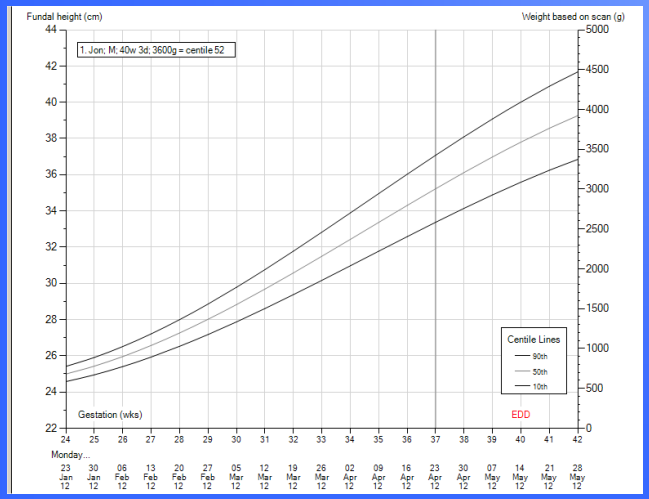
Customised Antenatal Growth Charts

Adapted with permission
Perinatal Institute



2020

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Aims of Training

- Promote best practice
- Understand risk assessment at booking
- Increase knowledge of customised growth charts
- Standardise fundal height measurement
- Expand awareness of referral criteria

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Parameters of normal growth

- What is the average size baby at term?
- What is the local definition of SGA?
- What is the local definition of LGA?

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Birth weight

2500g = SGA?

4500g = LGA?

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Antenatal Detection

Using population standards to assess fetal growth in the 3rd trimester will miss most cases of SGA. Population standards group all women together and predict they will all have the same size baby at term.

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Fetal growth restriction

associations

- Stillbirth
- Neonatal deaths
- SIDS

- Perinatal morbidity
- Cerebral palsy
- Effects in later life

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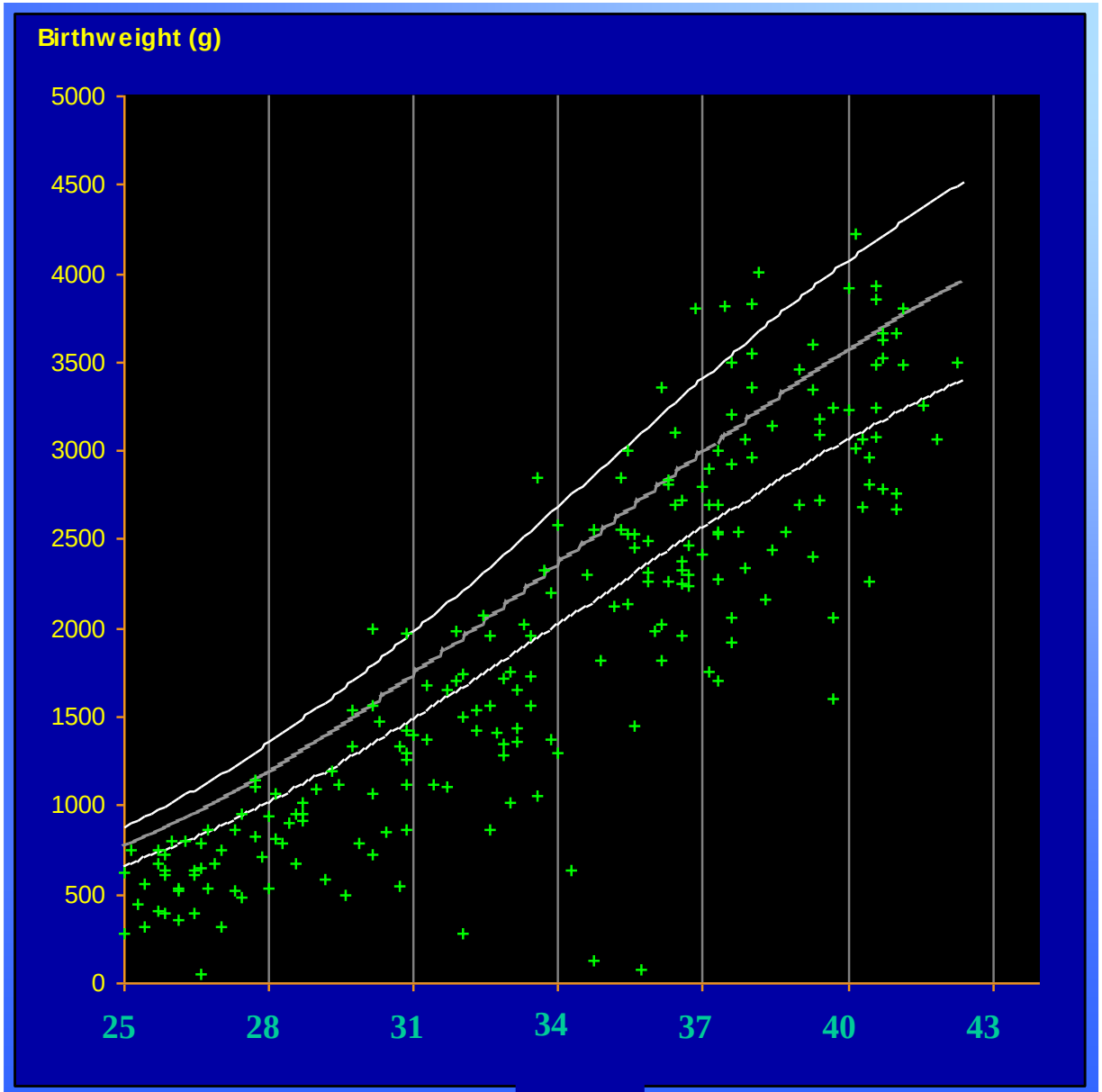
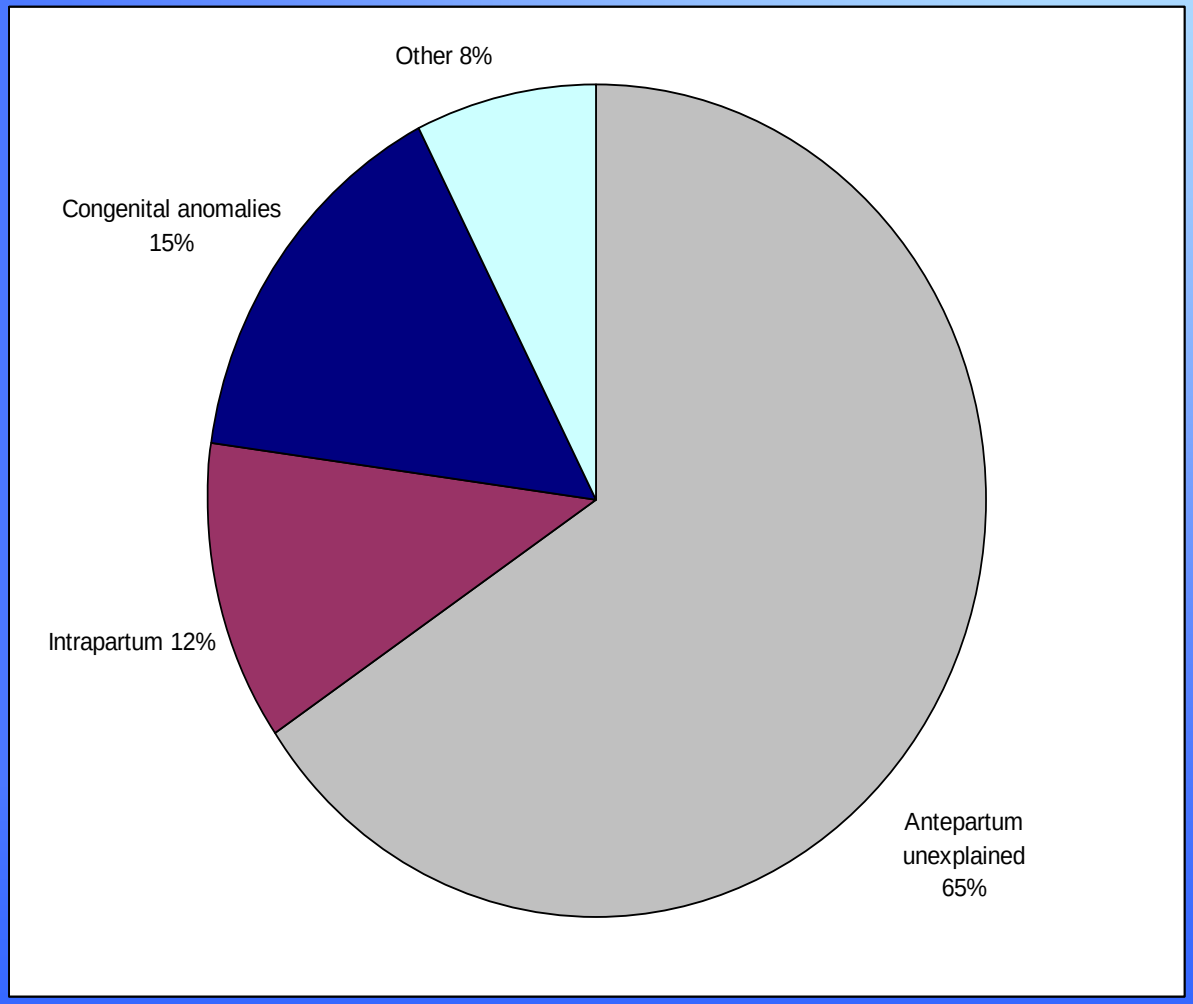
‘Unexplained’ Stillbirths in West Midlands, 2001
n=231; <10th percentile: 140 = 62 %



Stillbirths – Wigglesworth classification:
consistently about two-thirds are ‘Unexplained’



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Maternal, Newborn and Infant Clinical Outcome Review Programme

MBRRACE-UK
Mothers and Babies: Reducing Risk through Audits and Confidential Enquiries across the UK

MBRRACE-UK
Perinatal Mortality Surveillance Report

UK Perinatal Deaths for Births from January to December 2017

9. There has been a substantial reduction in stillbirths recorded as having an intrapartum cause in the CODAC classification of cause of death from 189 (5.8%) stillbirths in 2014 to 51 (1.8%) stillbirths in 2017. The proportion of stillbirths reported as having an unknown cause of death using CODAC has reduced from around a half (46.0%) in 2014 to around one third (34.6%) in 2017.

Key findings

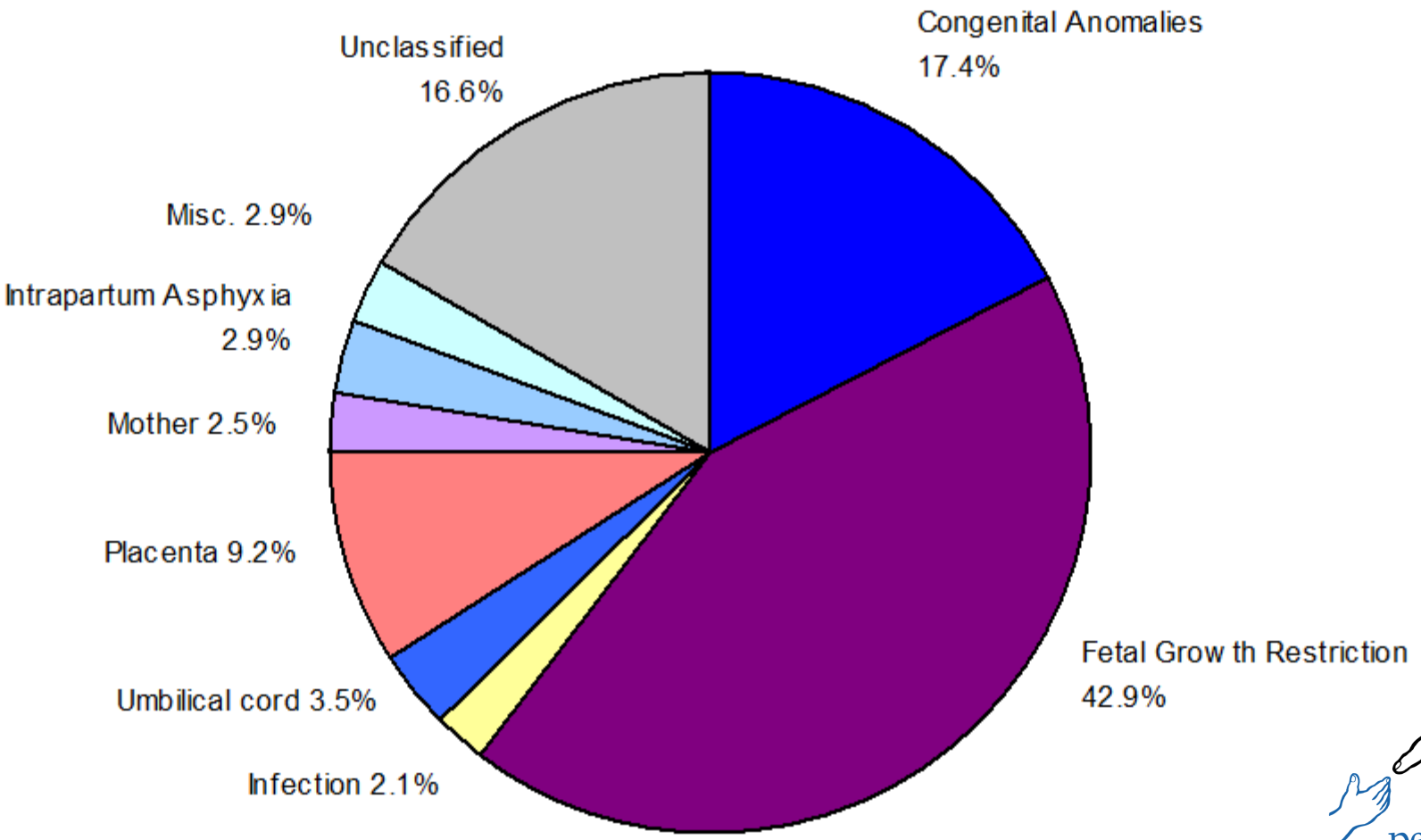
1. There has been a reduction in the rate of extended perinatal mortality in the UK in 2017: 5.40 per 1,000 total births for babies born at 24^{+0} weeks gestational age or later compared with 5.64 in 2016. This represents a 12% reduction in extended perinatal mortality since 2013, equivalent to nearly 500 fewer deaths in 2017.

2. The stillbirth rate for the UK in 2017 has reduced to 3.74 per 1,000 total births from 4.20 in 2013, which represents 350 fewer stillbirths.

3. The rate of neonatal mortality for babies born at 24 weeks gestational age or later in the UK continues to show a steady decline over the period 2013 to 2017 from 1.84 to 1.67 deaths per 1,000 live births. This represents a 10% reduction in neonatal mortality over the last five years.

4. The largest fall in stillbirth and neonatal death rates is seen in term babies (37^{+0} to 41^{+6} weeks gestational age), accounting for half of the reduction seen in these rates.

RECODE classification



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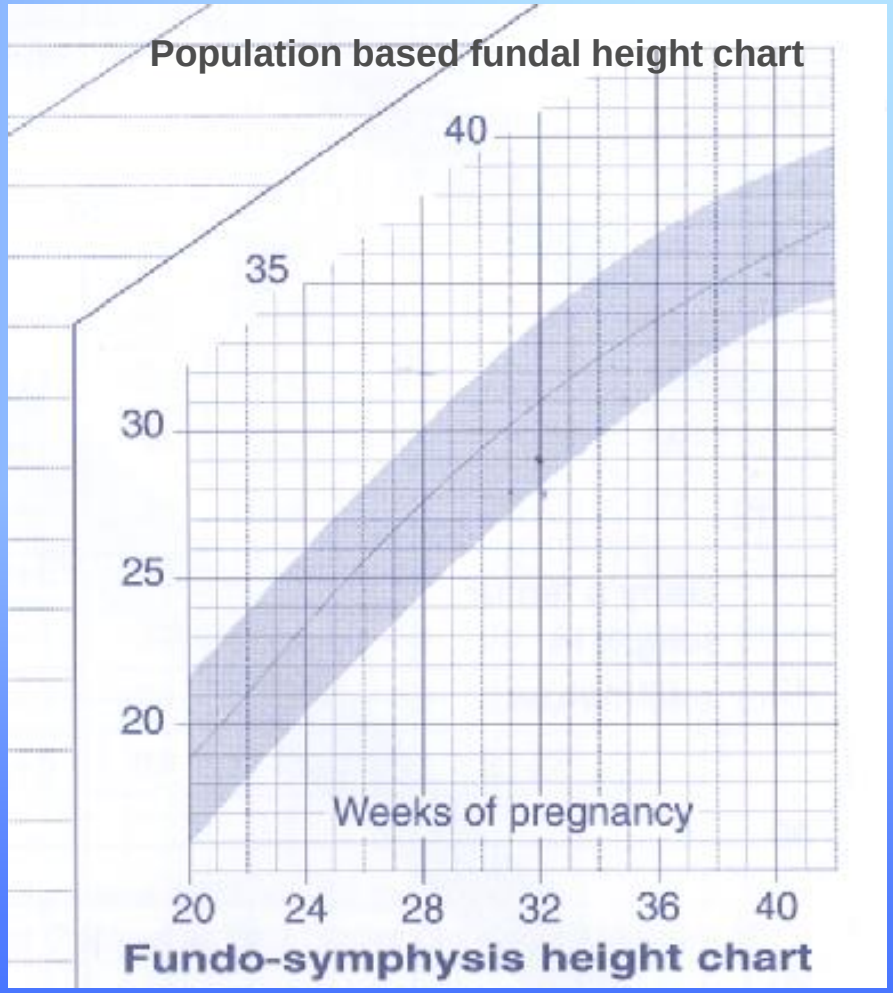
Fetal growth surveillance

Methods

- Manual palpation
  - Landmarks

- Fundal height measurements
  - Tape measure
  - Interpretation
  - Documentation

- Ultrasound
  - Biometry
  - Estimated fetal weight
  - Liquor volume
  - Doppler



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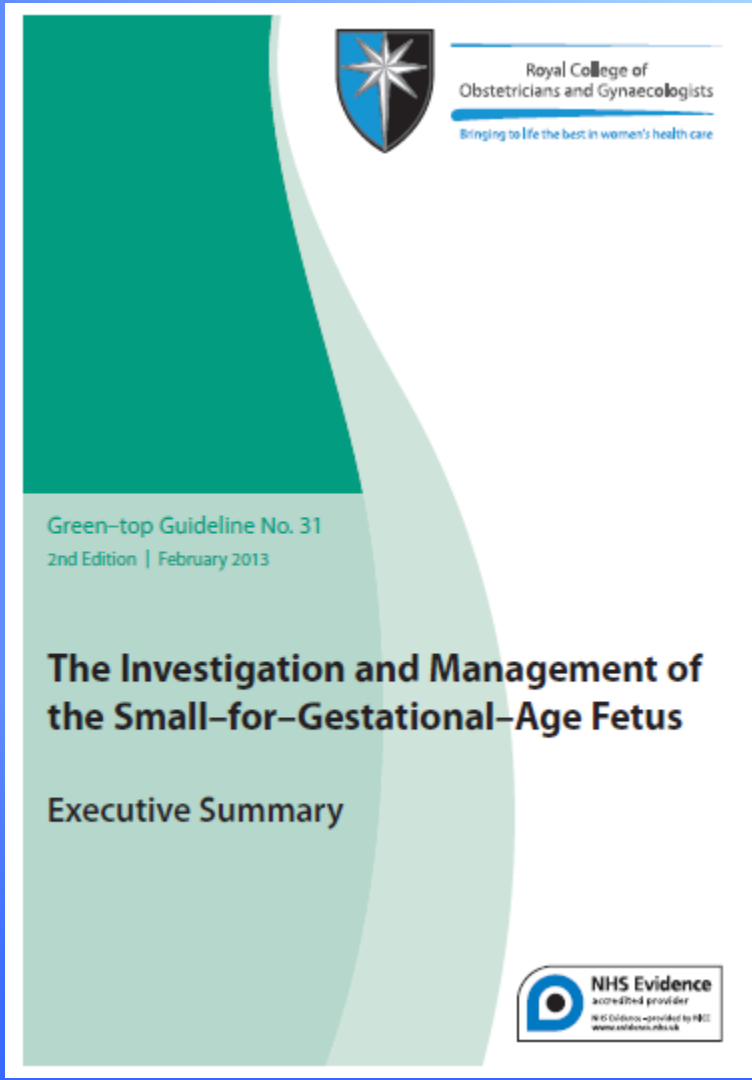
RCOG Guidelines



