ANATOMY:

he median umbilical ligament is the embryological remnant of what fetal structure?

Gubenaculum

Umbilical arteries

Umbilical veins

Urachus

Vitelline duct

**Incorrect**:

The answer is urachus. The urachus forms the median umbilical ligament. Be careful not to confuse it with the medial umbilical ligament, which represents the remnants of fetal umbilical arteries. Note there is an umbilical vein, not veins, and this forms the ligamentum teres hepatis.

The superficial inguinal ring is strengthened posteriorly by what structure?

Falx inguinalis

Puborectalis

Recti adbominus

Superficial inguinal tendon

Transversus abdominus

**Correct**:

The answer is the falx inguinalis. The falx inguinalis is also called the conjoint tendon and strengthens this anatomical area of weakness of the abdominal wall. Note that although the superficial inguinal tendon sounds plausible, it actually does not exist.

The inguinal canal transmits the round ligament and which important nerve?

Iliohypogastric nerve

Ilioinguinal nerve

Obturator nerve

Pelvic splanchnic nerve

Pudendal nerve

**Incorrect**:

The answer is the ilioinguinal nerve. It orginates from the anterior rami of L1 and supplies the skin on the mons pubis and labia majora. It also has motor supply to the internal oblique and transversus abdominis so it strengthens the conjoint tendon.

A urinary catheter is vigorously inflated in the urethra at the time of caesarean section. Urine leaks from the rupture into which anatomical space?

Into the anterior abdominal wall and mons pubis

Into the lesser pelvis

Into the peritoneal cavity

Into the vagina

Laterally to the femoral triangles

**Correct**:

The answer is into the anterior abdominal wall and mons pubis. This is the only route possible due to the anatomy of the urethra.

Which group of nerves all constitute branches of the pudendal nerve?

Internal pudendal nerve, perineal nerve, dorsal clitoral nerve

Mid rectal nerve, dostal clitoral nerve, perineal nerve

Perineal nerve and posterior clitoral nerve

Perineal nerve, dorsal clitoral nerve, inferior rectal nerve

Perineal nerve, inferior clitoral nerve, mid rectal nerve

**Incorrect**:

The answer is the perineal nerve, dorsal clitoral nerve and inferior rectal nerve. These are the three important branches of the pudendal nerve.

The inferior hypogastric plexus is an important plexus supplying the hind gut. What are its nerve root origins?

L3–L5

L4–L5 and S1–S4

S2–S4

T10–12 and L1–L2

T8–T12 and L1–L3

**Incorrect**:

The answer is T10–12 and L1–L2. The inferior hypogastric plexus is a continuation of both hypogastric nerves. It is derived from the lower three thoracic and upper two lumbar segments. The parasympathetic and sympathetic supply of this plexus effects uterine contractions and vasoconstriction.

Which three muscles form the superficial group of muscles of the perineum?

Bulbospongiosus, superficial transverse perineal muscle, and ischiocavernous

Deep transverse perineal muscle, external anal sphincter, and bulbospongiosus

External vaginal sphincter, deep transverse perineal muscle, and external anal sphincter

Iliococceageus, ischiocavernosus, and bulbospongiosus

Levator ani, ischiocavernous, and bulbospongiosus

**Correct**:

The answer is bulbospongiosus, superficial transverse perineal muscle and ischiocavernous. These three muscles make up the superficial group of perineal muscles. The bulbospongiosus is superficial to the Bartholin's glands.

Sympathetic supply to the bladder is derived from which lumbar segments?

L1 and L2

L2 and L3

L3 and L4

L4 and L5

S2 , S3 and S4

**Correct**:

The answer is L1 and L2. Nerve root supply for pelvic organs is a common single best answer examination question. It is worth drawing a table for each of the main pelvic organs and writing down the artery, venous, lymphatic and nerve supply. Note that the parasympathetic supply for the bladder comes from S2, S3 and S4 but the sympathetic is as above. Sensory nerves are found in both supplies.

The lower third of the vagina has lymphatic drainage to which nodes?

