. Assessment -personal or family genetic disorders*

i. *Congential abnormalities (present since birth) or illnesses in other family members including the father and father's family. Check also about deceased members.*

Mental Health

Significant physiological, social and psychological change occurs for women, their partners, and family/whanau in the pregnancy and post-partum period.

The 2015 New Mothers' Mental Health Survey in New Zealand reported that between 11-16 percent of mothers develop depression, anxiety or other mental illness in the perinatal period (Health Promotion Agency 2016). Women (and their partners) may experience mental health concerns for the first time during this period. However, women who have ongoing or previous mental health problems or a family history of mental illness are much more vulnerable to onset or exacerbation of mental health problems.

Perinatal mental distress or illness may negatively affect the mother-baby relationship and potentially harm the baby's development. Early intervention, working on the mother- baby relationship improves outcomes and reduces the need for later interventions. Most women experiencing mild to moderate mental distress can be managed by their GP and community support agencies. Women with severe mental distress should be referred early to specialist services.

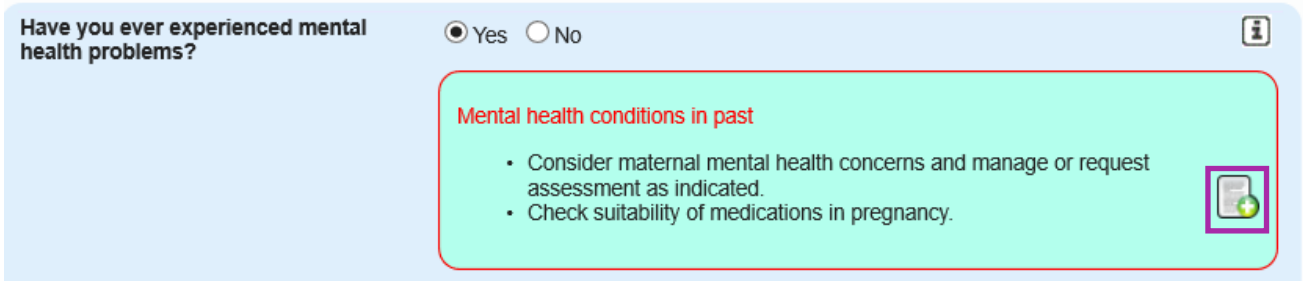
Equity Gain

Maternal suicide is the leading cause of maternal mortality in New Zealand. The rate of maternal suicide is seven times the rate in the United Kingdom. Māori women are overrepresented among maternal suicides. Between 2006 and 2016, 16 (57 percent) of the 28 women who died by suicide in pregnancy, or within six weeks of pregnancy, were Māori.

In the absence of any validated early pregnancy mental health screening tool the Best Start Pregnancy tool takes the approach of prompting a careful assessment of mental health distress or illness if a woman has a past or current mental health problem, and prompts brief screening with PHQ-2 (Patient Health Questionnaire) and GAD-2 (Generalised Anxiety Disorder) screening tools which primary care practitioners in New Zealand are familiar with and are using in other contexts. A positive response to brief screening prompts further assessment and management and links to the HealthPathway.

Affirmative response activates a free text field.

i. *Check personal and family history of mental illness, particularly in the perinatal period and consider risk factors for mental distress or illness. If there is a histlry of perinatal psychosis see HealthPathway for further information*



HealthPathways: ***Pregnancy and Post-Partum Mental Health***

Disparity risk

There is an evidence gap with respect to the use of the PHQ-2 and GAD-7 brief screening tools in the context of first trimester pregnancy care and with Māori women. Evaluation is required to determine the efficacy and appropriateness of the use of the mental health screening tools. PHQ-2 and GAD-2 in Best Start Pregnancy, particularly in respect to use with Māori women.

Decision support

Answered "Yes"	*Mental health conditions in past* • *Assess for current mental distress/illness [Link to HealthPathway on Perinatal Mental Health]* • *Complete EPDS or PHQ-9 or GAD-7 as appropriate* • *Consider maternal mental health concerns manage and request specialist assessment as indicated. [Link to HealthPathway on Perinatal Mental Health.]* *Check suitability of medications in pregnancy.*
If positive response to PHQ2 or GAD2	*Positive depression/anxiety screen* • *Complete EPDS or PHQ-9 or GAD-7 as appropriate.* • *Consider maternal mental health concerns manage and request specialist assessment as indicated*

Depression and Anxiety screening

Positive response to GAD-2 and PHQ-2 questions triggers decision support for best practice recommendations appearing in an aqua box.

Positive depression and anxiety screen

- Complete EPDS or PHQ-9 or GAD-7 as appropriate
- Consider maternal mental health concerns and manage or request assessment as indicated.

HealthPathways: *Pregnancy and Post-Partum Mental Health*

Wrap around support

Support people

It helps the practitioner to understand a woman's strengths through her family/whānau connectivity and identify people whom she considers important in the decisions and choices she makes in her pregnancy and beyond. Consideration should be taken when a woman is relatively isolated and or lacking in identifiable supports to have a low threshold for requesting additional support though Whānau Ora, Family Start and other community agencies.

Who are the people you live with who will help to care for your baby? (tick all that apply)

- ☐ Mother (of baby)
- ☐ Father (of baby)
- ☐ Grandparent/s
- ☐ Baby's brother/s or sister/s
- ☐ Auntie/uncle/cousin/s
- ☐ Friend/s
- ☐ Other caregiver
- ☐ Partner of Father
- ☐ Partner of Mother

Smoking

In pregnancy there are quite specific risks associated with smoking on the short term and long-term health and wellbeing of a developing foetus. There is strong evidence that if a woman smokes it is best that she quit before becoming pregnant or quit as early as possible if she unexpectedly discovers she is pregnant.

Smoking in pregnancy contributes to increased risk of;

- Placental insufficiency and baby born small for gestational age
- Preterm birth
- Antepartum haemorrhage
- Birth defects e.g. cleft lip and palate, club foot
- Sudden unexpected death in infancy (SUDI)
- Long term effects on infant health
    - lung development; asthma
    - Increased risk of obesity and heart disease in adulthood
    - glue ear
    - impaired brain development

A woman is most likely to be successful in quitting smoking if she engages with a smoking cessation service. Exposure to second-hand smoke is associated with adverse pregnancy and infant outcomes. Presence of other household members who smoke will influence a pregnant mother's capacity to breathe smoke free air and encumber success of her attempt to quit smoking (Ministry of Health 2014a).

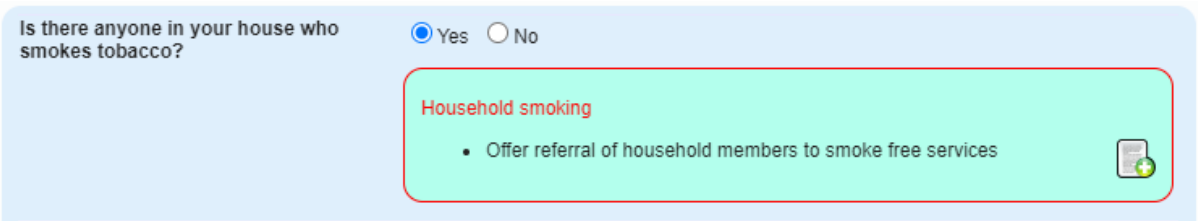
Equity Gain

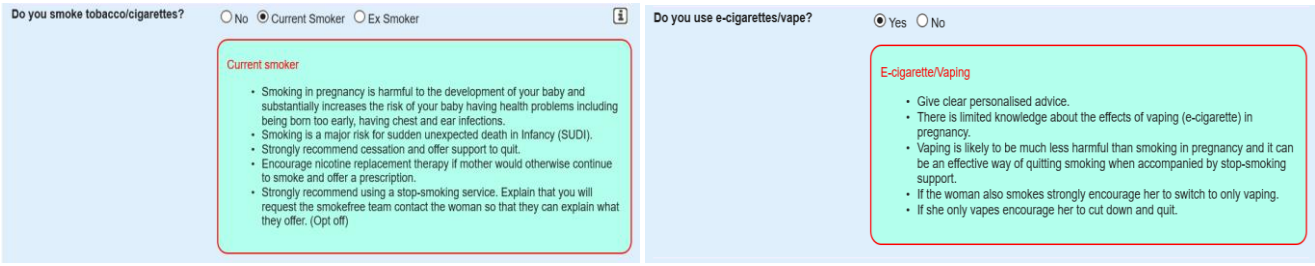
Māori women have a high rate of smoking during pregnancy, and smoking causes considerable burden in morbidity and mortality.