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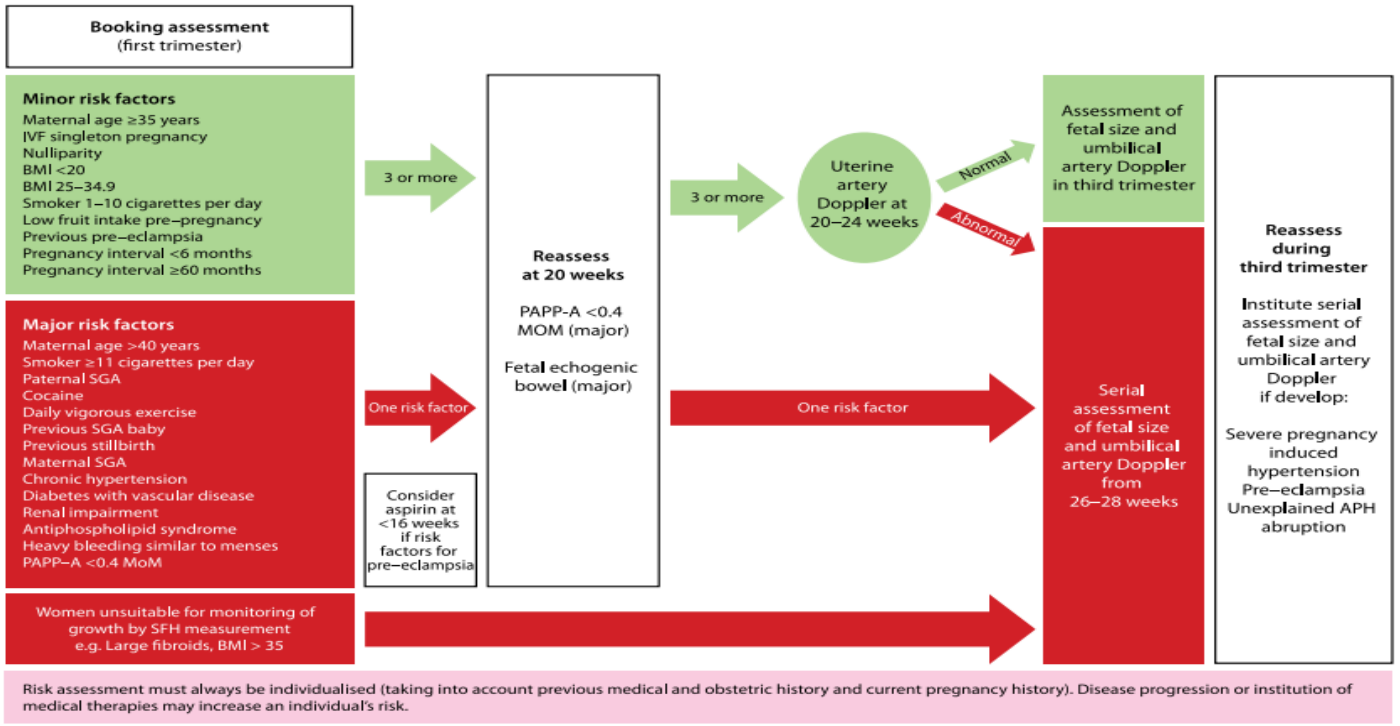
Booking Risk Assessment

APPENDIX II: Screening for Small–for–Gestational–Age (SGA) Fetus

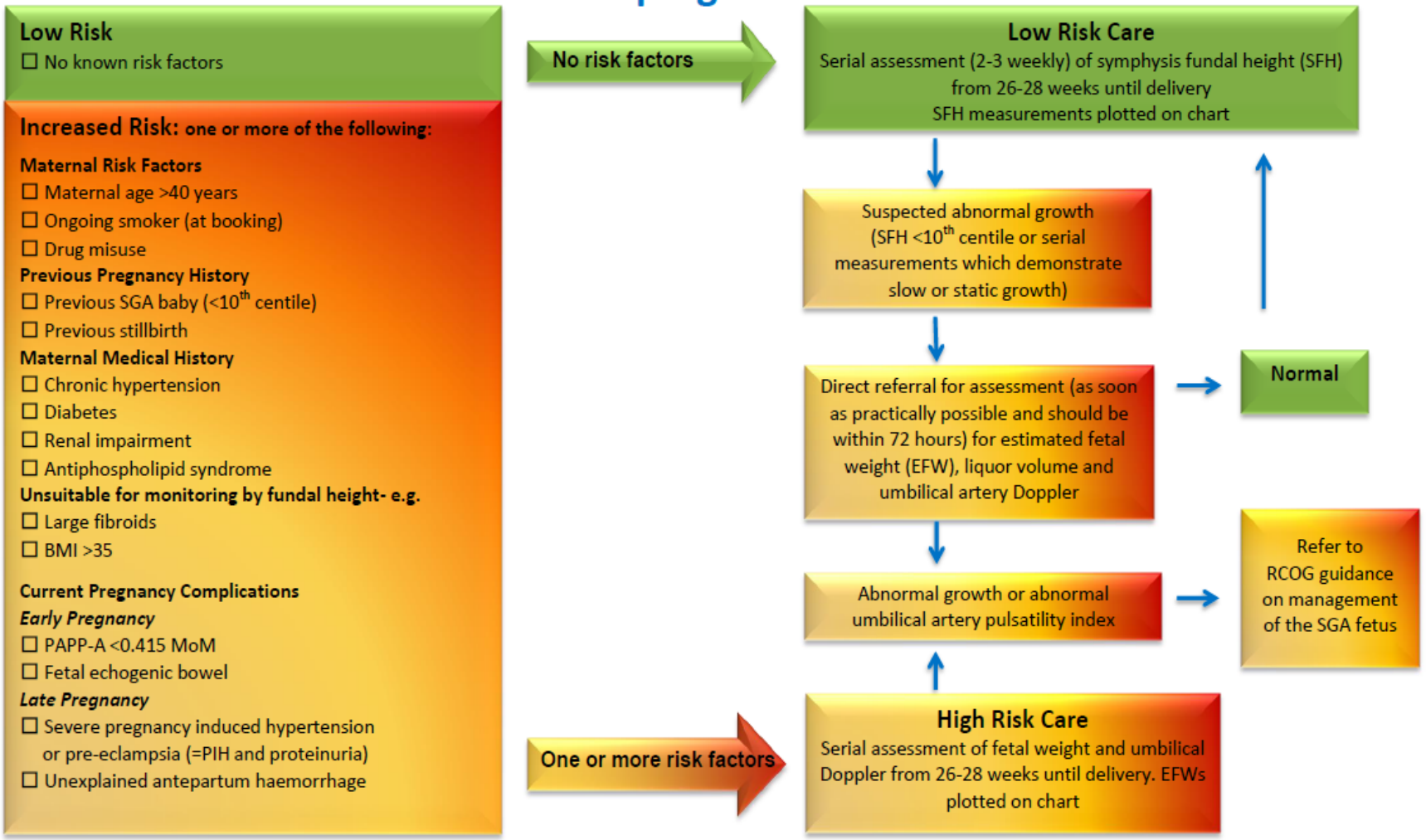


Risk assessment must always be individualised (taking into account previous medical and obstetric history and current pregnancy history). Disease progression or institution of medical therapies may increase an individual's risk.

NHS England -*Saving Babies' Lives: A care bundle for reducing stillbirth (2016)*

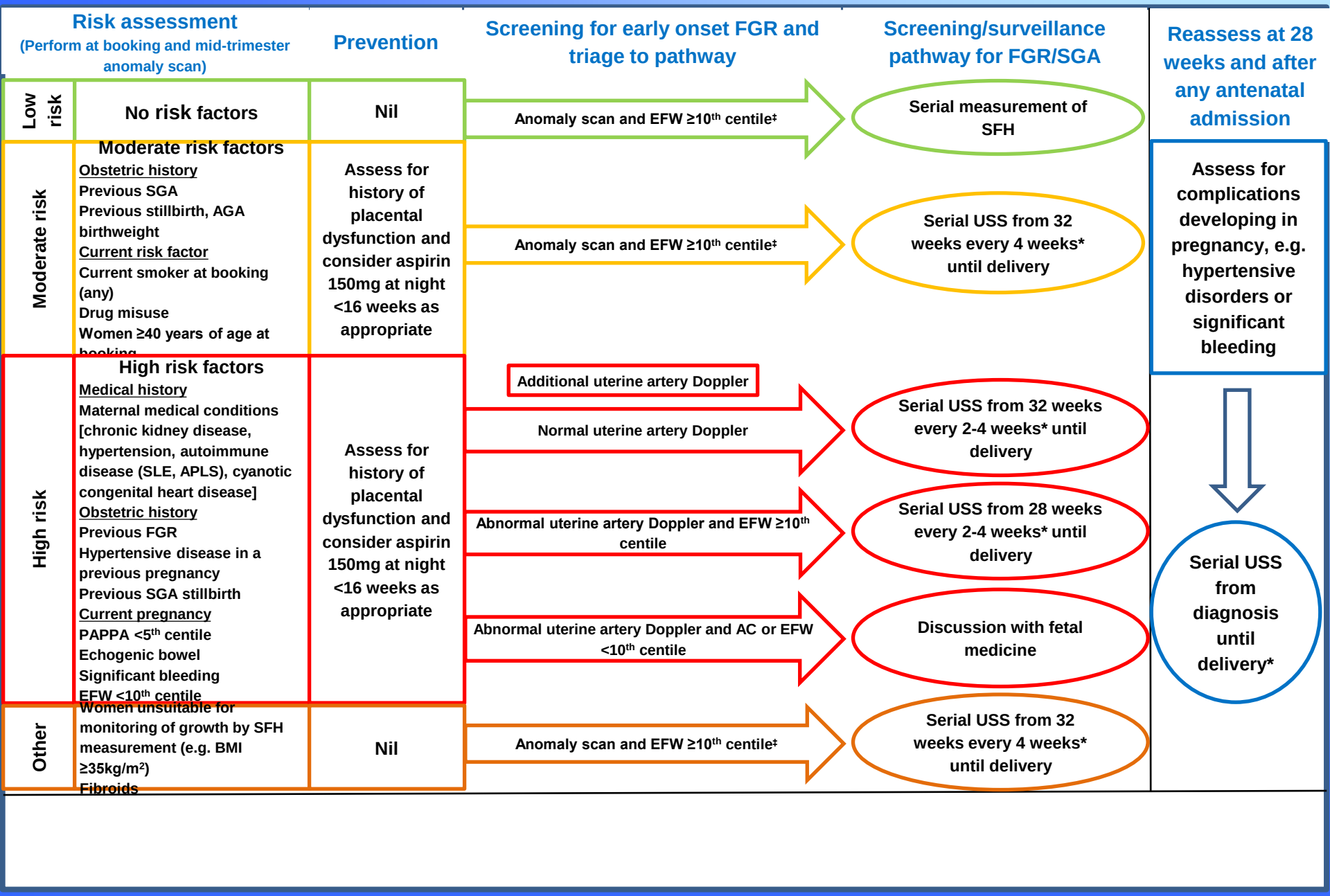
- Element 1- Reducing smoking in pregnancy
- Element 2- Risk assessment and surveillance for fetal growth restriction
- Element 3- Raising awareness of fetal movement
- Element 4- fetal monitoring during labour

Algorithm and Risk Assessment Tool: Screening and Surveillance of fetal growth in singleton pregnancies



Saving Babies Lives' Care Bundle Version 2 (2019)

- Reducing smoking in pregnancy
- Risk assessment, prevention and surveillance of pregnancies at risk of fetal growth restriction (FGR)
- Raising awareness of reduced fetal movement (RFM)
- Effective fetal monitoring during labour
- Reducing preterm birth


Risk assessment
(Perform at booking and mid-trimester anomaly scan)
Prevention
Screening for early onset FGR and triage to pathway
Screening/surveillance pathway for FGR/SGA
Reassess at 28 weeks and after any antenatal admission
Low risk
No risk factors
Nil
Anomaly scan and EFW ≥10th centile‡
Serial measurement of SFH
Moderate risk
Moderate risk factors
Obstetric history
Previous SGA
Previous stillbirth, AGA birthweight
Current risk factor
Current smoker at booking (any)
Drug misuse
Women ≥40 years of age at booking
Assess for history of placental dysfunction and consider aspirin 150mg at night <16 weeks as appropriate
Anomaly scan and EFW ≥10th centile‡
Serial USS from 32 weeks every 4 weeks* until delivery
Assess for complications developing in pregnancy, e.g. hypertensive disorders or significant bleeding
High risk
High risk factors
Medical history
Maternal medical conditions [chronic kidney disease, hypertension, autoimmune disease (SLE, APLS), cyanotic congenital heart disease]
Obstetric history
Previous FGR
Hypertensive disease in a previous pregnancy
Previous SGA stillbirth
Current pregnancy
PAPPA <5th centile
Echogenic bowel
Significant bleeding
EFW <10th centile
Assess for history of placental dysfunction and consider aspirin 150mg at night <16 weeks as appropriate
Additional uterine artery Doppler
Normal uterine artery Doppler
Serial USS from 32 weeks every 2-4 weeks* until delivery
Abnormal uterine artery Doppler and EFW ≥10th centile
Serial USS from 28 weeks every 2-4 weeks* until delivery
Abnormal uterine artery Doppler and AC or EFW <10th centile
Discussion with fetal medicine
Serial USS from diagnosis until delivery*
Other
Women unsuitable for monitoring of growth by SFH measurement (e.g. BMI ≥35kg/m²)
Fibroids
Nil
Anomaly scan and EFW ≥10th centile‡
Serial USS from 32 weeks every 4 weeks* until delivery

GAP Care Pathway (Phase I)

Risk assessment, surveillance, investigation and management

TO BE USED IN CONJUNCTION WITH EXPLANATORY NOTES

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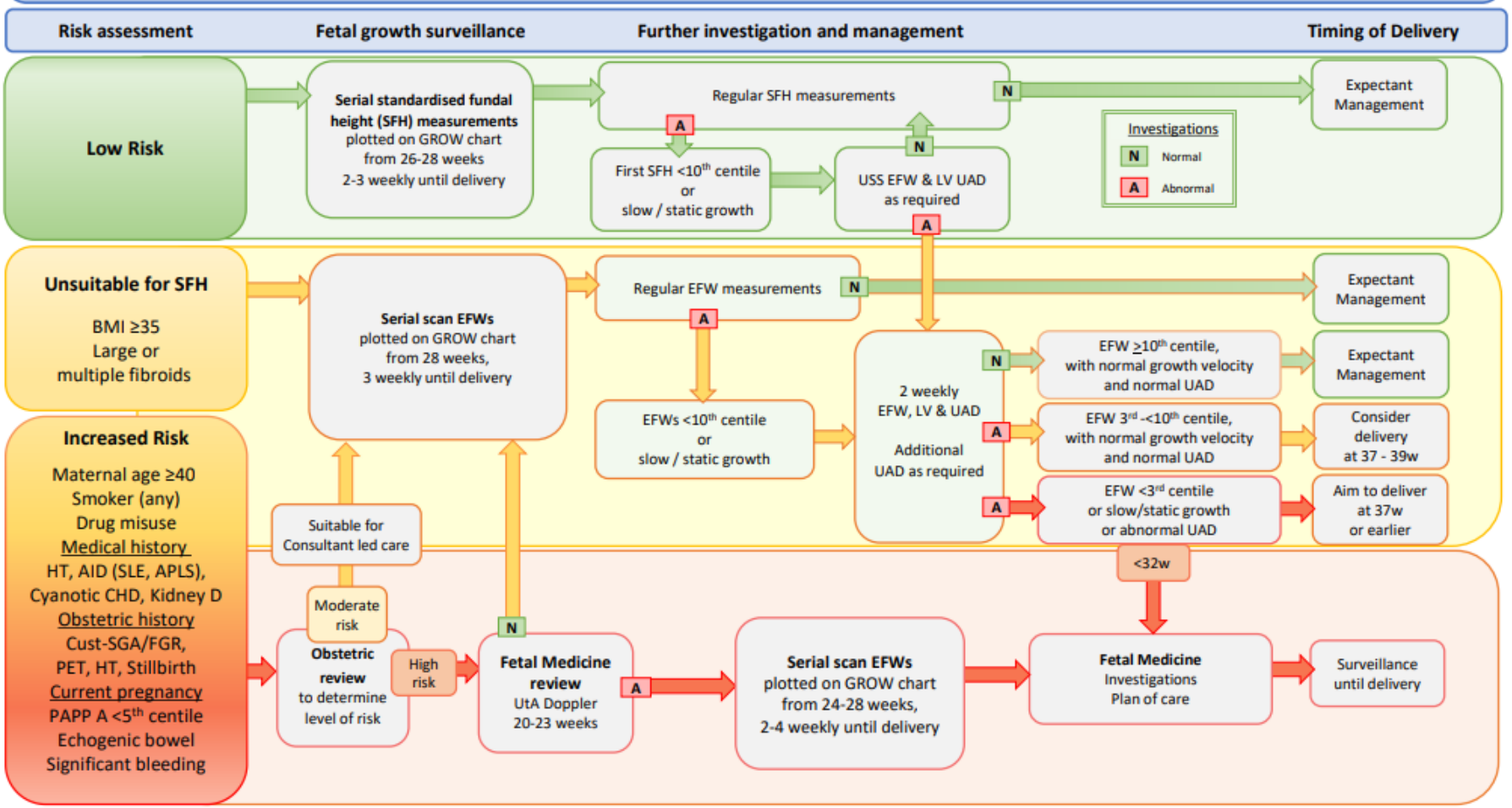

Abbreviations: AID= Autoimmune Disease; APLS= Antiphospholipid Syndrome; BMI= Body Mass Index; CHD= Coronary Heart Disease; CPR= Cerebro-Placental Ratio; EFW= Estimated Fetal Weight; FGR= Fetal Growth Restriction; SFH= Standardised Fundal Height; HT= Hypertension; LV= Liquor Volume; MCA = Middle Cerebral Artery; PET= Pre-eclampsia; SGA= small for gestational age; SLE= systemic lupus erythematosus; UAD= Umbilical Artery Dopplers: UtA = Uterine Artery Doppler. **See 'GAP Care Pathway v2 - Explanatory Notes'**

