

## Case 4 MCQ Quiz

Question 1: Which of the following describes the action of caffeine?

- A. Alpha adrenergic receptor antagonist
- B. Nicotinic receptor agonist
- C. Cholinergic receptor agonist
- D. Adenosine receptor antagonist**
- E. Beta adrenergic receptor agonist

Question 1 correct answer: D

Question 2: Based on the information provided in the Case, how would you advise a patient who mentions to you that they drink two cups of filter coffee during the day (one in the morning, and one after lunch)? They do not have a family history of glaucoma or elevated IOP.

- A. It is fine for them to continue with this routine, and they should carry on with their regular eye examinations**
- B. They should stop drinking all caffeinated beverages and switch to de-caf
- C. The patient should increase their caffeine consumption to five cups per day as this has been found to be protective against developing POAG
- D. The patient should substitute their afternoon coffee for black tea
- E. They should take caffeine tablets twice a day rather than drinking coffee

Question 2 correct answer: A

Question 3: At physiological concentrations, caffeine is which of the following?

- A. A respiratory bronchoconstrictor
- B. A central nervous system depressant
- C. An inhibitor of lipolysis
- D. A peripheral vasodilator
- E. A diuretic**

Question 3 correct answer: E

Question 4: Which of the following statements regarding caffeine, IOP and glaucoma is FALSE?

- A. Caffeine metabolism is influenced by various factors, including age, smoking and pregnancy

- B. Studies of patients ingesting low to moderate levels of caffeine (100-400 mg per day) concluded that there is a linear relationship between caffeine consumption and glaucoma risk**
- C. It is possible that a volume challenge posed by caffeinated beverage consumption may contribute to raised IOP
- D. Increased caffeine consumption was associated with high IOP and increased risk of glaucoma in patients with a family history of glaucoma
- E. Caffeine has both weak hydrophilic and lipophilic properties, and can pass through biological membranes

Question 4 correct answer: B

Question 5: In the Blue Mountains Eye Study, there was a significant positive correlation between daily coffee consumption and IOP in patients with ocular hypertension

TRUE OR **FALSE**

Question 5 correct answer: FALSE

Question 6: What is thought to be the mechanism behind elevated IOP while playing high-resistance musical instruments?

- A. The Valsalva manoeuvre causing an increase in uveal volume**
- B. Transient increase in aqueous humour production via activation of beta-adrenergic receptors
- C. Reduced aqueous outflow via the trabecular meshwork pathway as a result of pupillary dilation
- D. Lack of oxygen supply at the level of the optic nerve head
- E. Anterior rotation of the ciliary body causing a shallow anterior chamber

Question 6 correct answer: A

Question 7: Which of the following is NOT considered to be a high-resistance musical instrument?

- A. Oboe
- B. Bassoon
- C. Clarinet**
- D. Trumpet
- E. Tuba

Question 7 correct answer: C

Question 8: What is the Sensimed Triggerfish?

- A. A kinetic perimeter
- B. A non-contact tonometer for home IOP assessment
- C. A Fourier domain OCT
- D. A system that allows for 24-hour IOP-related monitoring using a contact lens**
- E. An ultrasound pachymeter

Question 8 correct answer: D

Question 9: What is the relationship between body mass index (BMI) and IOP

- A. For every 1 kg/m<sup>2</sup> increase in BMI, there is a 0.5 mmHg increase in IOP
- B. IOP increases linearly with BMI up until a BMI of 35 kg/ m<sup>2</sup>, after which point there is no correlation
- C. Patients with a BMI of greater than 30 are less likely to develop ocular hypertension or primary open angle glaucoma
- D. Patients with a BMI of between 18 and 25 have IOP that is, on average, 2.1 mmHg lower than those with a BMI of greater than 25
- E. Study findings are inconclusive**

Question 9 correct answer: E

Question 10: Cigarette smoking is associated with a higher risk of developing POAG

TRUE OR FALSE

Question 10 correct answer: FALSE

Question 11: Arachidonic acid is a precursor to which of the following:

- A. Interleukin-6
- B. Prostaglandin F2- $\alpha$**
- C. TNF-  $\alpha$
- D. Fas ligand
- E. Linoleic acid

Question 11 correct answer: B

Question 12: Among a group of 42 Dutch musicians, what was the mean IOP change after playing their wind or brass instruments for 20 minutes?

- A. No change
- B. 1.1 mm Hg increase
- C. 1.5 mmHg increase**
- D. 2.5 mmHg increase
- E. 4 mmHg increase

Question 12: correct answer: C

Question 13: In a study of 13 patients experiencing emotional stress, the Sensimed Triggerfish showed a significant increase in IOP-related profile during the stressful event.

**TRUE** or FALSE?

Question 13 correct answer: TRUE

Question 14: In an interventional study of 45 healthy volunteers undergoing an exercise programme, what was the mean reduction in IOP from baseline at the end of the six-week study?

