PRENATAL DIAGNOSIS
IMAGING

ULTRASOUND

EMBRYOSCOPY
FETAL MEDICINE
ULTRASOUND IMAGING

DATING
MULTIPLE PREGNANCY
ANOMALY SCREENING
FETAL GROWTH

AMNIOTIC FLUID VOLUME
PLACENTAL LOCALISATION

DOPPLER STUDIES
FETAL WELL-BEING
GUIDANCE OF INVASIVE PROCEDURES
PSYCHOLOGICAL ASPECTS
ULTRASOUND SCREENING DURING PREGNANCY

I: 11 - 14 WKS

II: 19 – 21 WKS

III: 32 - 36 WKS
ULTRASOUND SCREENING DURING PREGNANCY

FIRST EXAMINATION (11-14 WKS)

UTERUS, ADNEXAE
GESTATIONAL AGE
CHORIONICITY IN MULTIPLE PREGNANCIES
NUCHAL TRANSLUCENCY (NT)
EARLY MORPHOLOGY
ASSESSMENT OF GESTATIONAL AGE

MEAN GESTATIONAL SAC DIAMETER  +/- 7d

CROWN RUMP LENGTH (CRL)  +/- 5d

BIPARIETAL DIAMETER (BPD)  
  +/- 7 d  < 20 wks
  +/- 10d  20-26 wks
  +/- 2 wks  27-29 wks
  +/- 2.5 wks  30-32 wks
  +/- 3 wks  > 33 wks

FEMUR LENGTH (FL)

OTHER PARAMETERS (CEPHALIC CIRCUMFERENCE, HUMERUS LENGTH, CEREBELLUM, FOOT LENGTH)
ULTRASOUND SCREENING DURING PREGNANCY

FIRST EXAMINATION (11-14 WKS)

UTERUS, ADNEXAE
GESTATIONAL AGE
CHORIONICITY IN MULTIPLE PREGNANCIES
NUCHAL TRANSLUCENCY (NT)
EARLY MORPHOLOGY
FIRST-TRIMESTER SCREENING FOR FETAL ANEUPLOIDIES

NUCHAL TRANSLUCENCY MEASUREMENT:

1. CRL 41 - 80 mm
2. MEDIAN SAGITTAL SECTION OF THE FETUS IN NEUTRAL POSITION
3. DISTINCTION BETWEEN FETAL SKIN AND AMNION
4. THE FETUS SHOULD OCCUPY AT LEAST 75% OF THE IMAGE
5. MAXIMUM THICKNESS OF NT SHOULD BE MEASURED
6. CALLIPERS SHOULD BE PLACED ON THE LINES

Snijders RJM et al. Lancet 1998; 352: 343-6
FIRST-TRIMESTER SCREENING FOR FETAL ANEUPLOIDIES

SECONDARY BENEFITS OF NT MEASUREMENT:

WHEN THE FETAL KARYOTYPE IS NORMAL, A NT > 95th CENTILE MAY BE ASSOCIATED WITH:

1. CONGENITAL CARDIOPATHIES

2. OTHER FETAL ANOMALIES (ORGANIC / SYNDROMIC)
ULTRASOUND SCREENING DURING PREGNANCY

SECOND EXAMINATION (19-21 WKS)

GESTATIONAL AGE
MARKERS OF ANOMALY / ANEUPLOIDY
FETAL MORPHOLOGY I
PLACENTAL LOCALISATION
FETAL MORPHOLOGY SCAN

HEAD
SPINE
THORAX (HEART)
DIAPHRAGMA
ABDOMEN
EXTREMITIES
UMBILICAL CORD
FETAL GENDER (?)
FETAL MORPHOLOGY SCAN

HEAD

CRANIUM
CEREBRAL STRUCTURES
VENTRICLES, POSTERIOR FOSSA
ADDITIONNAL STRUCTURES ?