GAP Care Pathway (Phase II)

Risk assessment, surveillance, investigation and management

TO BE USED IN CONJUNCTION WITH EXPLANATORY NOTES

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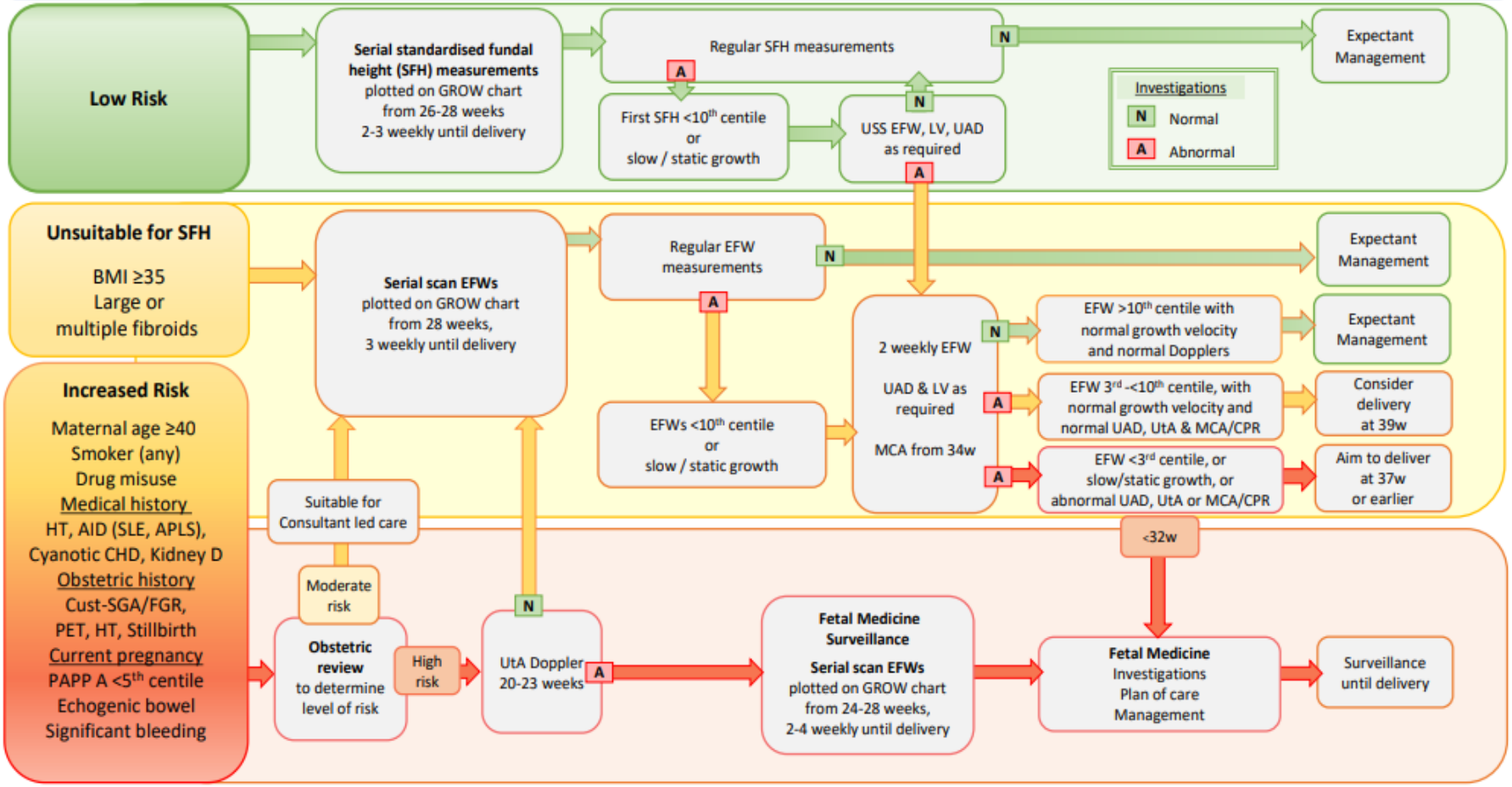

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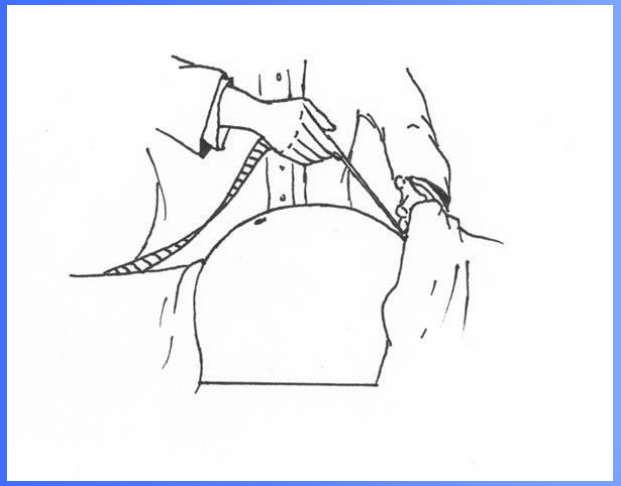
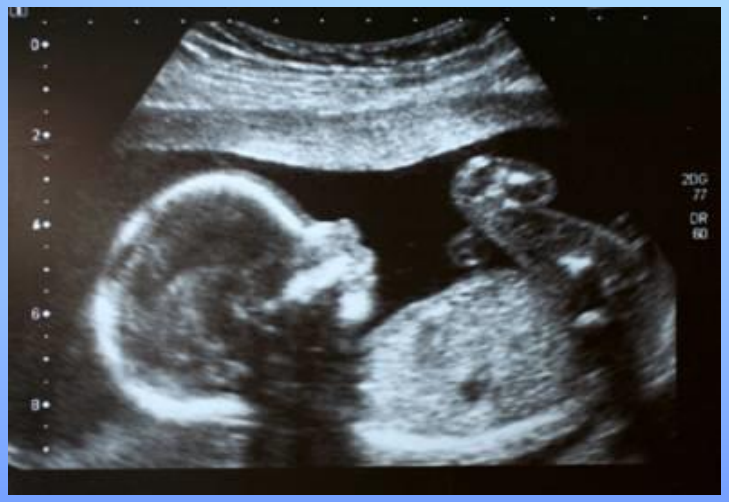
Risk assessment at booking





‘low risk’

‘increased risk’

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GROW

Gestation Related Optimal Weight

www.perinatal.org.uk

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Customised growth chart

- Generate once EDD by scan established

Adjusted for
- Height
- Weight
- Ethnic origin
- Parity

And not for
- Paternal
- Fetal

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Mother Ref. 1234

First Name A

Last Name B

Date of Birth 01/01/1990

Ethnic Origin British European

Parity 2

Height 163 cm 5ft 4ins

Weight 64 kg 10st 0lbs

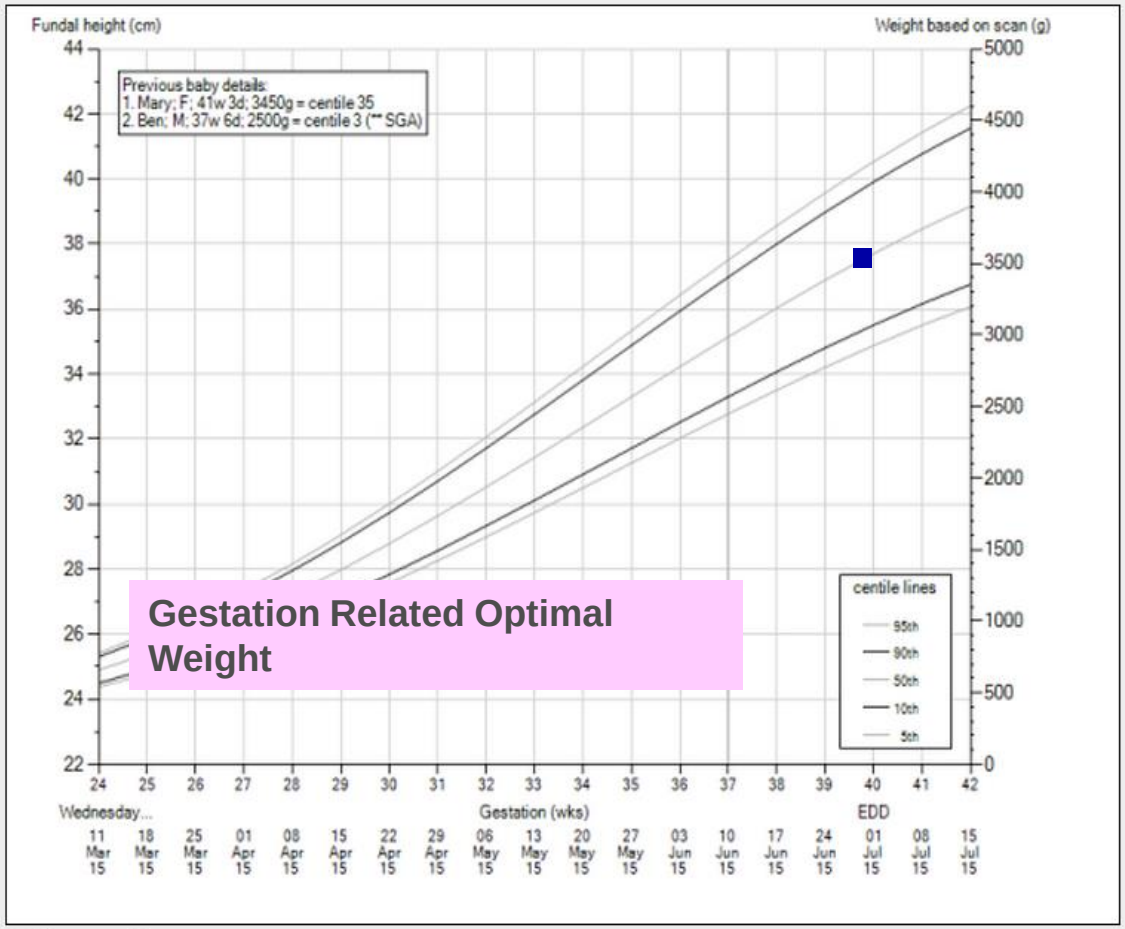
BMI **24.1**

TOW (g) **3570**

EDD known 01/07/2015

Calculate EDD

Generate Chart



Greyscale

Show 5th/95th centiles

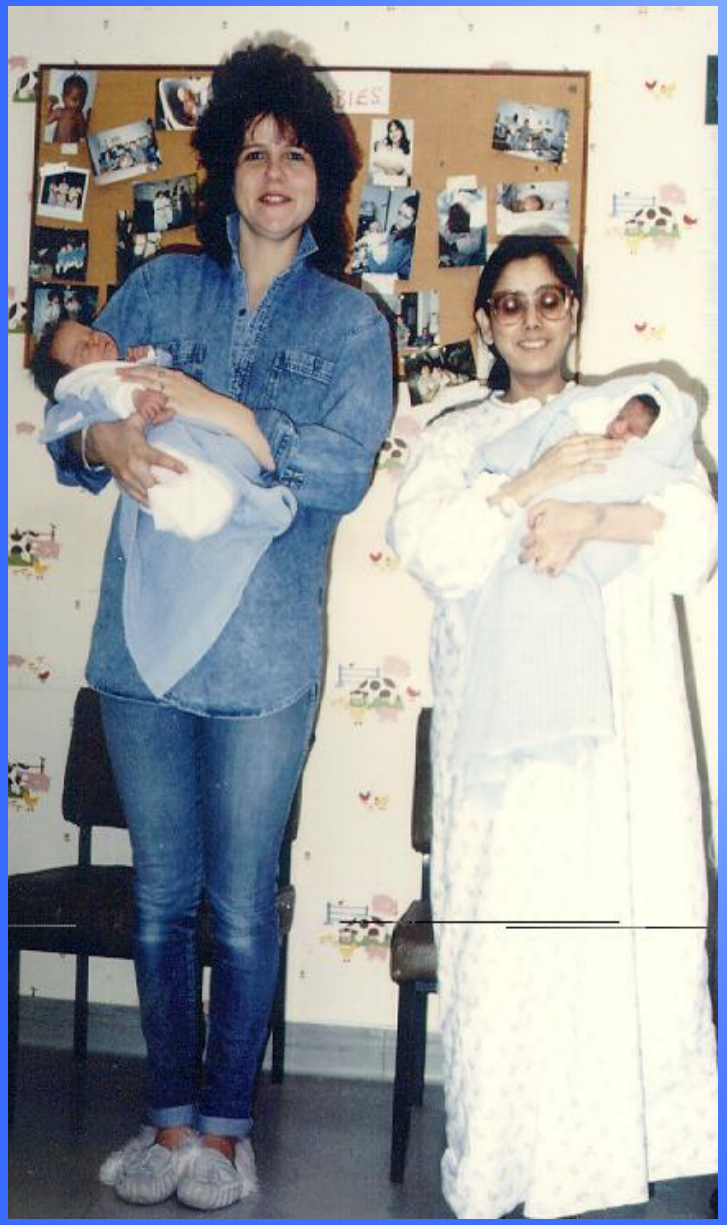
Gridlines by weight

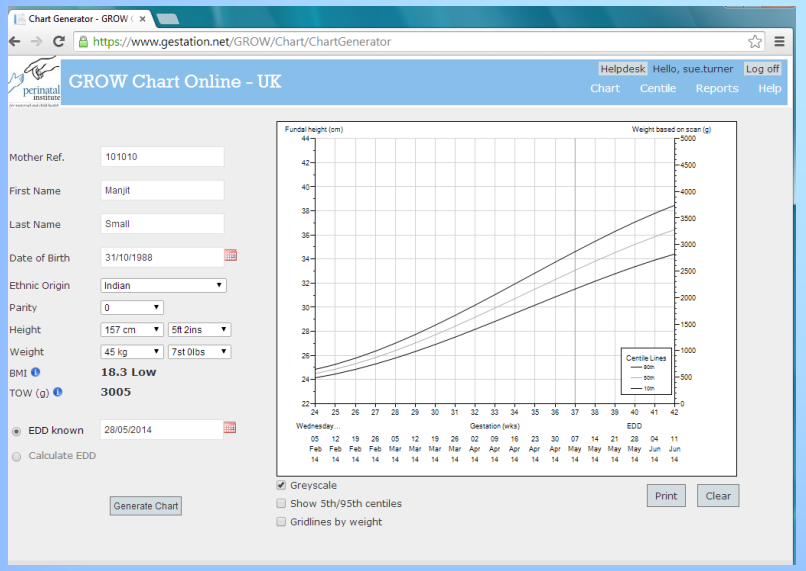
Print Clear

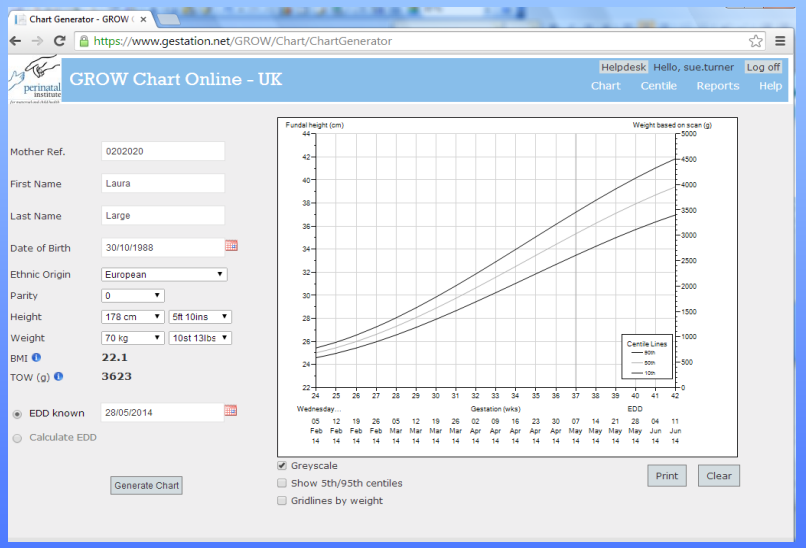
Co-efficients for the UK GROW web application

Using a multiple regression model, the term (280) day birthweight for a non-smoking British European primip of average weight (64kg) and average height (163cms) is calculated as 3453.4

When you input individual maternal characteristics the software then “adds on” or “subtracts from” the average we calculate the TERM OPTIMAL WEIGHT







