Course Name :An Overview on Maternal Health Antenatal, Intranatal and Postnatal Care

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Maternal Pelvis & Foetal Skull - Part 1

Hello students. Welcome you all to today's session for the NPTEL online certified courses on the topic and overview on maternal health, the antenatal, intranatal and postnatal care. I am Dr. Barnali Ghosh, an obstetrician and gynecologist working as an assistant professor at B.C. Roy Medical College and Research Center IIT, Kharagpur.

Today our topic of discussion is maternal pelvis and fetal skull. In the previous class we have discussed the obstetrical examination, the different maneuvers, the Leopold maneuvers, the obstetrical grips which help us to assess the position of the fetus, the lie, the presentation, the presenting part as well as the attitude of the fetus can be clinically determined by the third and the fourth Leopold maneuver that is the first and the second pelvic grip. All these examination gives us an idea whether the mother is going to deliver her fetus normally by vaginal route or will there be any chance of you know labor dystocia or problems during the process of labor. Today we are going to discuss the maternal pelvis.

Maternal pelvis is of very importance from the obstetrical point of view because this is the space through which the fetus has to negotiate itself during the delivery and thereby get delivered through the vaginal route. So, starting from the maternal pelvis we will discuss the different bony landmarks on the maternal pelvis, the diameters of the pelvis, the parts of the pelvis, the planes in the maternal pelvis as well as a discussion regarding the curve of carus. So, the keywords for today's class are as shown right. So, coming to the maternal pelvis. So, this is the picture of the maternal pelvis and here we can appreciate that this pelvis is a bony it is a bony part or it is a space which is bounded by bones all around and there are four different bones which help in the formation of this maternal pelvis.

This is the you know they here these are the two sides of the maternal pelvis and here these are the two innominate bones on two sides. What are they formed? These innominate bones are actually formed by the fusion of by the fusion of number one is the ilium, this is the pubis, pubis and this is the ischium right. So, these three bones will fuse together to form the innominate bone and posteriorly is the sacrum and below the sacrum this is the coccyx right. So,

this is the boundaries you know the bony pelvis it is useful to consider the bony pelvis as a whole rather than separately and we have already discussed it is composed of four bones that is the two innominate bones on the two sides and one is the sorry one is the sacrum posteriorly and below the sacrum is the coccyx and this innominate bone is nothing, but the fused part of ilium, ischium and pubis right. So, all these four bones they come together and they are they join together and they form the maternal pelvis.

So, coming to the demonstration of the maternal pelvis. So, this is the maternal pelvis and these are the two innominate bones on the two sides right. So, this is the ilium, this is the pubis and this is the ischium, these three bones they fuse together to form the innominate bones on two sides and behind is the sacrum and below the sacrum this is the coccyx right. So, this is the coccyx. Now see there are four bones.

Now what are the joints? There are four joints. Two joints posteriorly on either side right and left is the sacroiliac joint joining the ala of the sacrum and the ilium bone. So, this is the right sacroiliac joint and this is the left sacroiliac joint right. Another joint is the pubic symphysis. In between the two pubic bones this is the pubic symphysis which is nothing, but a secondary fibrocartilaginous joint right.

So, this is the pubic symphysis, this is the sacroiliac joint which are synovial joint. The pubic symphysis is a secondary fibrocartilaginous joint, it does not have a capsule, it does not have synovial fluid and so, there are three joints we have discussed. The fourth one is the sacrococcygeal joint joining the sacrum above and the coccyx below. The fifth sacral vertebra and the coccyx the joint is the sacrococcygeal joint which is also a synovial joint and it is a type of hinge joint because it helps in the movement of the coccyx posteriorly. There will be certain movement at this joint posteriorly when the fetal head comes out through the maternal pelvis at the time of crowning when the fetal head is at the obstetrical outlet right.

At the pelvic outlet there will be movement of this coccyx behind so, as to increase the diameter or this anteroposterior diameter of the pelvis thereby you know making more space for the fetal head to pass through right. So, I will first discuss from this demo I will discuss the maternal pelvis and then we will come to the slides. So, now, what is important for us to note is why is this pelvis, you know why knowing the pelvis the diameters of the pelvis is important because this is the space through which the fetus negotiates itself during the process of labour right. So, the we need to assess the pelvis whether it is adequate whether the space within the pelvic bones are adequate to negotiate the fetal head during the process of labour. If it is adequate as assessed by clinical pelvimetry then we can allow vaginal delivery right.