- A. 0.47 mmHg
- B. 1.49 mmHg
- C. 2.19 mmHg**
- D. 3.06 mmHg
- E. 3.92 mmHg

Question 14 correct answer: C

Question 15: Which of the following statements concerning aerobic exercise and IOP or glaucoma is TRUE?

- A. A reduction in IOP following aerobic exercise has been observed in healthy volunteers but not patients with primary open-angle glaucoma
- B. Optometrists should prescribe a 60-minute daily exercise program to all patients with glaucoma
- C. Patients with higher levels of physical fitness have higher measured IOP
- D. Aerobic exercise is not useful in the adjunctive management of patients with glaucoma
- E. In individuals who are less conditioned to physical activity, the exercised-induced IOP lowering may be shorter-lived**

Question 15 correct answer: E

Question 16: In a New Zealand study of participants performing heavy resistance exercise, what was the average transient increase in IOP during the leg press?

- A. 8.7 mmHg
- B. 13.9 mmHg
- C. 19.5 mmHg
- D. 26.4 mmHg**
- E. 33.6 mmHg

Question 16 correct answer: D

Question 17: With regard to wearing swimming goggles, which of the following statements is TRUE?

- A. Central corneal thickness decreased by an average of 54  $\mu\text{m}$  during 5 minutes of goggle wear**
- B. The average increase in IOP after wearing goggles for 5 minutes was 4.8 mmHg
- C. Anterior chamber angle extent increased by 3.9 degrees during goggle wear
- D. Five minutes after goggle removal, IOP remained elevated from baseline by an average of 2.5 mmHg
- E. Anterior chamber depth reduced by an average of 0.5 mm while wearing swimming goggles

Question 17 correct answer: A

The following questions are based on the required reading article *Modifiable risk factors in the management of glaucoma: a systematic review of current evidence* by Hecht and colleagues, 2017.

Question 18: Which of the following statements around diet and glaucoma is FALSE?

- A. A high intake of fruit and vegetables is associated with a decreased risk of glaucoma
- B. One study found that iron and calcium supplementation may increase glaucoma risk
- C. POAG patients who received supplementation with a range of compounds including Vitamins B1, B2, B6, magnesium, folic acid and l-carnosine had improved pattern ERG amplitude at 12 months compared with controls
- D. Patients taking saffron supplementation for one month showed a significant increase in IOP relative to controls**

- E. At two-year follow-up, there was no significant difference in visual field or OCT results in patients treated with lutein, zinc, copper, magnesium, selenium and omega-3 fatty acids

Question 18 correct answer: D

Question 19: Refer to table 2, what would be the most-appropriate sleeping position recommendation for a patient with POAG?

- A. The patient should sleep without a pillow, on their back
- B. The head should be positioned below the body for sleep
- C. Patients with POAG should sleep with their head slightly elevated and avoid lying on the side of their worst-affected eye**
- D. Patients with glaucoma should sleep on their stomach, as this is associated with reduced nocturnal IOP
- E. Patients with POAG should sleep in a non-reclined armchair to minimise IOP increase associated with the supine position

Question 19 correct answer: C

Question 20: By what factor is IOP increased during the headstand position in yoga?

- A. 0.5 x
- B. 1.2 x
- C. 1.7 x
- D. 2 x**
- E. 2.6 x

Question 20 correct answer: D

Question 21: Which of the following is TRUE regarding exercise and glaucoma?

- A. The forward bend position in yoga increases IOP by approximately 10 mmHg**
- B. Patients with glaucoma should be advised to swim without goggles
- C. Weight-lifting is associated with short-term reductions in IOP
- D. Patients with POAG have more limited IOP reduction following aerobic exercise than controls
- E. Patients with POAG should be encouraged to minimise all forms of exercise due to the detrimental effect on IOP

Question 21 correct answer: A

Question 22: Cannabinoids can lead to a transient reduction in IOP

## TRUE OR FALSE

Question 22 correct answer: TRUE

Question 23: What is the average change in IOP over a two-hour period following caffeine consumption equivalent to one cup of coffee?

- A. 1-2 mmHg decrease
- B. No change
- C. 1-2 mmHg increase**
- D. 3-5 mmHg increase
- E. >6 mmHg increase

Question 23 correct answer: C

Question 24: Refer to table 1: In the study on exercise and POAG, what was the *additional* reduction in IOP in patients who were prescribed exercise (30 minutes per day) alongside their medication for glaucoma?

- A. 1 mmHg
- B. 3 mmHg**
- C. 5 mmHg
- D. 7 mmHg
- E. 9 mmHg

Question 24 correct answer: B

Question 25: Refer to table 1 and the studies on sleeping position: Which of the following statements is TRUE?

- A. Bed head angle elevation reduces IOP by 5 mmHg compared with sleeping on multiple pillows
- B. Lateral decubitus sleeping side was associated with the lower IOP in the ipsilateral eye
- C. Sleeping position does not affect IOP
- D. At 20 degrees of head elevation, IOP was 1.5 mmHg lower than in supine position**
- E. IOP was 3.7 mmHg higher in face down sleeping position

Question 25 correct answer: D