Common iliac nodes

External iliac nodes

Internal iliac nodes

Superficial inguinal nodes

Para-aortic nodes

**Incorrect**:

The answer is the superficial inguinal nodes. Remember the embryological difference between the lower one-third of the vagina and the upper two-thirds. The upper part is derived from the fused mesonephric ducts, and the lower one-third from canalisation of the ectodermal thickening. The upper two-thirds of the vagina drain to the internal and external nodes.

A baby delivered after shoulder dystocia was diagnosed to have Erb’s palsy. Which component of the brachial plexus is most likely to be involved?

C5

C5, C6

C7, C8

C8, T1

C7, C8, T1

**Incorrect**:

The answer is C5, C6. Brachial plexus injury is a known complication of difficult delivery and shoulder dystocia. It results from excessive stretch to the brachial plexus nerve roots. Generally the type of the nerve injury is neuropraxia and leads to complete recovery. The classic picture is the 'waiter's tip' posture of the hand. It involves adduction and internal rotation of the shoulder, along with pronation and extension of forms.

A 20-year-old woman presents with a painful lump in the vagina. The examination confirms Bartholin’s abscess. Which one of the following glands is involved?

Bulbourethral glands (Cowper’s)

Glands of skini

Greater vestibular gland

Lesser vestibular gland

Seminal vescicle

**Incorrect**:

The answer is the greater vestibular (Bartholin’s) gland. These are small paired glands located in the superficial perineal pouch. They are partially covered by posterior portions of the bulb of the vestibule and the bulbospongiousus muscles. The duct opens into the vestibule between the hymen and the labium minus. These glands provide lubrication at the introitus. Bartholin’s abscess may occur due to infection and blockage of these glands.



Ischemic injury to the pelvic ureter may be caused by which one of the following arteries?

Aorta

Common iliac artery

Inferior vesical artery

Renal artery

Uterine artery

**Incorrect**:

The correct answer is the inferior vesical artery.

Which structure is lined by non-keratinised stratified squamous epithelium?

Endocervix

Fallopian tubes

Skin

Ureters

Vagina

**Incorrect**:

The answer is the vagina. The endocervix is lined by columnar epithelium. Skin is lined by keratinised squamous epithelium. The fallopian tubes are lined by ciliary, and ureters by transitional epithelium.

What is the most serious risk associated with the insertion of a Veress needle through the umbilicus in a thin patient, an outcome that is unlikely with the Hasan entry technique?

Bowel perforation

Damage to liver

Damage to ureters

Inferior epigastric artery injury

Vascular injury

**Incorrect**:

The answer is vascular injury. The aorta, inferior vena cava and common iliac arteries are put at risk with the insertion of the Veress needle. The open entry technique is considered to be safer in this matter. The risk of bowel damage is not completely avoided using the open entry technique.

The common iliac artery arises from the aorta on the left side of the fourth lumbar vertebra and divulges acutely. The inferior vena cava lies behind the right common iliac vessel. In a thin patient, the major blood vessels are only a few centimetres away and are particularly at risk with a Veress entry.

A 28-year-old woman presents to the gynaecology clinic with a history of dysmenorrhoea, dysparunia and menorrhagia. A vaginal examination reveals a thickened nodule in the posterior fornix. Which anatomical structure is most likely to be affected?

Constipated bowel

Ovaries

Pectineal ligaments

Ureter

Uterosacral ligaments

**Incorrect**:

The answer is the uterosacral ligament. The above trio of symptoms is characteristic of endometriosis. It is possible to palpate the affected uterosacral ligament by vaginal examination.

Which artery is a direct branch of the aorta?

Inferior vesical

Internal iliac

Ovarian

Uterian

Vaginal

**Incorrect**:

The answer is ovarian. The ovarian artery is a branch of the aorta. It arises anterolaterally just below the renal artery, running retroperitoneally to leave the abdomen by crossing the common or external iliac artery in the infundibulopelvic fold. It crosses corresponding ureters and supplies twigs to it but does not supply to abdominal organs. The internal iliac artery arises from the common iliac and its inferior branch further supplies to the pelvis.

A 65-year-old woman underwent vaginal surgery for which she was in the lithotomy position for 2 ½ hours. Postoperatively you have noticed parasthesia of the lateral side of the leg, foot and foot drop. The compression of which nerve is likely to be responsible?