So, what are the landmarks coming to the landmarks from anterior to posterior. So, from anteriorly you go from the symphysis from the upper border of the pubic symphysis then this is

the pubic crest right. This is the pubic crest which ends laterally at the pubic tubercle right. Now, this is the pectineal line then comes the iliopubic eminence then it will be continued as the iliopectineal line right. Now, it will meet with the sacroiliac joint and will be continued as the anterior border of the ala of the sacrum then the anterior border of the sacral promontory right and similarly the other way round.

So, this forms the boundary of the pelvic inlet this is called as the pelvic brim or the linea terminalis. This pelvic brim actually separates the maternal pelvis into two parts, the part above is the false pelvis or the greater pelvis and the part of the maternal pelvis which is in below this pelvic brim this part is the true pelvis or the lesser pelvis right. So, we have learnt the pelvic brim and the parts of the pelvis. Now, coming back to our slides. So, the four joints yes two sacroiliac joint, one anteriorly pubic symphysis and one is the sacrococcygeal joint right.

Next coming to the bony landmarks I have already discussed pubic symphysis, pubic crest, pubic tubercle, then the pectineal line , iliopubic eminence, then this is the iliopectineal line, this is the sacroiliac joint right, then the anterior border of the ala of the sacrum, then the sacral promontory right. So, this is one half and the other way round. Similarly, this is the other way round. So, this is this will not be actually this is the this is low down, this is the ischial spine, this is low down.

So, this is the pelvic brim right and this pelvic brim will be separating the maternal pelvis into false pelvis above and true pelvis below right. Now, false pelvis this is the pelvic brim, this is the pelvic brim, pelvic brim and below the pelvic brim this yellow part is the true pelvis and above is the false pelvis right. False pelvis is also called as the greater pelvis, true pelvis is also called as the lesser pelvis sorry yes true pelvis is also called as the lesser pelvis. Now, false pelvis has less obstetrical significance, it is it has boundaries what are the boundaries laterally is the iliac bones, the iliac fossa on two sides right behind above the sacrum are the lumbar vertebra. So, behind the false pelvis is bounded by the lumbar vertebra and anteriorly the it is devoid of any bones, it is the anterior abdominal wall right.

So, that is the boundaries. Now, I have already told this false pelvis from obstetrical point of view it is of less importance, it just helps in the support of the enlarged gravid uterus during the period of pregnancy. Coming to the true pelvis, the true pelvis which is below the pelvic brim is of you know maximum obstetric significance and it is through this space that the fetus actually traverses through during the process of labour and it is divided further into three parts. The number one is the pelvic inlet, number two is the pelvic cavity and third is the pelvic outlet coming to one by one right. So, true pelvis it is actually the space or canal through which the fetus has to pass through and from this demo we can appreciate that anteriorly this part is shallow, this is the pubic symphysis which is shallow, but posteriorly see this part is deep right.

This is the sacrum, this is deep, this is 4 centimeter anteriorly, but posteriorly this is 11.5 centimeter the length. The sacrum which is going down deep and it is concave anteriorly, the sacrum is concave anteriorly right. So, it is a concave sacral you know curve which is concave anteriorly and this canal is actually you know following this curvature of the sacrum right. So, there is an axis of this true pelvis.

What is the axis? Axis will be you know first it will be going downwards and backwards and then further low down it will go as downwards and forwards right. So, this is the plane or curve of the pelvis, this is called as the curve of carus right. So, this is regarding the true pelvis. Now, this true pelvis can be divided from above below into different planes. So, these are the planes right.

So, these are the planes of the true pelvis from above to below. It is first is the pelvic inlet, first is the pelvic inlet which is at the level of the pelvic brim right at the level of the linear terminalis. So, this will be this is the S1 vertebra sacral first sacral vertebra. So, this plane is actually extending from the superior this is the pubic symphysis. So, this is actually extending from the superior border of the pubic symphysis and posteriorly to the sacral promontory to the upper border of the sacral promontory.

So, this is the pelvic inlet. Then this part is actually the cavity and cavity as a as such is a you know circular in shape. It has again two important planes number 1 is the plane of greatest pelvic dimension and number 2 is the plane of least pelvic dimension right. So, this plane of least pelvic dimension is very important from obstetrical point of view and it is it is the least pelvic dimension is the minimum distance right at this plane the pelvis is contracted. And if the fetal head can pass through this plane if it can go down this plane then it will ultimately get delivered vaginally.