Consistent early effective smoking behaviour change conversation and subsequent positive engagement with smoking cessation services in early pregnancy is likely to be the single factor which produces the greatest effect on eliminating disparity experienced by Māori in maternal and child health and wellbeing outcomes.

Electronic cigarettes (e-cigarettes or vapes) are becoming increasingly popular and are touted as a safer alternative to smoking tobacco in pregnancy. There is no evidence in the literature which can guide us on the safety of e-cigarette use in pregnancy therefore it is important that women are informed about this lack of knowledge.

The Best Start Pregnancy Assessment Tool takes the well-established ABC approach; **A**sk about smoking, provide **B**rief clear personalised advice, and offer referral for **C**essation support. A link is provided to the HealthPathway for smoking cessation advice (Ministry of Health 2014b).





i. A current smoker has smoked at least 1 cigarette in the last month and more than 100 cigarettes in their lifetime.

Decision support

Any household smoking	*Household smoking* *Offer referral of household members to smoke free services.*
Current smoker	*Current smoker* • *Smoking in pregnancy is harmful to the development of your baby and substantially increases the risk of your baby having health problems including being born too early, having chest and ear infections.* • *Smoking is a major risk for sudden unexpected death in Infancy (SUDI).* • *Strongly recommend using a smoking cessation service.* • *Explain that you will request the smokefree service contact the woman to explain what they can offer her, and she can choose at that time whether she wants to continue with them.* • *Encourage nicotine replacement therapy if she would otherwise continue to smoke and offer a prescription.*
Vaping	*E-cigarette/Vaping* • *Give clear personalised advice.* • *There no knowledge about the safety and effects of vaping (e-cigarette) use in pregnancy.* • *Vaping is likely to be much less harmful than smoking in pregnancy and it can be an effective way of quitting smoking when accompanied by stop-smoking support.* • *If the woman also smokes strongly encourage her to switch to only vaping.* • *If she only vapes encourage her to cut down and quit.*

Alcohol

The following information is summarised from the Health Promotion Agency's report *Drinking alcohol during pregnancy: A literature review* (Health Promotion Agency 2014).

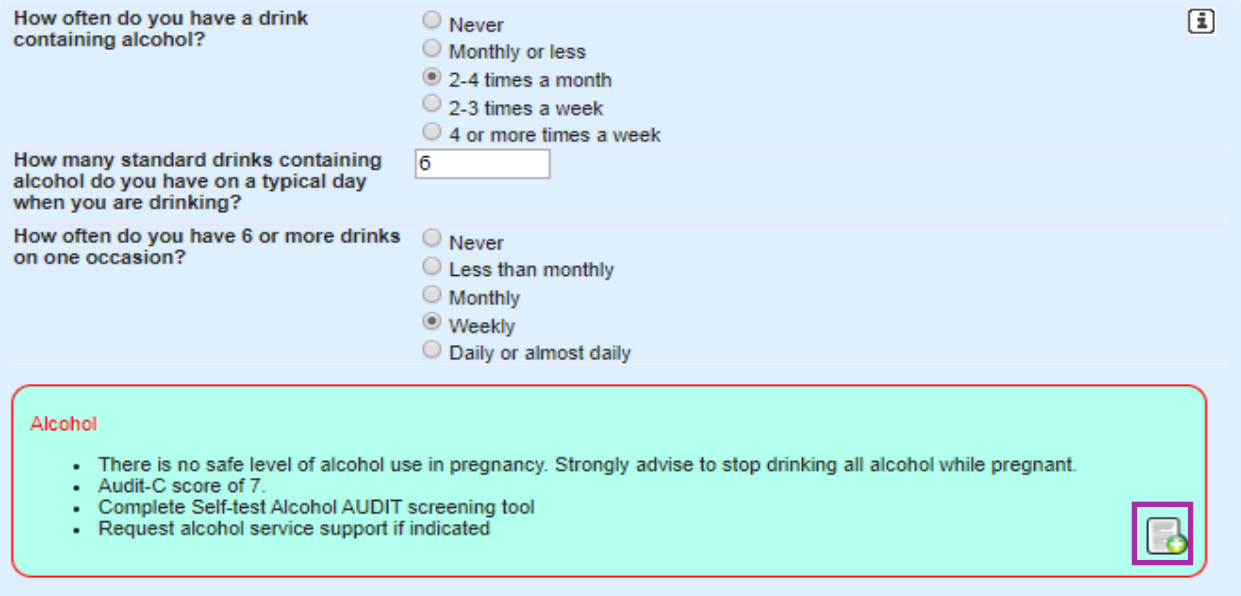
Healthcare providers are key sources of information on alcohol for pregnant women and can endorse prevention messages. However, women may not recall receiving advice on drinking during pregnancy especially if it is given verbally. A lack of formal training of providers means that information may be given in an unstructured way and providers may feel unsure of how to respond to a woman who is drinking alcohol and perceived as high risk.

The Best Start Pregnancy tool puts alcohol consumption assessment as routine enquiry in early pregnancy using the AUDIT-C Assessment Tool, as recommended since 2010 by the Ministry of Health (Ministry of Health

2010; World Health Organization 2001). Based on the score of AUDIT-C, the tool then prompts the provider to do further assessment. Foetal Alcohol Spectrum Disorder (FASD) describes a spectrum of physical, psychological and behavioural disabilities which result from exposure to alcohol during pregnancy (Research New Zealand 2014). FASD is preventable if no alcohol is consumed during pregnancy and this recommendation is adhered to.

The following factors most consistently predict women who are more likely to consume alcohol in pregnancy;

- Frequent and/or high alcohol consumption pre-pregnancy
- Alcohol problems
- Being abused or exposed to violence
- Social or psychological factors (e.g. anxiety or depression)
- Older age
- Higher socioeconomic status
- Smoking.



i. Ask about the past month or since knowing she was pregnant, whichever is longer.