BIPARIETAL DIAMETER
OTHER MEASUREMENTS WHEN NEEDED

FACIAL STRUCTURES, PROFILE
FETAL MORPHOLOGY SCAN

RACHIS

LONGITUDINAL, TRANSVERSE AND FRONTAL VIEWS
FETAL MORPHOLOGY SCAN

THORAX

HEART: POSITION / AXIS, DIMENSIONS, RHYTHM, 4 CHAMBERS, OUTFLOW TRACTS

THORACIC WALL, RIBS
THORACIC CIRCUMFERENCE IF NEEDED

ADDITIONAL STRUCTURES?
FETAL MORPHOLOGY SCAN

DIAPHRAGMA
FETAL MORPHOLOGY SCAN

ABDOMEN

DIAMETERS AND/OR CIRCUMFERENCE

CORD INSERTION
STOMAC, LIVER, GALLBLADER, UMBILICAL VEIN

KIDNEYS: DIMENSIONS, STRUCTURES
BLADDER: PRESENCE (DYNAMIC EVALUATION)

ADDITIONNAL IMAGES ?
FETAL MORPHOLOGY SCAN

EXTREMITIES

FEMORAL LENGTH
MEASUREMENTS OF OTHER LONG BONES WHEN NEEDED

PRESENCE OF ALL 4 EXTREMITIES AND THEIR SEGMENTS
MOBILITY
ATTITUDE
POLYDACTILY?
FETAL MORPHOLOGY SCAN

UMBILICAL CORD

NUMBER OF VESSELS
FETAL MORPHOLOGY SCAN

FETAL SEX (?)
FETAL MORPHOLOGY SCAN
CRITICAL POINTS

1. TIMING

2. COMPREHENSIVE AND SYSTEMATIC EXAMINATION

3. EXPERIENCE OF NORMAL FETAL IMAGES

4. ONLY ADEQUATELY VISUALISED STRUCTURES SHOULD BE EVALUATED

5. IMAGING CONDITIONS
US MARKERS OF FETAL ANOMALIES

- Oligohydramnios
- Polyhydramnios
- Early growth retardation
- Dysharmonious fetal growth
- Abnormal motor activity
- Cardiac arrhythmias
US MARKERS OF FETAL ANEUPLOIDY

2ND-TRIMESTER OLIGOHYDRAMNIOSES
POLYHYDRAMNIOSES
EARLY GROWTH RETARDATION
DYSHARMONIOUS GROWTH
NON-IMMUNOLOGIC HYDROPS
ABNORMAL PROFILE
STRUCTURAL ANOMALIES
SINGLE UMBILICAL ARTERY
ABNORMAL MOTOR ACTIVITY
ULTRASOUND SCREENING DURING PREGNANCY

THIRD EXAMINATION (32-36 WKS)

- FETAL GROWTH
- FETAL MORPHOLOGY II (CNS, HEART, URINARY AND DIGESTIVE TRACTS, DIAPHRAGMA)
- AMNIOTIC FLUID
- PLACENTAL LOCALISATION
ULTRASOUND IN OBSTETRICS

DOPPLER EVALUATION OF FETAL AND UTERO-PLACENTAL CIRCULATIONS
PRENATAL DIAGNOSIS

EMBRYOSCOPY

DIRECT, DETAILED OBSERVATION OF FETAL ANATOMY AND INTEGUMENT

TRANSCERVICAL / TRANSABDOMINAL
ACCEPTED (PROVEN) BENEFITS

1. BETTER GESTATIONAL AGE ASSESSMENT

2. EARLIER DETECTION OF MULTIPLE PREGNANCIES

3. EARLIER DETECTION OF CLINICALLY UNSUSPECTED FETAL MALFORMATIONS
ANOMALY SCREENING REMAINS A CONTROVERSIAL ISSUE

BUT

A DIAGNOSTIC TEST DEPENDS ON PROPER MANAGEMENT AFTER DIAGNOSIS TO BECOME EFFICIENT
REFERENCES