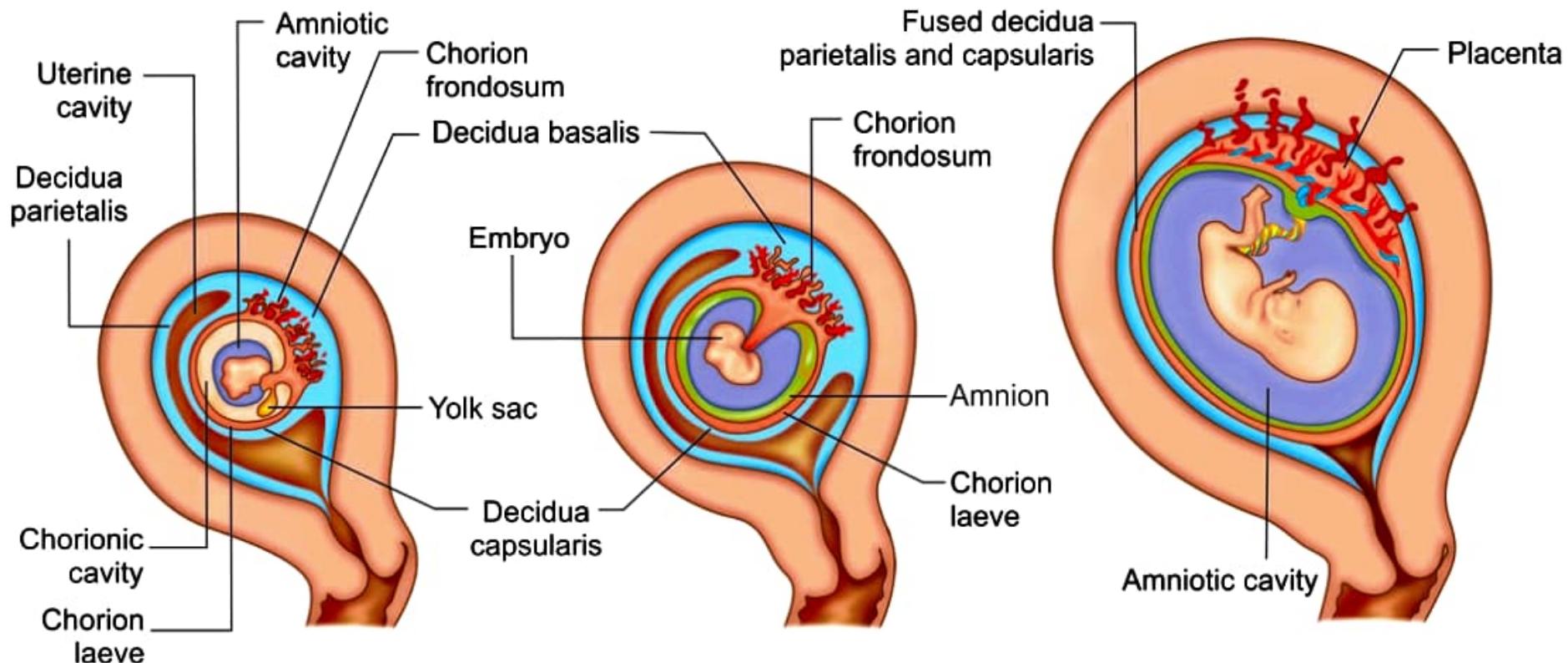


Formation of Placenta



(A) end of the 8th week; (B) 10 weeks after the last period; (C) end of the 12th week

Development

The placenta is a fetal organ made up of its parenchyma, chorion, amnion, and umbilical cord. The fetal structures form from the zygote and therefore separate the fetus from the endometrium. The fetal tissues form from the chorionic sac - which includes the amnion, chorion, yolk sac, and allantois. These tissues get delivered after birth. The maternal part comes from the endometrium and is called the decidua. There are three parts to the decidua - the decidua basalis (deep at the implantation site), the decidua capsularis (covers the implantation site), and the decidua parietalis (everything else).[\[1\]](#)

After fertilization, the fertilized ovum evolves into a morula, which will develop into the embryo and fetal placenta. The inner cell mass develops into the embryoblast, and the outer cell mass is the trophoblast. The morula then takes in fluid and forms a blastocyst with the trophoblast surrounding the inner cell mass and fluid. The blastocyst implants into the uterus approximately six days after fertilization. The contact of the trophoblast with the endometrium causes the development of the syncytiotrophoblast, which secretes human chorionic gonadotrophic hormone (hCG) and the cytotrophoblast which secretes enzymes that break down the bond between endometrial cells so the syncytiotrophoblast can invade the endometrial wall. Both the cytotrophoblast and the syncytiotrophoblast are part of the chorion, which develops into the placenta along with the

into the uterus approximately six days after fertilization. The contact of the trophoblast with the endometrium causes the development of the syncytiotrophoblast, which secretes human chorionic gonadotrophic hormone (hCG) and the cytotrophoblast which secretes enzymes that break down the bond between endometrial cells so the syncytiotrophoblast can invade the endometrial wall. Both the cytotrophoblast and the syncytiotrophoblast are part of the chorion, which develops into the placenta along with the extraembryonic mesoderm.[\[2\]](#)[\[3\]](#)[\[4\]](#)

The chorion forms the placenta and consists of the syncytiotrophoblast, cytotrophoblast, and extraembryonic mesoderm. The cytotrophoblast grows into the syncytiotrophoblast as finger-like projections, which are called the primary chorionic villi. The extraembryonic mesoderm splits into somatic and splanchnic mesoderm, and the somatic mesoderm grows into the primary villi creating the secondary villi. The mesenchyme gives rise to blood cells and vessels, which designate tertiary villi when formed. Capillary beds grow from the villi, which connect to the embryo heart. Maternal blood flowing through the embryonic capillaries provide oxygen and nutrients to the fetus. The villi continue to grow and branch into the villus chorion, which is the fetal placenta.[\[5\]](#)

As development continues, cells from the cytotrophoblast continue to extend through the syncytiotrophoblast to eventually form a cytotrophoblastic shell. As progesterone increases,

through the embryonic capillaries provide oxygen and nutrients to the fetus. The villi continue to grow and branch into the villus chorion, which is the fetal placenta.[\[5\]](#)

As development continues, cells from the cytotrophoblast continue to extend through the syncytiotrophoblast to eventually form a cytotrophoblastic shell. As progesterone increases, the decidua connective tissue develops into “decidua cells,” which help protect the uterus from an invasion of the syncytiotrophoblast. As the sac continues to grow, the decidua capsularis villi degenerate and eventually disappear as they fuse with the decidua parietalis.

The amniotic sac enlarges faster than the chorionic sac, which causes them eventually to come into contact and fuse into the amniochorionic membrane. The amniochorionic membrane then fuses to the decidua capsularis and, ultimately, the decidua parietalis for stability. The amniochorionic membrane with the fetal vessels makes up the chorionic plate. Parts of the decidua basalis grow into the chorionic plate dividing it into separated septa called cotyledons, in which each contains stem villi.[\[6\]](#)

The fetomaternal junction provides stability for the chorion. The chorionic villi that attach to the decidua basalis are an anchor for the fetal chorionic sac to the endometrium. Endometrial vessels, called spiral arteries, make their way through openings in the

X ⚡ Embryology, Placenta - S... https://www.ncbi.nlm.nih.gov



chorionic plate. Parts of the decidua basalis grow into the chorionic plate dividing it into separated septa called cotyledons, in which each contains stem villi.[\[6\]](#)

The fetomaternal junction provides stability for the chorion. The chorionic villi that attach to the decidua basalis are an anchor for the fetal chorionic sac to the endometrium. Endometrial vessels, called spiral arteries, make their way through openings in the cytotrophoblastic shell and reside inside the villi where they release maternal blood to bathe the chorionic villi in each cotyledon; this allows for maternal blood to provide oxygen and nutrients to the fetus across the placental membrane.

Endometrial veins then drain the blood. Although the fetal vessels are bathed in maternal blood, there is normally no mixing between maternal and fetal red blood cells.[\[7\]](#)

The placental membrane is where the mother and fetus exchange gases, nutrients, etc. The membrane forms by the syncytiotrophoblast, cytotrophoblast, embryonic connective tissue (Wharton's jelly), and the endothelium of fetal blood vessels.

The umbilical cord serves to attach the fetus to the placenta and consists of two umbilical arteries and one umbilical vein

PLACENTAL FUNCTION

The main functions of the placenta are:

1. Transfer of nutrients and waste products between the mother and fetus.

In this respect, it attributes to the following functions:

- **Respiratory;**
- **Excretory;**
- **Nutritive**

2. **Endocrine and enzymatic function:** Placenta is an endocrine gland.

It produces both steroid and peptide hormones to maintain pregnancy

3. **Barrier function.**

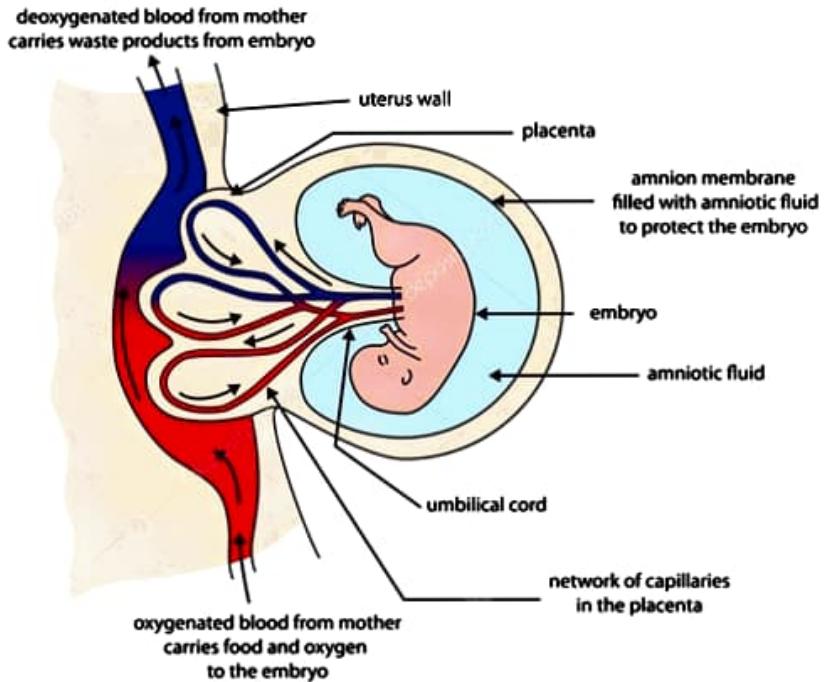
4. **Immunological function.**

1- Respiratory function:

Intake of oxygen and output of carbon dioxide take place by **simple diffusion** across the fetal membrane.

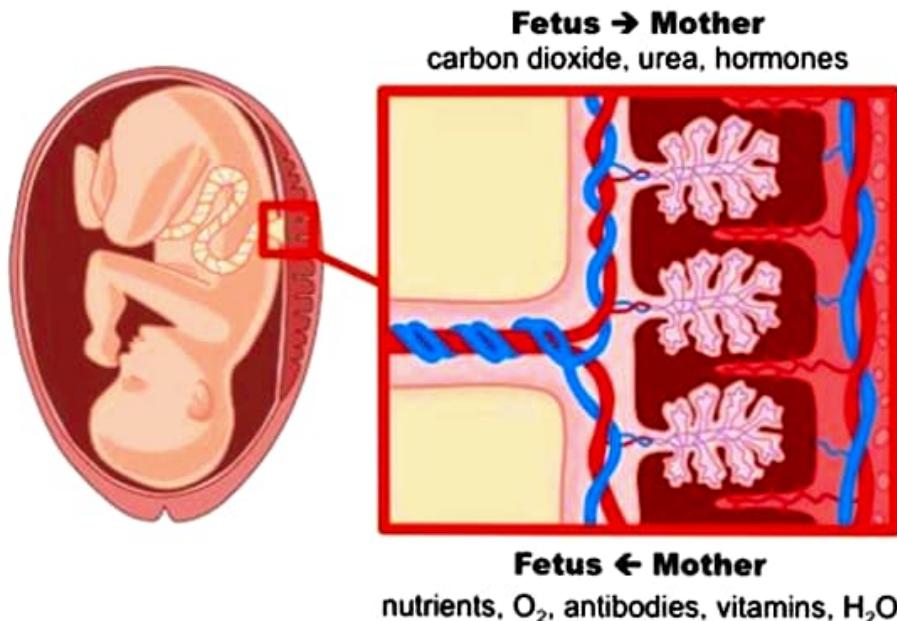
Partial pressure gradient is the driving force for exchange between the maternal and fetal circulations.

The developing embryo in the uterus



2- Excretory function:

Waste products from the fetus such as urea, uric acid, and creatinine are excreted in the maternal blood by simple diffusion.