HealthPathways: ***Alcohol Intervention***

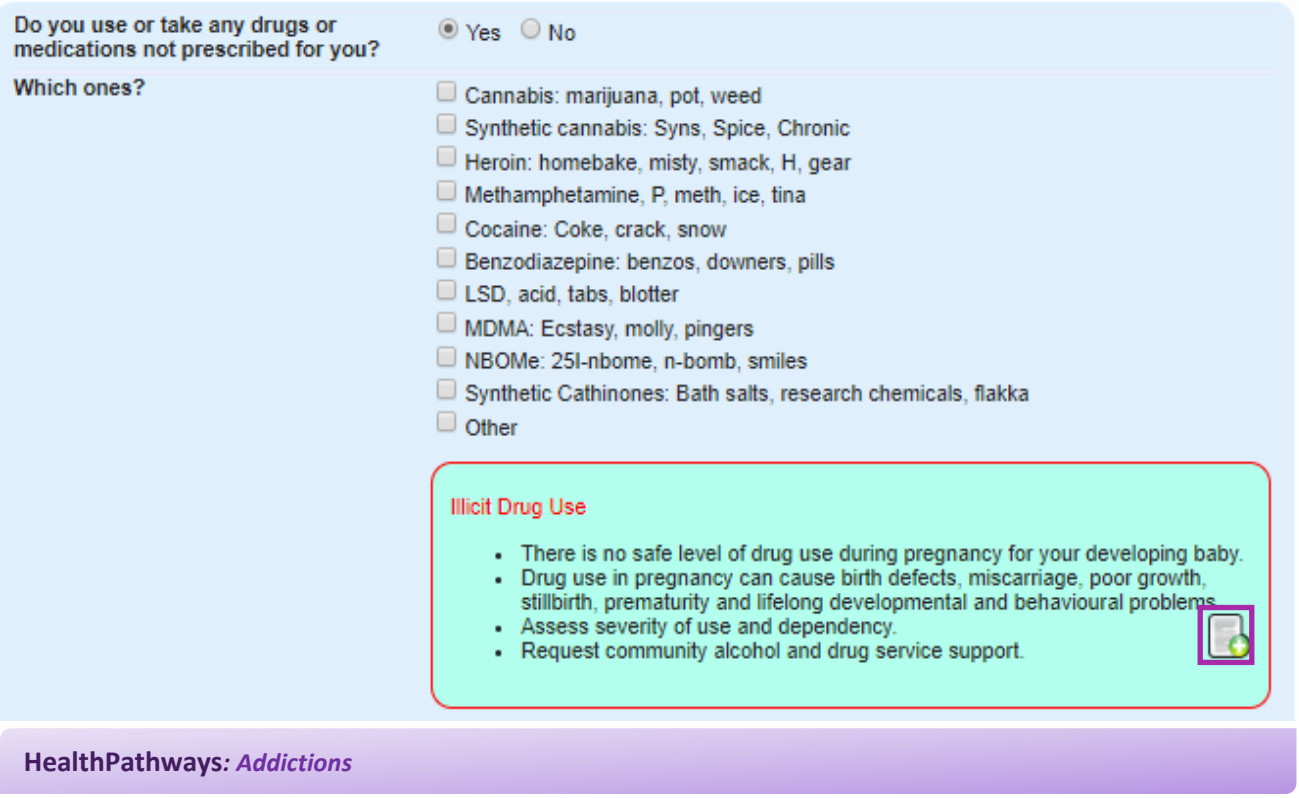
Decision support

Any drinking	• ***There is no safe level of alcohol use in pregnancy.*** • ***Strongly advise to stop drinking all alcohol while pregnant.*** • ***Other factors may make it more difficult to quit alcohol; pre-pregnancy frequent or high alcohol consumption, smoking, exposure to abuse/violence, social or psychological factors. Consider referral to alcohol support service.***
Audit-C score > 5	• ***Audit-C score of x indicates high risk drinking*** • ***Complete Self-test Alcohol AUDIT screening tool*** • ***Other factors may make it more difficult to quit alcohol; pre-pregnancy frequent or high alcohol consumption, smoking, exposure to abuse/violence, social or psychological factors.*** • ***Request alcohol service support if indicated [Link to HealthPathway on Alcohol Intervention.]***

Drugs use in Pregnancy

Substance use in pregnancy is a common problem associated with adverse outcomes for both mother and baby, often leading to preterm birth and small for gestational age babies as well as abnormalities in physical, cognitive and behavioural development. It is recommended that substance use is assessed early in pregnancy and if identified sensitive counselling and referral to an appropriate multidisciplinary drug and alcohol management programme should be undertaken (The Royal Australian and New Zealand College of Obstetricians and Gynaecologists 2018).

The Best Start Pregnancy Tool contains routine enquiry for drugs and non-prescribed medications and provides advice based on a positive response, and a link to the HealthPathway for Addictions Support to enable rapid access to further information on assessment and management of substance use and services for support.



Healthy housing

A warm, dry stable and safe home is important for the health and wellbeing of whānau/families. Early pregnancy is an opportune time to ask about healthy housing and offer support to create a healthy home in preparation for a new baby.

The Healthy Homes Initiative programme has improved health and social outcomes for families who have taken part. Healthy Homes Initiative

As at December 2018, the Healthy Homes Initiative (HHI) programme has received 15,330 eligible referrals and delivered over 40,000 interventions to low-income households. These are estimated to have resulted in 1,533 fewer hospitalisations, 9,443 fewer GP visits and 8,784 fewer filled prescriptions in the first year after the programme's intervention (Pierse et al 2019).

Do you have a stable, safe home with enough room for everyone? ○ Yes ◉ No

Family of 5 in one bedroom

Is your home warm and dry? ○ Yes ◉ No

House is cold, mould on ceiling in bedroom

Healthy Homes

- Consider requesting Healthy Homes Initiative. Check criteria in pathway

HealthPathways: ***Healthy Homes Initiative***

Decision support

Either question answered "No"

Healthy Homes

- ***Consider requesting Healthy Homes Initiative. Check criteria in pathway [Link to HealthPathway on Healthy Homes Initiative.]***

Family violence

Routine enquiry for Intimate Partner Violence (IPV) should occur at every prenatal and postpartum visit (maximum three opportunities).

Routine enquiry should be current (past year) and lifetime experience of physical, sexual and/or psychological partner abuse. See the Family Violence Assessment and Intervention Guideline (Fanslow and Kelly 2016).

Because family violence affects a lot of women and children, we ask about it in pregnancy.

Is there anyone in your life whom you are afraid of, who hurts you in any way or prevents you from doing what yout want to do?	◉ Yes	○ No
Is there anyone at home who makes you feel you are no good or worthless?	◉ Yes	○ No
Have you ever had a relationship with someone who made you feel afraid, hurt you, or made you have sex when you didn't want to or in a way you didn't want?	○ Yes	◉ No
Are you afraid of your partner or ex-partner?	◉ Yes	○ No
Have you been hit, kicked, punched, or hurt by someone in the last year?	○ Yes	◉ No

Family Violence

- Determine risk category and decide on appropriate support.

HealthPathways: ***Family Violence***

i. *Ask about Family Violence when apropriate*
Do not ask about abuse if patient

- *Has urgent medical needs*
- *Is under the influence of drugs*
- *Has cognitive disability*
- *Iis empotionally traummitised*
- *Has language barriers*
- *Has partner present, or has not chance to talk privately*
- *Has a child aged > 2 years*

Decision support

Any question answered "Yes".

Family Violence

- ***Determine risk category and decide on appropriate support. [Link to HealthPathway on Family Violence]***

Use the following to write to pdf document
SVF= screen family violence, then either Y (yes), U (unable to complete), then + (if positive screen), - (if negative screen), PH (if past history but no longer a risk). i.e. could get SFV + PH, or SFV U or SFV

Examination and Health Checks

Blood Pressure

initial assessment the tool enables early identification of risk factors, appropriate referrals and provides recommendations for commencement of preventative therapies. The Best Start Pregnancy tool incorporates best practice recommendations into the decision support (Ministry of Health 2018)

Major risk factors for developing pre-eclampsia include;

- history of pre-eclampsia or HELLP (Haemolysis, Elevated Liver enzymes, Low Platelet count),
- chronic hypertension,
- pre-existing diabetes, renal disease,
- autoimmune diseases,
- family history of pre-eclampsia
- oocyte donation.

Women at high risk of developing pre-eclampsia should begin taking low-dose aspirin on or before 12 weeks of pregnancy and calcium before 16 weeks' pregnancy to reduce their risk of developing pre-eclampsia and the resulting adverse events such as preterm birth.

Equity Gain
Early proactive identification and management of modifiable risk including risk for pre-eclampsia and preterm delivery in early pregnancy is an obvious opportunity to "do better" and thereby contributing to the elimination of disparity in preterm births for Māori infants.

Decision Support

Retrieves from PMS all blood pressures recorded 12 months prior and since the date of LMP/date of conception (including any blood pressure recorded on the form itself).