Common peroneal nerve

Femoral nerve

Great saphenous nerve

Obturator nerve

Pudendal nerve

**Correct**:

The answer is common peroneal nerve. The injury is thought to be secondary to compression of the nerve between the lateral head of the fibula and the bar holding the legs. When the stirrups are used, special attention must be paid in order to avoid compression. Injury to the femoral nerve will cause hypoesthesia in the anterior and anteromedial area on the thigh below the inguinal ligament.

You have been asked to suture a deep episiotomy by a midwife. On examination you notice that the external anal sphincter is mostly torn, with a few fibres left intact. The internal anal sphincter is intact. How would this tear be described?

Second-degree tear

Third-degree tear, 3a

Third-degree tear, 3b

Third-degree tear, 3c

Fourth-degree tear

**Incorrect**:

The correct answer is third-degree tear, 3b.

3a: less than 50% external anal sphincter involvement.

3b: more than 50% external anal sphincter involvement.

3c: both external and internal sphincter involvement.

It is essential that the appropriate diagnosis is made. A third-degree tear should be repaired in theatre under adequate light and by a trained surgeon.

A 30-year-old woman has developed haematuria, pain and reduced urine output on day 3 following a total abdominal hysterectomy. A urine dipstick showed red blood cells but no nitrites. An X-ray of the pelvis was unremarkable. What is the most likely diagnosis?

Bladder injury

Intra-abdominal bleeding

Ureteric stone

Ureteric trauma

Urinary tract infection

**Incorrect**:

The answer is ureteric trauma. While intra-abdominal bleeding may be associated with these signs, it is more likely to present at an earlier stage, as would significant bladder injury. The unremarkable pelvic X-ray makes ureteric stone unlikely, while the absence of nitrites makes urinary tract infection unlikely.

What is the lymphatic drainage of the ovaries?

Common iliac nodes

External iliac and superficial iliac nodes via the round ligament

External iliac nodes

Internal iliac nodes

Lateral aortic and preaortic nodes

**Incorrect**:

The answer is lateral aortic and pre-aortic nodes. It is useful to remember the following: the bladder drains to the external iliac nodes; the urethra drains to the internal iliac nodes; the fallopian tubes and fundus uteri drain to the external iliac and superficial iliac nodes via the round ligament; and the cervix drains to the external and internal iliac, rectal and sacral nodes and occasionally obturator nodes.

BIOCHEMISTERY:

Which of the following amino acid bases is not contained in RNA?

Adenine

Cytosine

Guanine

Thymine

Uracil

**Incorrect**:

The answer is Thymine. In RNA the thymine is replaced by uracil. The other bases (adenine, cystosine and guanine) remain the same.

Which of the following blood clotting factors activates fibrinogen in the common pathway?

Factor VIII

Factor XIII

Kallikrein

Kinin

Prothrombin

**Incorrect**:

The answer is Prothrombin. Accelerin (V) stimulates activation of prothrombin (II) to thrombin (II), which activates fibrinogen (I) to form fibrin clot. This is stabilised by cross linking with the aid of fibrin-stabilising factor (XIII). Remember heparin increases the rate of complex formation of antithrombin III, which inactivates thrombin.

Which part of the cell cycle is noted for sister chromatids separating and moving to opposite sides of the cell?

Anaphase

Metaphase

Prophase

Synthesis phase

Telophase

**Correct**:

The answer is Anaphase. Within the cell cycle DNA replication occurs in the synthesis phase before entering the Gap 2 phase. Mitosis starts with chromosomes condensing (prophase) follow by chromatids aligning (metaphase), following by sister chromatids separating and moving (anaphase). Finally the cell membrane divides in telophase.

Which biochemical technique is used to detect the presence and the amount of a protein?

Northern blotting

Polymerase chain reaction

Southern blotting

Western blotting

X-ray crystalography

**Incorrect**:

The answer is Western blotting. Southern blotting (named after Edwin Southern) is used to detect particular sequences to DNA. Northern blotting is used for the same reason but for RNA. Polymerase chain reaction is used to amplify very small amounts of DNA (although it can be used for RNA if converted to DNA). X-ray crystallography is used to reveal the structure of nucleic acids such as DNA and RNA.

Which of the following molecules generates weak forces that can attract neutrophils to cell walls?

