

Paper 3 · Section D option · Addiction

A-level topic mock · 2026 · Maximum mark: 48

Addiction is A-level only (AQA spec 4.3.10) — it is a Paper 3 option and is not assessed at AS. Indicative content is not exhaustive; credit any other valid points. Levels-based questions (Q10 and Q11) require holistic judgement using the descriptors — match the answer to the band that best fits, then fine-tune within it. Specialist vocabulary (physical/psychological dependence, tolerance, withdrawal syndrome, genetic vulnerability, personality, social influences, brain neurochemistry, dopamine, cue reactivity, partial/variable reinforcement, cognitive bias, aversion therapy, covert sensitisation, Prochaska's six-stage model) follows AQA's 2025 wording. **Note (2025 spec): the theory of planned behaviour has been removed** — Prochaska's six-stage model is the only behaviour-change model on the spec. Risk factors are now worded as "social influences" (covering stress, family and peers), and the topic refers to "nicotine addiction" (not "smoking behaviour").

D Addiction**0 1**AO1 · 1 mark multiple choice

Which one of the following best describes tolerance?

Answer: B — Needing more of a substance to achieve the same effect.

A describes craving/dependence; C describes withdrawal; D describes the illusion of control (a cognitive bias in gambling).

0 2AO1 · 1 mark multiple choice

Which one of the following is a stage in Prochaska's six-stage model of behaviour change?

Answer: C — Precontemplation.

Prochaska's stages are precontemplation, contemplation, preparation, action, maintenance and termination. A (desensitisation) and B (disinhibition) are media/aggression terms; D (reinforcement) is a learning-theory term.

0 3

AO1 · 1 mark multiple choice

| Which one of the following neurotransmitters is most associated with the rewarding effects of nicotine?

Answer: D — Dopamine.

Nicotine binds to nicotinic *acetylcholine* receptors (B is a tempting distractor), but its **rewarding** effect comes from the resulting release of **dopamine** in the mesolimbic reward pathway. A (serotonin) and C (GABA) are not the primary reward transmitter here.

0 4

AO1 · 3 marks short answer

| Outline what is meant by physical dependence, tolerance and withdrawal syndrome.

Marks for this question: AO1 = 3 marks (1 per term)

- **Physical dependence:** a state in which the body has adapted to a substance so that it is needed for normal functioning; stopping produces a physical withdrawal reaction.
 - **Tolerance:** as a result of repeated use, more of the substance is needed to achieve the same effect (the body's response is reduced through neuroadaptation).
 - **Withdrawal syndrome:** the set of unpleasant physical and psychological symptoms (e.g. tremors, sweating, anxiety, nausea) experienced when a dependent person stops or reduces use.
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0 5

AO2 · 4 marks application

Use your knowledge of risk factors to explain why Aisha may be vulnerable to addiction.

Marks for this question: AO2 = 4 marks

- **4 marks** — clear, coherent application of two or more risk factors to the stem, using accurate terminology.
- **3 marks** — effective but one factor less developed.
- **2 marks** — one factor applied to the stem.
- **1 mark** — brief/partial.

Indicative content:

- **Genetic vulnerability:** Aisha's father was addicted to alcohol and several relatives have had addiction problems, suggesting an inherited predisposition (e.g. genes affecting the dopamine reward system).
- **Personality:** she "loves taking risks" and "gets bored very easily" — impulsivity and sensation-seeking are personality traits linked to a higher risk of addiction.
- **Social influences:** her close friends "drink heavily and often encourage her to join them" — peer pressure and social norms increase the likelihood of addictive behaviour.

Top-band answers name the factors AND tie each to a specific detail of Aisha's situation.

0 6

AO2 · 4 marks application

Use your knowledge of ways of reducing addiction to explain the two methods offered to Carl.

Marks for this question: AO2 = 4 marks

- **2 marks** for explaining nicotine replacement therapy as **drug therapy**; **2 marks** for identifying and explaining the imagery technique as **covert sensitisation**.

