Sonographic values in obstetrics and gynaecology

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Obstetric and gynaecological ultrasound is rampant with numerous cut off values. Some of these get revised over the years. The following list is a useful aid to refer to and revise.

- **1 mm**
  - rate of increase of a mean sac diameter per day in early pregnancy
- **2 mm**
  - generally accepted value for a thickness for a significant fetal pericardial effusion
  - generally accepted thickness for a decidual reaction for an early pregnancy
  - generally accepted thickness of an intertwin membrane in order differentiate a MCDA from a DCDA pregnancy
- **2.5 mm**
  - considered by some as the upper limit for a normal nuchal translucency (others take it as 3 mm)
  - traditional single cut off lower limit value for a nasal bone length below which it is considered as a hypoplastic nasal bone
- **3 mm**
  - considered by some as the upper limit for a normal nuchal translucency (others take is as 2.5mm)
  - considered by many as the upper limit of seperation between the choroid and the medial wall of the ventricles in or to support the diagnosis of a mild fetal ventriculomegaly
- **4 mm**
  - considered by some as the lower limit for an endometrial thickness below which is interpreted as endometrial atrophy
  - considered by many as the upper limit for a fetal renal pelvic diameter in the second trimester beyond which it is taken as fetal renal pelvic dilatation
- **5 mm**
  - **depth** of invasive component for cervical cancer to be upgraded from **stage Ia** to **stage Ib**
  - accepted upper limit for an endometrial thickness in a post menopausal patient
  - considered by many as the upper of the thickness of fetal subcutanous tissues beyond which it is interpreted as fetal anasarca

- upper size limit of microcysts in a type III CPAM
- accepted upper limit for an endometrial thickness following a DC/STOP procedure beyond which the diagnosis of retained products of conceptionshould be considered
- considered by some as a mininum size difference between a gestational sac over the size of the fetal pole for a healthy pregnancy

6 mm

- considered by many as the upper limit for a nuchal thickness
- maximal CRL beyond which a fetal heart rate should be seen for a viable pregnancy under current ASUM criteria

7 mm

- recently revised RCOG recommendation for CRL beyond which a fetal heart beat should be seen (ASUM criteria in process of revision).
- **width** of invasive component for cervical cancer to be upgraded from **stage Ia** to **stage Ib**

8 mm

- maximal gestational sac diameter (MSD) on a transvaginal scan beyond which a yolk sac should be seen for a viable pregnancy

10 mm: 1 cm

- upper limit for the accepted width of normal fetal ventricles beyond which it is considered as mild fetal ventriculomegaly
- considered by some as a upper limit for a simple appearing anechoicovarian cyst beyond which sonographic follow up required in a post menopausal patient
- upper limit for the diameter of the cisterna magna beyond which it is considered as a mega cisterna magna

12 mm: 1.2 cm

- accepted by many as the upper limit for a junctional zone in MRI above which is concerning for adenomyosis

15 mm: 1.5 cm

- upper limit for the accepted width of normal fetal ventricles in mild fetal ventriculomegaly beyond which it is considered as fetal hydrocephalus

16 mm: 1.6 cm

- considered by some as the upper limit of normal for gestational sac diameter (MSD) on a transvaginal scan scan beyond which a fetal pole should be seen for viable pregnancy: some consider this as 20 mm

20 mm: 2 cm

- considered by some as the upper limit of normal for gestational sac diameter (MSD) on a **transvaginal scan** scan beyond which a fetal poleshould be seen for viable pregnancy (current ASUM criteria)
- considered by some as the upper limit of size for a gestational sac (MSD) on a **transabdominal scan** beyond which a yolk sac should be visible
- minimum depth of amniotic fluid pocket below which it is reported asoligohydramnios
- accepted by many as the minimum distance between the placental edge and the internal cervical os below which it is classified as a low lying placenta
- size of peritoneal deposits in ovarian cancer which differentiates **stage IIIb**from **stage IIIc**