Most of the arrest occurs at this plane right and ultimately is the pelvic outlet which is not a smooth plane you can see from this picture right. So, it is actually extending from the pubic symphysis then laterally here are the ischial tuberosities and then up to the tip of the coccyx right. So, this is the pelvic outlet and this is the coronal section showing the same this is the inlet and in the cavity the plane of greatest pelvic dimension and see this is the ischial spines the bony prominences present sorry. These are the bony prominences present on the inner surface on the inner surface of the pelvic sidewalls these are the ischial spines ischial spines. So, at the level of the ischial spine is the is the plane of least pelvic dimension right and this is the plane of pelvic outlet which is at the level of ischial tuberosity.

So, you getting a you know concept or an you know picture in your mind regarding the different planes of the pelvis. Now, coming to the inlet. So, inlet is the plane of the pelvic brim and it is also called as the superior strait right. So, we have already discussed that the pelvic

brim is you know the boundaries of the pelvic frame from anterior to posterior and at this pelvic brim or this plane of pelvic inlet it has certain diameters right. There are anteroposterior diameter see these are the anteroposterior diameter this is the transverse diameter and this is the oblique diameter right.

So, anteroposterior diameter of the pelvic inlet is also called as the conjugates and then comes the transverse diameter. What are diameters of pelvis? These are the distance between two fixed bony points right. So, coming to them one by one plane of the pelvic inlet yes that is the plane of the pelvic brim this is the plane of the pelvic inlet and here you need to appreciate that the when the female is standing erect right. So, then the pelvic inlet this plane this plane will be forming an angle with the horizontal it is not horizontal it is inclined right at the anatomical position when the female or the mother is standing erect the pelvis is inclined and this plane of pelvic inlet will form an angle with the horizontal that will make an angle of approximately 55 degrees with the horizontal right. And this pelvic inlet this plane will also make an angle with the first and second sacral vertebra.

See this is the pelvic plane right inlet plane of the pelvic inlet and here this angle this is the sacrum first and second sacral vertebra. So, this angle this angle is approximately 90 degrees. So, this angle is called as the sacral angle right. So, that is about the plane of the pelvic inlet and what I was discussing this is the angle of inclination 55 degrees with the horizontal. And you know this is important right this plane this angle of inclination is important right to because due to this pelvic inclination the uterus when the gravid uterus the the axis of the gravid uterus will coincide with the axis of the pelvis.

This axis of the pelvis which is going downwards and backwards this will be in alignment or will be parallel or will coincide with the axis long axis of the gravid uterus. So, when the uterine musculature they contract it will force the fetus to go down inside the pelvis right as these two axes are in the same line. So, it will force it will push the fetus to go inside the pelvis and another angle is the sacral angle which is you know most cases it is 90 degrees and that is between the first and second sacral vertebra and the plane of the pelvic inlet right. And this is the angle between the lumbar vertebra and the plane of the pelvic inlet right. So, that is regarding the pelvic inlet this is the anterior shallow border which is 4 centimeter pubic symphysis formed by the pubic symphysis posteriorly 11.5 centimeter which is formed by the deep long curvature of the sacrum and the coccyx. Now, regarding inclination this inclination this angle this angle can become more or less depending upon sacralization of lumbar vertebra or lumbarization of sacral vertebra. What does that mean? Say if this S 1 this S 1 becomes a lumbar vertebra or sometimes this lumbar vertebra L 5 this is L 5 it gets fused with the sacrum and that is called as the lumbarization of the sacralization of lumbar vertebra. Lumbar vertebra fuses with the sacrum that is sacralization of lumbar vertebra what happens? So, then the angle of inclination will be from here because that this vertebra has fused. So, we will calculate the

angle of in then the pelvic inlet will start from above and it will increase the inclination the angle of inclination will increase.

So, lumbarization you know when the lumbar vertebra fuses with the sacrum called as sacralization of lumbar vertebra the angle of inclination increases and this causes delay in engagement because the uterine axis will now the uterine axis will not coincide with the axis of pelvic inlet. So, that will hamper it will cause occipitoposterior position it will hamper in the descent of the head and making the bath canal more longer right and it will interfere with the internal rotation the different maneuvers that the fetal head undergoes in the pelvis and resulting in more chances of labor dystocia. Number 2 I have told that low inclination which occurs when the sacral vertebra becomes a lumbar vertebra there is lumbarization of sacral vertebra, but low inclination as such does not cause any obstetrical adversities right. So, it is of less importance. Sacral angle I have told it is the angle formed by the true conjugate the conjugate meaning the anteroposterior diameter of the pelvic inlet.