3- Nutritive function: Fetus obtains its nutrients from the maternal blood

Glucose- transferred to the fetus by facilitated diffusion

Lipids for fetal growth and development has dual origin. They are transferred across the fetal membrane or synthesized in the fetus

Amino acids are transferred by active transport

Water and electrolytes- Na, K ,Cl cross by simple diffusion, Ca , P, and Fe cross by active transport

Water soluble vitamins are transferred by active transport but the fat soluble vitamins are transferred slowly

4-Endocrine and Enzymatic function

Placenta secretes various hormones –

Protein hormones like HCG, human placental lactogen,

pregnancy specific beta 1 glycoprotein,

pregnancy associated plasma protein, steroidal hormones like estrogen and progesterone

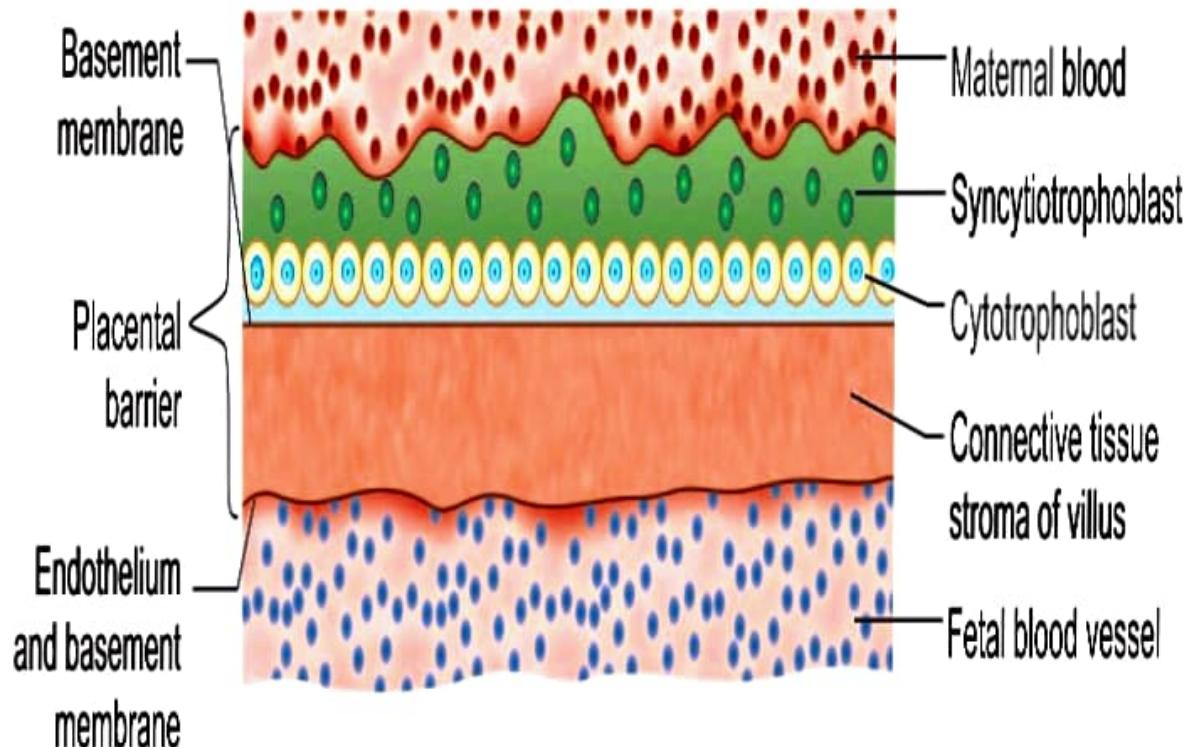
Enzymes-

diamine oxidase which inactivates the circulatory pressure

oxytocinase which neutralizes the oxytocin,

5-Barrier function

- Placental membrane is thought to be a **protective barrier for the fetus against harmful agents in the maternal blood**
- Substances with large molecular weight or size like insulin or heparin are transferred minimally
- Maternal infections during pregnancy by **virus** (rubella, chickenpox, measles, mumps, poliomyelitis), **bacteria** (*Treponema pallidum*, *Tubercle bacillus*) or **protozoa** (*Toxoplasma gondii*, malaria parasites) may be transmitted to the fetus across the so-called placental barrier and affect the fetus in utero.
- Similarly, almost any drug used in pregnancy can cross the placental barrier and may have deleterious effect on the fetus.



6-Immunological function

The fetus and the placenta contain paternally determined antigens, which are foreign to the mother.

In spite of this, there is no evidence of graft rejection.

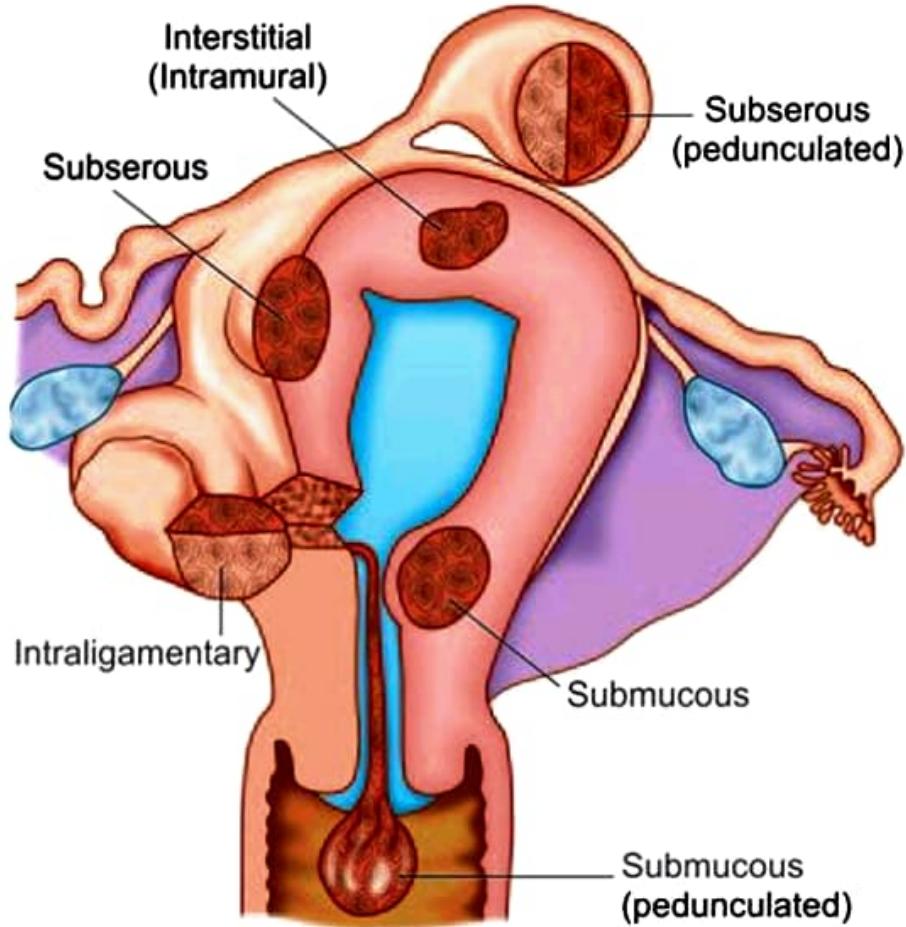
Placenta probably **offers immunological protection against rejection**.

FIBROID

- 1) Fibroid is the commonest benign tumor of the uterus
- 2) the commonest benign solid tumor in female
- 3) this tumor is composed of **smooth muscle** and **fibrous connective tissue**, so named as **uterine leiomyoma, myoma or fibromyoma**.
- 4) It is predominantly an estrogen-dependent tumor.

Risk factors for fibroid

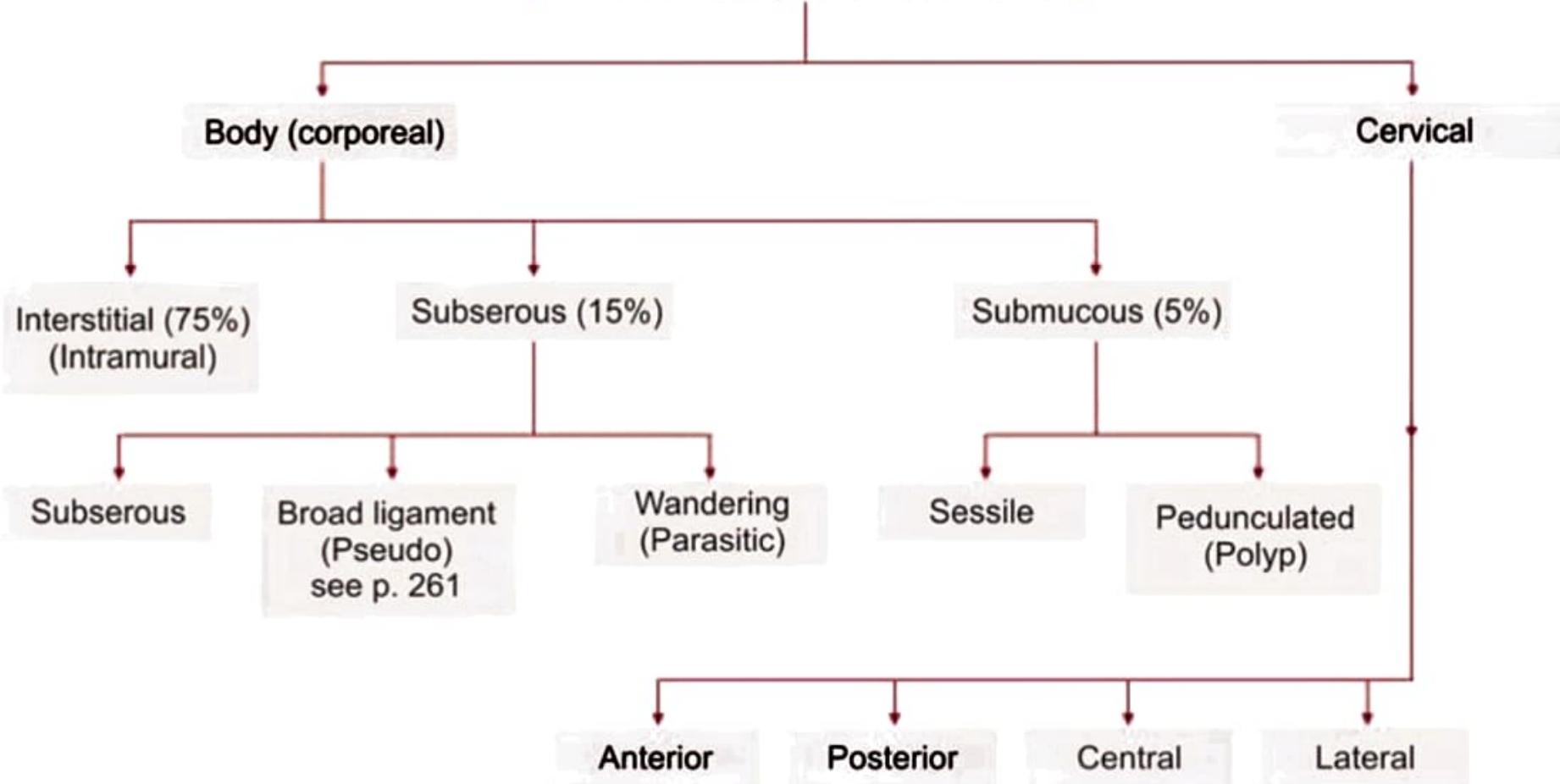
- 1) Nulliparity
- 2) Obesity
- 3) Hyperestrogenic state
- 4) Black women



Various types of uterine fibroids

UTERINE FIBROIDS

(Classification by anatomic location)



Types: 1) Body 2) Cervical

1) Body: The fibroids are mostly located in the body of the uterus.

1) Interstitial or intramural (75%)

Initially, the fibroids are intramural in position but subsequently, some are pushed outward or inward.

2) Subperitoneal or subserous (15%)

In this condition, the intramural fibroid is pushed outwards towards the peritoneal cavity

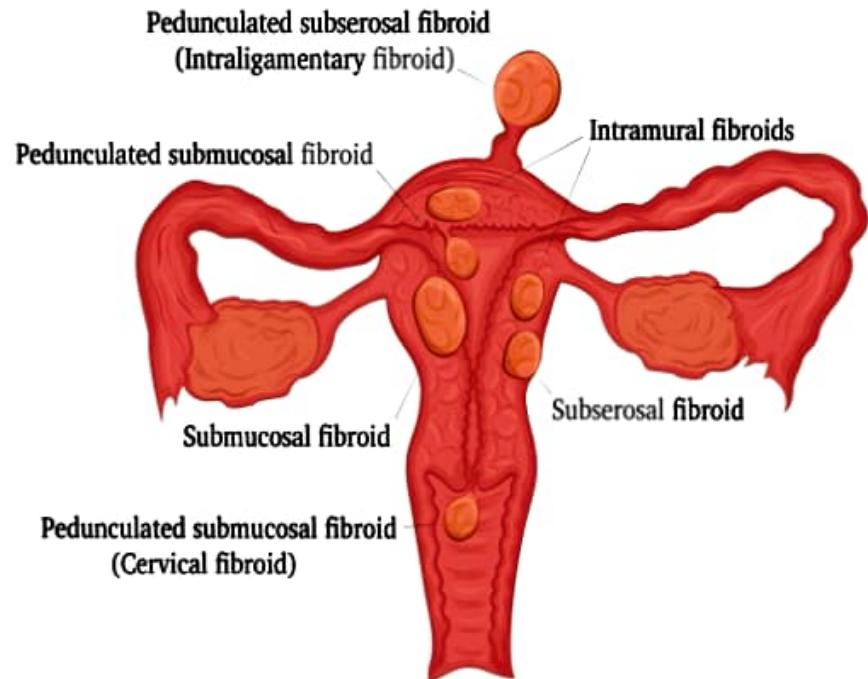
3) Submucous (5%)

The intramural fibroid when pushed toward the uterine cavity, and is lying underneath the endometrium, it is called submucous fibroid.