25 mm: 2.5 cm

- upper limit for mean sac diameter on a trans-abdominal scan beyond which a yolk sac should be seen for viable pregnancy
- recently revised RCOG recommendation for upper limit MSD beyond which a fetal pole should be seen (ASUM criteria in process of revision).
- accepted lower limit for a cervical length up to ~24 weeks below cervical incompetence is considered

30 mm: 3 cm

- considered by many as the upper limit for a ovarian cyst or paraovarian cyst in a premenopausal patient beyond which it should be mentioned on a radiology report

35 mm: 3.5 cm

- considered by some as the lower limit length of the umbilical cord to be considered as a short umbilical cord

40 mm: 4 cm

- considered by many as the maximal placental thickness at any gestation beyond which is it taken as placentomegaly

45 mm: 4.5 cm

- often accepted as the lower limit for a CRL in order for a nuchal translucency to be valid

50 mm: 5 cm

- considered by some as the upper limit for a ovarian cyst or paraovarian cyst in a premenopausal patient beyond which sonographic follow is recommended

70 mm: 7 cm

- considered by many as upper limit for a simple appearing ovarian cyst orparaovarian cyst beyond which MRI is recommended for full evaluation
- considered by many as upper limit for the umbilical cord length beyond which it is taken as a long umbilical cord

- **80 mm: 8 cm**
  - maximum depth of amniotic fluid pocket below which it is reported as polyhydramnios
- **84 mm: 8.4 cm**
  - often accepted as the upper limit for a CRL in order for a nuchal translucency to be valid

Normal reference values

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A list of **normal radiological reference values** is as follows:

1. adrenal gland: < 1 cm thick, 4-6 cm length
2. aorta: < 3 cm diameter
3. appendix: on CT < 6 mm calibre
4. atlantodental distance:
   - adults - < 3 mm
   - children - < 5 mm
5. azygous vein: on erect chest x-ray < 10 mm diameter
6. bladder wall: < 3 mm (well distended state)
7. boehler's angle: 20-40^{o}
8. capitolunate angle: < 30^{o}
9. carinal angle: < 60-70^{o}
10. colon:
    - lumen: < 5 cm

- wall: < 3 mm

11. common bile duct:

- < 7 mm and add 1mm for each decade over age of 60
- up to 10mm post cholecystectomy

12. diaphragm (right dome is usually higher than left)

- difference between right and left: < 3 cm

13. endometrial thickness:

- pre-menopausal: 3-15 mm
- post-menopausal: < 6 mm

14. esophagus wall: < 3 mm (with distended lumen)
15. gallbladder wall: < 3 mm (well distended)
16. heart (cardiothoracic ratio): < 55%
17. inferior venacava: < 28 mm
18. internal carotid artery:

- PSV: < 125 cm/s
- EDV: < 40 cm/s

19. kidneys : 8-10 cm x 4-6 cm
20. liver span: < 15 cm
21. lymph nodes:

- mediastinal: < 10mm in short axis
- retro-crural: < 6mm in diameter

22. ovarian follicle: < 2.5-3 cm
23. ovaries: volume:

- pre-menopausal: < 18 cc
- post-menopausal: < 8 cc

24. paraspinal lines:

- left: < 10 mm wide
- right: < 3 mm wide

25. paratracheal stripe: < 5 mm
26. portal vein: < 13 mm diameter
27. prevertebral soft tissue thickness (lateral c-spine x-ray):

- 7mm at C2
- 2cm at C7
- easiest way to remember is "7 at 2 and 2 at 7"

28. prostate volume: < 25 - 30 cc
29. pulmonary artery:
    - descending branch of right pulmonary artery: < 16 mm (males), < 15 mm (females)
    - main pulmonary artery: < 29 mm
30. scapholunate angle: 30 - 60^{o}
31. small bowel:
    - lumen: < 3 cm
    - wall: < 3 mm
32. spleen: < 12 cm
33. splenic vein: < 10 mm diameter
34. testis:
    - vein: < 2 mm diameter
    - size: < 5 x 3 x 3 cms (volume: 12.5-19 cc)
35. thyroid: < 2 cm anteroposterior dimension
36. trachea:
    - chest x-ray: < 25 mm (males) , < 21 mm (females)
37. ureter: 30-34 cm long, 2-8 mm diameter