So, this angle between the conjugate true conjugate and the first and second sacral vertebra this is the sacral angle and lesser the sacral angle lesser meaning this angle will be acute and there will be more funneling of the pelvis approximately it is 90 degrees in most of the cases most of the cases meaning in gynaecoid pelvis. Axis yes what is the axis it is the line which connects that it is the perpendicular line perpendicular to the planes of the pelvis that line will be perpendicular to the planes of the pelvis and it will go through the midpoint of the anteroposterior diameters right. So, this axis of the pelvic inlet is directed downwards and backwards and it coincides with the uterine axis right. Now, coming to the different diameters of the pelvic inlet. First is the anteroposterior diameter I have already told that anteroposterior diameter this is also called as conjugate in case of inlet this is in case of pelvic inlet right.

Now, conjugate there are 3 different types of conjugate what are they number 1 is the anatomical conjugate anatomical conjugate or conjugate vera or true conjugate all are the same names of you know same identity it is synonymous conjugate vera true conjugate or anatomical conjugate what is it? It is actually the distance between anteriorly 2 fixed pony points. So, what is the fixed pony point anteriorly? It is the midpoint of the upper boundary of symphysis pubis. So, the midpoint of the upper boundary of the symphysis pubis to the midpoint of the sacral promontory. So, this line is the true conjugate right. Next is the obstetrical conjugate obstetrical conjugate as the name suggests this is of obstetrical importance and what is the definition? It is the distance between the most prominent part or the most prominent point on the inner surface of the pubic symphysis.

Pubic symphysis this inner surface is rough and the most prominent point on the inner surface of the pubic symphysis from that point to behind this point is fixed the midpoint of the sacral promontory. So, this is the obstetric conjugate and lastly is the diagonal conjugate which is from

the lower border of the pubic symphysis midpoint of the lower border of the pubic symphysis which is the apex of the pubic arch. So, from this midpoint of the lower border of the pubic symphysis if you go behind and we reach the midpoint of the sacral promontory. So, this is the diagonal conjugate. What are the lengths? We need to know the lengths right.

So, diagonal conjugate is 12 centimeter and from this diagonal conjugate we can calculate the obstetrical conjugate which is minus 2 centimeter that is 10 centimeter anatomical conjugate is 11 centimeter right. So, point here to note is this diagonal conjugate can be measured clinically. We can assess the diagonal conjugate by parvaginal examination. We make the patient lie down in lithotomy position right. Lithotomy you know dorsal, dorsal position that means, the patient is supine with the hips and knees flexed.

Now, we go for pervaginal examination, we go for parvaginal examination and we you know trace below we know make our hand and arm more low down. So, that we go inside the pelvis and go up up up and we you know can feel a bony resistance you know from where the bone receives back that is the sacral promontory. So, when this when we feel this sacral promontory now with the left hand I make a point or mark on the you know gloves of the right hand here. So, the then we take out this hand and from the measuring the length of this point which is marked at the you know which was just below the pubic arch of the mother up to the middle finger tip of the middle finger this gives the diagonal conjugate and it can be measured clinically and approximately you know it comes as 12 centimeters when it is called as adequate pelvis right. Some most of the cases we cannot palpate we cannot go to the sacral promontory in that case also the pelvis is said to be adequate.

So, these are the anteroposterior diameter and from the diagonal conjugate we can of course, calculate the obstetric conjugate by subtracting 1.5 in some books it is written or 2 centimeter that is 12 centimeter it is 10.5 or 10 centimeter right. So, from diagonal conjugate we can calculate the obstetrical conjugate which is the actual space which is available for the fetal head to pass through. Other two diameters that is the transverse diameter and the oblique diameter.

So, what is the oblique and transverse diameter length transverse diameter is 13.5 centimeter oblique diameter is 12 centimeter right in some books it is given 12.5, but 12 if you say it is ok. So, this I will again tell you the definitions what is the transverse diameter it is the it is a distance between the two farthest point on the iliopectineal lines right and what is the oblique diameter from the say this is the left sacroiliac joint from the left sacroiliac joint when we measure the distance to the iliopubic eminence of the opposite side this gives us the left oblique diameter and the right oblique diameter is measured from the right sacroiliac joint right. So, these are the pictorial representation of the diameters this is the anteroposterior diameter 12, 10 and 11 average taken it is 11 centimeter right, but to be more precise all the conjugates three different conjugates had three different lengths right and the oblique diameter is 12 centimeter

left oblique right oblique 12 centimeter and the transverse diameter is the distance between the two farthest point on the pelvic brim right two farthest point on the two sides of the pelvic brim.

