**Question 1**

A patient requires treatment for benign prostatic hyperplasia. Which of the following antiandrogens is a 5 alpha reductase inhibitor?

A Spironolactone

B Flutamide

C Cyproterone acetate

D Finansteride

Explanation D

Testosterone acts intracellular in target cells. In skin, prostate, seminal vesicles and epididymis, it is converted to 5 alpha dihydrotestosterone by 5 alpha reductase. In these tissues dihydrotestosterone is the dominant androgen. The distribution of this enzyme in the foetus is different and important in the developmental implications

Finansteride is a 5 alpha reductase inhibitor. It reduces the size of the prostate in men with benign prostatic hyperplasia

Cyproterone acetate are effective antiandrogens that inhibit the action of the androgens at the target organ

Spironolactone, a competitive inhibitor of aldosterone also competes with dihydrotestosterone for the androgen receptors in target tissues.

Flutamide is a potent antiandrogen. It is not a steroid but is a competitive antagonist at the androgen receptor

**Question 2**

With regards to glucocorticoids, which of the following statements is correct?

A Dexamethasone has a short half life

B Fludrocortisone can only be given intravenously

C Prednisone is 4 times more potent than hydrocortisone

D Methylprednisolone has no mineralocorticoid effects

Explanation C

Fludrocortisone can be given orally, as an injection and topical. Methylprednisolone has salt retaining properties (only slight) and dexamethasone has a long half life of 36-54hrs. Dexamethasone has the highest anti-inflammatory properties of the group. Prednisone is 4 times the potency of hydrocortisone and prednisolone is 5 times the potency of hydrocortisone.

Anti-inflammatory strengths:

Hydrocortisone-1; cortisone-0.8; Prednisone-4; prednisolone-5; Methylprednisolone-5; Fludrocortisone-10.

Note: this answer reflects the anti-inflammatory strengths of the glucocorticoids and not their mineral corticoid strengths seen in other questions

**Question 3**

With regard to oral hypoglycaemics which of the following statements is correct?

A Tolbutamide and glipizide are sulphonylureas

B Metformin is more effective once weight is controlled

C Chlorpropramide has a half life of 4-6 hours

D Lactic acidosis is more common with metformin than phenformin

Explanation A

Lactic acidosis is more common with phenformin and, as a result, has been taken off the market. It had a mortality of 50% once lactic acid developed. Metformin is not more effective once weight is controlled. Chlorpropramide has a half life of 32hrs. Sulphonylureas (SU) can cause hypoglycaemia where as the buguanides (B) don’t. Metformin does not require functioning pancreatic beta cells for its action

SU= tolbutamide, tolazamide, acetohexamide, chlorpropamide, glyburide, glipizide, glimepiride.

B= metformin, phenformin, buformin

**Question 4**

Which of the following has the most potent mineralcorticoid activity?

A Corticosterone

B Cortisone

C Cortisol

D Aldosterone

Explanation D

Mineralocorticoid Potency- potenct relative to hydrocortisone (cortisol) of 1

Aldosterone 200-1000

Fludrocortisone 250

Cortisone 0.8

Prednisolone 0.8

Dexamethasone 0

**Question 5**

Which of the following is NOT an action of glucagon?

A Stimulates gluconeogenesis

B Positive inotrope

C Positive chronotrope

D Smooth muscle contraction

Explanation D

Glucagon raises blood sugar at the expense of stored hepatic glucagon. It does not have any effect on stored skeletal glucagon because of a lack of receptors on the skeletal muscle. Pharmacological amounts of glucagon cause release of insulin from normal pancreatic b cells, cathecolamines from pheochromocytoma and calcitonin from medullary carcinoma cells

Glucagon relaxes smooth muscle of the GIT system. However, this mechanism has not been fully identified. Some studies failed to produce any demonstrable changes in the longitudinal contraction and tonicity of the lower oesophagus. The recent experimental evidences have suggested that the inhibitory effect of glucagon on the motility of the smooth muscle of the alimentary tract may not be due to its direct action on the receptor, but to its interference with intramural cholinergic neuronal transmission.

Source: Effect of glucagon on the motility of oesophageal smooth muscle: Lin SZ et al

**Question 6**

Insulin causes all of the following EXCEPT?

A Decrease in glycogenolysis in the liver

B Increase in lipolysis in the liver

C Increase in glycogen synthesis in the liver

D Inhibition of gluconeogenesis

Explanation B

Insulin is a polypeptide containing two chains of 51 amino acids linked by disulphide bridges. It is synthesized in the rough endoplasmic reticulum of the beta cells of the pancreas. Insulin is a small protein with a molecular weight in humans of 5808.Lipogenesis occurs as does muscle development, glycogen synthesis and storage in liver and muscle, triglyceride synthesis and storage in adipose tissue.In the liver there is a decreased glucose output due to decreased gluconeogenesis, increased glycogen synthesis and increased glycolysis. (This is an intermediate effect of insulin)

**Question 7**

Regarding metformin, which of the following statements is correct?

A It is a sulphonylurea

B It is similar to chlorpropamide

C It causes a mild lactic acidosis

D It does not require functioning pancreatic B cells for its action

Explanation D

Metformin is a biguanide and can cause a significant lactic acidosis (and is contraindicated in the presence of renal or liver disease or condition which result in tissue anoxia). Chlorpropamide is a sulfonylurea and a different class of hypoglcaemics. Metformin is an insulin-sparing agent and does not increase weight gain or cause hypoglycaemia in such patients. Their blood glucose lowering action does not depend on the presence functioning pancreatic B cells.

**Question 8**

Insulin causes which of the following effects?

A A decrease in lipolysis in liver

B An increase in glycogen synthesis in liver

C A decrease glycogenesis in liver

D A decrease in lipolysis in skeletal muscle

Explanation B

Insulin is polypeptide hormone. It has multiple anabolic effects. Lipogenesis occurs, as does muscle development, glycogen synthesis and storage in liver and muscle and triglyceride synthesis and storage in the adipose tissue

**Question 9**

After treatment for hyperthyroidism a patient has fever and neutropenia, which is the likely drug?

A Propylthiouracil.

B Radioactive iodine

C Propranolol

D Amiodarone

Explanation A

The most dangerous complication of the thiamides (which includes propylthiouracil and methimazole) is agranulocytosis. It is infrequent but potentially fatal. It occurs in 0.3-0.6% of patients but may be increased in the elderly and those taking higher concentrations of the drug. The reaction is usually reversible once the drug is discontinued but antibiotics may be needed for complicating infections. The cross sensitivity between the two thiamides is 50% so switching between the two drugs in patients with severe reactions is not recommended. Other more common side effects include a maculopapular rash and fever which occurs in 3-12% of patients.