Any BP recorded > 160/110.	*High Blood Pressure* • *BP of xxx/xx recorded dd/mm/yyyy* • *Give medication immediately to lower blood pressure [Link to HealthPathway on Hypertension in Pregnancy and Postpartum]* • *Request acute obstetric assessment.*
Any BP recorded ≤ 160/110 but > 140/90 and gestation < 20 weeks	*High Blood Pressure* • *Gestation < 20 weeks and most recent BP > 140/90. Repeat measurement and if confirmed, record chronic pre-existing hypertension* • *If not previously investigated arrange investigation of hypertension [Link to HealthPathway on Hypertension in Pregnancy and Postpartum* • *Start or review antihypertensive medication management suitable in pregnancy*
Any BP recorded ≤ 160/110 but > 140/90 and gestation ≥ 20 weeks	*High Blood Pressure* • *Gestation ≥ 20 weeks and most recent BP > 140/90 - possible pre-eclampsia.* • *Seek urgent advice from obstetrics [Link to HealthPathway in Hypertension in Pregnancy and Postpartum*

Height/weight/BMI

Healthy weight change in pregnancy is important for maternal and infant health outcomes. Excessive weight gain during pregnancy can increase risk for:

- high blood pressure with complications in pregnancy (pre-eclampsia)
- diabetes during pregnancy (gestational diabetes)
- needing a caesarean section
- having a large baby which increases the risk of obese weight in childhood and early adult life
- maternal difficulty losing weight after the baby is born increased risk of developing diabetes, heart disease and some cancers later in life.

Not gaining enough weight during pregnancy increases the risk of having a premature (preterm) birth, or a small for age baby (SGA). The Best Practice Pregnancy tool has inbuilt decision support to enable calculation of BMI and incorporates the weight changes recommendations in accordance with MoH's *Guidance for Healthy Weight Gain in Pregnancy* (Ministry of Health 2014c).

Decision support

If pregnancy <10 weeks gestation	*Recommended healthy weight gain in pregnancy based on BMI is:* • *BMI <18.5 = 13-18kg,* • *BMI 18.5-24.9 = 11-16kg,* • *BMI 25-29.9 = 7-11kg* • *BMI >30 = 5-9kg*
If ≥ 10 weeks gestation	*Ask for pre-pregnancy or early pregnancy weight. Use this to calculate BMI and provide recommendations based on this.* *If pre-pregnancy or early pregnancy weight is not known, then display* • *No information on weight. Advise on recommended weight gain based on clinical assessment and history.* *Link* *https://www.health.govt.nz/system/files/documents/publications/healthy-weight-gain-in-pregnancy-poster-aug14.pdf*

Heart Sounds

Heart sounds; normal or abnormal, free text box to capture additional information.

Decision support

Abnormal	*Heart Sounds* • *Consider whether obstetric physician assessment is required. [Link to HealthPathway on Heart Conditions and Pregnancy.]*

Abdominal/Pelvic &Respiratory Exam

Free text box to capture information.

Abdominal/pelvic examination

Respiratory

Cervical Screening

The National Screening Unit provide the following advice: The NCSP encourages GPs, nurses and midwives to raise women's awareness of the importance of having regular smears during pregnancy. If the woman is due for a smear but has a screening history of all result normal smears, a decision may be made to delay screening until three months' post-partum (National Screening Unit 2016).

Cervical screening up to date ○ Yes ◉ No

Cervical screening status ○ Completed today ○ Declined ○ Recall set

i. *Cervical smears are safe to perform in pregnancy and should be performed if the woman is overdue.*

Decision support

Yes	***Information tab:*** ***Cervical samples can be taken at any time during pregnancy particularly if the woman:*** • ***Has never been screened*** • ***Is overdue for a test*** • ***Has an abnormal screening history and is dur for a test, or;*** • ***If the woman has a normal screening history, a decision may be made to delay screening until three months' post-partum*** ***Set a recall.*** ***NOTE: it is recommended to use a cervibroom. Do not use a cytobrush.***

Sexually transmitted infection examination and testing

Sexually transmitted infections occurring during pregnancy can have a profound effect on the mother and developing foetus. STI's may be asymptomatic, chronic infections or historical but still relevant e.g. genital herpes, genital warts.

HIV, Hepatitis B, syphilis testing is routinely offered in the first antenatal blood tests and chlamydia testing should be offered to all women in pregnancy. Other testing should be offered if indicated by her history or symptoms

Sexually transmitted infection examination and testing

Any symptoms suggestive of STI?

- ☐ None
- ☐ Vaginal discharge
- ☐ Dysuria
- ☐ Genital sores
- ☐ Abnormal intermenstrual bleeding (before pregnancy)
- ☐ Lower abdominal pain
- ☐ Other

Examination

i. It is recommended all women are tested for chlamydia in pregnancy . A self-test low vaginal swab is satisfactory. Check history of vaginal discharge, dysuria, genital sores, abnormal intermenstruation bleeding, lower abdominal pain. If positive-see Health Pathways- Female Sexual Health check for appropriate testing and managment. If no history suggestive of STI then provide routine ascreening for syphillis and chlamydia.

i. If no history suggestive of STI then provide routine screening for Chlamydia and syphilis

HealthPathways: *Female Sexual Health Check*

Routine Testing

The MoH recommend a set of routine testing in early pregnancy. It is important that women know what is being tested for, who will notify her of the results, and what she will be offered if she will require further testing or treatment. Consider other testing if indicated e.g. hepatitis C.

Routine screening

- Complete blood count
- Blood group, Rhesus factor and antibodies
- Rubella antibody status
- Hepatitis B serology
- Syphilis serology; for more information, see: BPAC information on syphilis
- HIV (the Ministry of Health recommends that all pregnant women be routinely offered HIV testing)
- HbA1c
- Ferritin

Chlamydia testing	Completed Previously	Ordered Today	Declined
Routine antenatal blood tests	Completed Previously	Ordered Today	Declined
Midstream Urine	Completed Previously	Ordered Today	Declined

i. Routine antenatal bloods consider whether additional testing is required based on medical history.

i. Routine screening for asymptomatic bacteriuria

P: Patient handout on antenatal blood tests

First trimester combined screening and Second trimester maternal serum screening

Screening can provide information about the chance of the baby having Down syndrome or other conditions. The screening options available provide a risk estimate for Down syndrome (trisomy21), Edwards Syndrome (trisomy 18), Patau Syndrome (trisomy 13) and other rare genetic disorders.

First trimester combined screening Is available for women less than 14 weeks pregnant. This option combines the results of a blood test and a nuchal translucency (NT) ultrasound scan with other information, such as maternal age and weight, to give a risk result.

Second trimester maternal serum screening Is available for women 14-20 weeks pregnant and combines the results of a maternal blood test with other information including maternal age and weight, to give a risk result.

First/Second Trimester Combined Screening

Combined screening

- (•) Accepted
- ( ) Declined
- ( ) Midwife to request
- ( ) Other

i. First trimester genetic screening should be offered at 9-10 weeks, if the patient does not have an LMC general practice, as non LMC providers are required to offer screening. Optimal screening: blood test at 9-13 weeks and nuchal translucancy scan is 11-13.5 weeks gestationtation. If a woman first presents in her second trimester offer second trimester screening.

HealthPathways: *Antenatal Genetic screening*

Equity Gain

Māori and Pacific women have the lowest uptake of completed first versus second trimester screening after adjusting for age, deprivation and DHB. Cost may be a contributing factor to inequity in timing of completed prenatal screening uptake, as first trimester screening incurs a part-charge to the individual, while second trimester screening is fully funded. Systemic factors within the NZ maternity model of care may also be contributory with a potential disconnect occurring for the woman between primary medical care and later registration with a Lead Maternity Carer in the first trimester.