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Mother Ref. 123456

First Name Manjit

Last Name Small

Date of Birth 31/10/1988

Ethnic Origin Indian

Parity 0

Height 157 cm 5ft 2ins

Weight 45 kg 7st 1lbs

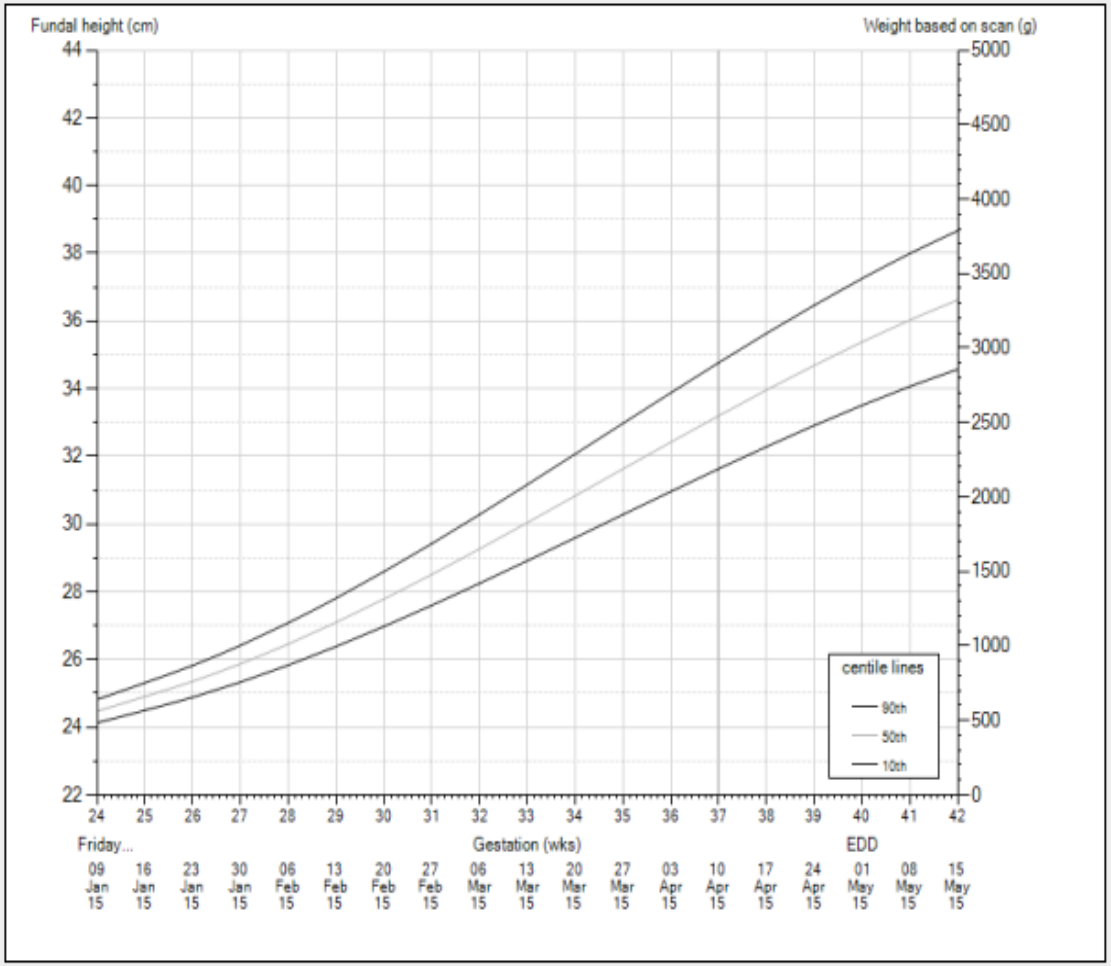
BMI 18.3 Low

TOW (g) 3042

EDD known 01/05/2015

Calculate EDD

Generate Chart



Greyscale

Show 5th/95th centiles

Gridlines by weight

Print Clear

GROW-App UK

Helpdesk | Hello, sue.turner | Log off

Chart | Centile | Reports | Help | Users

Mother Ref. 12345

First Name Laura

Last Name Tall

Date of Birth 31/10/1988

Ethnic Origin British European

Parity 0

Height 178 cm | 5ft 10ins

Weight 70 kg | 11st 0lbs

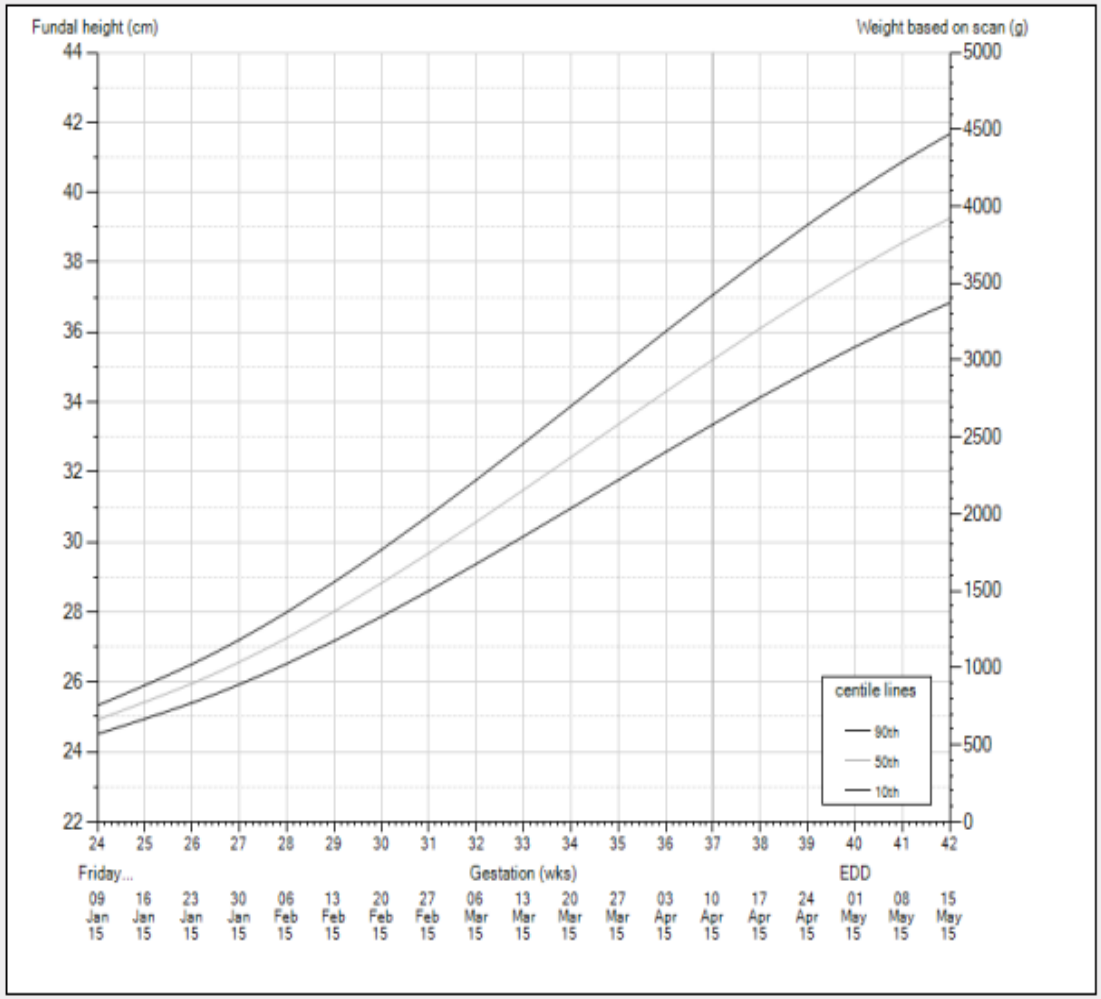
BMI 22.1

TOW (g) 3590

EDD known 01/05/2015

Calculate EDD

Generate Chart



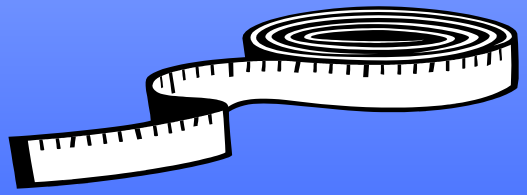
Greyscale

Show 5th/95th centiles

Gridlines by weight

Print | Clear

Standardised Fundal Height Measurement



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Fundal Height Measurement

- Primary screening tool
- Acceptable to women
- Easy to perform
- Non-invasive
- Inexpensive

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Standardising Practice

- Intra observer variation
- Inter observer variation
- Bladder volume
- Tape measure
- Frequency of assessment

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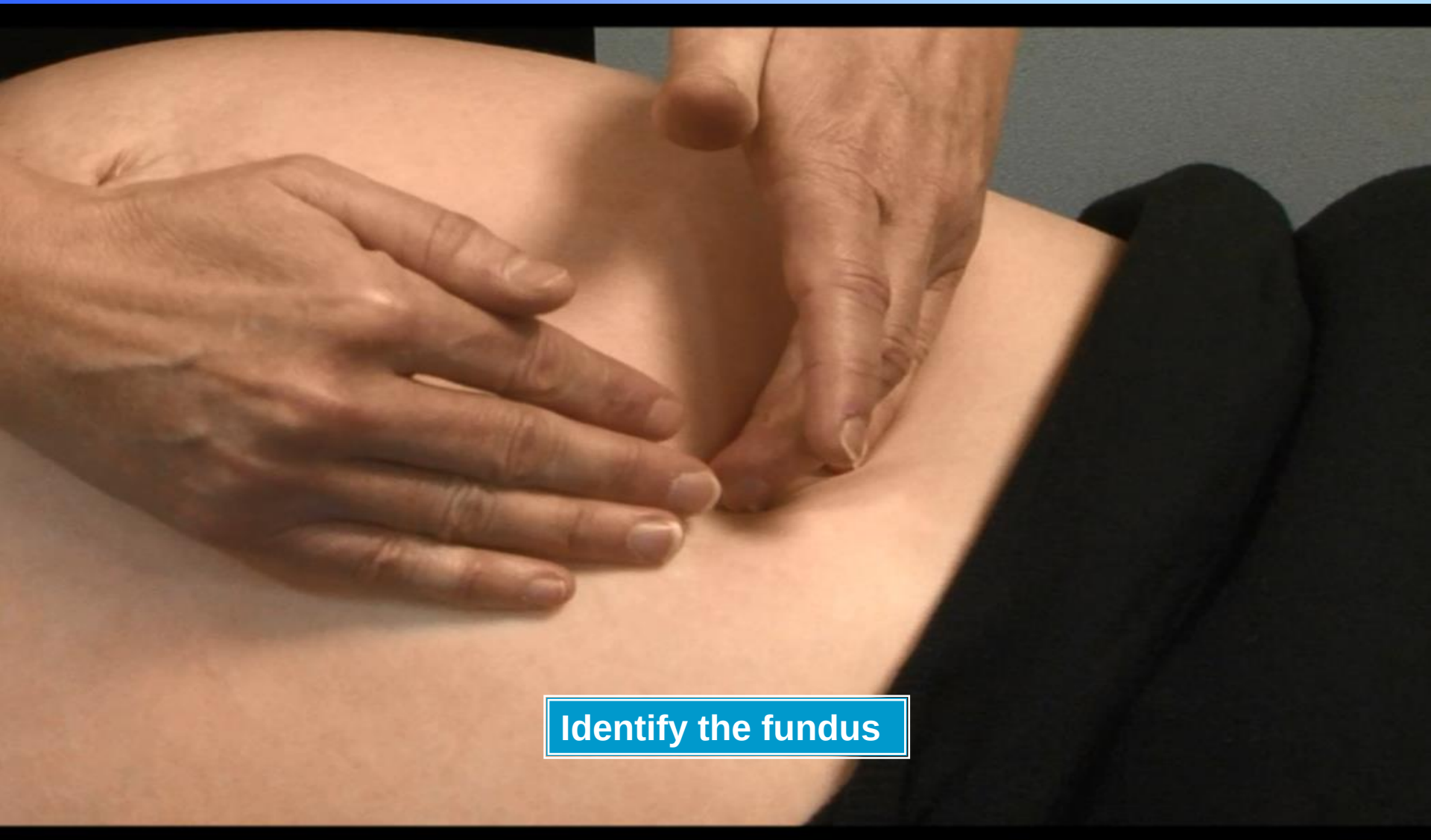
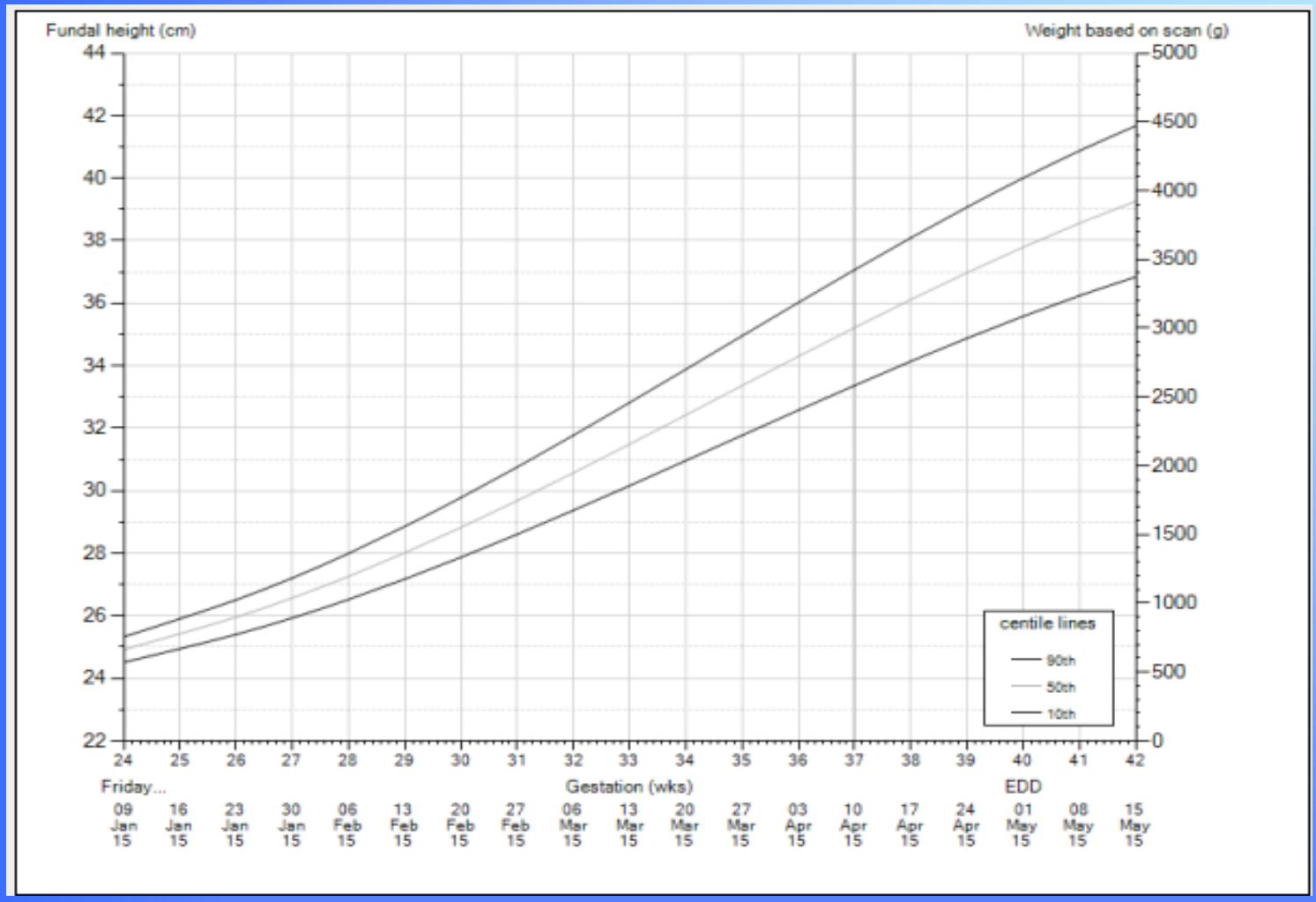
Semi recumbent-empty bladder

Fundal height




Identify top of the symphysis pubis

Semi recumbent-empty bladder



6. Plot measurement on customised growth chart and refer for USS if required

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Considerations

- Descent of the head
- Malpresentation
- Multiple Pregnancies
- Already having serial scans – how frequent is serial?
- Obesity

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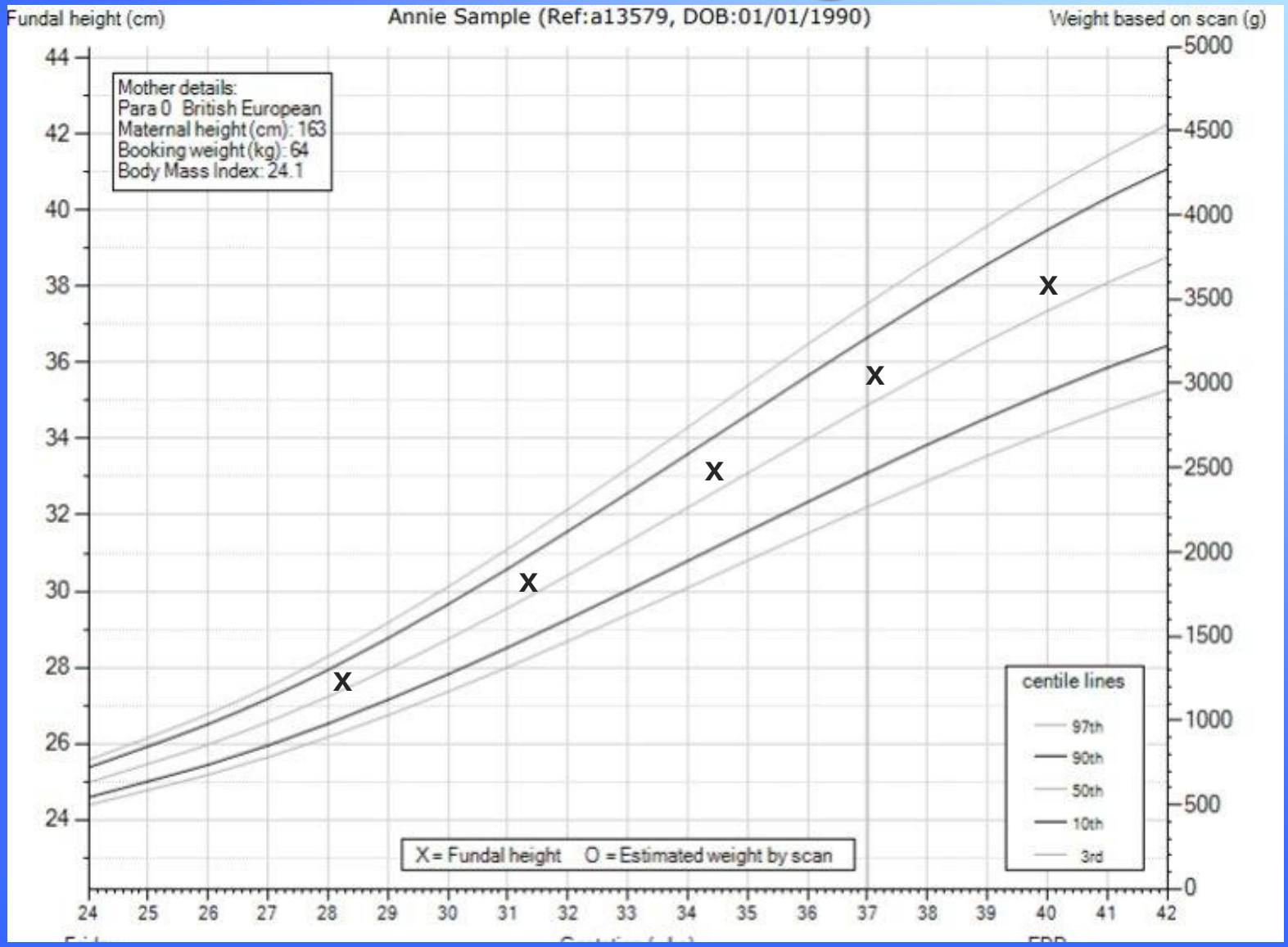
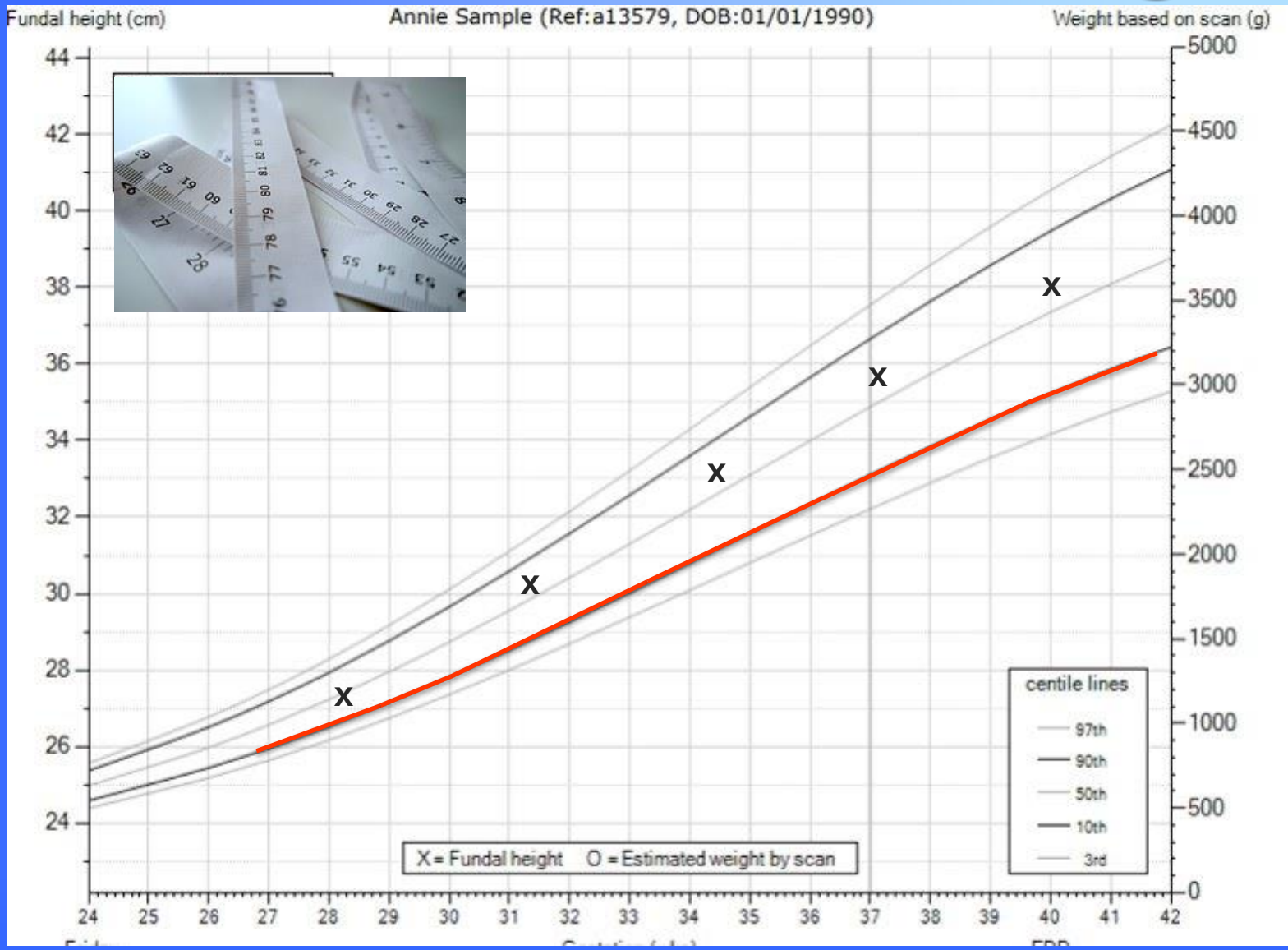
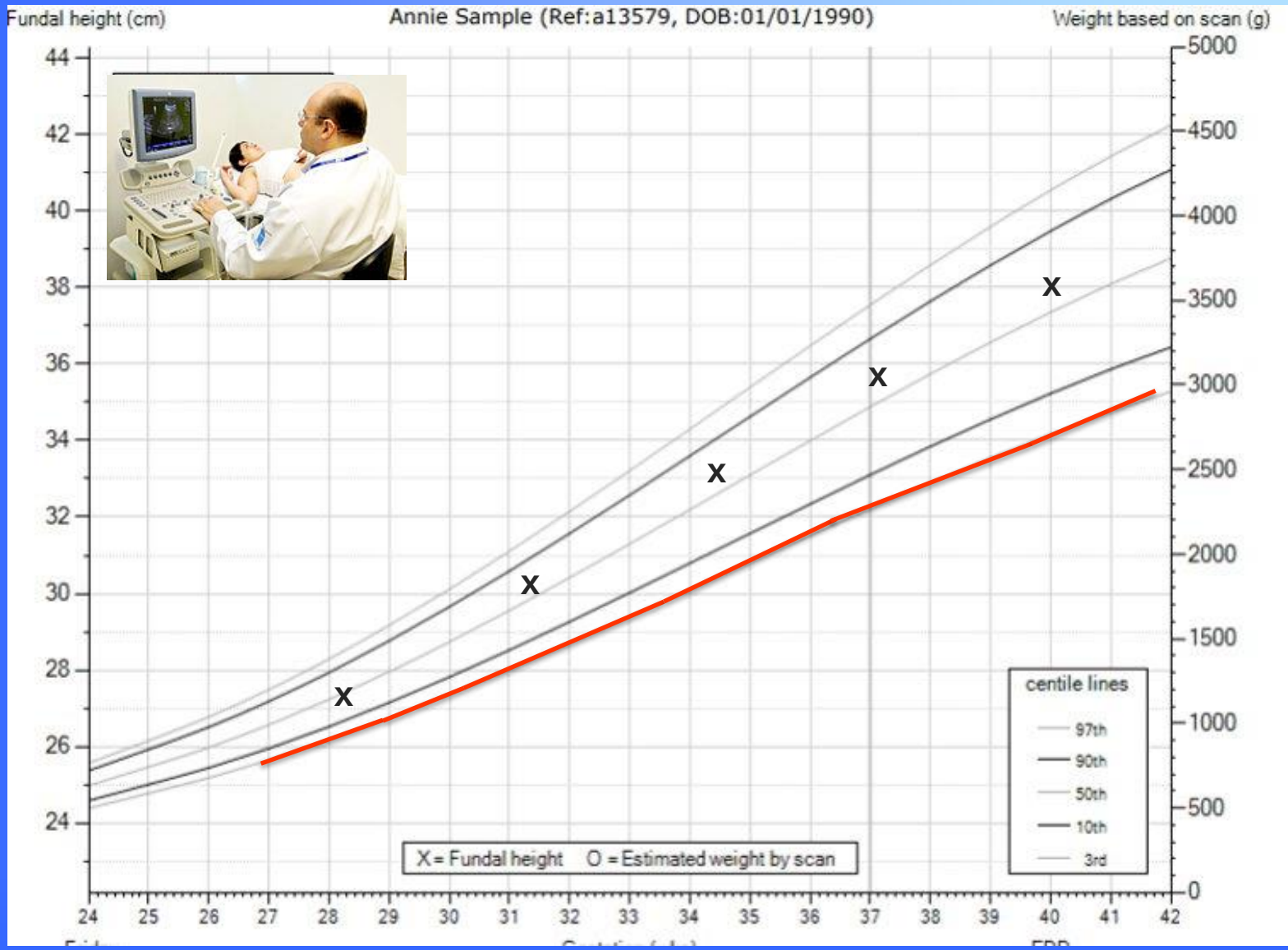
Is this normal growth?