Cadhedins

Eicosanoids

Hemidesmosomes

Integrins

Selectins

**Incorrect**:

The answer is Selectins. Selectins are molecules that are expressed in endometrial cell walls and also leucocytes. They generate weak attraction forces. Inflammatory processes via interleukins increase the amount of selectins present and hence, attract more leucocytes.

Ribosomes are located in which part of the cell?

Golgi complex

Lysosomes

Mitochondria

Rough endoplasmic reticulum

Smooth endoplasmic reticulum

**Incorrect**:

The answer is Rough endoplasmic reticulum. Ribosomes 'read' the messenger RNA created from the nuclear DNA and translate it to create proteins via transfer RNA. There are free ribosomes in the cytoplasm of cells but they are in abundance in the rough endoplasmic reticulum.

Which ketone bodies can be used as an energy supply for the brain in starvation?

Acetyl CoA

Acetone

Acetoacetate

Choline

Succinate

**Incorrect**:

The answer is Acetoacetate. Acetone is also a ketone body but is not used for energy. It is excreted in urine and is also exhaled in the breath.

You have been asked to review an asymptomatic patient in the early pregnancy unit. Ultrasound scan is negative for pregnancy. βhCG levels over 48 hours are 550 and 350, and serum progesterone levels are 17 nmol. What is the most likely finding?

Ectopic pregnancy

Failing pregnancy

High risk of ectopic pregnancy needing intervention for treatment

Non-viable pregnancy with the possibility of spontaneous resolution

Viable pregnancy

**Incorrect**:

The correct answer is Non-viable pregnancy with the possibility of spontaneous resolution. Serum progesterone levels are useful adjuncts in the diagnosis of pregnancy of unknown location. Levels below 15-25 are indicative of non viable pregnancy. Results below 20nmol/l are associated with spontaneous resolution with sensitivity of 93% and specificity of 94%. Levels above 60 strongly indicate development into normal pregnancy in the future. Serum hCG levels are useful in localising pregnancy while serum progesterone helps with the prognosis.

Your consultant has asked you to send a urea and electrolytes test (U&E) for a postoperative patient who had undergone transcervical resection of fibroids. Which particular blood tests should you be specifically worried about?

Hypernatremia

Hypokalaemia

Hyponatraemia

Hypovolaemia

Increased serum osmolality

**Incorrect**:

The answer is Hyponatraemia. Absorption of large amounts of glycine is associated with hypervolaemia, hyponatraemia and reduced osmolality. The term was coined as TURP syndrome. The patient initially becomes restless, and complains of headache. Sodium levels below 120mEq/L cause cardiac depression. Level less than 115mEq/L is associated with bradycardia, widening of QRS complex and T inversion. Level below 105mEq/L is associated with respiratory and cardiac arrest. It is essential to log input versus output in transcervical resection of fibroid cases. A loss of more than 1.5 L is associated strongly with TURP syndrome.

In a pregnant woman with diabetes mellitus, target levels of HbA1C should be below what level?

4.1 %

6.1%

8.1%

10.1%

12.1%

**Incorrect**:

The answer is 6.1%. Diabetic women should be managed by a specialised multidisciplinary team. There should be an increased frequency of self monitoring and monthly checks of HbA1c levels. The aim is to achieve optimum control with the levels of HbA1c below 6.1%. Maternal and fetal risks are reduced with decreasing HbA1c levels. However, rapid reduction is not advisable. If the levels are above 10%, pregnancy is not recommended.

A 14-year-old child presents to the adolescent gynaecology clinic. She has a history of virilisation after undergoing pubertal changes. The karyotype reveals 46XY. An ultrasound scan does not show the presence of a uterus and ovaries. Which enzyme deficiency may be associated with these clinical features?

5-alpha-reductase deficiency

Complete androgen insensitivity syndrome

Kallmann syndrome

Polycystic ovary syndrome

Turner syndrome

**Correct**:

The answer is 5-alpha-reductase deficiency. Turner syndrome is 45 XO. Polycystic ovarian syndrome has a normal female karyotype. The child described above is genetically male. However, testosterone is not converted to dihydrotestosterone in target tissues. Five-alpha-reductase deficiency prevents conversion of androgen to estrogen. The child may have been born with ambiguous genitalia and raised as a female. At puberty, elevated levels of androgen lead to masculinisation including virilisation. Complete androgen insensitivity is not the answer because increased androgens are converted to estrogen and do not show any virilisation. It involves phenotypic females and an unresponsiveness to androgens.Kalman's syndrome is a form of hypogonadotropic hypogonadism and anosmia.