Disparity Risk

Payne et. al. note that it is possible that a limitation to access to first trimester screening for Maori and Pacific woman is the co-payment cost of ultrasound scanning. If cost is a major driver of disparity the potential benefit of the Best Start Pregnancy Tool in prompting referral for screening will be diminished, and indeed may create a widening of disparity. Some DHB's enable access by covering the co-payment cost, for specific populations, but this then creates a disparity based on location.
It is important that evaluation of the Best Start Pregnancy Tool considers equity in access to ultrasound scanning including first trimester combined serum screening.

The following is content from the National Screening Unit which describes the clinical requirements around offering screening (National Screening Unit 2012).

The Ministry of Health recommends all pregnant women are offered antenatal screening for Down syndrome and other conditions in either the first or second trimester of pregnancy (National Screening Unit 2014a).

The exception is women who have:

- been pregnant with or had a child with a significant physical or learning disability
- a family history of a genetic condition.

These women should be offered a referral for a discussion with a specialist obstetrician or geneticist prior to being offered screening (National Screening Unit 2014b).

The maternity provider referring the woman for screening must:

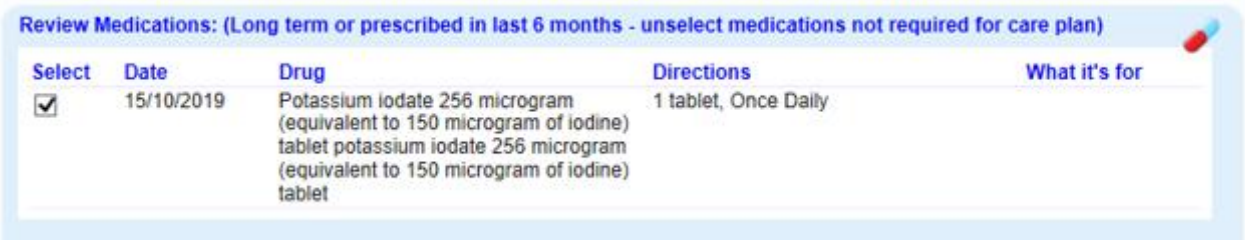
- provide written and verbal information about screening to the woman, and support her to obtain further information if appropriate
- discuss antenatal screening for Down syndrome and other conditions as early as possible in the pregnancy, to allow women the opportunity to consider participation in screening, ask questions, and seek further information
- confirm and document informed consent (which may be verbal) prior to ordering screening
- agree how results will be communicated to the woman and by whom.

Medicines

Careful consideration and discussion of the risk and benefits of all medicines are required in the management of pregnant women or women intending to become pregnant. Medicines, where possible should be used at the lowest effective dose for the shortest possible duration (Medsafe 2013).

- Medicines should be used with caution in pregnancy
- Medicines should only be prescribed in pregnancy if the expected benefits to the mother are greater than the risk to the mother and foetus
- First trimester exposure to medicines presents the greatest risk of foetal malformations.

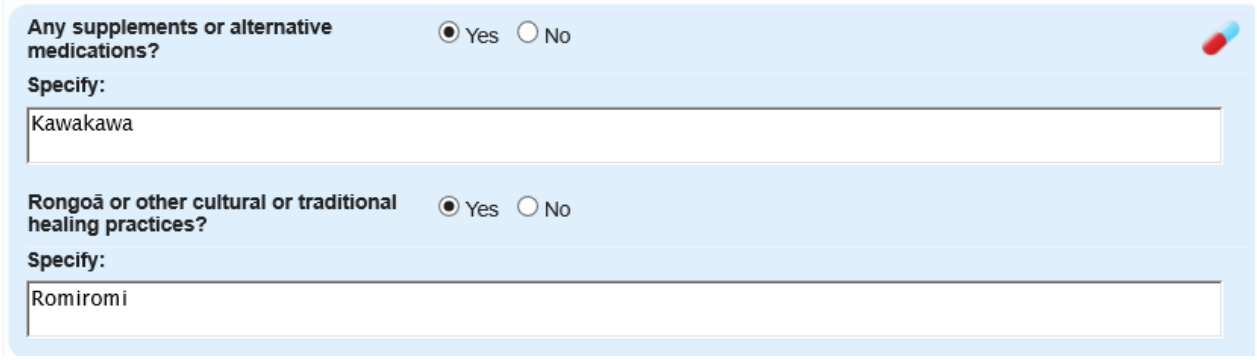
The Best Start Pregnancy tool facilitates practitioners to consider the implications of prescribed and non-prescribed medications in pregnancy, the tool sources prescribing information from the PMS and pre-populates the form.



Review Medications: (Long term or prescribed in last 6 months - unselect medications not required for care plan)

Select	Date	Drug	Directions	What it's for
☑	15/10/2019	Potassium iodate 256 microgram (equivalent to 150 microgram of iodine) tablet potassium iodate 256 microgram (equivalent to 150 microgram of iodine) tablet	1 tablet, Once Daily	

The tool asks about non-prescribed medicines e.g. over the counter medications, supplements etc.



Any supplements or alternative medications? ◉ Yes ○ No

Specify:

Kawakawa

Rongoā or other cultural or traditional healing practices? ◉ Yes ○ No

Specify:

Romiromi

***Tablet**: Community pharmacy guide on medicine safety in pregnancy*

Medications/supplements

- Review medications. See Medications in Pregnancy and Breastfeeding

HealthPathway: ***Medications in pregnancy and breast feeding.***

First-trimester medicine exposure (particularly days 18 to 56 post-conception) is associated with the highest risk of malformation. Use of some medicines in the third trimester may be associated with withdrawal effects in the foetus (e.g. SSRIs).

All available information about the medicine, as well as any circumstances unique to the patient, should be considered. It is also worth considering any medicines the male partner of a pregnant woman is taking as rarely these may also cause problems (e.g., finasteride). Medicines should only be prescribed in pregnancy when the expected benefits to the mother outweigh any potential risks to the mother and foetus. The 'pill'

icon links to the Community Pharmacy Guide on medicine safety in pregnancy (Best Practice Advocacy Centre New Zealand 2019).

Folic Acid

A major cause of birth defects is the neural tube defects (NTDs), which include spina bifida and anencephaly occur at a rate of 3.4 per 10,000 live births – around 20 babies each year in New Zealand. Taking folic acid supplement in early pregnancy reduces NTD risk.

Women at low risk of a NTD affected pregnancy, who plan to become pregnant, are recommended to take a 800 µg of folic acid daily for at least four weeks prior to conception, and for 12 weeks after conceiving to reduce the risk of NTDs (Ministry of Health 2019c).

Women who are themselves affected with a NTD, or who have had a child with a NTD, or a close family member who has had a NTD, or whose partner is affected or had a family history of NTD, are recommended to take a higher dose of 5000 µg (5 mg) of folic acid daily for at least four weeks prior to conception and for 12 weeks after conceiving to reduce the risk of NTDs.

A daily folic acid tablet of 5 mg is also recommended for women who are on insulin treatment for diabetes or with medical indications (coeliac disease, sickle cell anaemia) for at least four weeks prior to conception and for 12 weeks after conception to reduce the risk of NTDs.

A daily folic acid tablet of 5 mg is also recommended for women who are taking medicines known to affect folate metabolism such as anti-epileptics (e.g. carbamazepine, sodium valproate). This tablet should be taken for at least four weeks prior to conception and for 12 weeks after conception to reduce the risk of NTDs.

Already taking folic acid?	○ Not currently ○ Regular dose (0.8mg daily) ◉ High dose (5mg daily)
Reasons for high dose folic acid	☑ History of neural tube defect in mother, father or their children ☐ Maternal diabetes mellitus ☐ Coeliac disease (or other malabsorption state) ☐ Sickle cell anaemia ☐ Taking antiepileptic medications ☐ No reasons for high dose folic acid
Prescribed today	○ Not required ○ Regular dose (0.8mg daily) ◉ High dose (5mg daily)

i. Ideally should be started 4 weeks prior to conception and continued for first 12 weeksof pregnancy , throughout pregnancy if mother has sickle cell anaemia.