Submucous fibroid can make the **uterine cavity irregular and distorted.**

Pedunculated submucous fibroid may come out through the cervix. This **variety is least common (about 5 %)** but it produces maximum symptoms

Types of uterine fibroids

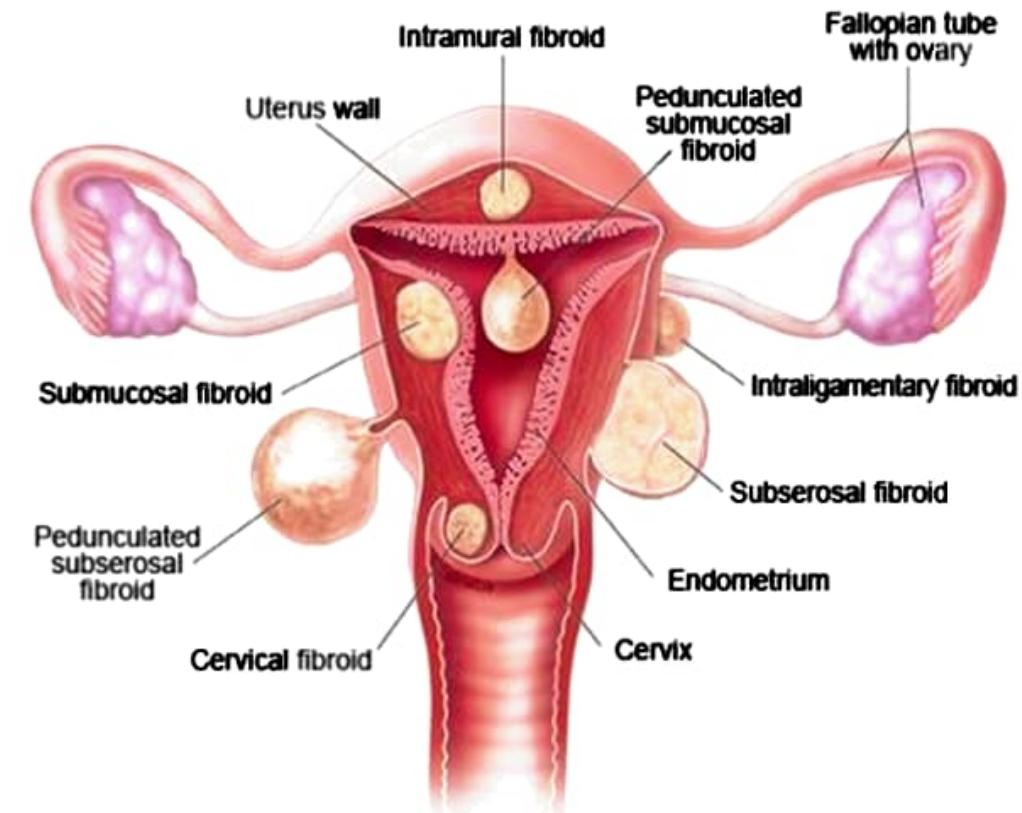


2) Cervical

Cervical fibroid is rare (1–2 %).
it may be interstitial or subperitoneal variety.

Depending upon the position, it may be

- 1) anterior,
- 2) posterior,
- 3) lateral or
- 4) central.



CLINICAL FEATURES

Patient Profile

- 1) The patients are usually **nulliparous** or having **long period of secondary infertility**.
- 2) Early marriage and frequent childbirth make its frequency high even amongst the multiparous women.
- 3) The incidence is at its **peak between 35–45 years**. There is a tendency of delayed menopause.

Symptoms:

- 1) The majority of fibroids remain **asymptomatic (75%)**.

The symptoms are related to anatomic type and size of the tumor.

The site is more important than the size.

A small submucous fibroid may produce more symptoms than a big subserous fibroid.

- 2) **Menstrual abnormality:** Menorrhagia, metrorrhagia

- 3) **Dysmenorrhea**

- 4) **Dyspareunia**

- 5) **Infertility (30%)**

- 6) **Pressure symptoms**

- 7) **Recurrent pregnancy loss (miscarriage, preterm labor)**

- 8) **Lower abdominal or pelvic pain**

- 9) **Abdominal enlargement.**

गर्भ की परिभाषा

शुक्र शोणित जीव संयोगे तू खलुकुक्षिगते गर्भ संज्ञा भवति॥(च. शा. ४/५)

शुक्र, शोणित एवं जीव (चेतना) के कुक्षि (गर्भाशय) के अंतर्गत संयोग को गर्भ संज्ञा दी जाती है.

शुक्रशोणितं गर्भाशयस्थमात्मप्रकृतिविकारसम्मूच्छितं 'गर्भ' इत्युच्यते।(सु.शा. ५/३)

महर्षि सुश्रुत के अनुसार गर्भाशय में स्थित आत्मा (चेतना), प्रकृति एवं विकारों से सम्मूच्छित शुक्र तथा शोणित को गर्भ कहा जाता है.

ध्रुवं चतुर्णा॒ सान्निध्याद्वर्भः स्याद्विधिपूर्वकम् ।

ऋतुक्षेत्राम्बुदीजानां सामग्यादङ्कुरो यथा ॥३३॥

Su. sha. 2/33

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ऋतुरङ्गनाया रजःसमयः, क्षेत्रं गर्भाशयः, अम्बु

पुनराहारपाकजो व्यापी रसधातुः, बीजं स्त्रीपुंसयोरार्तवशुक्रे ॥३३॥

dhruvam caturñām sānnidhyādgarbhah syādvidhipūrvakam |

r̥tukṣetraṁbubijānām sāmagryādānukuro yathā ||33||

Su. sha. 2/33

Dalhana

r̥turaṅganāyā rajaḥsamayah, kṣetram garbhāśayah, ambu
punarāhārapākajo vyāpī rasadhātuḥ, bijam
strīpum̄sayaḥorārtavaśukre||33||

गर्भ निर्माण के लिए आवश्यक सामग्री को एक पौधे (पौधे) के उदाहरण से समझाया गया है।

पौधे के अस्तित्व में आने के लिए 4 कारकों की अनिवार्य रूप से आवश्यकता होती है।

वे हैं -

ऋतु - उचित और अनुकूल जलवायु

क्षेत्र - उपजाऊ भूमि

अम्बु - पानी और पोषक तत्व

बीजा - अच्छी गुणवत्ता वाले बीज



यह वेबसाइट कुकीज़ का उपयोग करती है।

स्वीकार करना

ऋतु

1. ऋतु

ऋतु का अर्थ है बीज बोने और पौधे के बढ़ने के लिए एक आदर्श जलवायु। पौधे की बुवाई और खेती उपयुक्त जलवायु या मौसम में की जानी चाहिए, जो पौधे के विकास के लिए पर्याप्त अनुकूल हो। यदि जलवायु या मौसम पौधे के बढ़ने के लिए अनुकूल नहीं है, तो यह उम्मीद नहीं की जा सकती कि बीज एक सुंदर पौधे में टूट जाएगा।

यही नियम गर्भ पर भी लागू होता है। गर्भ के बनने के लिए, शुक्राणु के डिंब को निषेचित करने के लिए गर्भशय (गर्भाशय और फैलोपियन ट्यूब) में एक आदर्श जलवायु प्रबल होनी चाहिए। यह मादा की उपजाऊ अवधि के साथ मेल खाता है।



यह वेबसाइट कुकीज़ का उपयोग करती है।

स्वीकार करना

X गर्भधान के लिए आवश्‌
रveda-com.translate.goog



G अंग्रेजी → हिन्दी ✓

⋮ X

2. क्षेत्र

क्षेत्र का अर्थ है उपजाऊ भूमि, पौधे के बढ़ने के लिए आदर्श। यद्यपि बीज पौधे के बढ़ने के लिए आवश्यक है, हम यह उम्मीद नहीं कर सकते कि बीज कहीं भी और हर जगह पौधे का रूप ले ले। इस प्रक्रिया के होने के लिए एक आदर्श और उपजाऊ भूमि की आवश्यकता होती है। यदि बीज को उपजाऊ भूमि में बोया जाता है जो स्वस्थ है, तो बीज एक सुंदर पौधे या पौधे में टूट जाता है।

गर्भ निर्माण के लिए भी यही नियम लागू होता है। यहाँ भूमि रोग मुक्त और स्वस्थ गर्भाशय, स्त्री के गर्भ या गर्भाशय से संबंधित है।

गर्भ उत्तपत्ति सामग्री के संदर्भ में क्षेत्र (आदर्श भूमि) -

गर्भ निर्माण के संदर्भ में क्षेत्र को उस स्थान के रूप में लिया जाना चाहिए जहां निषेचित डिंब पालन करता है और बढ़ता है। यह महिला के गर्भ या गर्भाशय में होता है।

यह वेबसाइट कुकीज़ का उपयोग करती है।

स्वीकार करना

अम्बु

3. अंबु

अम्बु का अर्थ है पानी। एक पौधे को उसके बीज से अंकुरित होने के लिए और बीज को एक पौधे के रूप में आकार देने के लिए सबसे आवश्यक तत्व या घटक पानी है। यदि किसी पौधे को पानी की आपूर्ति काट दी जाती है या यदि खेतों में बीज बोए जाते हैं, तो पानी उपलब्ध नहीं कराया जाता है, कोई भी पौधों के उत्थान को देखने की उम्मीद नहीं कर सकता है। वास्तव में बीज सिकुड़ जाते हैं और मिट्टी में मर जाते हैं। अन्य पोषक तत्व जो पौधे के विकास या पौधे के रूप में बीज की अभिव्यक्ति का समर्थन करते हैं, उन्हें भी इस विषय के अंतर्गत शामिल किया गया है।

यही नियम गर्भ के लिए भी लागू होता है। गर्भ (शुक्र-शोनिता या निषेचित डिंब) के ठीक से बढ़ने के लिए पोषण की आवश्यकता होती है। इस पोषण की तुलना अम्बु या पानी से की जाती है (पौधे से इसके संबंध के संदर्भ में)।

4. बीजा

बीजा का अर्थ है बीज (बीज)। अधिकांश पौधे उनके बीजों से उगते हैं। यह आवश्यक है कि एक स्वस्थ बीज को एक उपजाऊ मिट्टी (भूमि) में बोया जाए और एक बीज से एक स्वस्थ पौधा उत्पन्न करने के लिए अच्छी जल आपूर्ति, आवश्यक पोषक तत्वों और सहायक जलवायु से पोषित किया जाए।

गर्भ के लिए भी यही नियम लागू होता है। एक स्वस्थ गर्भ के निर्माण के लिए उसका बीज अर्थात् जिस शुक्राणु से वह निकला है, वह गुणवत्ता और मात्रा की दृष्टि से स्वस्थ, अच्छे गुणों से भरपूर होना चाहिए। एक रोगग्रस्त, दूषित या विकृत शुक्राणु एक स्वस्थ संतान पैदा नहीं कर सकता। बीजा पुरुष युग्मक यानी शुक्राणु (शुक्राणु) और शुक्राणुओं को वहन करने वाले वीर्य को ढकता है।

बीजा (स्वस्थ बीज, पुरुष के स्वस्थ वीर्य और शुक्राणुओं के संदर्भ में) गर्भोत्पत्ति सामग्री के संदर्भ में - वीर्य



यह वेबसाइट कुकीज़ का उपयोग करती है।

स्वीकार करना

Endometriosis

Defn - 1) Presence of functioning endometrium in sites other than uterine mucosa is called Endometriosis.

- Types 2)
- Superficial peritoneal endometriosis
 - Endometriomas
 - Deeply infiltrating endometriosis
 - Abdominal wall endometriosis

Adenomyosis

1) Ectopic endometrial tissue may be found in myometrium then it is called adenomyosis or internal or adenomyoma. A condition where is ingrowth of endometrium in myometrium.

- Focal
- Adenomyoma
- Diffuse

Clinical \Rightarrow Dysmenorrhea (70%)
 feature. \Rightarrow Abnormal menstruation (20%)
 \Rightarrow Infertility - (40-60%)
 \Rightarrow Dyspareunia - (20-40%)
 \Rightarrow Chronic pelvic pain
 \Rightarrow Abdominal pain
 \Rightarrow Dysuria
 \Rightarrow Hematuria
 \Rightarrow Painful defecation
 \Rightarrow Diarrhea
 \Rightarrow Constipation
 \Rightarrow Fatigue

\Rightarrow Menorrhagia (70%)
 \Rightarrow Dysmenorrhea (30%)
 \Rightarrow Dyspareunia
 \Rightarrow Infertility

ENDOMETRIOSIS

VERSUS

A DENOMYOSIS

ENDOMETRIOSIS

A condition resulting from the appearance of endometrial tissue outside the uterus and causing pelvic pain, especially associated with menstruation

Endometrial cells establish outside the uterus; on the ovaries, supporting ligaments of the uterus as well as in the cavities of the pelvis

Causes: Retrograde menstruation, coelomic metaplasia, altered immunity, and metastatic spread

Occurs in both old and women in the reproductive age

Risk Factors: Earlier onset of menstruation, shorter menstrual cycle, taller height, consumption of alcohol and caffeine, etc.