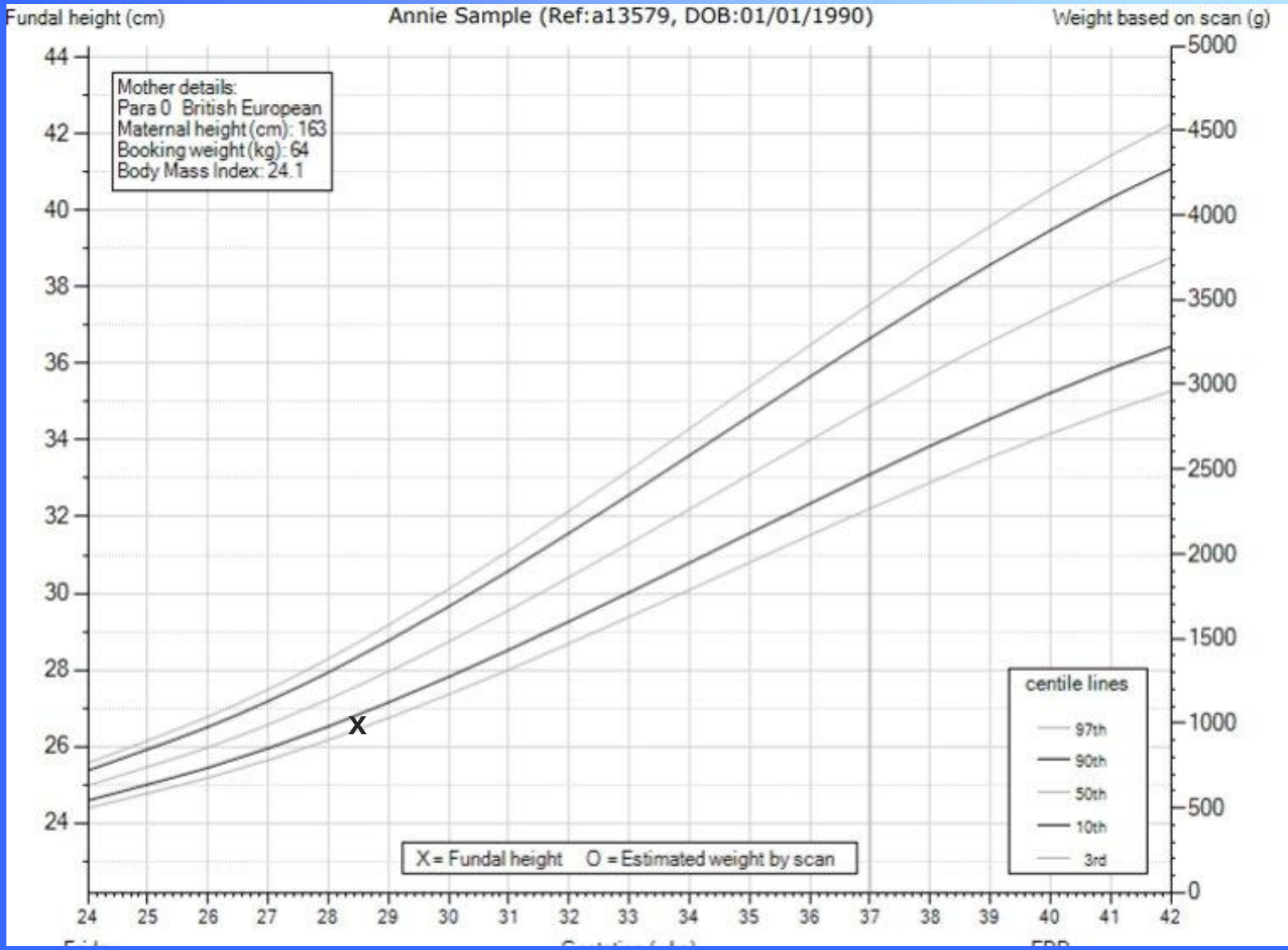
Referral line- fundal height



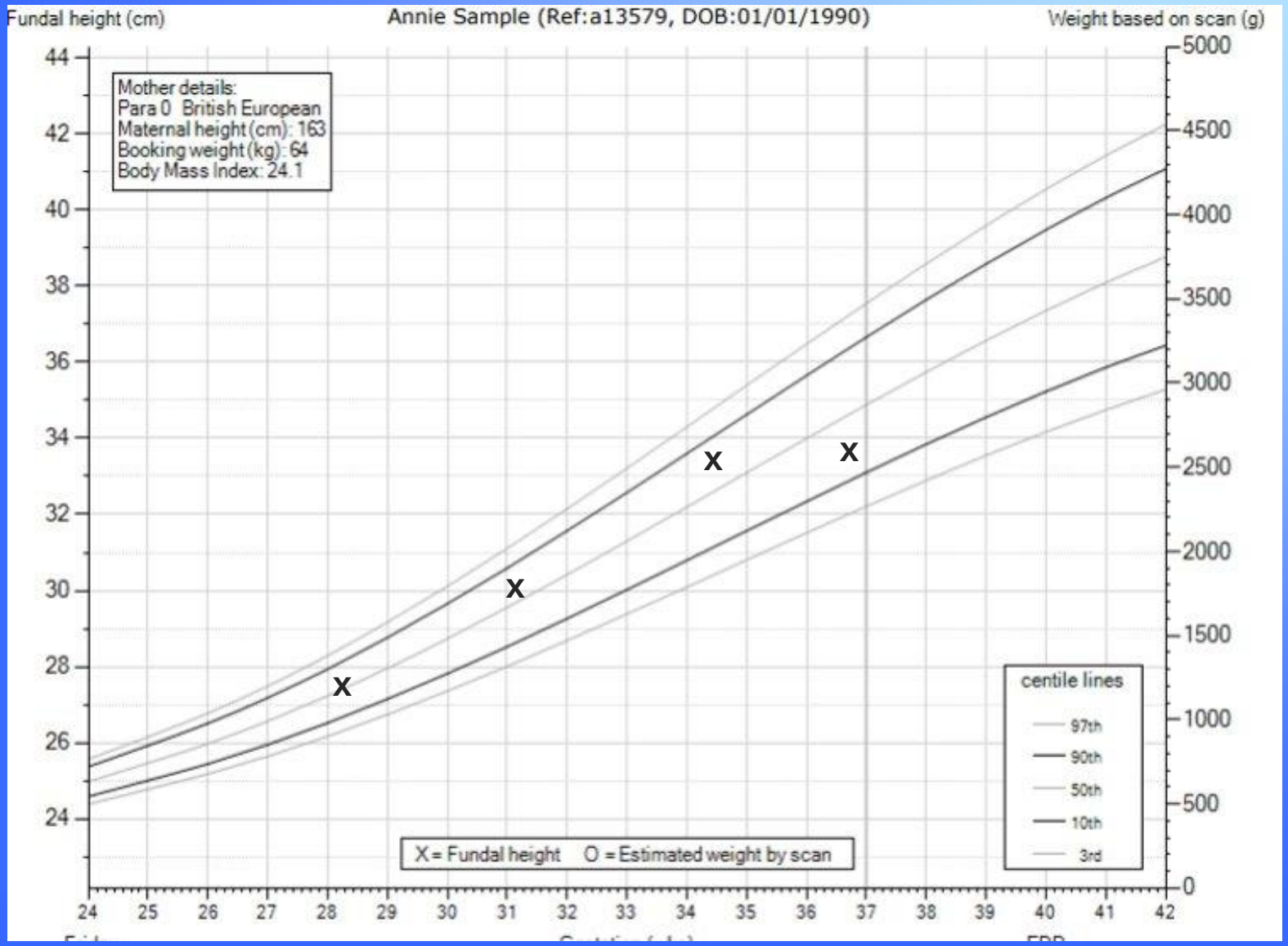
Referral line-EFW



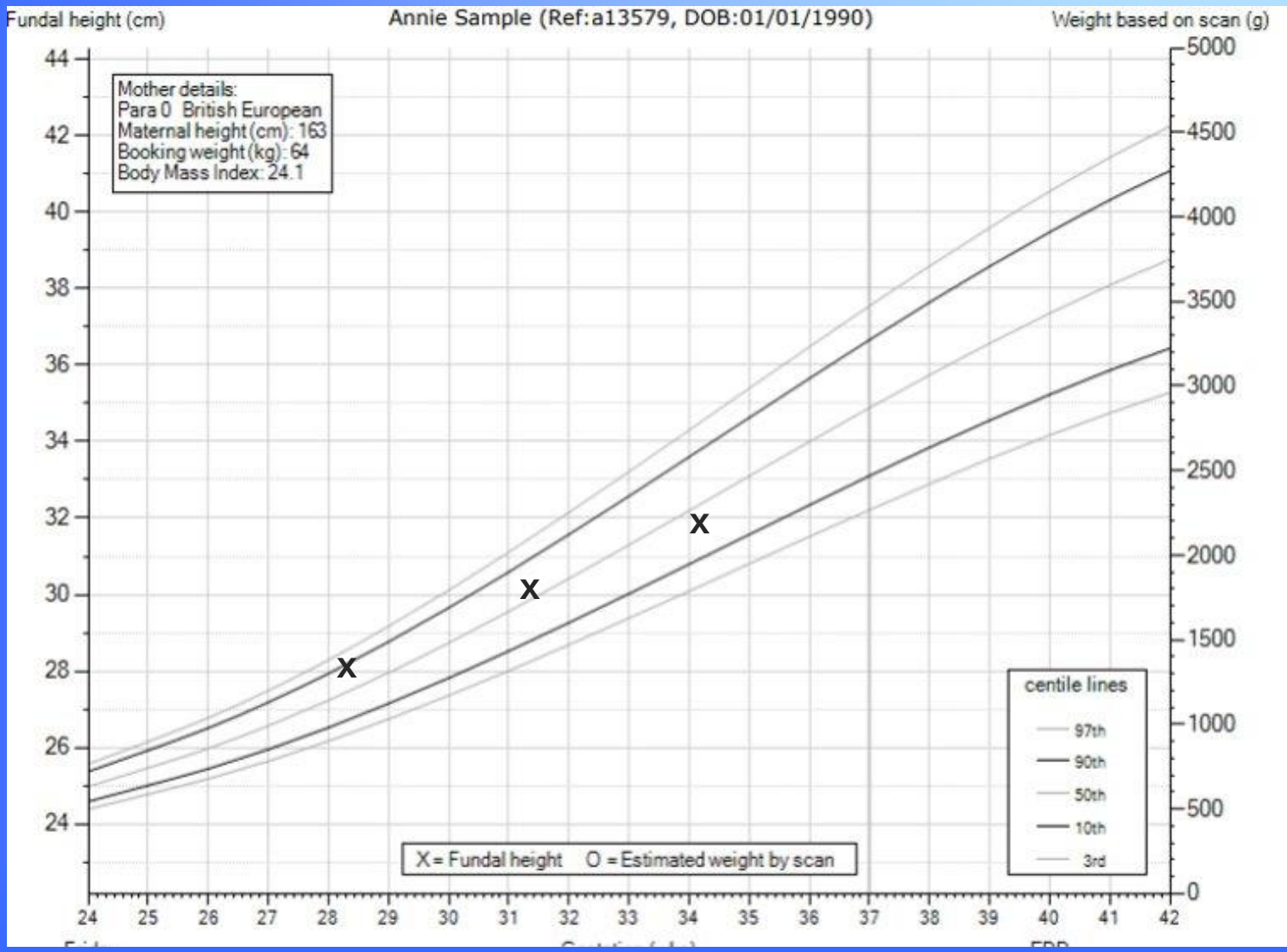
1st plot below 10th centile



No growth


Fundal height (cm)
Annie Sample (Ref:a13579, DOB:01/01/1990)
Weight based on scan (g)
Mother details:
Para 0 British European
Maternal height (cm): 163
Booking weight (kg): 64
Body Mass Index: 24.1
X = Fundal height O = Estimated weight by scan
centile lines
97th
90th
50th
10th
3rd