Indicative content:

- **Drug therapy (nicotine replacement):** NRT acts as an **agonist**, supplying nicotine (e.g. via patches or gum) without the harmful smoke. This reduces withdrawal symptoms and cravings and allows Carl to be gradually weaned off the drug.
- **Covert sensitisation:** repeatedly *imagining* the unpleasant consequences of smoking (feeling sick, coughing, breathlessness) is a behavioural intervention that pairs the behaviour with an aversive consequence in the imagination, so that smoking becomes associated with disgust and Carl is put off it. (Credit a candidate who frames this as a form of aversion therapy carried out "in vitro".)

Full marks require both methods to be correctly identified and tied to the stem.

0 7

AO1 · 4 marks short answer

Outline Prochaska's six-stage model of behaviour change as applied to addiction.

Marks for this question: AO1 = 4 marks

- **Precontemplation** — not yet thinking about changing; may deny a problem.
- **Contemplation** — aware of the problem and weighing up the pros and cons of change (often ambivalent).
- **Preparation** — intends to change soon and begins making a plan.
- **Action** — actively changing the behaviour (e.g. stopping the addictive behaviour).
- **Maintenance** — sustaining the new behaviour and working to avoid relapse.
- **Termination** — the new behaviour is established and there is no temptation to relapse.

Award up to 4 marks. Credit the idea that the model is cyclical — a person can relapse and re-enter at an earlier stage. (The theory of planned behaviour is no longer on the spec and should not be required.)

0 8

AO1 · 3 marks short answer

Briefly outline drug therapy and one behavioural intervention as ways of reducing addiction.

Marks for this question: AO1 = 3 marks

- **Drug therapy** (up to 2): **agonists** mimic/replace the substance to reduce withdrawal (e.g. NRT, methadone); **antagonists** block its rewarding effects; **aversives** (e.g. disulfiram) make use unpleasant.
- **One behavioural intervention** (up to 2): **aversion therapy** — pairing the addictive behaviour with an unpleasant stimulus (e.g. an emetic with alcohol) so a negative association forms (classical conditioning); OR **covert sensitisation** — the same principle carried out using aversive *imagery*.

Award up to 3 marks across the two approaches (at least 1 mark for each required element).

Outline genetic vulnerability and personality as risk factors in the development of addiction.

Marks for this question: AO1 = 3 marks

- **Genetic vulnerability** (up to 2): addiction runs in families and shows higher concordance in MZ than DZ twins; candidate genes affect the **dopamine reward system** (e.g. fewer D2 receptors, so more of the substance is needed to feel reward).
- **Personality** (up to 2): traits such as **impulsivity** and **sensation-seeking**, and high neuroticism, are associated with greater vulnerability to addiction; antisocial personality is also linked.

Award up to 3 marks. Full marks require accurate detail on both factors (or substantial detail on one plus the other).

Discuss explanations for nicotine addiction. Refer to brain neurochemistry and/or learning theory, and to at least one strength and one limitation.

Marks for this question: AO1 = 4 marks, AO3 = 4 marks

Level	Marks	Descriptor
4	7–8	Knowledge of explanations for nicotine addiction is accurate and well detailed. Evaluation includes at least one strength and one limitation, both effectively explained. Clear, coherent, focused; specialist terminology used effectively.
3	5–6	Knowledge generally accurate; evaluation mostly effective but limited in places. Reasonable structure.
2	3–4	Some accurate knowledge. Evaluation limited; mainly descriptive.
1	1–2	Knowledge limited or muddled. Little or no evaluation.
0	0	No relevant content.

Indicative AO1 content:

- **Brain neurochemistry:** nicotine binds to nicotinic acetylcholine receptors, triggering **dopamine** release in the mesolimbic reward pathway (the "nicotine reward"). This positively reinforces smoking. Repeated use down-regulates receptors, producing **tolerance** and a **withdrawal** state that is relieved by smoking (negative reinforcement).
- **Learning theory:** smoking is maintained by **operant conditioning** (positive reinforcement from the dopamine reward; negative reinforcement from relief of withdrawal) and by **cue reactivity** — through classical conditioning, cues associated with smoking (e.g. coffee, the pub, stress) become conditioned stimuli that trigger cravings.