Other Symptoms: Painful bowel movements (dyschezia), painful urination (dysuria), pelvic pain, and fatigue, diarrhea, and nausea during periods

Causes pain and may affect fertility

ADENOMYOSIS

A condition in which the endometrial tissue breaks through the muscle wall of the uterus, causing menstrual cramps, lower abdominal pressure, bloating before menstrual periods, and heavy periods

Endometrial cells establish within the wall of the uterus in adenomyosis

Causes: Inappropriate proliferation of endometrial tissue into the myometrium, differentiation of pluripotent Mullerian stem cells, altered lymphatic drainage pathways as well as displaced bone marrow stem cells

Mainly occurs in older women

Risk Factors: Having more than one child, treated with breast cancer, having surgery in uterus, depression, etc.

Other Symptoms: Chronic pelvic pain, abnormal or prolonged bleeding during periods, enlarged uterus, and infertility

Causes thickening of the walls of the uterus and it is recently been associated with infertility

Measurement examination:

1) Height:

- ≥ 150 cm indicates towards normal pelvis.
- ≤ 150 cm indicates towards small / abnormal pelvis.



2) Weight:

- Weight gain of a woman with normal BMI during 9 months of pregnancy = 10-11 kg
 - 1st trimester = 1 kg increase / Static / 1-2 kg decrease due to emesis, food aversion
 - 2nd trimester = 5 kg increase; 1.5-2 kg / month; roughly 500 gm / week
 - 3rd trimester = 5 kg increase; 1.5-2 kg / month; roughly 500 gm / week
- Insufficient weight gain indicates malnutrition.
 - Protein intake should be increased.
 - In 3rd trimester Ksheerabasti with Shatavari can be done for Brimhana- artha.
- Excessive increase of weight (> 2 kg / month) indicates fluid retention in the body.
- Risk of HTN
- Punarnavastaka Kvatha
- Restriction of salt in diet
- Diuretics are contraindicated during pregnancy.



3) Blood Pressure:

- Hypotension is a normal physiological symptom of pregnancy.
It may occur any time after 20 weeks of pregnancy.

High level of progesterone -> Muscle relaxation -> Relaxation of muscles of arterial walls -> Hypotensive state (110/70 – 100/60)

***Note:** Hypotension may lead to dizziness; administration of lemon water with salt & sugar helps to relieve dizziness.

- Hypotension before 20 weeks of pregnancy indicates pathological origin.

- Hypertension: PIH – Pregnancy Induced Hypertension (140/90)

***Note:** - Investigation = Urine albumin test

- PIH with albumin in urine indicates pre-eclampsia (PE).

- Pre-eclampsia / Toxemia is a disorder of pregnancy characterized by the onset of high blood pressure and often a significant amount of protein in the urine. Toxemia may cause maternal death. Anemia may cause foetal death.

4) Pulse:

Tachycardia (90 / min) is a normal physiological symptom of pregnancy.

High progesterone level -> High Basal Metabolic Rate (BMR) -> Increased temperature -> Tachycardia



Laboratory Investigations: (Routine investigations)

- ABORh, CBC (Hb, PCV)
- HBsAg, VDRL, HIV, HCV
- FBS, PPBS
- TSH, FT₃, FT₄
- BT, CT, Rubella antibody titre,
- Urine analysis

Miscellaneous Test: (For specific purpose or patients)

- Urine culture, Mantoux test, Estimation of G6PD deficiency, Vitamin B₁₂ deficiency
- Sickle cell test, thalassemia test
- CVS (Chorionic villus sampling), AFP (Alpha-foetoprotein), Genetic evaluation, etc.



The Quad Screen:

The quad screen, also known as the **quadruple marker test**, the second trimester test, is a prenatal test that measures levels of four substances in a pregnant women's blood:

- 1) Alpha-fetoprotein (AFP), a protein made by the developing baby
- 2) Human chorionic gonadotropin (HCG), a hormone made by the placenta
- 3) Estriol, a hormone made by the placenta and the baby's liver
- 4) Inhibin A, another hormone made by the placenta

Ideally, the quad screen is done **between weeks 15 and 18 of pregnancy** - during the second trimester. However, the procedure can be done up to week 22.

The quad screen is used to evaluate whether a pregnancy has an increased chance of being affected with certain conditions, such as **Down syndrome or neural tube defects**.



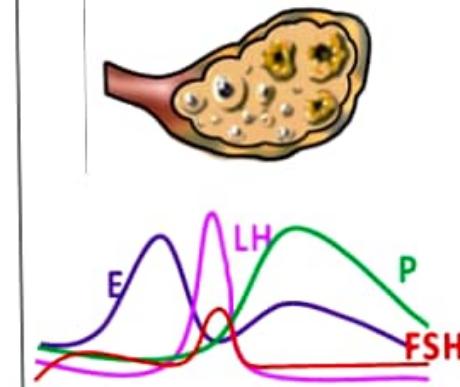
MENOPAUSE

DEFINITION

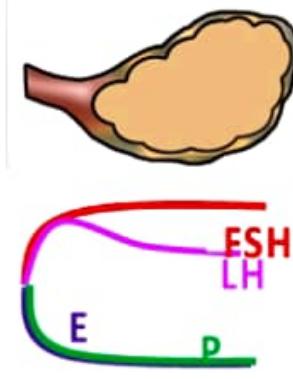
Menopause means of menstruation at the end of reproductive life due to loss of ovarian follicular activity.

It is the point of time when last and final menstruation occurs .

A. Reproductive age



B. Post-menopausal



CLIMACTERIC :

It is the period of time during which women passes from the reproductive to non reproductive stage .

This phase covers 5-10 yrs on either side of menstruation

Menopausal symptoms

1) Vasomotor symptoms

Characteristic symptom of menopause is “**hot flush**”.

Hot flush is characterized by sudden feeling of heat followed by profuse sweating.

It may last for 1–10 minutes, and may be at times unbearable.

Sleep may be disturbed due to night sweats.

The thermoregulatory center in association with GnRH center in the hypothalamus is involved in the etiology of hot flush.

There may also be the symptoms of palpitation, fatigue and weakness.



2) Genital and urinary system

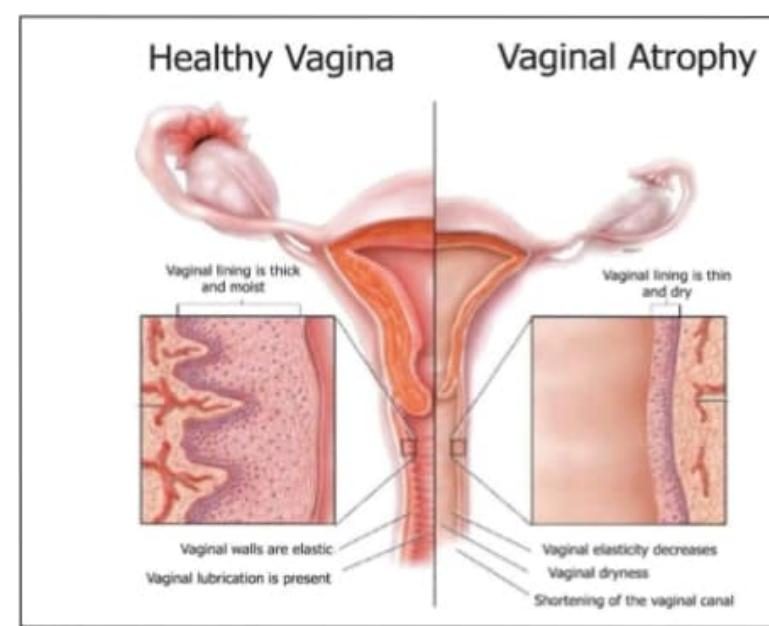
Steroid receptors have been identified in the mucous membrane of urethra, bladder, vagina and the pelvic floor muscles. Estrogen plays an important role to maintain the epithelium of vagina, urinary bladder and the urethra.

Estrogen deficiency produces atrophic epithelial changes in these organs. This may cause dyspareunia and dysuria.

Vagina: Minimal trauma may cause **vaginal bleeding**. **Dyspareunia, vaginal infections, dryness, pruritus and leucorrhea are also common.**

The urinary symptoms are: urgency, dysuria and recurrent urinary tract infection and stress incontinence.

Sexual dysfunction: Estrogen deficiency is often associated with decreased sexual desire. This may be due psychological changes (depression anxiety) as well as atrophic changes of the genitourinary system.



3) Psychological changes:

There is increased frequency of anxiety, headache, insomnia, irritability, dysphasia and depression.

They also suffer from dementia, mood swing and inability to concentrate.

Dementia: Estrogen is thought to protect the function of central nervous system.

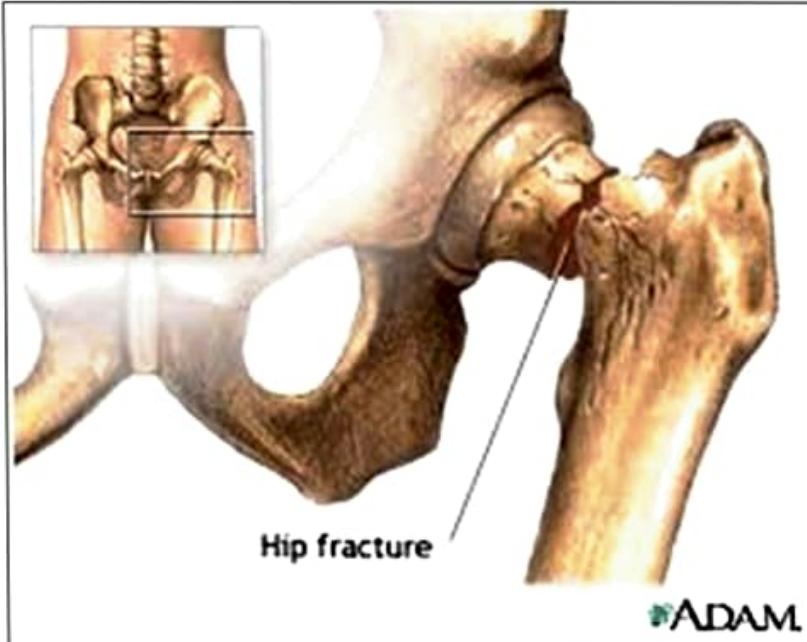
Dementia and mainly Alzheimer disease are more common in postmenopausal women.



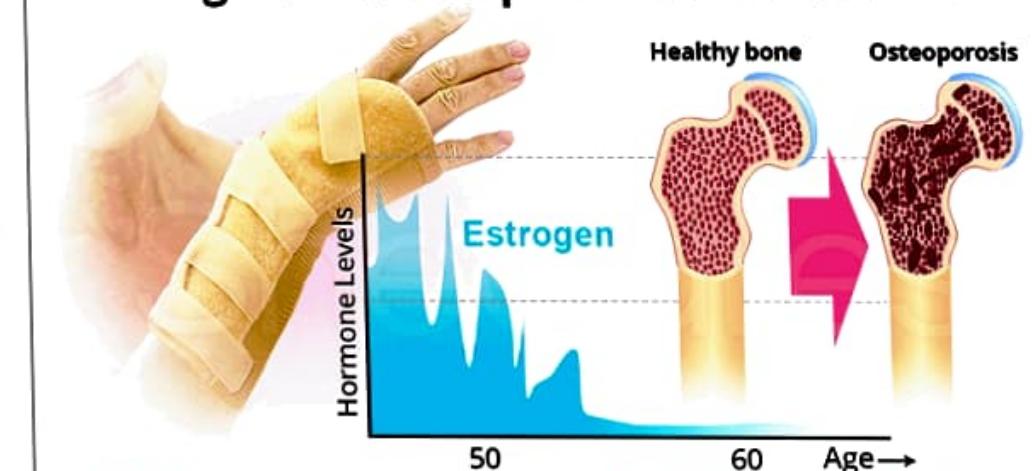
4) Osteoporosis : Osteoporosis and fracture: Following menopause there is decline in collagenous bone matrix resulting in osteoporotic changes

Osteoporosis may be **primary (Type 1)** due to estrogen loss, age, deficient nutrition (calcium, vit. D) or hereditary.

It may be **secondary (Type 2)** to endocrine abnormalities (parathyroid, diabetes) or medication



Estrogen and Osteoporosis: A Direct Relation



During menopause, estrogen levels decrease in the body breaking down bones at a faster rate.

5) Skin and hair

- I. There is thinning, loss of elasticity and wrinkling of the skin.
- II. Estrogen receptors are present in the skin and **maximum are present in the facial skin.**
- III. Estrogen replacement can prevent this skin loss during menopause.
- IV. After menopause, there is some loss of pubic and axillary hair and slight balding.



slight balding.