And note here that this transverse diameter is a somewhat posterior from the midpoint it is a little posteriorly right and another is the sacrocotyloid diameter this is from the sacro midpoint of the sacral promontory to the illiopubic eminence of the same side and it is 9.5 centimeter it comes in relation when there is asynclitism of the fetal head during its engagement right. So, these are regarding the these are the trans true conjugate obstetric conjugate and diagonal conjugate regarding the pelvic inlet this is the measurement of the diagonal conjugate clinically. So, we have dealt with the pelvic inlet. Now, coming to the cavity the cavity is I have told it is more or less circular with and transverse and you know anteroposterior diameters all equal that is 12 centimeter.

So, this is the cavity this is below above by the pelvic inlet and below by the pelvic outlet in between is the pelvic cavity which is circular all throughout. So, anteroposterior oblique and transverse all three these are equal and they are of 12 centimeter. Now, coming to the outlet. So, this is the outlet it is a diamond shaped right outlet is diamond shaped why see this side. So, this is the symphysis pubis lower border these are the two ischial tuberosities and this is the tip of the coccyx.

So, this forms the outlet right. So, from the ischial tuberosity these are the sacrotuberous ligament right these two are the sacrotuberous ligament. So, ischial this is the lower border of symphysis pubis then the ischiopubic rami inferior ischiopubic rami ischial tuberosity the sacrotuberous ligament then the tip of the coccyx. So, this side also the tip of the coccyx and this forms a diamond shaped space called of the obstetrical of the pelvic outlet. And to note here that the transverse diameter of the inlet is the AP diameter of the outlet whereas, the AP diameter of the inlet is the transverse diameter of the outlet it is just reverse and this helps in internal rotation of the fetal head this orientation will help in the internal rotation of the fetal head during the process of delivery. So, here during engagement when it passes through the pelvic brim this fetal head it passes through the pelvic brim it will undergo rotation right.

So, it will undergo rotation by 90 degrees and this you know this alignment this change in the diameters of the inlet and the outlet helps in this accommodation of the fetal head during the process of rotation. So, the anteroposterior diameter becomes a transverse diameter and the transverse becomes the anteroposterior diameter right. So, now coming to the pelvic cavity, pelvic cavity is nothing, but is bounded above by the pelvic inlet and below by the plane of least pelvic dimension. Now, we have already discussed that there are two pelvic you know within the pelvic cavity there are two planes. Now, above is the plane of greatest pelvic dimension and below is the plane of least pelvic dimension say this is the sacrum S1, S2, S3, S4, S1, S2, S3, S4 and S5 and say here is the pubic symphysis.

So, this plane which is at the junction between S2 and S3 and the midpoint of the inner boundary of the pubic symphysis this plane is the plane of the greatest pelvic dimension right. And, this is more or less circular pelvic cavity is circular it has an AP diameter approximately 2.5 centimeter 12.5 centimeters and transverse diameter also same 12.5 to 12 point some say 75 centimeters right. So, this is the plane of greatest pelvic dimension it has roomy it is it has enough space to know pass the fetal head. So, we are less concerned what we are concerned is the plane of least pelvic dimension which will extend from the lower border of the symphysis pubis to the tip of the fifth sacral vertebra. So, this is the plane of the least pelvic dimension and this plane laterally has the ischial spines it is at the level of the ischial spines right. So, this plane of least pelvic dimension is of importance because it is less roomy it is narrow and it has to you know negotiate the fetal head to pass through. So, least pelvic dimension extends from the lower border of symphysis pubis to the tip of each ischial spines and posteriorly they meet the fifth sacral vertebra.

Now, what is the this plane of least pelvic dimension? What is the significance? It is the narrowest plane of the pelvis it gives origin of the levator ani muscles the pelvic floor muscles. Then it is this plane where the internal rotation of the fetal head occurs right. Then I have told that the plane of the pelvis each you know the axis the axis first it goes backwards and downwards then goes downwards and forwards this change in direction of the axis of the pelvis occurs at this plane. This also is the landmark for pudendal nerve block the pudendal nerve block given in cases of episiotomy this nerve winds round the ischial spine. So, at this plane we give the pudendal nerve block this ischial spine level is corresponding to the station 0 and it is irregularly oval and it has two prominent ischial spines projecting from the lateral pelvic wall.