Slow growth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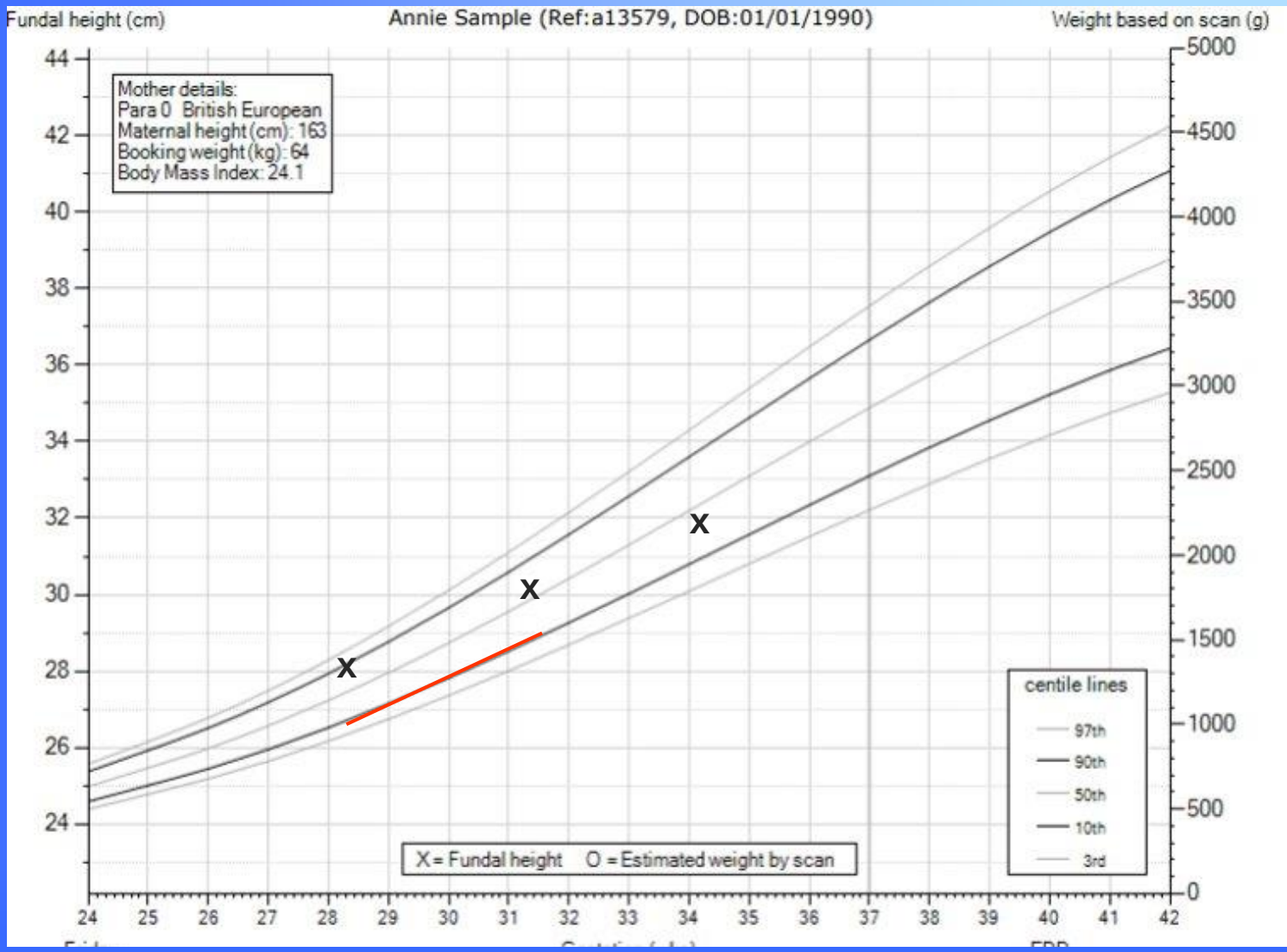
Slow growth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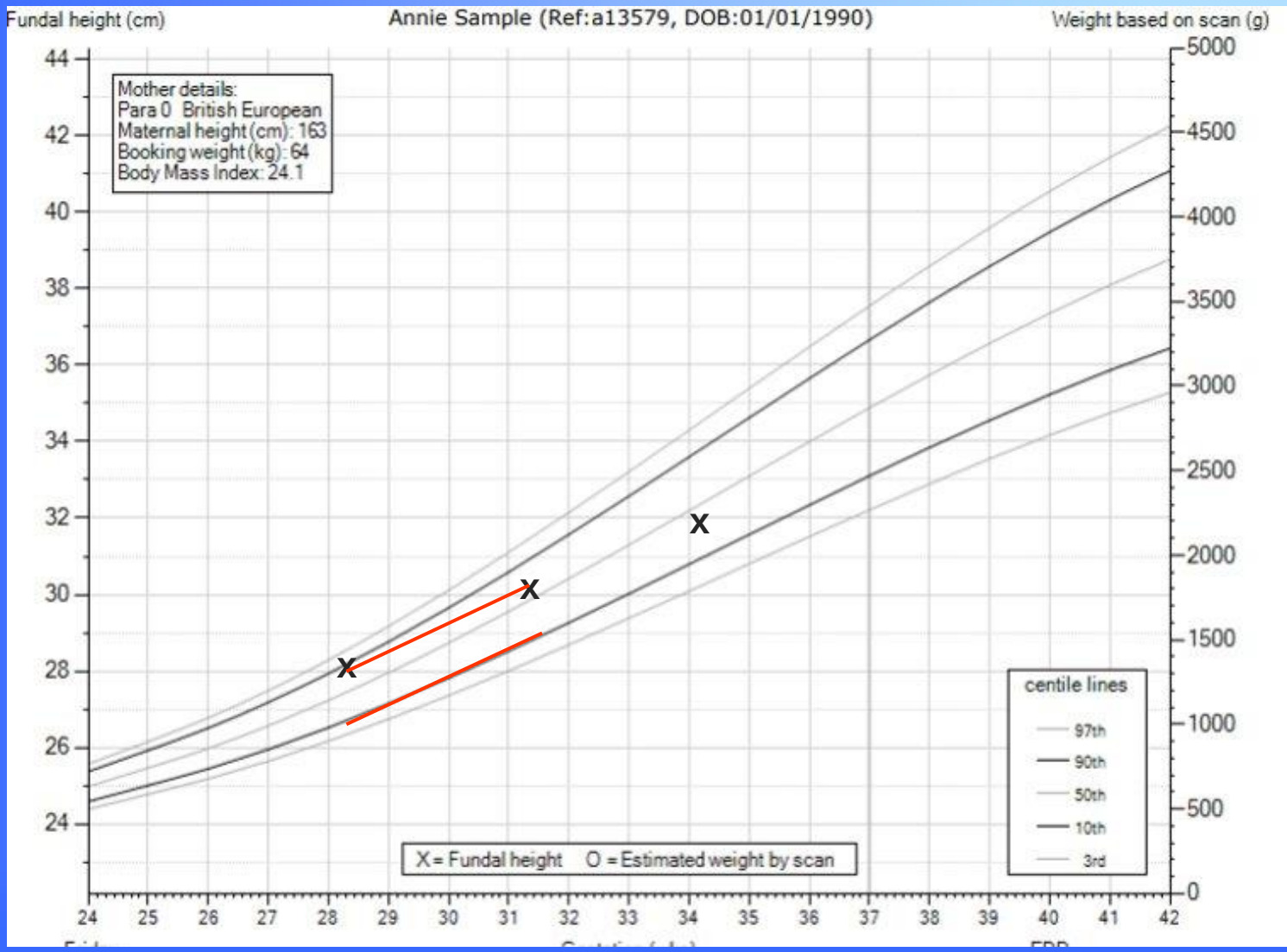
Slow growth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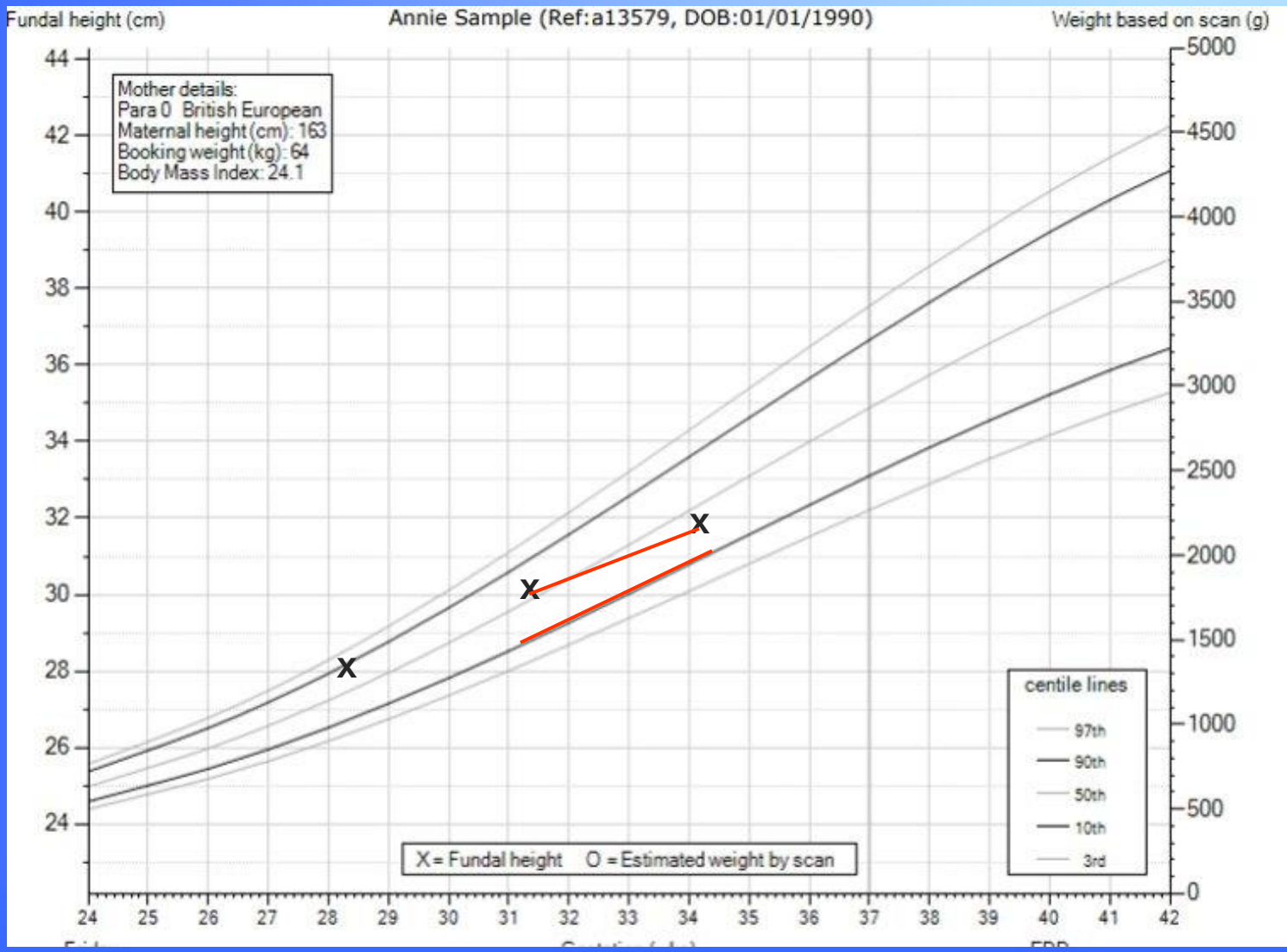
Slow growth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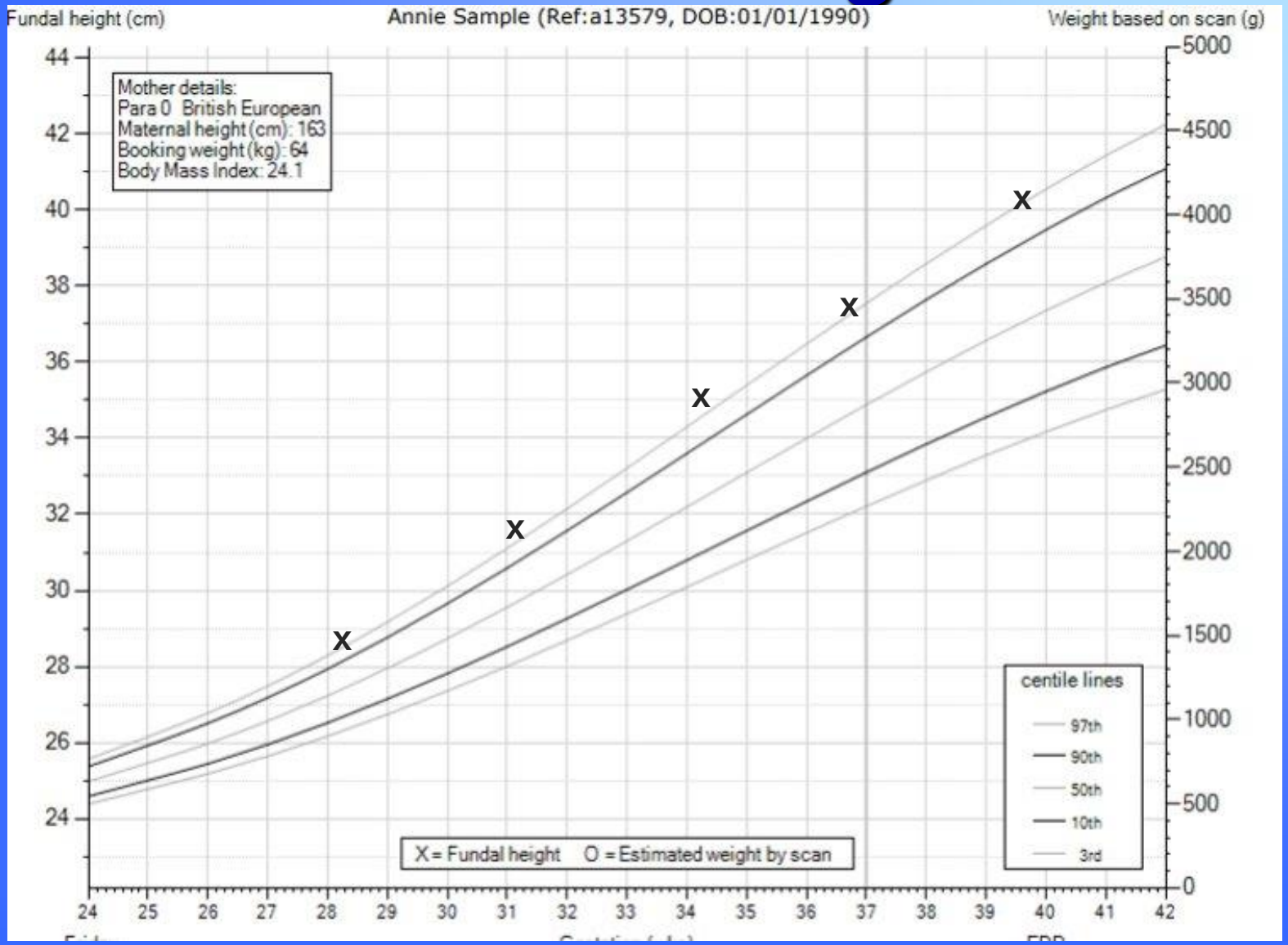
Body Mass Index: 24.1
X = Fundal height O = Estimated weight by scan
centile lines
97th
90th
50th
10th
3rd

Slow Growth Demonstration

- https://www.perinatal.org.uk/GAP/slow_growth_SFH.mp4

Is this normal growth



Fetal growth screening implementation strategy

- Standardised fundal height measurement
- Serial plotting on customised charts
- Clear referral protocols
- Revolving door policy

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Growth Assessment Protocol (GAP)

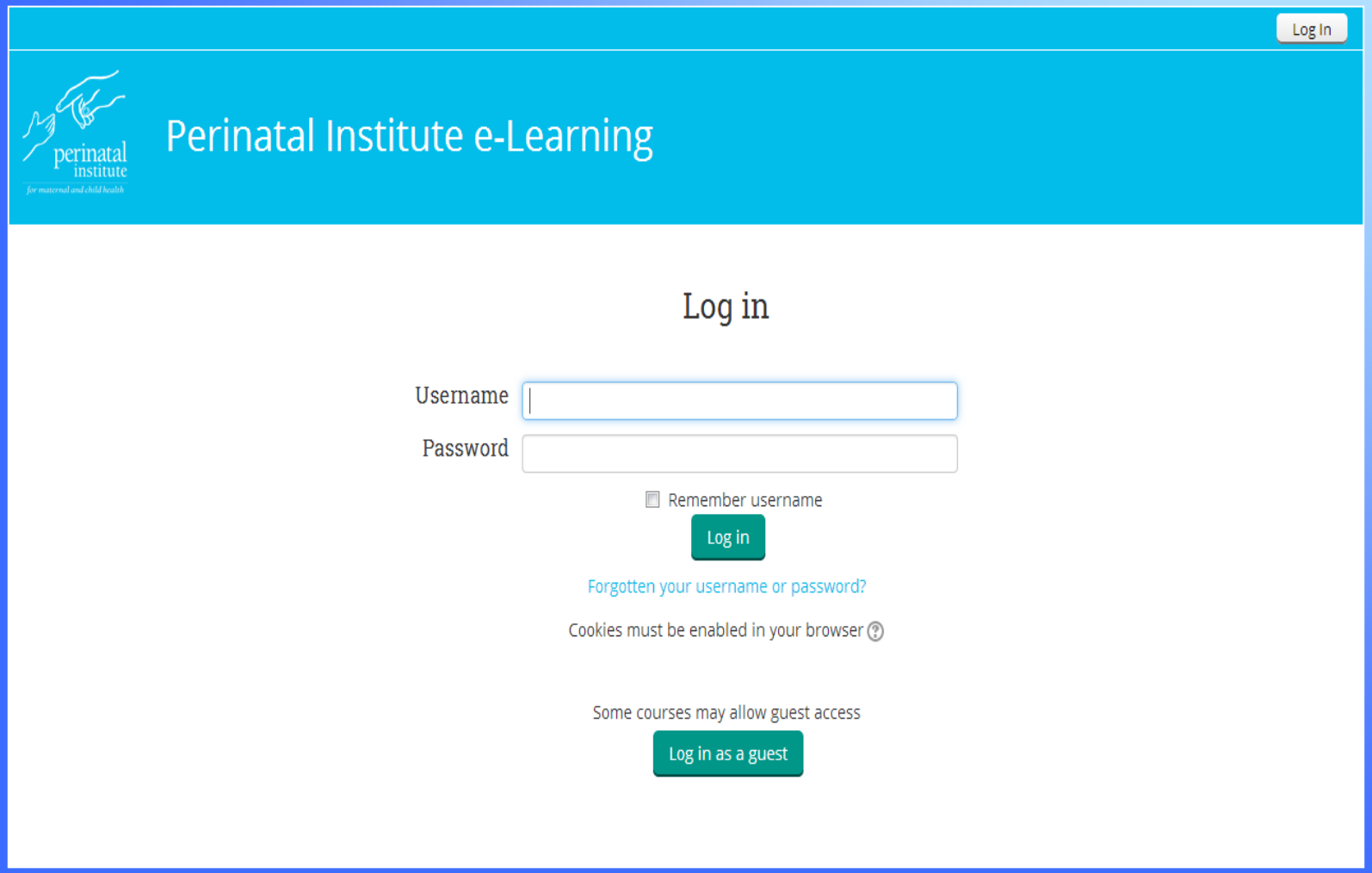
- Face-to-face training
- E learning
- Completion of baseline audit
- Competency assessments
- Template fetal growth protocol
- Monitoring detection rates
- Audit of non-detected cases of FGR
- GAP leads (midwife, obstetrician, sonographer)
- PI support