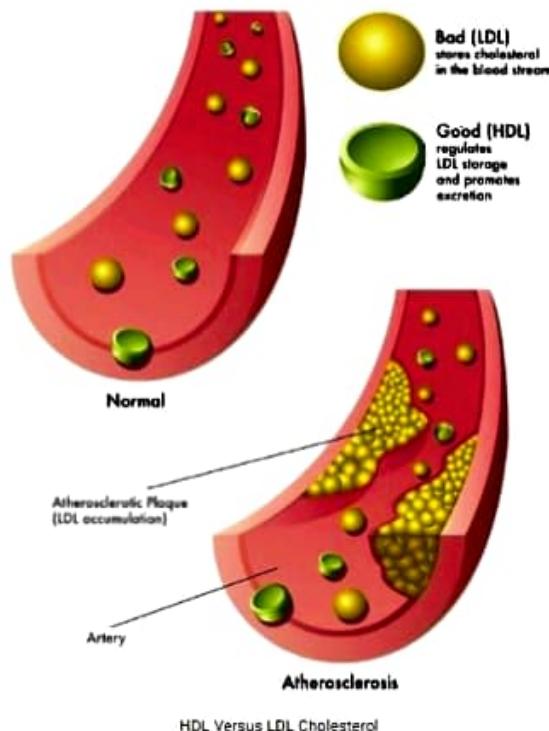
thinning, loss of elasticity and wrinkling of the skin.

6) Cardiovascular and cerebrovascular effects:

Vascular atherosclerotic changes, vasoconstriction and thrombus formation

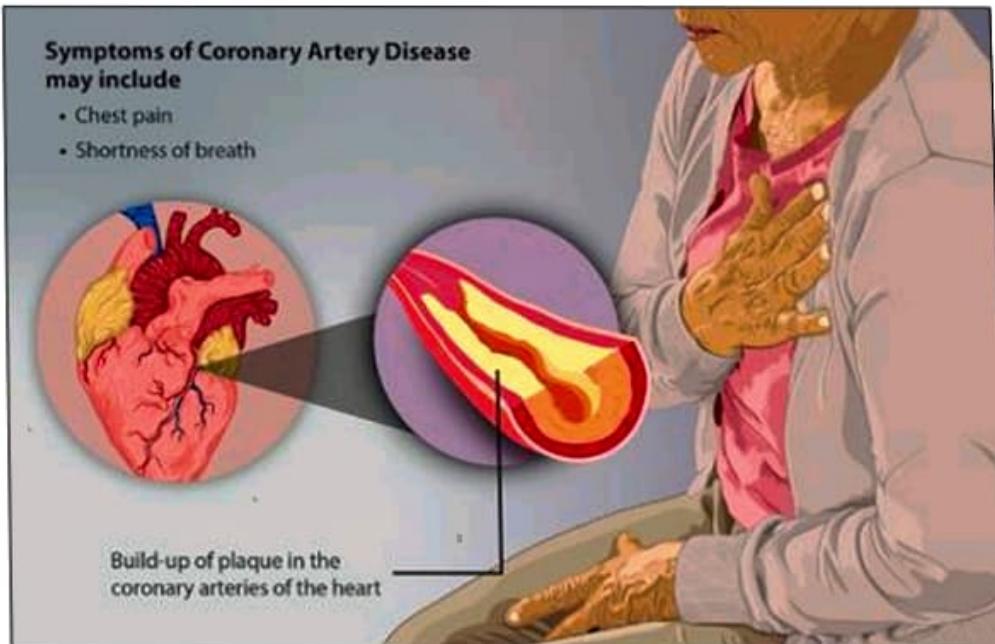
Risks of **ischemic heart disease**, coronary artery disease and **strokes** are increased.

Bad vs. Good Cholesterol



Symptoms of Coronary Artery Disease may include

- Chest pain
- Shortness of breath



गर्भ-व्यापद

उपविष्टकगर्भः स्यात्तथा नागोदरः स्मतः ।

मक्कलो मूढगर्भश्च विषकम्भो गृढगर्भकः ॥

जरायुदोषो गर्भस्य पातशचाष्टमकः स्मतः ॥

(शा सं पूर्व ७)

- ▶ Upavishtaka
- ▶ Nagodara
- ▶ Makkal
- ▶ Mudhagarbha
- ▶ Gudhagarbha
- ▶ Vishkambha
- ▶ Jarayu
- ▶ Garbha pata

Dr. Jasmine Gujarathi

होना आदि विकारों को गर्भ व्यापति का कारण माना है।

गर्भस्त्राव एवं गर्भपात

परिभाषा

आचतुर्थात् ततो मासात् प्रस्त्रवेद् गर्भविच्युति ।
ततः स्थिरशरीरस्य पातः पञ्चमषष्ठयोः ॥

(सु.सं.नि. 8/12)

गर्भधारण के दिन से चतुर्थ मास तक गर्भ के विच्युति (स्वस्थान से अलग होकर गिरना) को गर्भस्त्राव कहते हैं तथा उसके बाद पाँचवें और छठवें मास में स्थिर (हस्तपादादि अंगों से युक्त तथा घन) शरीर के विच्युति को गर्भपात कहते हैं।

अर्थात् चतुर्थ मास तक की गर्भ-च्युति को गर्भस्त्राव तथा पाँचवें एवं छठे महीने की गर्भ-विच्युति को गर्भपात कहते हैं।

आचार्य माधवकर, भाव मिश्र एवं योगरत्नाकर ने गर्भ के चतुर्थ मास तक गर्भ का विद्रव होना गर्भस्त्राव माना है।

मधुकोष में भोज का वचन उद्धृत करते हुए गर्भस्त्राव की मर्यादा तीन माह तक तत्पश्चात् संघातभूत होने के कारण गर्भपात की संज्ञा दी गई है।

कर्म के वशीभूत होकर गर्भाशयगत शुक्रार्तव को वायु विषमांश में (एक अंश अधिक एवं दूसरा अंश छोटा) भेद करती है। जब गर्भाशय में गर्भ की वृद्धि होती है तो एक यमल विशेष रूप से पुष्ट एवं दूसरा न्यून होता है अर्थात् जो भाग बड़ा होता है उससे उत्पन्न गर्भ पुष्ट एवं बड़ा तथा जो जो भाग छोटा होता है उससे दुर्बल एवं छोटा गर्भ होता है।

Abortion

Definition

Abortion is the termination of pregnancy, spontaneous or induced, before the period of viability; which is now accepted as 20 weeks of gestation or a birth weight of 500 g. The expelled embryo or foetus is called abortus.

Types

1. Spontaneous :

- An abortion can occur spontaneously due to complications during pregnancy.
- Spontaneous abortion is beyond the patient's control.
- The spontaneous abortions are termed as miscarriages.
- A spontaneous abortion in its natural course goes through several stages -
 - a) Threatened abortion
 - b) Inevitable abortion
 - c) Incomplete abortion

HYSTEROSALPINGOGRAPHY

Hysterosalpingography is the radiographic evaluation of uterus and fallopian tubes under fluoroscopic guidance.

INDICATION

1. Infertility (main role)
2. Recurrent spontaneous abortions
3. Congenital anomalies of uterus
4. Postoperative evaluation following (a)tubal ligation (b) reversal of tubal ligation
5. Suspected case of genital tuberculosis
6. To prove tubal occlusion after insertion of transcervical sterilization microinsert (essure)

HSG also has a potential therapeutic role in increasing the probability of pregnancy (especially if oil soluble contrast –lipiodol is used)

CONTRAINDICATION

- Suspected pregnancy
- Acute pelvic infection
- Active vaginal bleeding
- Recent dilation and curettage
- Immediate pre and post menstrual phase
- Tubal or uterine surgery within last 6 wks
- Contrast sensitivity

DETECTABLE PATHOLOGY

UTERINE	TUBAL
1. Uterine anomaly	1. tubal block
2. Fibroid (submucosal)	2. Tubal spasm
3. Adenomyosis	3. Tubal polyp
4. Endometrial polyp	4. Hydrosalpinx
5. Intrauterine adhesions/synaechia	5. Salpingitis isthmic nodosum (SIN)
6. Endometrial TB	6. Peritubal adhesions
7. Cervical incompetence	7. TB salpingitis

NON PATHOLOGIC FINDINGS

- **Air bubble**- round, often multiple, welldefined mobile filling defect ,usually displaced to fallopian tubes if additional contrasts given
- **Normal myometrial folds**-longitudinal folds with parallel orientation to uterine cavity
- **Prominent cervical glands**-tubular structure with their origin in both cervical walls
- **Previous caeserean section scar**

Follicular Study/Monitoring

Prepared by Dr Vrishit
Guided by Prof. Dr Dharmraj

- Ovulation was initially monitored by conventional methods like BBT, mid luteal serum progesterone and urinaryLH.
- Nowadays, USG is used for follicular monitoring for both natural and stimulated cycles.

Follicular monitoring

Vital component of IVF/IUI assessment and timing

Employs a simple technique of assessing ovarian follicles on regular intervals, and documenting the pathway of ovulation.

Ultrasound monitoring in induced cycles, and predicting success of IVF

Most of the IVF studies are conducted after induction of ovaries with help of ovulation inducing agents like Clomiphene citrate. In such induced cycle, primary determinants of success are:

- ovarian volume
- antral follicle number
- ovarian stromal bloodflow

Ovarian volume

is easy to measure,
although not a good predictor of IVF outcome.
a low ovarian volume does not always lead to
anovulatory cycle.

But, it's important to recognize a polycystic ovarian pattern and differentiate it from post-induction multicystic ovaries.

Follicles arranged in the periphery forming a 'necklace sign', echogenic stroma, and more than 20 follicles of less than 9 mm size, signify a polycystic pattern in induced cycle.

While, follicles in the center as well as the periphery, are seen in normal induced multicystic

Antral follicle number

- **Antral follicle number** of less than three, usually signify possible failure of assisted reproductive therapy (ART).

Ovarian stromal blood flow

- has been recommended as a good predictor of ART success. Increased peak systolic velocity (>10 cm/sec) is one of such parameters which has been advocated.

SIGNIFICANCE:

Helps in prediction of impending ovulation and optimal timing for:

hCG administration,

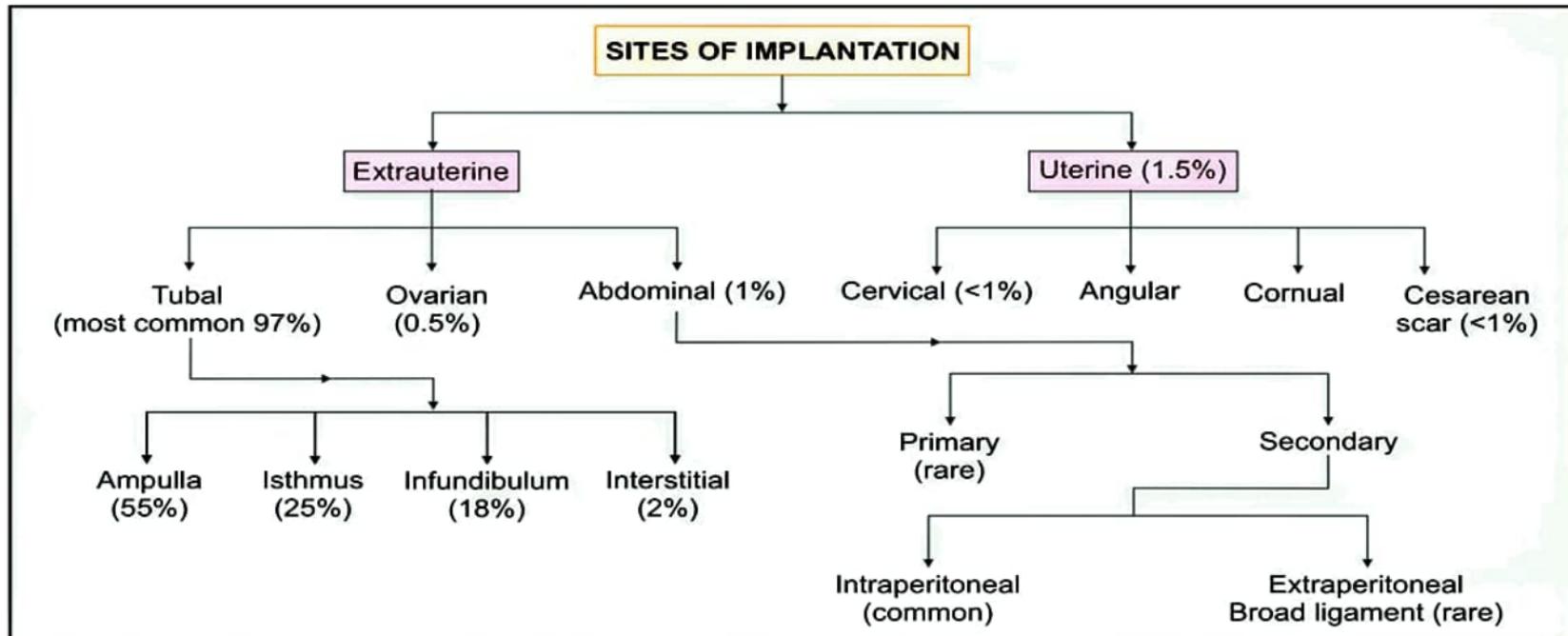
intercourse, donor or husband insemination
egg collection

If not ovulating can be treated with ovulation induction agents.

