Dystocia due to pelvic contraction
Any contraction of the pelvic diameter that diminishes the capacity of the pelvis can create dystocia during labour. Pelvic contracture may be classified as follows:

1. Contraction of the pelvic inlet.
2. Contraction of the midpelvis.
3. Contraction of the pelvic outlet.
4. Generally contracted pelvis (combination of the above).

I Contracted pelvic inlet:
Pelvic inlet usually considered contracted if its shortest anteroposterior diameter is less than 10 cm, or if the greatest transverse diameter is less than 12 cm. The anteroposterior (AP) diameter i.e the obstetric conjugate is usually obtained clinically by measuring the diagonal conjugate (the distance between the promontory of the sacrum and the lower margin of the symphysis pubis), and subtracting 1.5 cm from it. Otherwise the obstetric conjugate can only be measured by X-Ray pelvimetry, similarly the transverse diameter of the inlet can only be measured by imaging pelvimetry.

* The configuration of the pelvic inlet is also an important determinant of the adequacy of any pelvis independent of the actual measurement of these diameters.

* A small woman is likely to have a small pelvis, but she is also likely to have a small infant.
* Normally cervical dilatation is facilitated by the hydrostatic action of the unruptured membranes, or after their rupture by direct application of the presenting part against the cervix. In contracted pelvises, when the head is arrested in the pelvic inlet, the entire force exerted by the uterus acts directly upon the portion of membrane that overlies the dilating cervix, consequently early spontaneous rupture of the membrane is more likely to result.
* After membrane rupture, the absence of pressure by the head against the cervix and lower uterine segment predispose the less effective contraction leading to slow progress or even arrest of cervical dilatation.
* Also in woman with contracted pelvis, face and shoulder presentation are encountered 3 times more frequently, while cord prolapsed occur 4 - 6 times more frequently.
II Contracted midpelvis:

More common than inlet contraction, it is frequently a cause of transverse arrest of the fetal head in labour, which can lead to difficult midforceps operation or to caesarean section.

The obstetrical plan of the midpelvis extend from the inferior margin of the symphysis pubis, through the ischial spines and touches the sacrum near the junction of the fourth and fifth vertebrae. A transverse line theoretically connecting the ischial spines divides the midpelvis into anterior and posterior portions.

Average midpelvis measurement are as follows:

- Transverse (interspinous) 10.5 cm.
- Anteroposterior (form the lower border of symphysis pubis to the junction of the fourth and fifth sacral vertebrae) 11.5 cm.
- Posterior sagittal (from the midportion of the interspinous line to the same point on the sacrum about 5 cm.

The midpelvis likely to contracted when the sum of the interschial spinous and posterior sagittal diameters of the midpelvis (normally 10.5 + 5 = 15.5 cm) falls to 13.5 cm or below.

You should suspect midpelvis contracture, whenever the interschial spinous diameter is less than 10 cm, when less than 8 cm, it mean Contracted midpelvis.

No precise manual method of measuring midpelvis dimensions, usually a prominent ischial spines, pelvic sidewalls converge, or the sacroischial notch is narrow. Should arise the possibility of midpelvis contracture.

III Contracted pelvis outlet:

Usually defined as decrease interischial tuberous diameter to 8 cm or less.

The pelvic outlet described as 2 triangle with interischial tuberous diameter constituting the base of both.

* Diminution in the intertuberous diameter with consequent narrowing of the anterior triangle must inevitably force the fetal head posteriorly whether delivery can take place partly depend on the size of the posterior triangle, or more specifically on the interischial tuberous diameter and the posterior sagittal diameter of the outlet.

* A contracted outlet may cause dystocia not so much by itself, but through the often associated midpelvic contracture. Outlet contraction without concomitant midpelvis contracture is rare.