Decision support

Any of the following answered in the tool is auto filled, or checked manually from list, then recommended higher dose folic acid:

- ***History of neural tube defect in mother, father or their children***
- ***Maternal diabetes mellitus***
- ***Coeliac disease or other malabsorption state***
- ***Sickle cell anaemia***
- ***Taking anticonvulsant medications***

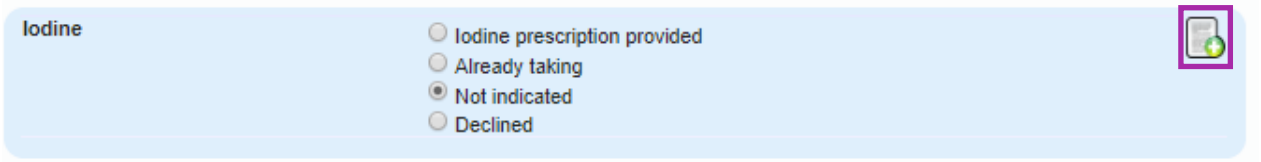
If no indications found for high dose folic acid, then recommend regular dose folic acid

Recommend to take higher dose folic acid 5 mg daily from 4 weeks preconception until 12 weeks completed pregnancy (ongoing throughout pregnancy for women with sickle cell anaemia).

Low risk for NTD
Regular dose folic acid 0.8 mg daily indicated until the end of 12 weeks pregnancy.

Iodine

Iodine is important in foetal growth and brain development; pregnant and breastfeeding mothers need more Iodine. Iodine supplementation of a 0.15 mg tablet once daily through out pregnancy and breastfeeding is indicated for most women (Ministry of Health 2018b).



HealthPathways: ***Iodine supplementation in pregnant women***

Aspirin

Pre-eclampsia is a syndrome caused by abnormal development and function of the placenta. Aspirin as an anti-platelet agent is thought to work by acting to prevent clotting and inflammatory pathological changes in the placenta occurring in early pregnancy, which result in abnormal placental function, and therefore pre-eclampsia. Recommended treatment for prevention of pre-eclampsia is Low dose aspirin 100mg enteric coated tablet taken at night from 12-weeks to 36-weeks of pregnancy, provided there no contraindications for use (Ministry of Health 2018a).

In a Cochrane systematic review treatment of women at high risk of preeclampsia with low dose aspirin before 16 weeks of pregnancy achieved a relative risk (RR) of 0.54 (95%CI 0.41-0.70). (A relative risk of 1.0 means that there is no effect of the intervention on the outcome. A value less than one with confidence intervals that do not cross 1.0, show an effective intervention which lowers risk. A RR over 1.0 indicates an increased risk of the outcome.) There is still good effect low dose aspirin for women at moderate risk RR 0.86 (95% CI 0.79 to 0.98) (Duley, L et al 2007). There is minimal evidence of harm from initiating aspirin earlier than 12 weeks of pregnancy, and it may improve compliance to initiate at the first consultation (L. McCowan, personal communication, 23 Aug 2019).

Calcium

Calcium supplementation in pregnancy (1.5-2 g per day of elemental calcium) started by 16 weeks of pregnancy reduces the risk of pre-eclampsia. For women at higher risk, calcium supplementation is highly effective (RR 0.22, 95% CI 0.12 to 0.42) to prevent pre-eclampsia. Women should be encouraged to have a high calcium intake in pregnancy and be supplemented if at moderate or high risk of pre-eclampsia, starting on or before 16-weeks of pregnancy. Risk of small for gestational age (SGA) is not reduced by calcium supplementation alone and is therefore SGA alone is not an indication for treatment.

Equity Gain

Māori and Pacific women are at greater risk of pre-eclampsia in pregnancy (Māori RR 1.51 95%CI 1.16-1.96, Pacific 1.21 95% CI 0.99-1.57) and are reported to receive midwifery care later in pregnancy than woman of other ethnicities therefore missing the optimum time to start aspirin and calcium to reduce in the incidence of pre-eclampsia. Systematically identifying women at high risk for pre-eclampsia through the Best Start Pregnancy Tool and starting treatment earlier in pregnancy (particularly for aspirin) and referring early for specialist assessment will overcome system bias contributing to disparity.

Disparity Risk

A potential disparity may be induced by the Best Start Pregnancy Assessment Tool by identification of women who will benefit from medications in pregnancy, but socio-economic and other factors are barriers for access to medications. For example; folic acid and iodine are standard prescriptions in pregnancy, however, a woman may also require vitamin D, aspirin and calcium, and possibly a few courses of antibiotics.

Decision support

Any of the following "major" risk factors: • *Anti-phospholipid antibodies, scleroderma or SLE* • *Chronic hypertension* • *Diabetes* • *Renal disease* • *Family history of pre-eclampsia in mother or sister* • *Sperm donation* • *Oocyte donation* • *Any previous baby with complication of pre-eclampsia requiring delivery before 37 weeks or with pre-eclampsia complication of HELLP(Haemolysis, elevated LFT's and/or low platelets)*	*When major risk factors are present pre-eclampsia will occur in about 1 in 5 women. With low dose aspirin treatment, the risk is reduced to 1 in 10 women:* *Recommendations:* • *Low dose aspirin and calcium are indicated to reduce the risk of pre-eclampsia.* *Actions:* • *Provide information on aspirin and calcium in pregnancy.* • *If no contraindications start low dose aspirin 100mg in the evening.* • *If contraindications for Aspirin, request obstetric specialist review.* • *Calcium supplementation (prescribed and dietary) is indicated. Prescribe calcium to achieve intake of 1g elemental calcium intake per day until birth.*
No major risk factors but at least 2 of the following "minor" risk factors: • *African, Indian, Māori or Pacific ethnicity* • *Family history of pre-eclampsia in baby's father's family* • *Gravida = 1 (Nulliparity)* • *BMI > 35* • *Maternal age ≥ 40* • *Most recent baby born > 10 years ago* • *Diastolic BP ≥ 80*	*When 2 or more minor risk factors are present there is an increased risk for pre-eclampsia:* *Recommendations:* • *Low dose aspirin and calcium are indicated to reduce the risk of pre-eclampsia.* *Actions:* • *Seek obstetrics advice.* • *Provide information on aspirin and calcium in pregnancy.* • *If no contraindications start low dose aspirin 100mg in the evening.* • *If contraindications for Aspirin, request obstetric specialist review.* • *Calcium supplementation (prescribed and dietary) is indicated. Prescribe calcium to achieve intake of 1g elemental calcium intake per day until birth*

Vitamin D

Vitamin D deficiency has been associated with adverse foetal outcomes including; impaired growth and bone development of the foetus, neonatal hypocalcaemia seizures, increased wheeze and asthma in childhood. In pregnancy Vitamin D deficiency is associated with increased risk of hypertension and pre-eclampsia in pregnancy, low birth weight and impaired glucose tolerance (Ministry of Health 2013).

While there is mounting evidence for the role of supplementing Vitamin D in pregnancy for women who are at risk of deficiency, there is a lack of evidence about the required dose and frequency.

MoH released a consensus statement for guidance on Vitamin D in pregnancy in 2013. Please note that further evidence in the literature since this guideline was published strengthens the case for supplementing women at risk of Vitamin D (Ministry of Health 2013).