So, this where the regarding the least pelvic dimension plane and its importance. Now, coming to the outlet, outlet I have already shown that it is a diamond shaped you know space right diamond shaped that is the anatomical outlet and what is the obstetrical outlet? Obstetrical outlet is a segment right it is a segment which you know extends from the plane of least pelvic dimension above and the anatomical outlet below. So, this segment of anatomical sorry anatomical anatomical outlet below and this segment the shaded segment is the obstetrical outlet this segment of the pelvis right and outlet I have told it extends from the lower border of the symphysis pubis this is the ischial tuberosity this is the ish the what is that sacrotuberous sacrum sacrotuberous ligament and this is the tip of the coccyx. So, this is a diamond shaped diamond shaped structure and in front is the urogenital triangle and behind is the anal triangle which is divided by the line joining the ischial tuberosities anterior anterior posterior diameter yes we have noted it is the transverse diameter of the inlet which is 11.5 centimeter and actually here I have to say transverse diameter of the pelvic inlet was 13 centimeter right.So, this 13 centimeter is attained when the coccyx is pushed behind during the process of labor the coccyx is pushed behind and the anterior posterior diameter then increases from 11.5 centimeter to 13 centimeter

and the transverse diameter will be the anterior posterior diameter of the inlet which is taken on an average as 11 centimeter. So, that was regarding the your outlet. Now, coming to the waste space of Morris.So, say this is this is the pelvis right. So, this is the pelvis and what is the waist space of Morris if we I am taking a bangle right. So, this may be say this bangle this has a diameter of 9.3 centimeter. So, when you keep it you know below the pubic arch when you keep this bangle below the pubic arch the distance or the space between the lower border of the symphysis pubis and this you know out the circumference of the bangle this space this space is called as the waste space of Morris right.

So, what is you know being denoted by this? This is actually what 9.3 centimeter signifies that the fetal head the biparietal diameter the biparietal diameter of the fetal head measures 9.5 centimeters, but during the process of delivery due to you know pressure by the pelvic tissue by the pelvic bones by the pelvic muscles this you know fetal head undergoes compression and there is overlapping of this fetal skull bones and this 9.5 centimeter you know may be decreased to 9.3 centimeters. And now this fetal head has to negotiate during the crowning during the process of crowning it has to negotiate through the pelvic outlet.

Now this fetal head which is like a bangle of 9.3 centimeters if this is present below the pubic arch this space between the lower border of the symphysis pubis and the circumference this space is the waste space of Morris why? Because this space is not being utilized by the fetus to pass through and this is this space is wasted right. So, if this space if this space this is the waste space of Morris say this is the waste space of Morris if this space or this distance is less than 1 centimeter then it is right it is all right or we can consider right we can consider it right. So, the pelvis is adequate, but if it is less than 1 centimeter that means, that the pelvis is contracted and when it occurs when the sub pubic angle this is the sub pubic angle when the sub pubic angle becomes narrow right then this space will increase if the sub pubic angle is more then this space will decrease. So, the this space this waste space of Morris increases if sub pubic angle decreases and it occurs where it occurs in android pelvis. So, in this type of pelvis where it is the sub pubic angle is narrow there you have to you know the fetal head is pushed more posteriorly and it you know we need to give more liberal episiotomy to allow the fetal head to be delivered or there will be tear sphincter tear anal sphincter tear perineal tears right.

So, that is the importance of the waste space of Morris and it can be you know assessed clinically also while examining if say 3 fingers can be put between the 2 pubic arches of the mother during examination then the feet the pelvis is said to be adequate, but if it is less or less than even 2 fingers right. So, then it is narrow pubic angle sub pubic angle and the feet pelvis is inadequate or contracted. Now, curve of carus I have already discussed this is the curve of carus which is actually the path traversed by the fetal head during its process of delivery and this is first you know pointed backwards and downwards and then ultimately it goes downwards and forwards and this change this change in this angle occurs at the level of the ischial spines it is at

the level of the ischial spines or at the level of or that the plane of least pelvic dimension right. So, this is the curve of carus. So, that was regarding the maternal pelvis and I have you know specifically dealt with the diameters of the inlet, cavity and outlet and the curve of carus and giving an overview about the waste space of Morris, but there are different you know types of maternal pelvis which we will discuss in our subsequent class and which pelvis are adequate, which pelvis will help in you know more normal progression of labor and you know smooth vaginal delivery and which pelvis can cause arrest can cause labor dystocia.

These needs to be learned from you know clinical examination and the different diameters of the fetal skull will be dealt in the next class. So, thank you for today and keep reading all these things from the textbooks. Thank you.