Which structure synthesises alphafetoprotein in a fetus?

Gut

Kidney

Pancreas

Placenta

Spleen

**Correct**:

The answer is the Gut. Alphafetoprotein is synthesised by three fetal structures: the gut, the liver and the yolk sac. It is a glycol protein. It may be elevated in the case of an anterior abdominal wall and neural tube defect. As these defects are not covered by skin, AFP freely enters the amniotic fluid from the fetal circulation, thus leading to elevation of levels.

Which body fat has a major role in gene transcription?

Eicosanoids

Fatty acids

Membrane phospholipids

Phospholipids

Triglycerides

**Incorrect**:

The answer is Fatty acids. The eicosanoids have a role in hormone synthesis. The phospholipids are involved in membrane formation. Membrane phospholipids are broken down to second messengers when the hormone binds to its receptor.

Which electrolyte has a role in maintaining intracellular fluids, helping the regulation of pH and establishing resting membrane potential of the cells?

Bicarbonates

Calcium

Chloride

Potassium

Sodium

**Incorrect**:

The answer is Potassium. Hypokalaemia may be caused by inadequate replacement by intravenous therapy, insulin therapy, vomiting and diarrhoea. It is commonly associated with paralytic ileus. Sodium has a key role in fluid balance. It contributes half the osmolarity of the extracellular fluid. Calcium has a main role in excitable cells, neurotransmitter release and blood clotting.

Which biochemical process creates pyruvate as an energy supply?

Beta oxidation

Glycolysis

Gluconeogenesis

Oxidative deamination

The citric acid cycle

**Incorrect**:

The answer is Glycolysis. Glycolysis converts monosaccharides into pyruvate before conversion to acetyl coenzyme A. This then fuels the citric acid cycle. It is particularly helpful because it does not require oxygen. Gluconeogenesis is metabolic pathway resulting in generation of glucose from non-carbohydrate substrates such as lactates,glycerol and aminoacids. Beta oxidation involves fatty acid breakdown in mitochondria to generate acyl CoA .

Chronic renal failure can produce what effect on the parathyroid system?

Hypoparathyroidism

Primary hyperparathyroidism

Pseuohypoparathyroidism

Secondary hyperparathyroidism

Tertiary hyperparathyroidism

**Incorrect**:

The answer is Secondary hyperparathyroidism. Chronic renal failure is the most common cause of secondary hyperparathyroidism. Other causes include chronic pancreatitis and small bowel disease.

An active 70-year-old woman is admitted to the gynaecology clinic for a sling procedure with a known history of Paget’s disease of the bone. Which biochemical findings are most likely?

Elevated calcium, elevated phosphate and elevated alkaline phosphatise

Elevated calcium, reduced phosphate and reduced alkaline phosphatise

Normal calcium, normal phosphate and elevated alkaline phosphatase

Reduced calcium, elevated phosphate and elevated alkaline phosphatise

Reduced calcium, reduced phosphate and elevated alkaline phosphatase

**Incorrect**:

The answer is Normal calcium, normal phosphate and elevated alkaline phosphatase. Calcium and phosphate are usually normal but alkalaline phosphatase is often highly elevated.

HbA1C is a marker of diabetic control over what time period?

48 hours

Up to 1 week

4–8 weeks

8–10 weeks

10–12 weeks

**Incorrect**:

The answer is 8–10 weeks. Measurement of HbA1c is an indicator of glycaemic control over the previous 8–10 weeks, and is used to monitor patients with type I diabetes. It should not be used as a diagnostic test for type I diabetes.

With regard to the oxygen dissociation curve, which factor increases the percentage of oxygen saturation for the same partial pressure of oxygen available, shifting the curve to the left?

Alkalosis

Anaemia

Heat

Hypercapnoea

Hypoxia

**Correct**:

The answer is Alkalosis. All the other options shift the curve to the right, in promoting the release of oxygen to the tissues that need it.