Ectopic Pregnancy

DEFINITION: An ectopic pregnancy is one in which the fertilized ovum is implanted and develops outside the normal endometrial cavity.

SITES OF IMPLANTATION:



CLINICAL FEATURES OF ECTOPIC PREGNANCY

1) Acute

2) Unruptured

3) Subacute (chronic or old)

1) Acute

Symptoms:

- 1) **Amenorrhea:** Short period of 6–8 weeks (usually); there may be delayed period or history of vaginal spotting.
- 2) **Abdominal pain** is the most constant feature. It is **acute, agonizing or colicky**. Otherwise it may be a vague soreness. Pain is located at lower abdomen: unilateral, bilateral or may be generalized.
Shoulder tip pain (25%) (referred pain due to diaphragmatic irritation from hemoperitoneum) may be present.
- 3) **Vaginal bleeding** may be slight and continuous. Expulsion of decidua cast (5%) may be there
- 4) **Vomiting, fainting attack**

SIGNS:

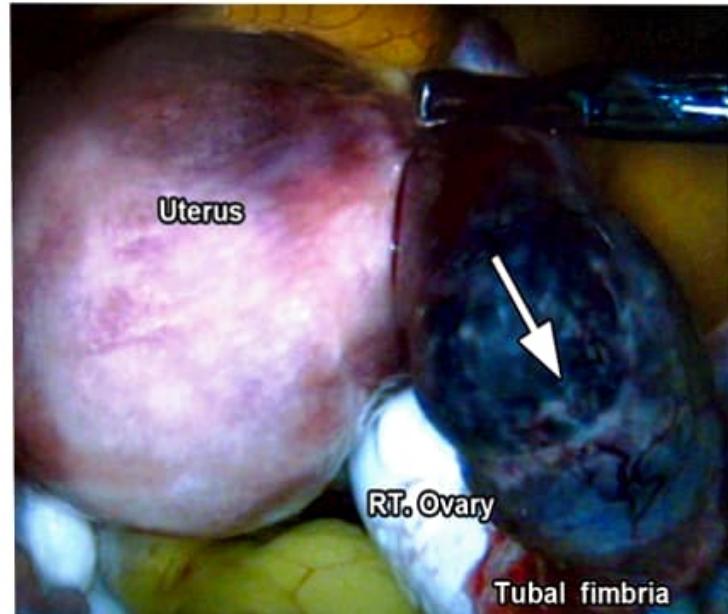
General look (diagnostic): The patient lies quiet and conscious, perspires and looks blanched.

Pallor: Severe and proportionate to the amount of internal hemorrhage.

Features of shock: Pulse—rapid and feeble, hypotension, extremities—cold clammy.

Abdominal examination: Abdomen (lower abdomen)—**tense, tumid, tender.** No mass is usually felt, shifting dullness present, bowels may be distended. Muscle guard—usually absent.

Pelvic examination is less informative due to extreme tenderness and it may precipitate more intraperitoneal hemorrhage due to manipulation.



Laparoscopic view of an unruptured tubal ectopic pregnancy (Rt). Hugely dilated ampulla is seen (arrow)

MANAGEMENT OF ECTOPIC PREGNANCY

ACUTE

Principle: The principle in the management of acute ectopic is resuscitation and laparotomy

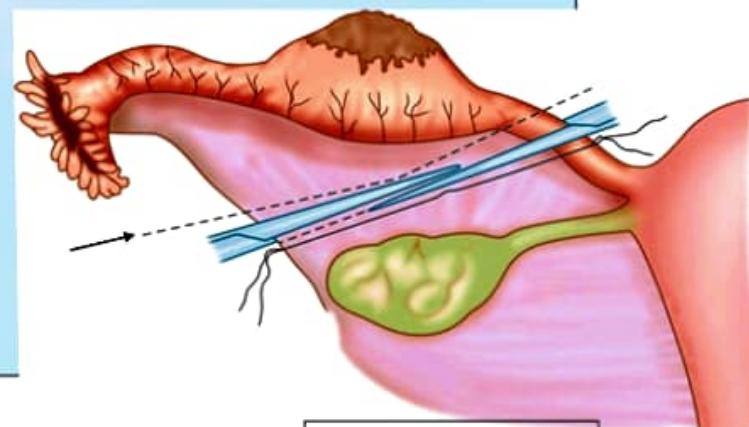
Antishock treatment: Antishock measures are to be taken energetically **with simultaneous preparation for urgent laparotomy.**

Laparotomy: Indications of laparotomy are—(i) Patient hemodynamically unstable. (ii) Laparoscopy contraindicated. (iii) Evidence of rupture. **The principle in laparotomy is “quick in quick out”**

Steps:

- 1) Abdomen is opened by infraumbilical longitudinal incision.
- 2) To grasp the uterus and draw it up under vision.
- 3) The tubes and ovaries of both the sides are quickly inspected to find out the side of rupture.
- 4) **Salpingectomy** is the definitive surgery.

The excised tube should be sent for histological examination.



Salpingectomy.

12. उदावर्तनी, उदावर्ता, उदावृता

वेगोदावर्तनाद्योनिमुदावर्तयतेऽनिलः।

सा रुगार्ता रजः कृच्छ्रेणोदावृतं विमुञ्चति॥

(च.चि ३०/२५)

आर्तवे सा विमुक्ते तु तत्क्षणं लभते सुखम्।

रजसो गमनादूर्ध्वं ज्ञेयोदावर्तिनी बुधैः॥

(च.चि ३०/२६)

वेगों के ऊपर की ओर जाने से, प्रकुपित वायु योनि को ऊपर की ओर जाने वाली वायु से पूरित कर देती है।



वो वेदना से पीड़ित योनि, रज को ऊपर की ओर ले जा कर बहुत मुश्किल से मुञ्चित करती है।



आर्तव का मुञ्चन होने से तत्काल स्त्री को सुख प्राप्त होता है।



रज के ऊपर की ओर जाने के कारण इस व्याधि को उदावर्तिनी कहते हैं (Primary/Spasmodic dysmenorrhoea)

१३ उदावर्तिनी या उदावर्ता या उदावृत्ता योनिव्यापद्

वेगोदावर्तनाद्योनिमुदावर्तयतेऽनिलः । सा रुगार्ता रजः कृच्छ्रेणोदावृत्तं विमुञ्चति ॥
आर्तवे सा विमुक्ते तु तत्क्षणं लभते सुखम् । रजसो गमनादूर्ध्वं ज्ञेयोदावर्तिनी बुधैः ॥

(च.सं.चि. 30/25-26)

सफेनिलमुदावर्ता रजः कृच्छ्रेण मुञ्चति । चतुसृष्ट्यपि चाद्यासु भवन्त्यनियलवेदनाः ॥

(सु.सं.उ. 38/9,11)

वेगोदावर्तनाद्योनिं प्रपीडयति मारुतः । सा फेनिलं रजः कृच्छ्रादुदावृत्तं विमुञ्चति ॥

इयं व्यापदुदावृत्ता....। (अ.सं.उ. 38/36, अ.ह.उ. 33/33-34)

रज के ऊपर की ओर जाने के कारण इस व्याधि का नाम उदावर्तिनी है ।

दोष

आचार्य चरक - वात दोष

आचार्य सुश्रुत - वात दोष

आचार्य वाग्भट - वात दोष

निदान

वेगों के उदावर्तन अर्थात् अधोमार्ग से निकलने वाले वातादि वेग का धारण करने से वायु का उर्ध्वगमन।

सम्प्राप्ति

वेगों का उदावर्तन



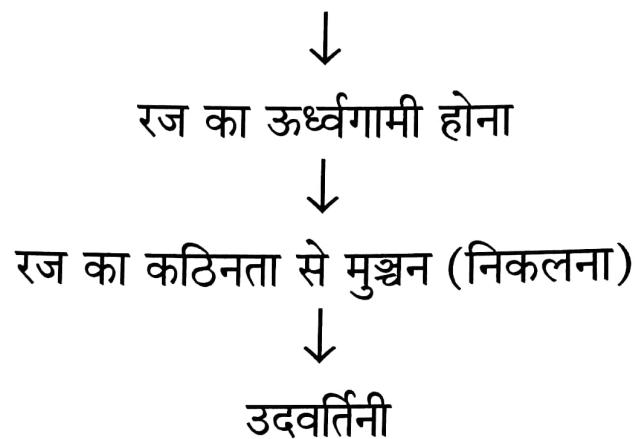
प्रकुपित वातदोष



योनि उदावर्तित (ऊपर की ओर जाने वाली वायु से योनि का उपर की ओर होना)



योनि में वेदना एवं ऊर्ध्वमुखी योनि



लक्षण

- रज/आर्तव की अधिक कठिनता से निकलना ।
- फेनयुक्त रज का निकलना ।
- योगरत्नाकर के अनुसार कफयुक्त आर्तव का निकलना ।
- योनि में वेदना ।
- आर्तव का मुञ्चन होते ही स्त्री को तत्काल सुख प्राप्त होता है ।
- वात की अन्य वेदनाओं का होना ।

आधुनिक परिपेक्ष्य में इसका समन्वय Spasmodic dysmenorrhoea से कर सकते हैं ।

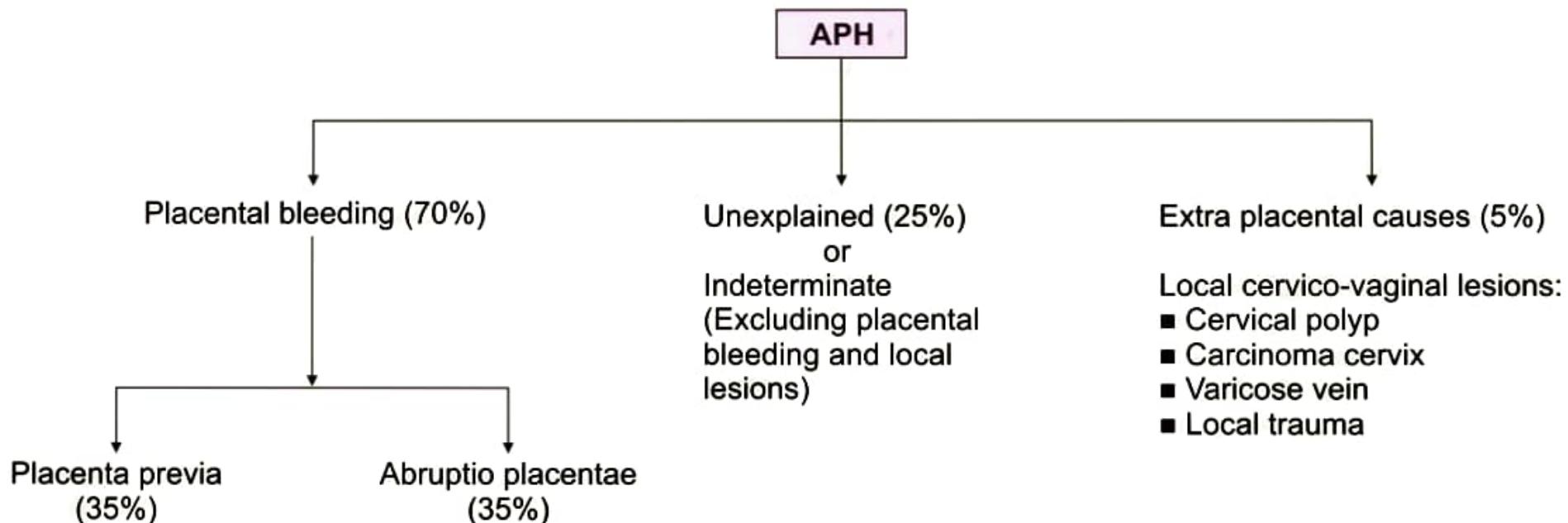
चिकित्सा

	Acharya Charaka	Acharya Sushruta
Dauhrida Kala	3 rd month	4 th month
Dauhrida Utpatti Karana	<p>Along with Indriyas becoming conspicuous, Mana is associated with pain, happiness and sorrow. During the same period, as a result the foetus expresses the desires of previous life through the mother.</p> <p>The foetal heart which is formed from Matrija bhava is attached to mother's heart by Rasavaha Srotas through which the desires are expressed. Through the desires, the foetus tries to get rid of sorrows and gain happiness.</p>	<p>Atma/Chetana resides in Hridayas. Therefore, along with consciousness of Hridaya, Chetana becomes apparent during the 4th month. So, the foetus desires the objects of Indriya (Shabda, Sparsha, Rupa, Rasa, Gandha) through the mother.</p> <p>Just as the future of the present life depends upon deeds of the past, likewise the longings of Dauhrida Kala are influenced by the previous life, fate and God.</p>
Effects of fulfilment or non-fulfilment of Dauhrida	<p>Suppression or non-fulfilment of the desires leads to aggravation of Vayu which causes various diseases, abnormalities or even death.</p> <p>Whatever a Dauhridini desires should be given to her, except if the things she desires are extremely harmful.</p>	<p>Non-fulfilment of the desires causes teratological deformities/abnormalities such as hump back, crooked arm/leg, developmental delay, impaired growth, deformed/absent eyes, etc.</p> <p>Suppression of desires related to specific Indriya produces abnormality of corresponding Indriya in the foetus.</p> <p>Whatever she desires should be fulfilled, by doing so, she gives birth to a progeny possessing superior qualities and longevity.</p>