E-learning

Module 1 – Theory
Module 2 - Practice

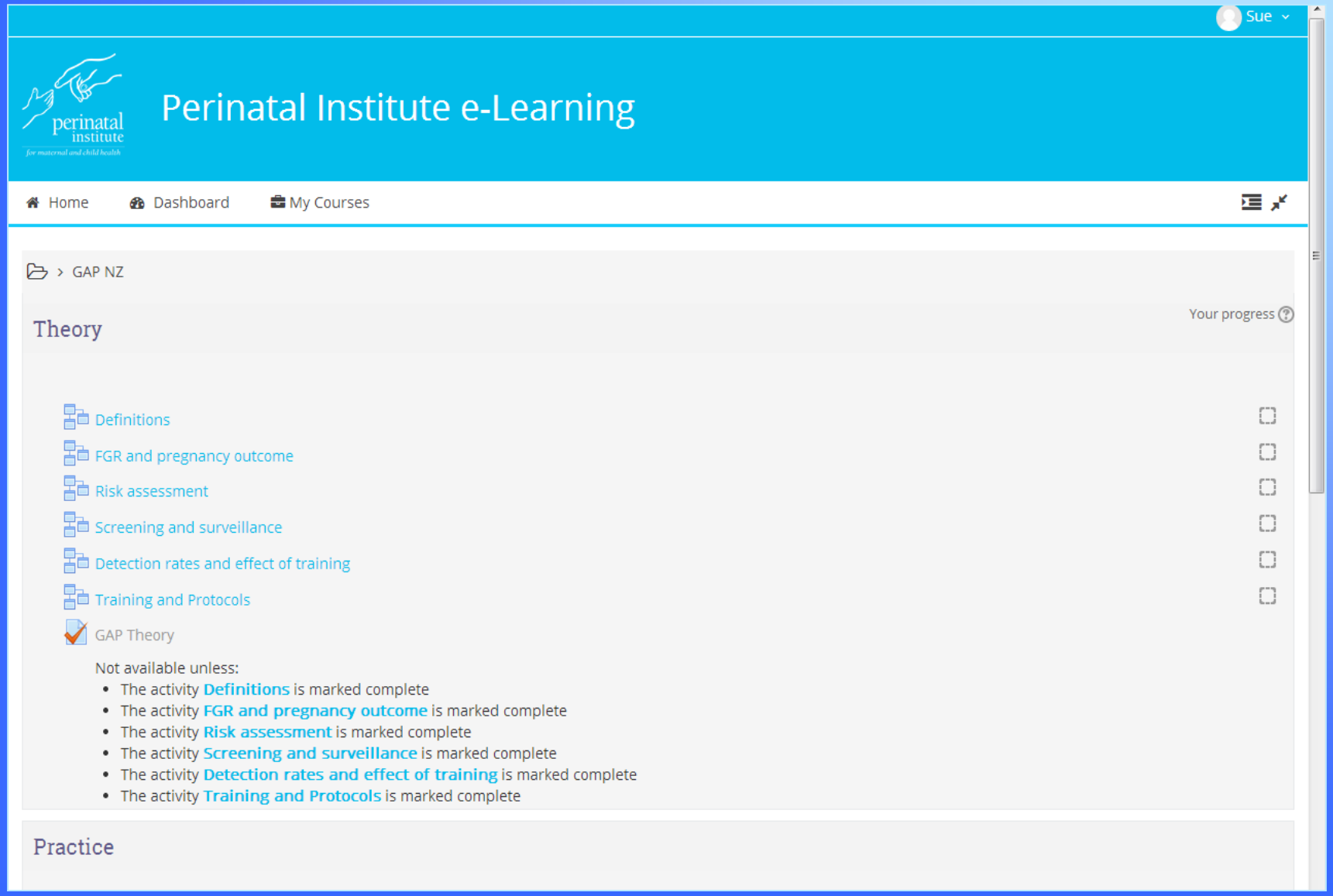
- Can be accessed from anywhere with an internet connection
- Will take approximately 1 hour to complete
- User can update themselves as required
  (every 12 months recommended)
- Email address required for every user
  Account will be set up and login details emailed to them
- Key leads will have a training log of all users who have completed on line training

Log in Screen



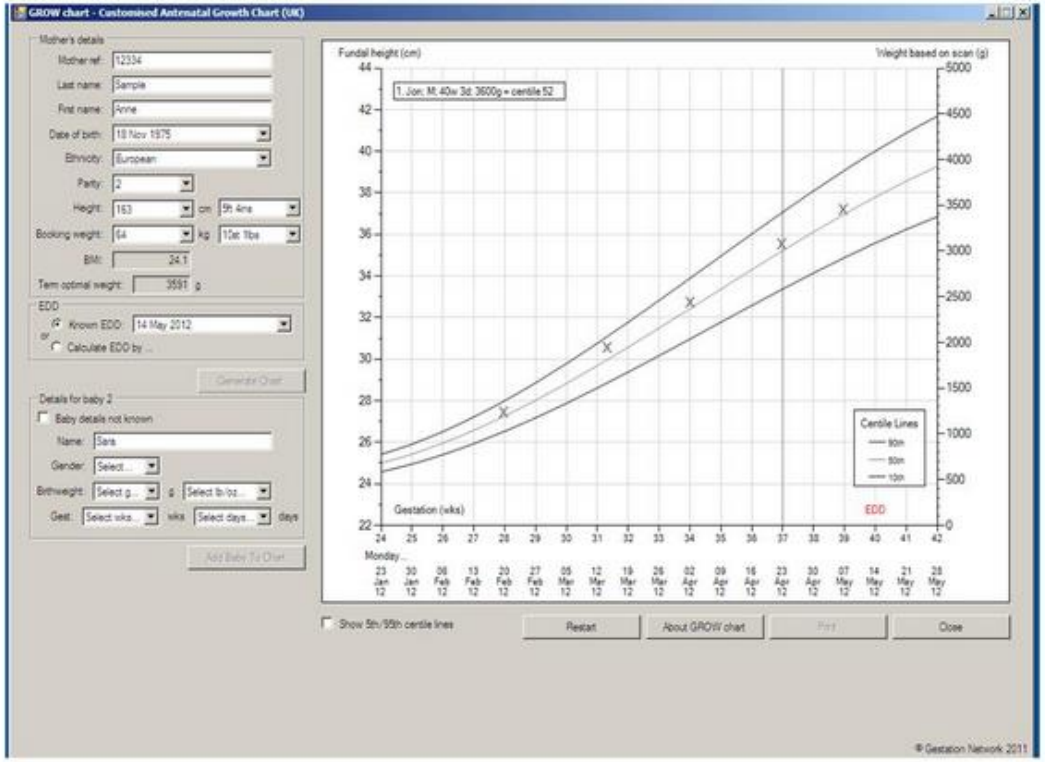
Log in details will be emailed to users with details of how to access the system

Courses


Sue
perinatal institute
for maternal and child health
Perinatal Institute e-Learning
Home
Dashboard
My Courses
GAP NZ
Theory
Your progress
Definitions
FGR and pregnancy outcome
Risk assessment
Screening and surveillance
Detection rates and effect of training
Training and Protocols
GAP Theory
Not available unless:
The activity Definitions is marked complete
The activity FGR and pregnancy outcome is marked complete
The activity Risk assessment is marked complete
The activity Screening and surveillance is marked complete
The activity Detection rates and effect of training is marked complete
The activity Training and Protocols is marked complete
Practice

Question 5 / 20

What does this chart show?



A. Accelerated growth

B. Static growth

C. Slow Growth

D. Normal growth

Next

Test at the end of each module

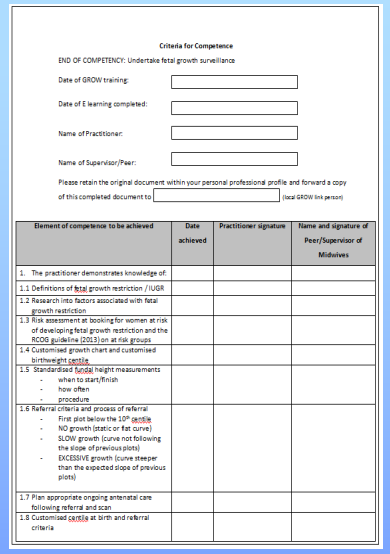
Assists learner to retain information

Can take test as many times as required

Can print own certificate

Competency Assessment

- Knowledge of:
  - Definitions of FGR
  - Research evidence
  - Risk assessment at booking
  - Customised growth chart and referral criteria
  - Standardised fundal height
  - Customised centile at birth and on going management
- Demonstration of:
  - Production of a GROW chart
  - Standardised fundal height
  - Plotting measurements on a chart



Criteria for Competence

END OF COMPETENCY: Undertake fetal growth surveillance

Date of GROW training:

Date of E learning completed:

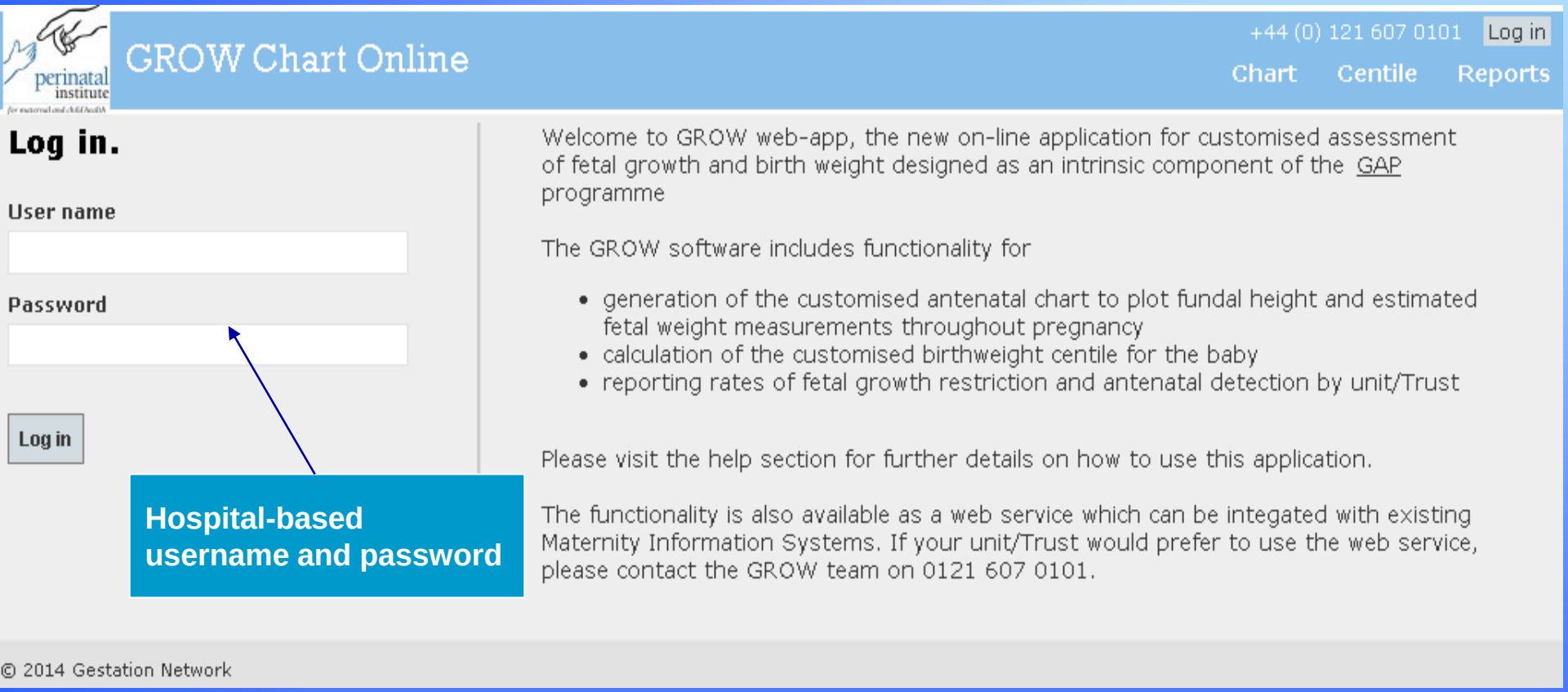
Name of Practitioner:

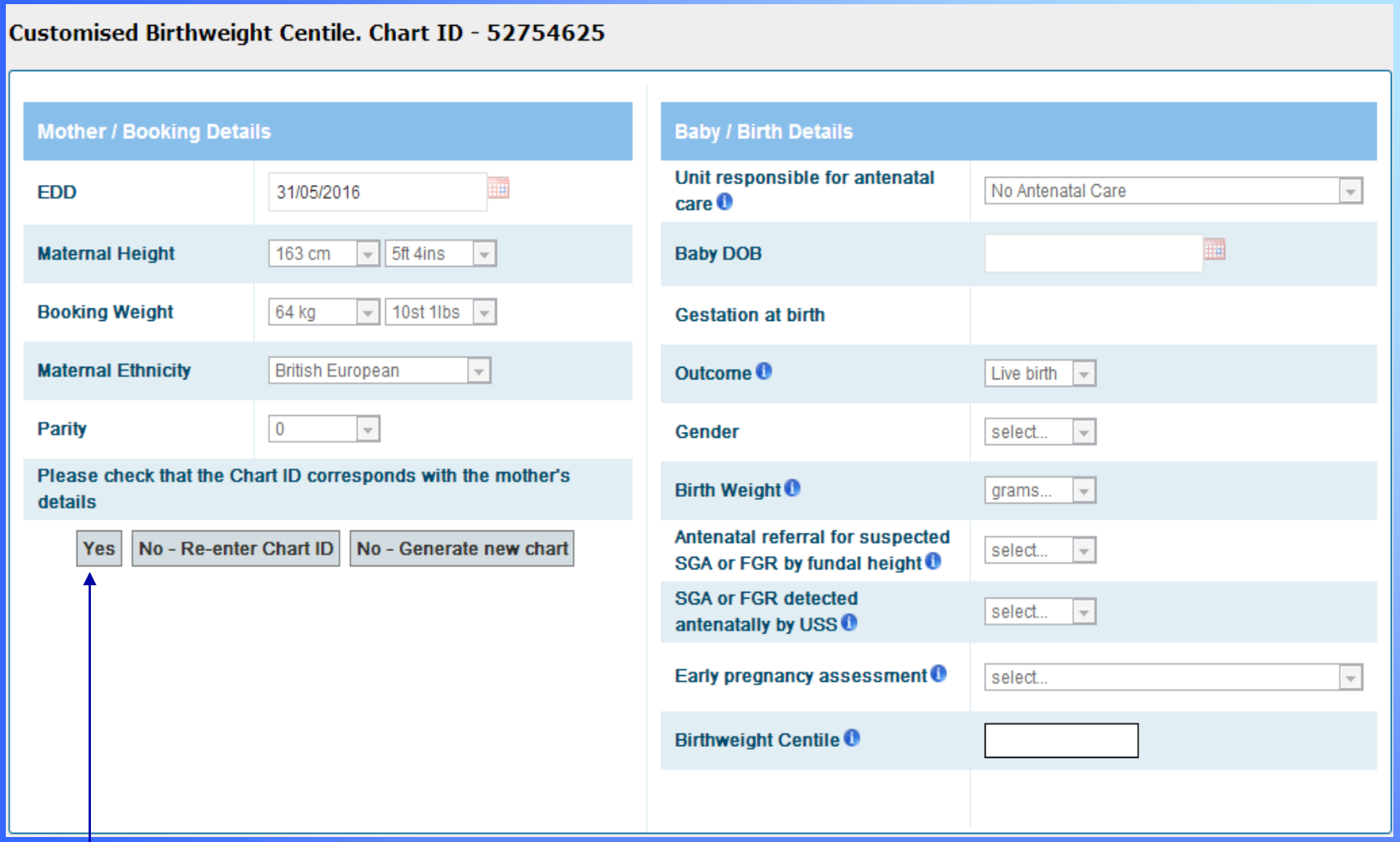
Name of Supervisor/Peer:

Please retain the original document within your personal professional profile and forward a copy of this completed document to (local GROW link person)

Element of competence to be achieved	Date achieved	Practitioner signature	Name and signature of Peer/Supervisor of Midwives
1. The practitioner demonstrates knowledge of:			
1.1 Definitions of fetal growth restriction / IUGR			
1.2 Research into factors associated with fetal growth restriction			
1.3 Risk assesment at booking for women at risk of developing fetal growth restriction and the RCOG guideline (2013) on at risk groups			
1.4 Customised growth chart and customised birthweight centile			
1.5 Standardised fundal height measurements - when to start/finish - how often - procedure			
1.6 Referral criteria and process of referral - First plot below the 10th centile - NO growth (static or flat curve) - SLOW growth (curve not following the slope of previous plots) - EXCESSIVE growth (curve steeper than the expected slope of previous plots)			
1.7 Plan appropriate ongoing antenatal care following referral and scan			
1.8 Customised centile at birth and referral criteria			

GROW Web App

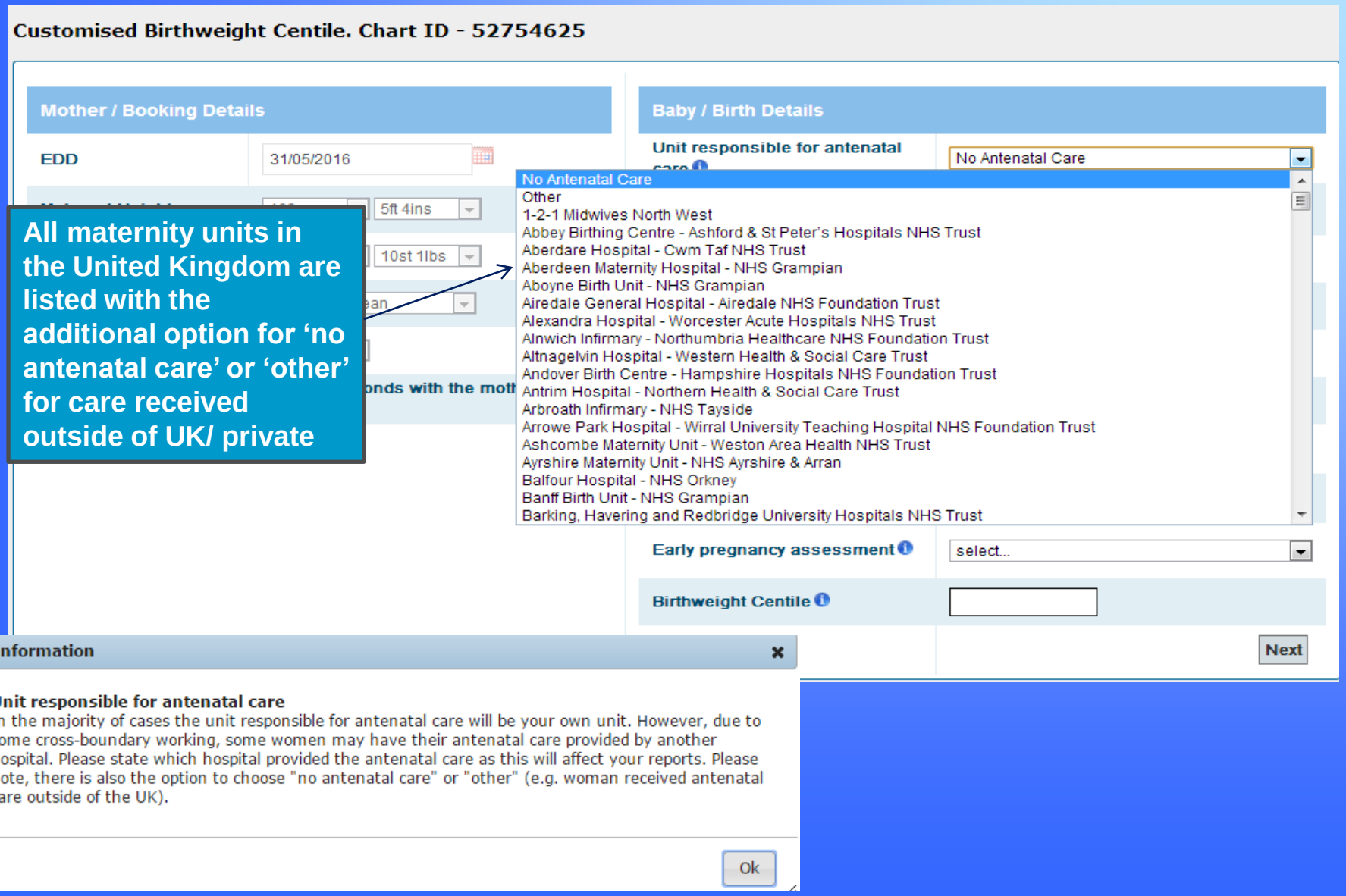

perinatal institute
GROW Chart Online
+44 (0) 121 607 0101
Log in
Chart
Centile
Reports
Log in.
User name
Password
Log in
Hospital-based username and password
Welcome to GROW web-app, the new on-line application for customised assessment of fetal growth and birth weight designed as an intrinsic component of the GAP programme
The GROW software includes functionality for
generation of the customised antenatal chart to plot fundal height and estimated fetal weight measurements throughout pregnancy
calculation of the customised birthweight centile for the baby
reporting rates of fetal growth restriction and antenatal detection by unit/Trust
Please visit the help section for further details on how to use this application.
The functionality is also available as a web service which can be integated with existing Maternity Information Systems. If your unit/Trust would prefer to use the web service, please contact the GROW team on 0121 607 0101.
© 2014 Gestation Network