In general, testing of asymptomatic pregnant women and infants is not recommended. Supplements should be prescribed based on risk of vitamin D deficiency. The standard subsidised monthly 1.25 mg (50,000 international units, IU) cholecalciferol tablet prescribed in New Zealand may be appropriate for women who

have, or are at a higher risk of, vitamin D deficiency. This dose is not recommended for widespread use in all pregnant women due to a lack of evidence of its safety in pregnant women who may not be vitamin D deficient

Women at risk of VitD deficiency:

- Have darker skin
- Completely avoid sun exposure
- Have liver or kidney disease or are on certain medications
- Live in southern regions of NZ

Equity Gain

Anecdotally Vitamin D deficiency in pregnancy is rarely thought about in early pregnancy by health practitioners but may be important for pregnant Māori and Pacific women who spend less time in the sun because of work or lifestyle. While the evidence is incomplete, actual and potential benefit from treating vitamin D deficiency may contribute to outcomes for which inequity exists for Māori; pre-eclampsia, preterm birth, small for gestational age and respiratory illness in childhood.

Vaccination

The tool guidelines reference Ministry of Health guidelines on immunisation for pregnant women (Ministry of Health 2019d)

Influenza (flu)

Influenza immunisation is safe given during any stage of pregnancy. There is no increased risk of reactions to the vaccine for pregnant women and you cannot get influenza from being immunised.

Women should be offered influenza immunisation at the first trimester visit, if it is available. If the vaccine is unavailable at the time of consultation a recall should be set for offering her vaccination as soon as possible in the new season.

The influenza vaccine will not harm the developing baby. The vaccine simply stimulates the maternal immune system to make antibodies that can fight off the virus that protect the mother and also pass on immunity to the baby naturally, which has been shown to decrease the chances of newborn infants getting the flu. Newborn and young infants have higher rates of influenza and hospitalisation than other children, so the protection they receive from maternal immunisation in pregnancy is important

Women who catch influenza during pregnancy have higher rates of pregnancy complications, including premature birth, stillbirth and SGA babies. New Zealand research shows that healthy pregnant women are nearly five times more likely to be admitted to hospital when suffering from influenza complications than women who are not pregnant.

Pertussis (Whooping cough)

Maternal immunisation for pertussis stimulates maternal antibodies which she passes on to her baby thereby providing some protection for the newborn baby until they are old enough to be immunised. Women should be offered pertussis immunisation from 16 weeks of pregnancy, preferably in the second trimester of pregnancy to provide maximum protection, but there is still some effect up until 2 weeks before birth.

Whooping cough spreads very easily through coughing and sneezing. It can cause severe, prolonged coughing attacks and may lead to serious complications like pneumonia and brain damage. It is worse for babies under 1 year of age. They are often unable to feed or breathe properly so can become very ill and may need to be cared for in hospital. In New Zealand, babies are immunised against whooping cough at ages 6 weeks, 3 months and 5 months, then again at ages 4 and 11 years. They are not well protected from whooping cough until they have had their first three doses.

Maternal immunisation for pertussis stimulates maternal antibodies which she passes on to her baby thereby providing some protection for the newborn baby until they are old enough to be immunised. Woman should be offered pertussis immunisation from 16 weeks of pregnancy, preferably in the second trimester of pregnancy to provide maximum protection, but there is still some effect up until 2 weeks before birth (Immunisation Advisory Centre 2019). Pertussis immunisation is free for all pregnant women. Immunity to pertussis decreases over time. So, people who have had pertussis in the past or been immunised can still catch pertussis and pass it on to babies. The Ministry of Health recommends that other adults in close contact with babies should also be immunised against whooping cough. However, this is not free (Ministry of Health 2019d).

Note the disparity in immunisation rates for women of Māori and Pacific ethnicity in **Figure 3.**

Figure 3 Immunisation in pregnancy for influenza and pertussis

Births 12 months to December 2018 and enrolled in a PHO Q1 2019			
		PERTUSIS	INFLUENZA
TOTAL	Auckland	53.5%	39.6%
	Counties Manukau	37.4%	31.2%
	Waitemata	49.8%	33.6%
	Auckland Metro	45.8%	34.2%
MAAORI	Auckland	34.3%	26.2%
	Counties Manukau	19.4%	18.4%
	Waitemata	28.5%	19%
	Auckland Metro	24.2%	19.8%
PACIFIC	Auckland	29.7%	29.1%
	Counties Manukau	27.8%	28.6%
	Waitemata	29.7%	26.4%
	Auckland Metro	28.6%	28.3%

(Counties Manukau Health 2019).

Equity Gain

Achieving a systematic approach to immunisation in pregnancy through the Best Start Pregnancy Assessment tool provides an excellent opportunity for reducing disparity in rates of maternal immunisation in pregnancy.

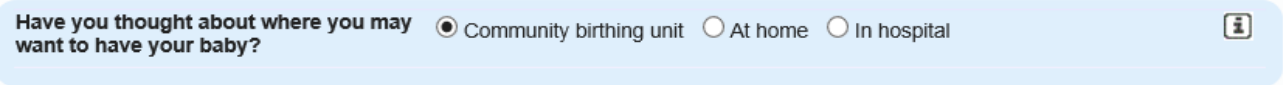
Disparity Risk

Providing a recommendation for 'other adults in close contact with babies' to have a pertussis vaccination may create disparity for whānau who cannot afford to pay for the immunisation, but who may be at higher risk of pertussis because of sociodemographic factors.

Care Planning

Birthing location

Early discussion can assist women in choosing birthing location and an LMC provider aligned with her preferences and her needs during her pregnancy, birthing and post-partum period.

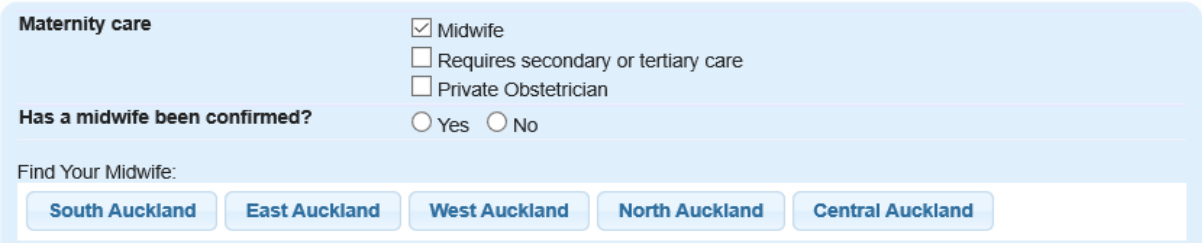


i. Women with low risk pregnancies should consider birthing in the community birthing unit or at home.

Local and international research demonstrates that women who have low risk pregnancies have an increased likelihood of less intervention and overall improved outcomes if they birth in a primary birthing setting. Conversely women with higher risk pregnancies should birth in hospital birthing facilities (Farry 2015; Bailey 2017).

Maternity Care

Early engagement with an LMC is a primary goal of the Best Start Pregnancy Tool, the outcome being all opportunities for interventions to improve maternal and infant health and wellbeing are actioned as early as possible in pregnancy.



The tool links to the Find Your Midwife New Zealand pathway. If a woman does not yet have a midwife confirmed a recall will be set in the PMS to ensure the woman has follow up by the practice staff and assisted to find a midwife.

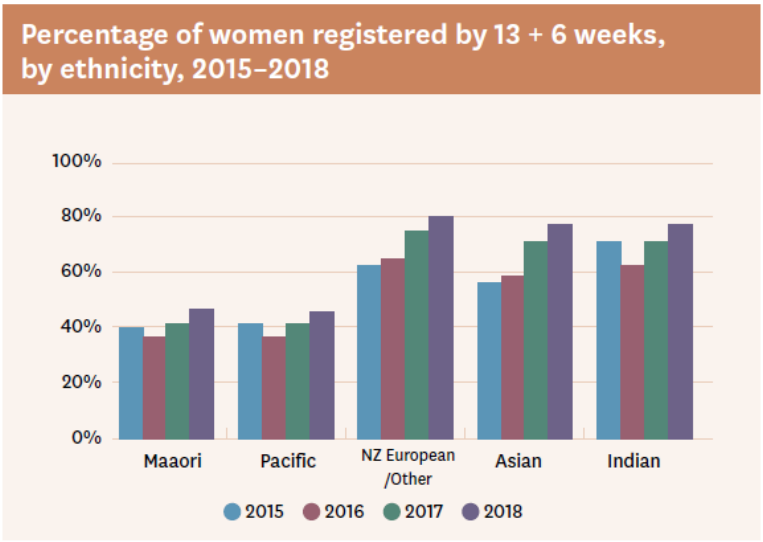
Equity Gain

Māori women are currently less likely to have their pregnancy registered within the first trimester. Primary care has an important role to ensure women seek care early in pregnancy and actively support women to engage with a midwife. By standardising and setting recalls the Best Start Pregnancy Assessment Tool will promote the primary care role in actively assisting women to find a midwife early.