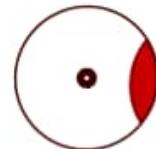
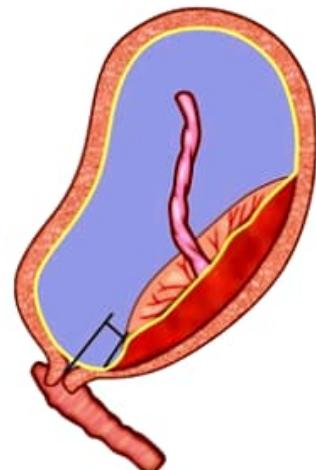
DEFINITION: It is defined as bleeding from or into the genital tract after the 28th week of pregnancy but before the birth of the baby

CAUSES:

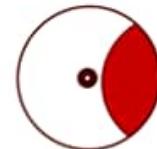
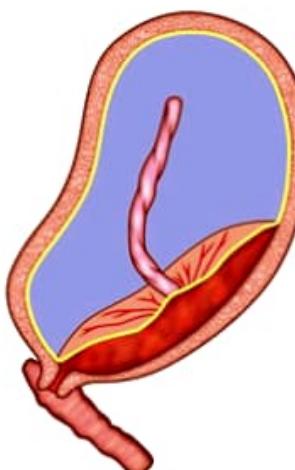
CAUSES OF ANTEPARTUM HEMORRHAGE



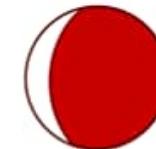
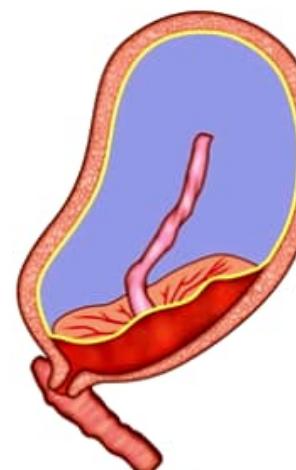
TYPES OR DEGREES: There are four types of placenta previa depending upon the degree of extension of placenta to the lower segment.



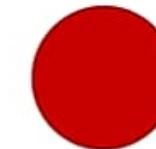
Type 1



Type 2



Type 3



Type 4

Degrees of placenta previa with findings on ultrasound examination

Type—I (Low-lying): The major part of the placenta is attached to the upper segment and only the lower margin encroaches onto the lower segment but not up to the os.

Type—II (Marginal): The placenta reaches the margin of the internal os but does not cover it.

Type—III (Incomplete or partial central): The placenta covers the internal os partially (covers the internal os when closed but does not entirely do so when fully dilated).

Type—IV (Central or total): The placenta completely covers the internal os even after it is fully dilated.

(5) गर्भाशय (Uterus)

1- स्त्रीणां गर्भाशयोऽप्तम् इति।

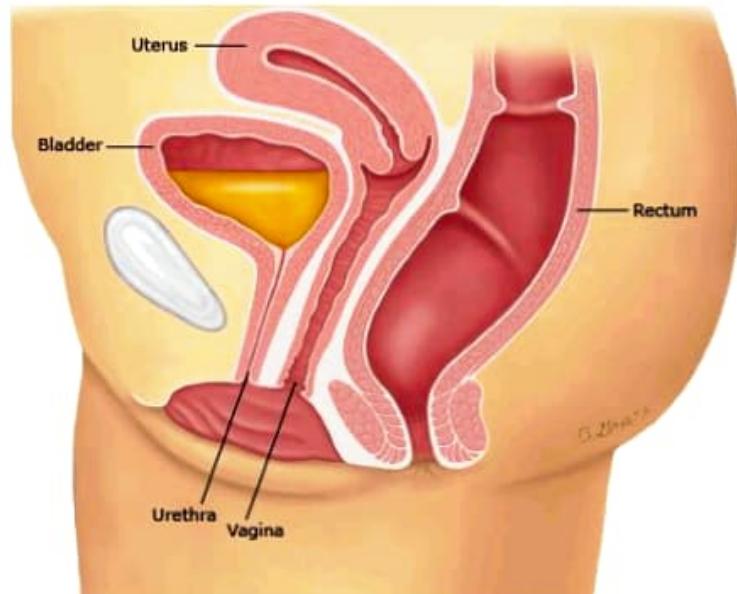
सु.शा.5/8

स्त्रियों में पुरुषों की अपेक्षा एक आठवाँ आशय गर्भाशय अधिक होता है।

2- शड्खनाभ्याकृति योनिस्त्रयावर्ता सा प्रकीर्तिता।

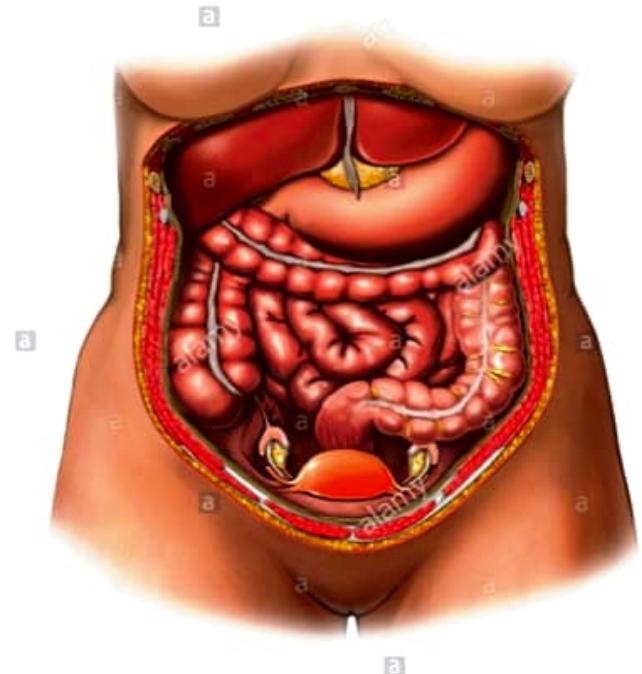
तस्यास्तृतीये त्वावर्ते गर्भशश्या प्रतिष्ठिता॥ सु.शा.5/55

योनि के तृतीय आर्वत में, वस्ति के पाश्व में होती है।
गर्भ का आधार होता है।



३- पित्पक्वाशयोर्मध्ये गर्भशय्या यत्र गर्भस्तिष्ठति॥ सु.शा.५/५१

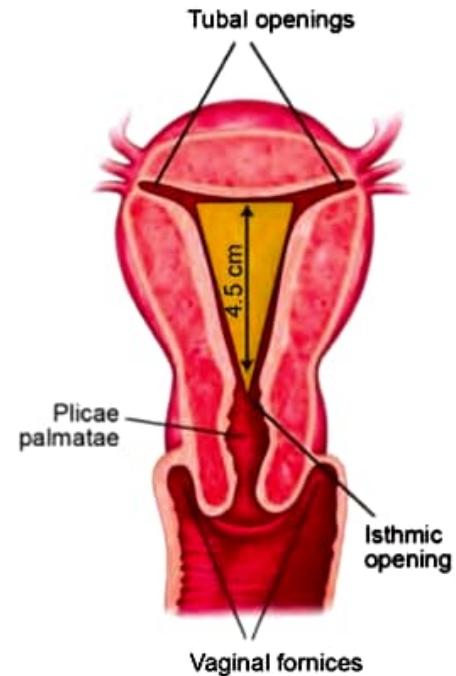
पिताशय एवं पक्वाशय के मध्य स्थित होता है।



4- रोहितमत्स्य मुँख भवति रूपतः।

आकृती- रोहितमत्स्य मुखवत्

सु.शा.5/56



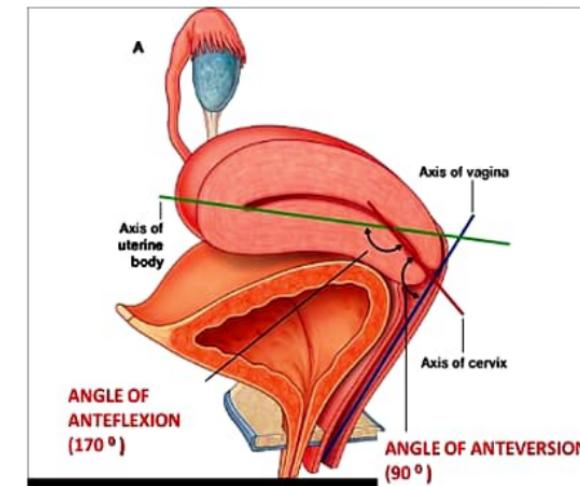
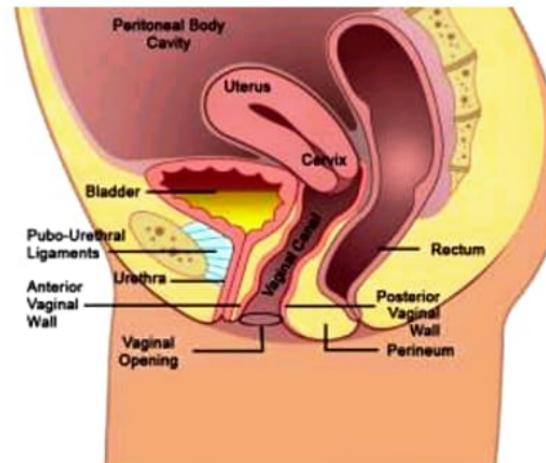
2) Uterus

Synonym: Hysteria, Womb

The uterus is a hollow pyriform muscular organ situated in the pelvis between the bladder in front and the rectum behind.

position: Its normal position is one of the anteversion and anteflexion.

The uterus usually inclines to the right (dextrorotation) so that the cervix is directed to the left (levorotation)



Measurements and Parts of Uterus

The uterus measures about 8 cm long, 5 cm wide at the fundus and its walls are about 1.25 cm thick.

Its weight varies from 50–80 g.

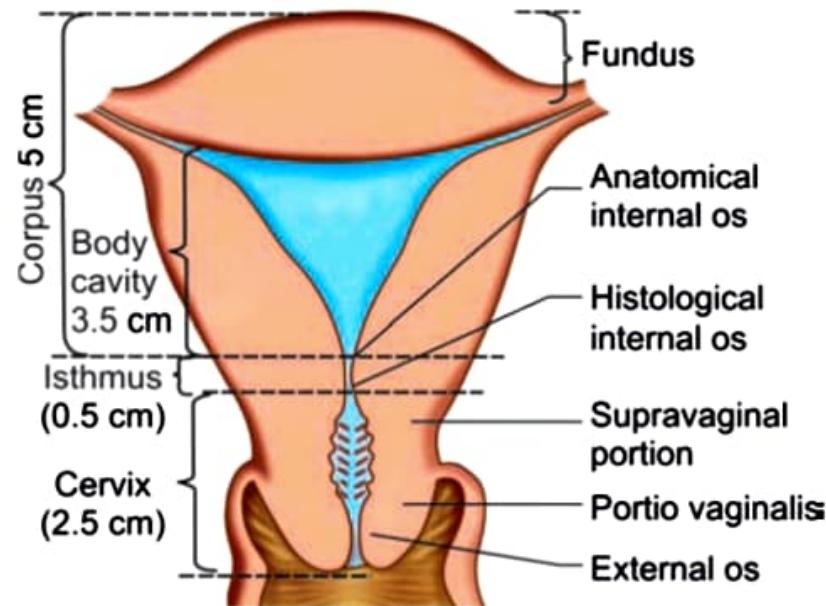
It has got the following parts-

1) Body or corpus: The body is further divided into

fundus—the part which lies *above the openings of the uterine tubes*. **body** properly is triangular and lies between the openings of the tubes and the isthmus.

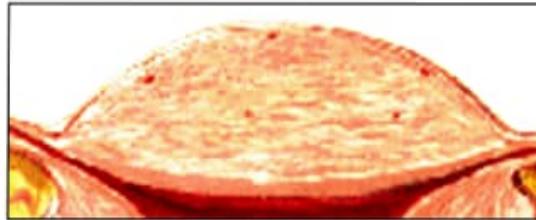
2) Isthmus: The isthmus is a *constricted part* measuring about 0.5 cm situated between the body and the cervix.

3) Cervix: The cervix is the *lowermost part of the uterus*. It extends from the histological internal os and ends at external os which opens into the vagina.
measures about **2.5 cm** in length and diameter.



1) Body or corpus: The body is further divided into

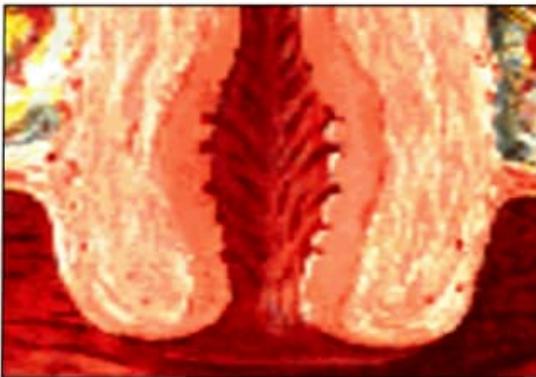
(i) Fundus: lies above the entrance of uterine tubes



(ii) Body: lies below the entrance of uterine tubes and above the Cx.