* With increasing narrowing of the pelvic arch, the occiput cannot emerge directly beneath the symphysis pubis but is forced increasingly father down upon the ischiopubic rami. So exposing the perineum to greater danger of disruption.
**Pelvic fractures:**
Car accident, the most common cause of pelvic fractures, when bilateral fractures of the pelvic rami occur, it will compromise the capacity of the birth canal, by callus formation or malunion. So history of pelvic fracture require careful review of previous X – Ray and MRI.

**Estimation of pelvic capacity:**
1 – Clinical evaluation : using digital examination of the boney pelvis during labour.
   i.e  a/ measure the anterior – posterior diameter of the inlet (diagonal conjugate) by introducing 2 fingers into the vagina and by depressing the wrist, the tip of the second finger may feel the promontory of the sacrum, and this vaginal hand elevated until it contact the pubic arch and the point on the index finger marked, the hand is withdrawn and distance measured between the mark and the hip of the second finger and then by subtracting 1.5 cm, the obstetric conjugate is obtained.

   b/ Interspinous diameter of the midpelvis.

   c/ The intertuberous distance of the pelvic outlet (transverse diameter of the outlet), here a measurement of over 8 cm is normal, done by placing a closed fist against the perineum between the ischial tuberosities after first measuring the width of the closed fist.

   d/ Pubic arch if narrow < 90°, can signify a narrow pelvis.
   similarly an unengaged head can indicate either excessive fetal head size or reduced pelvis inlet capacity.

2 – X – Ray pelvimetry : prognosis for successful vaginal delivery in any given pregnancy cannot be established on the basis of x – ray pelvimetry alone. So it is of limited value in the management of labour with cephalic presentation. But in breech vaginal delivery, it is still used in many centers.

3 – CT – scan computed tomographic scanning : the advantage of CT pelvimetry is a reduction in radiation exposure. And with greater accuracy and easier perform.
   Conventional x – ray - Gonadal exposure is estimated to be 885 mrad, while CT – ray from 250 – 1500 mrad.

4 – Magnetic resonance imaging (MRI) :
   Advantages include :
   a/ Lack of ionizing radiation.
   b/ Accurate pelvic measurement.
   c/ Complete fetal imaging, as well as evaluation of soft tissue dystocia.
**Excessive fetal size:**

Selection of fetal size threshold to predict fetopelvic and therefore, prevent obstructed labour, is not possible because most cases of disproportion occur in fetus whose weight is well within the range of the general obstetrical population.

Also the method to estimate fetal head are also imprecise. The brow and suboccipital region. In a cephalic presentation are grasped through the abdominal wall with the finger and firm pressure is directed down wards in the axis of the inlet. Fundal pressure by an assistance is usually helpful. The effect of the forces on the descent of the head can be evaluated by concomitant vaginal examination. If no disproportion exist the head readily enters the pelvis and vaginal delivery can be predicted.

Also the biparietal diameter and head circumference can be measured by ultrasound.

**Maternal – fetal effects of dystocia:**

1. Intrapartum infection: especially if membrane are ruptured.
2. Uterine rupture: especially in woman of high parity and those with previous cesarean section.
3. Pathological retraction ring: pathological retraction ring of bandle, result from obstructed labour with marked stretching and thinning of the lower uterine segment. Sometimes seen clearly as an abdominal indentation and signify impending rupture of the lower uterine segment.
4. Fistula formation: when the presenting part is firmly weighted into the pelvic inlet but dose not advance for a considerable time, portions of birth canal lying between it and the pelvic wall may be subjected to excessive pressure causing impaired circulation so that necrosis may occur several days late as vesicovaginal fistual, or vesicocervical or retrovaginal fistula.
5. Pelvic floor injury: during childbirth the pelvic floor is exposed to direct compression form the fetal head, as well as downward pressure from maternal expulsive effort resulting in stretching and distending the pelvic floor and this may lead to anatomical and functional alteration in muscles, nerves, and connective tissue which may cause urinary an fecal incontinence and genital prolapsed.