Disparity Risk

It will be important to prevent widening of disparity in this indicator that implementation of Best Start Pregnancy Tool is co-implemented with promotion of increased early recognition of pregnancy for Māori and Pacific and young women by Primary Care. For example: access to free pregnancy testing with nurse follow up and encouraging women to present early if they think they may be pregnant.

Figure 4 Percentage of Women registered with an LMC by ethnicity in first trimester of pregnancy in Counties Manukau Health DHB.



(Counties Manukau Health, 2019)

Figure 4 above shows that the percentage of women registered with an LMC in the first trimester of pregnancy by ethnicity was: Maori 60%, Pacific 45.4%, Indian 71.9%, Asian (excl. Indian) 75.3%, European/other 82.4%.

Contraception

Asking a woman about her contraceptive plans early in pregnancy enables her to decide on her preferences and for planning to be in place.

Primary care is well placed to set recalls and offer access to funded long acting reversible contraceptives (LARCs), as well as other contraception options when her baby is born. LARC will be queried in E6Māmā, with information from initial consult populating into the module.

Have you thought about what contraception you might want to use when your baby is born?

- ☐ IUD
- ☐ Implantable (Jadelle)
- ☑ Progestogen only pill
- ☐ Depo-provera
- ☐ Combined oral contraceptive
- ☐ Vasectomy
- ☐ Tubal ligation (not recommended))
- ☐ Natural family planning
- ☐ Other
- ☐ Undecided
- ☐ Would like to become pregnant again

i. Early pregnancy is a good time to consider future contraception expecially long acting reversible contraception (LARC) soon after birth.

HealthPathways: ***HealthPathways Contraception information***

Equity Gain

Best Start Pregnancy aims to start trhe contraception conversation early and communicate clearly a woman's contraceptive choice to enable timely access to affective contraception.

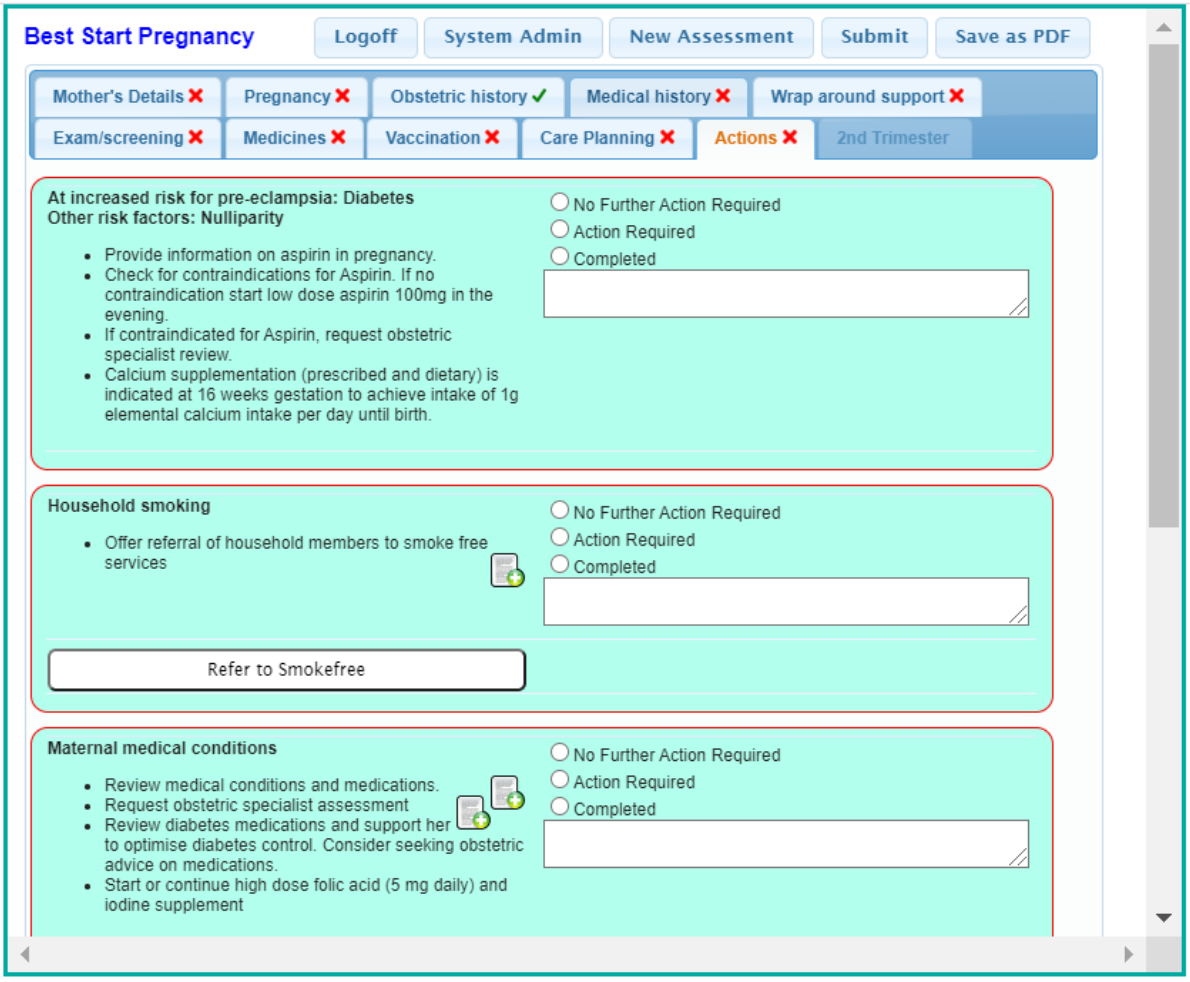
Safe Storage and preparation of foods

Food safety needs to be discussed in early pregnancy and women need to be provided with information so that they are able choose and prepare foods that are safe (Ministry for Primary Industries 2015).

Action Summary

The action summary is generated from the decision support within the tool and summarises action items with a check box for completion status, either by the primary care team or the midwife. The status of the action is marked to enable communication of progress of items from one healthcare provider to another.

In Stage 2 version of the Best Start Pregnancy Assessment Tool it will be possible to refer directly to some services from this tab on the tool e.g. Smokefree, Healthy Housing, Whānau ora.



Best practice-evidence based support

Maintaining content of the Best Start Pregnancy Tool

Evidence changes over time as do funding arrangements and therefore an important aspect of sustainability of Best Start Pregnancy Tool will be funding of an annual review of content and maintaining the ability to do urgent updates. Update work will be prioritised based on patient safety..

Linkages to HealthPathways

An essential component of the Best Start Pregnancy Assessment Tool is the link to the HealthPathways platform. This provides the ability to have more detailed information and localised pathways of care and local providers on the HealthPathways while keeping the Best Start Pregnancy Assessment tool brief.

In rolling out the Best Start Pregnancy Assessment Tool the local HealthPathways will be at various stages of localisation. We will advocate for priority for these pathways to be localised on the local work plan to support the Best Start Pregnancy tool.

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