2) Isthmus: constricted part between the body and the cervix.



3) Cervix: from the internal os to external os ' it has uterine & vaginal parts

Parts of Uterus

Cavity: The cavity of the uterine body *is triangular on coronal section*

It measures about **3.5 cm**.

There is no cavity in the fundus.

the normal length of the uterine cavity including the cervical canal is usually 6–7 cm

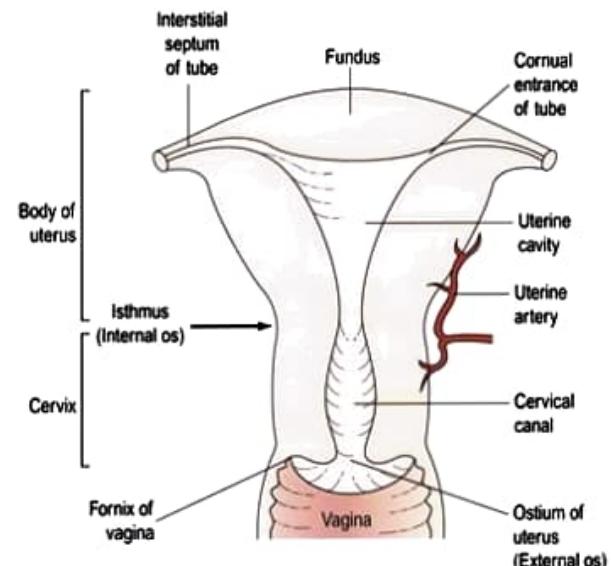
Body—The wall consists of 3 layers from outside inwards:

- 1) Perimetrium (outer, serous layer)
- 2) Myometrium (middle, muscle layer)
- 3) Endometrium (inner, mucous)

The endometrium is changed to decidua during pregnancy

Cervix: The cervix is composed mainly of fibrous connective tissues.

The cervix is insensitive to touch, heat and also when it is grasped by any instrument.



Blood supply of Uterus

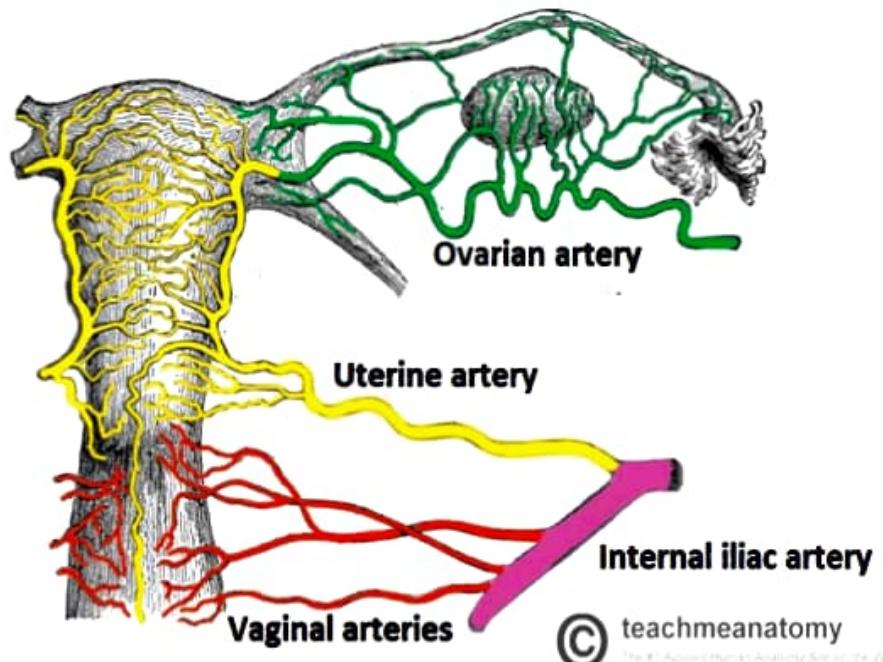
- 1) Uterine artery- it supplies uterus + 3/4th fallopian tube + vagina
- 2) Ovarian artery- a branch of abdominal aorta

Venous drainage:

- 1) Uterine vein
- 2) Ovarian vein

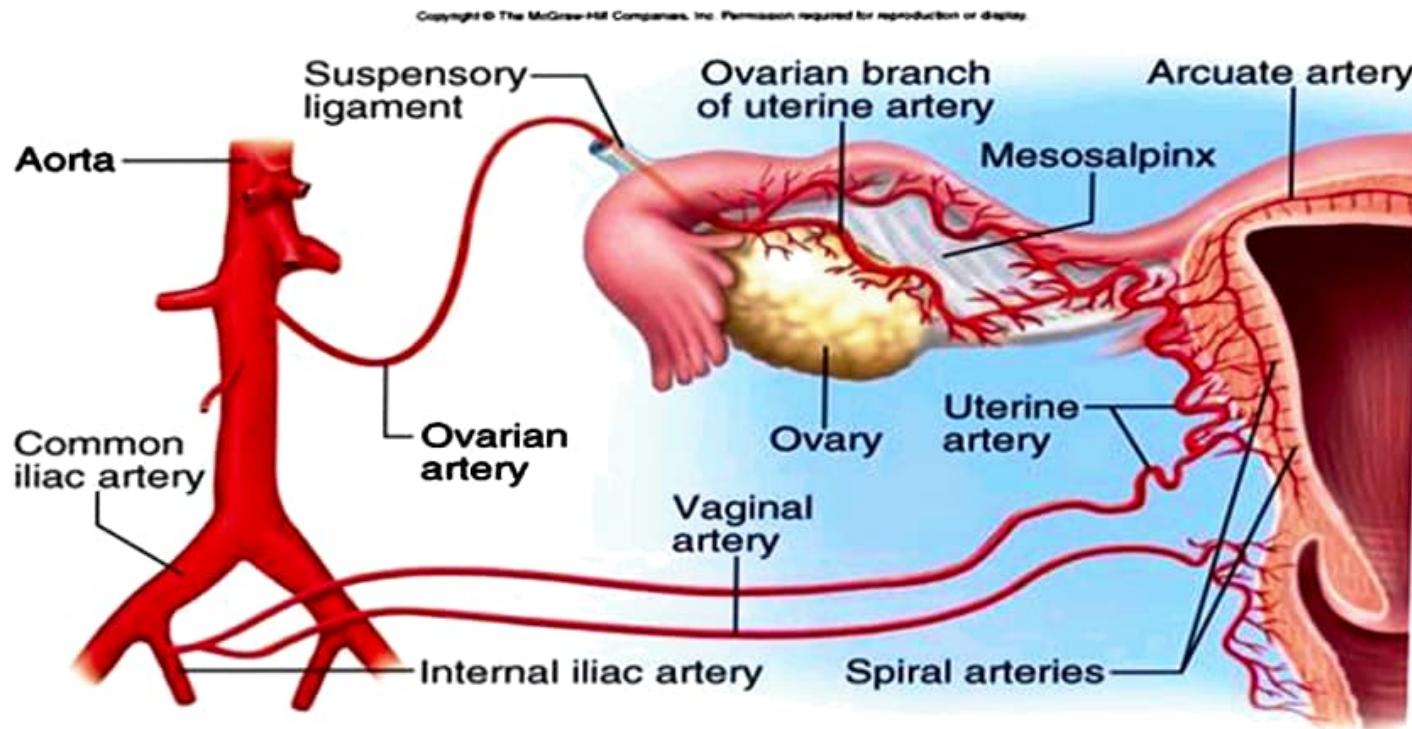
Nerve supply:

- Sympathetic: T10 – L1
- Parasympathetic: S2 – S4



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Blood Supply to Uterus



Via ovarian arteries and branches off the internal iliac.

Support of Uterus and Cervix:

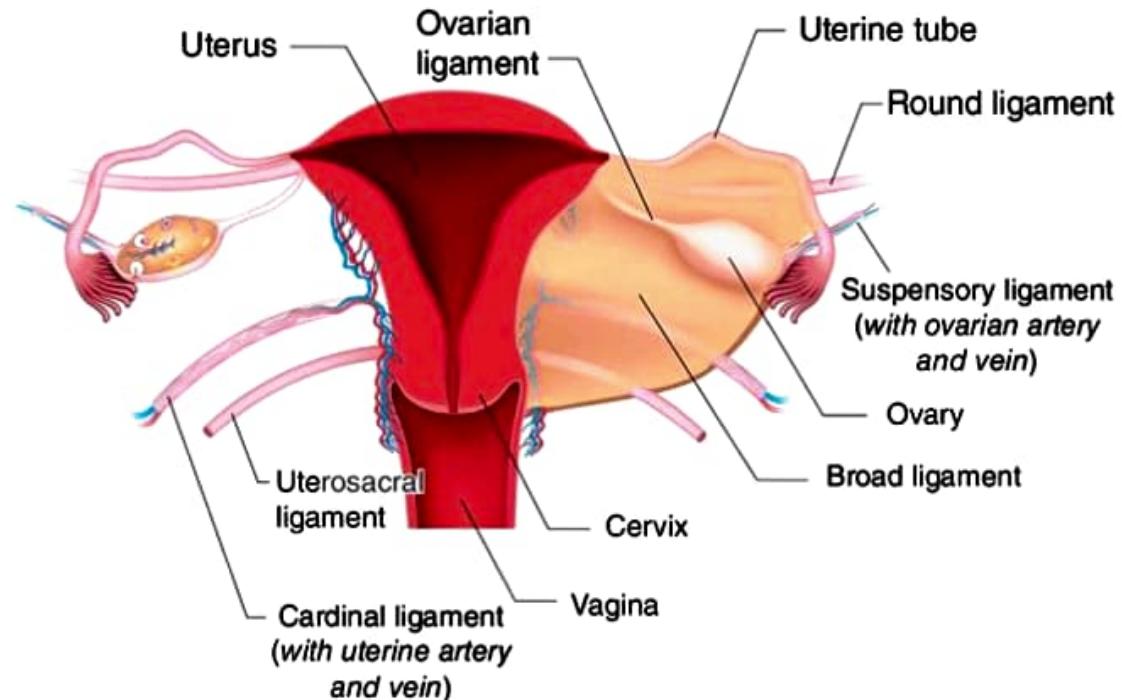
Ligaments: - 5 pairs

- 1) Broad ligament**
- 2) Round ligament**
- 3) Ovarian ligament**

- 4) Transverse ligament**
- 5) Suspensory ligament**

1,2 & 3 are attached to the uterus.

4 & 5 are attached to the cervix.

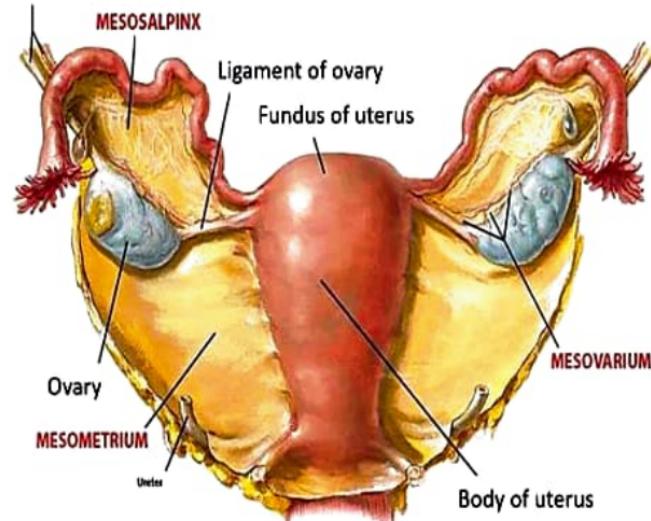


1) Broad ligament

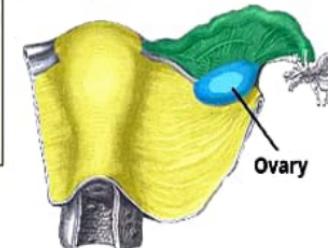
- No: 2
- It is the double fold of the peritoneum.
- It extends from the lateral walls of the uterus to the pelvic sidewalls.
- Each broad ligament contains a fallopian tube, uterine & ovarian arteries, veins & nerves.

Parts: 4

- i) Infundibulo-pelvic ligament (from infundibulum of fallopian tube to the lateral pelvic wall)
- ii) Mesovarium (it is a fold of the peritoneum posterior of the broad ligament to which the ovary attaches)
- iii) Mesosalpinx
- iv) Mesometrium



Coronal Plane:



Sagittal Plane:



Mesometrium
Mesosalpinx
Mesovarium

2) Round ligament

- No.: 2
- Length: 10-12 cm
- One end is attached to the cornu of the uterus (entry point of fallopian tube) and the other end terminates in the anterior third of the labium majus.

3) Ovarian ligament

- No.: 2
- Length: 2.5 cm
- Each one is a fibromuscular cord-like structure which attaches to the uterus posteriorly below the level of attachment of the fallopian tube.

4) Transverse / Cardinal / Mackenrodt's ligament

- No.: 2
- It extends in a fan-shaped manner from the supra-vaginal cervix to the lateral pelvic wall.

5) Suspensory / Lateral-sacral ligament

- No.: 2
- It extends from the postero-lateral surface of the cervix at the level of internal OS to the sacrum.

Figure 27.11a The Ovaries, Uterine Tubes, and Uterus