Indicative AO3 content:

- **Strength — supporting evidence:** brain-imaging studies confirm nicotine-induced dopamine release, and **cue-reactivity** studies show smokers show craving and physiological arousal to smoking-related cues, supporting the learning account.
- **Strength — explains relapse and supports treatment:** cue reactivity explains why ex-smokers relapse on encountering cues, and the neurochemical account underpins NRT — giving the explanation real applied and economic value (reduced smoking-related illness lowers NHS costs).
- **Limitation — reductionist:** explaining nicotine addiction purely through dopamine or conditioning ignores cognitive and social factors (expectations, peers, personality) that also influence smoking.
- **Limitation — does not explain individual differences:** many people smoke without becoming addicted, which a purely neurochemical/learning account cannot easily explain — pointing to the role of genetic and personality risk factors.

Discuss explanations for gambling addiction. Refer to the case of Dev as part of your discussion.

Marks for this question: AO1 = 6 marks, AO2 = 4 marks, AO3 = 6 marks

Level	Marks	Descriptor
4	13–16	Knowledge of explanations for gambling addiction is accurate and generally well detailed. Application to Dev is effective and integrated across the stem. Discussion is thorough and effective. Clear, coherent and focused; specialist terminology used effectively.
3	9–12	Knowledge evident with some accuracy. Application mostly effective. Discussion mostly effective but limited in places.
2	5–8	Some accurate knowledge of one or more explanations. Application limited. Discussion superficial / mainly descriptive.
1	1–4	Knowledge limited; little or no application or discussion.
0	0	No relevant content.

Indicative AO1 content — credit both explanations (a good answer covers both):

- **Learning theory:** gambling is positively reinforced by **wins** (operant conditioning). Crucially, it is reinforced on a **partial, variable-ratio schedule** — wins are unpredictable — which makes the behaviour highly resistant to extinction. Classical conditioning means cues (lights, sounds, the betting environment) become associated with arousal.
- **Cognitive theory:** gambling is maintained by **cognitive biases** — the *illusion of control* (believing skill affects chance outcomes), the *gambler's fallacy* (believing a win is "due" after losses), the *near-miss* effect, and biased recall (remembering wins, discounting losses).

Indicative AO2 content — engagement with Dev:

- **Variable reinforcement:** his early wins were "unpredictable — sometimes after a single bet, sometimes only after many" = a variable-ratio schedule, which explains why he now gambles persistently every day.
- **Illusion of control:** he is "convinced he has developed a special 'skill' for predicting results" — overestimating his influence over chance outcomes.
- **Gambler's fallacy:** after a run of losses he believes a big win "must be due soon" — a classic cognitive bias.

Indicative AO3 content:

- **Strength — support for the learning account:** variable-ratio schedules are well established (in animals and humans) as producing persistent, extinction-resistant behaviour, which fits the difficulty gamblers have in stopping.
- **Strength — support for the cognitive account:** "thinking-aloud" studies (e.g. Griffiths) found gamblers make far more irrational verbalisations than non-gamblers, and brain-imaging shows "near misses" activate reward areas — supporting the role of cognitive bias.

- **Strength — application:** the cognitive explanation underpins **CBT** for gambling, which challenges irrational beliefs and is an effective treatment — giving the theory practical and economic value.
- **Limitation — does not explain individual differences:** many people gamble on variable schedules and hold cognitive biases without becoming addicted, suggesting biological and personality risk factors also matter.
- **Limitation — cause or effect:** it is unclear whether cognitive biases *cause* gambling addiction or are a consequence of it, since much evidence is correlational.
- **Limitation/strength — complementary explanations:** learning and cognitive accounts may be best combined, as gambling involves both reinforcement and distorted thinking — an integrated account is more complete than either alone.

Top-band answers will (1) describe both the learning and cognitive explanations accurately; (2) map Dev's unpredictable early wins onto a variable-ratio schedule, his "special skill" onto the illusion of control, and his "a big win must be due" onto the gambler's fallacy; (3) evaluate with named evidence (e.g. Griffiths, near-miss research) and at least one limitation; and (4) reach a clear conclusion — typically that learning and cognitive explanations together account well for gambling addiction, but are limited by individual differences and by uncertainty over the direction of causation.