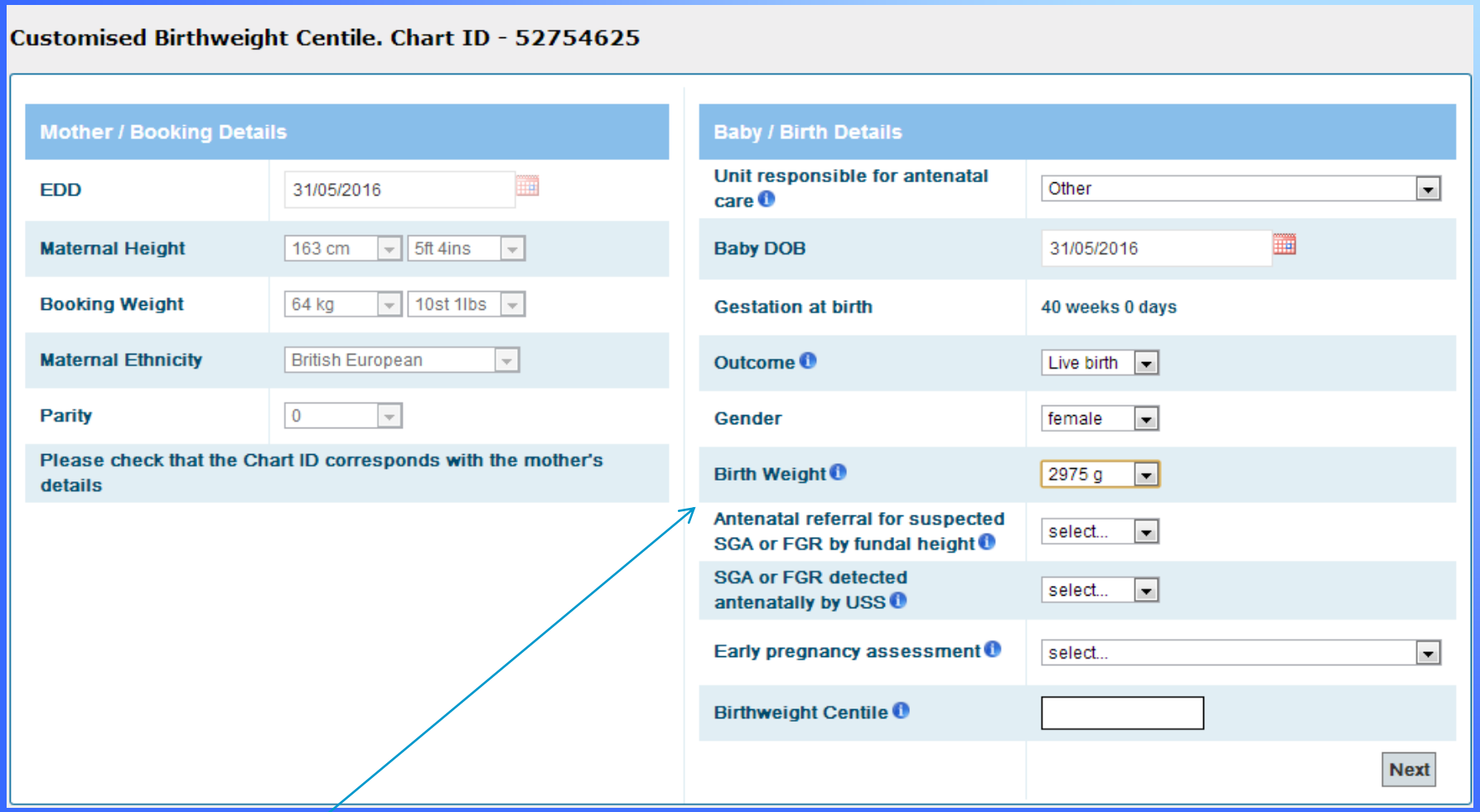
Confirm mother's details are correct. If so select "yes"

If mothers details are incorrect, re enter chart ID number. If details remain incorrect, generate a new chart, and use the new chart ID number.

Input unit responsible for antenatal care



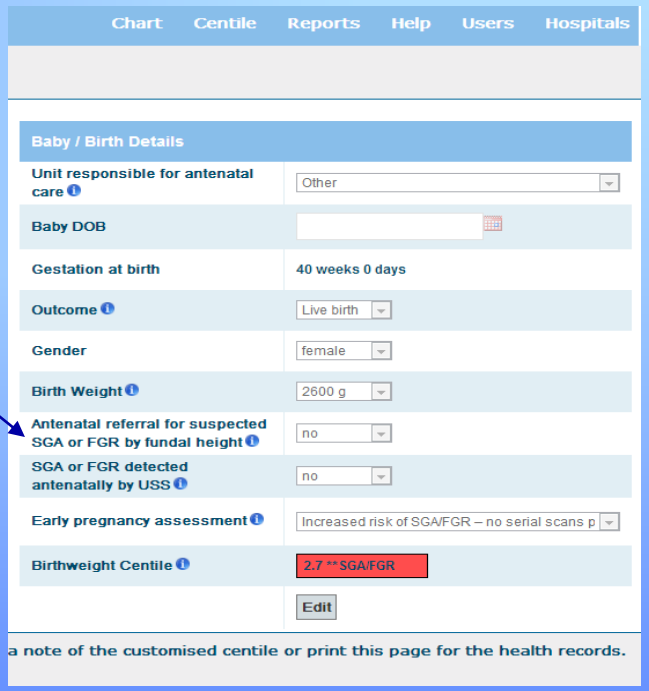
Obtaining a birthweight centile

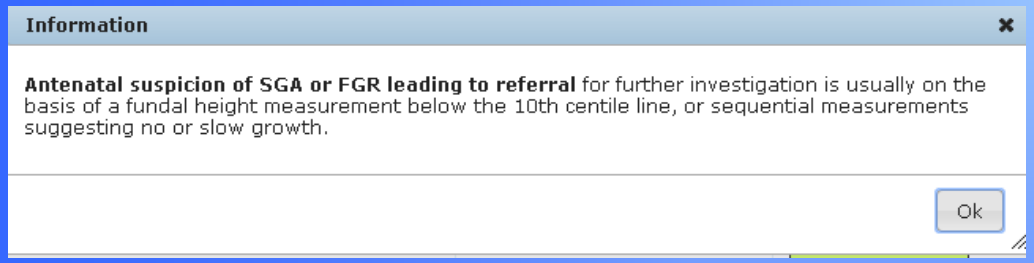


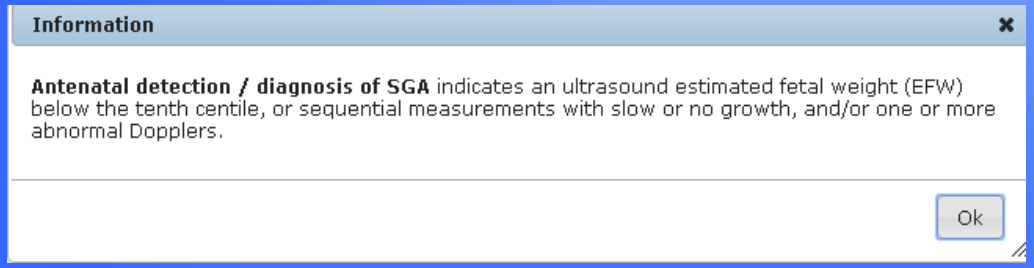
Complete birth details

Input baby birth details

Confirm if SGA / FGR was suspected (from a fundal height) or detected by scan antenatally

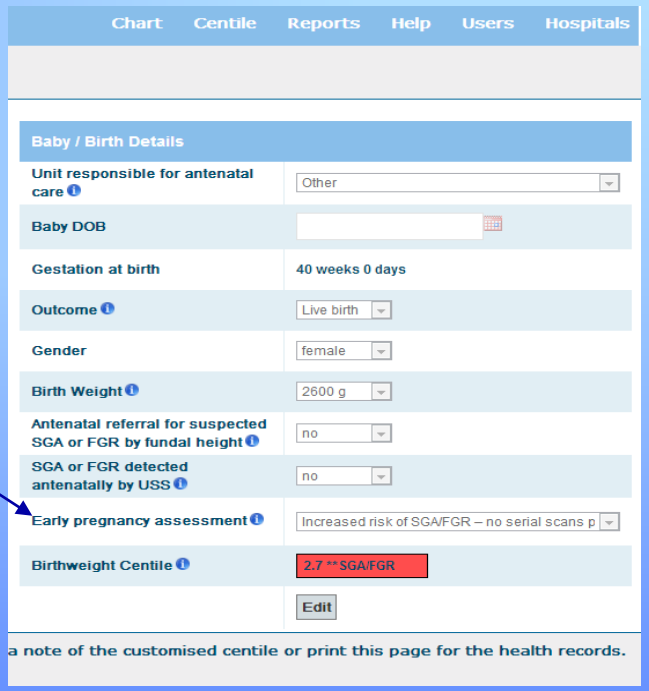


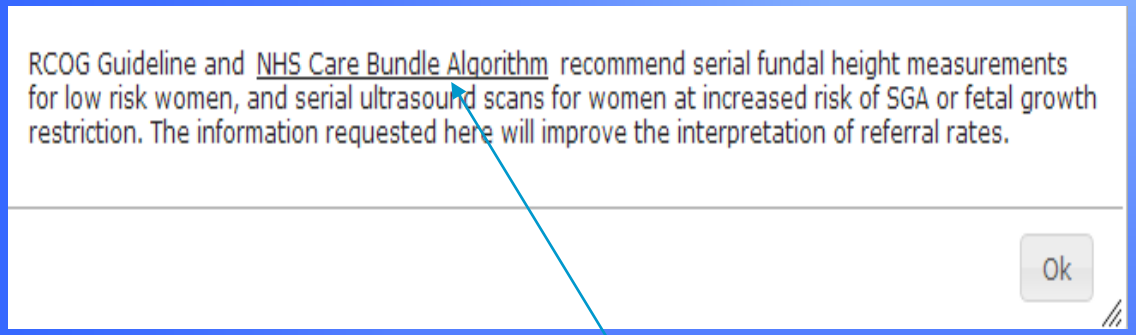




Input baby birth details

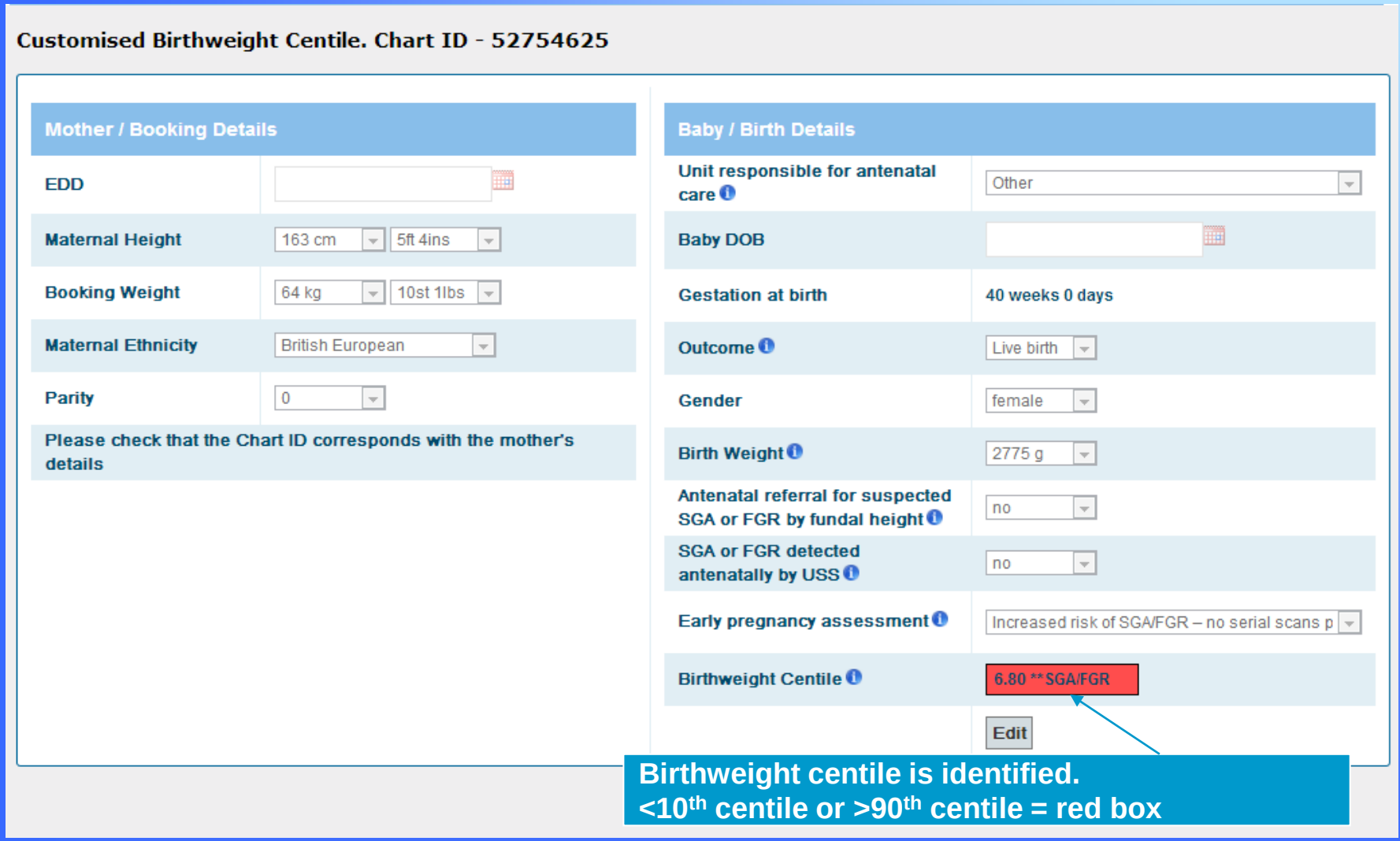
Identify early pregnancy assessment for low or increased risk *for fetal growth restriction.*





To review the NHS England Saving Babies Lives care bundle algorithm …..click here

New edit function for centile page outcome, gender, birth weight



Customised Birthweight Centile. Chart ID - 52754625

Mother / Booking Details	
EDD	
Maternal Height	163 cm / 5ft 4ins
Booking Weight	64 kg / 10st 1lbs
Maternal Ethnicity	British European
Parity	0
Please check that the Chart ID corresponds with the mother's details	

Baby / Birth Details	
Unit responsible for antenatal care	Other
Baby DOB	
Gestation at birth	40 weeks 0 days
Outcome	Live birth
Gender	female
Birth Weight	2775 g
Antenatal referral for suspected SGA or FGR by fundal height	no
SGA or FGR detected antenatally by USS	no
Early pregnancy assessment	Increased risk of SGA/FGR – no serial scans p
Birthweight Centile	6.80 **SGA/FGR
	Edit

Alterations can be made to:-
Outcome
Gender
Birth weight

Edit function:

Trust reports;

- Show local report on GROW application web page:
- https://ukaws.growservice.org/App

Benefits of Data collection

- Baseline FGR and antenatal detection rates
- Quarterly FGR reports
- Benchmarking against other units (anonymously)
- National picture

- Can identify missed cases to audit
- Can monitor performance and improvement
- Commissioning support – Ultrasound resources
- PI - Evaluation of GAP

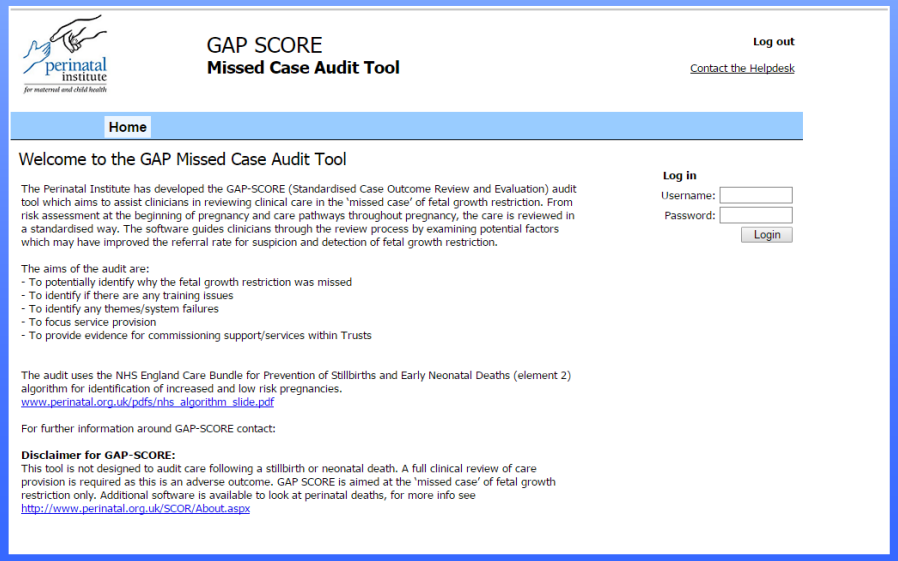
Audit missed cases - Aim

- For each case:
  - To identify why the FGR was missed if possible
  - To identify if there are any training issues
- Overall
  - To identify themes/system failures
  - To focus service provision
  - To provide evidence for commissioning support/services

GAP-SCORE

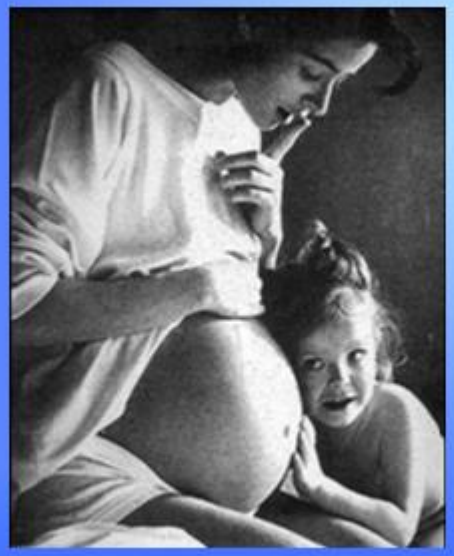
- We provide an electronic audit tool to audit to missed cases in an standardised manner

- GAP-SCORE = Standardised Case Outcome Review and Evaluation.



GAP-SCORE

- Based on risk at booking/throughout pregnancy and serial scanning
  (RCOG guideline, 2014 & NHS England Saving Babies Lives Care Bundle, 2016)
- Use of customised growth chart
- Plotting and referring
- Growth scans
- Provides taxonomies and action plans



Thank You

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