

The PPL Cheat Sheet

P20 Human Performance

The facts that actually get tested in the EASA PPL(A) theory exams, stripped to the bone: definitions, key numbers, formulas, mnemonics and the classic traps for each subject. Built for the night before, the commute, and the last scroll before you walk into the exam hall.

P20 Human Performance

30 memory items

One of 9 subjects; the full set is free at skystudyatpl.com/ppi-cheat-sheet

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Human Performance

Physiology, hypoxia, vision, hearing, disorientation, health, information processing, decision-making, stress and fatigue.

◆ TIME OF USEFUL CONSCIOUSNESS WITH ALTITUDE

20,000 ft
about 30 min

30,000 ft
1 to 2 min

35,000 ft
30 to 90 s

40,000 ft
15 to 20 s

A rapid decompression roughly halves the time above; it also empties the lungs.

Four hypoxia types

Hypoxic (low pressure, altitude) · Anaemic (blood cannot carry oxygen: CO, anaemia)

Stagnant (poor circulation: high g, cold) · Histotoxic (cells cannot use it: alcohol, drugs)

Night vision starts to degrade from about 5000 ft.

Hyperventilation mimics hypoxia (tingling, dizziness); treat it by slowing the breathing. When in doubt at altitude, assume hypoxia and use oxygen.

◆ MUST-KNOW DEFINITIONS AND CONCEPTS

- **Hypoxia** is a lack of oxygen to the tissues. The altitude form (hypoxic hypoxia) comes from the falling partial pressure of oxygen with height.
- **Time of useful consciousness (TUC)** is the time from an oxygen supply cut to the point where you can no longer take corrective action.
- **Hyperventilation** is over-breathing that blows off carbon dioxide, causing tingling, dizziness and anxiety; its symptoms overlap with hypoxia.
- **Carbon monoxide** binds to haemoglobin far more readily than oxygen; a cracked exhaust heater muff is the classic cabin source.
- **Cones** in the fovea give day, colour and detail vision; **rods** off-centre give night vision but no colour; look slightly off-centre at night.
- **Spatial disorientation** is a false sense of attitude, position or motion from misleading sensory cues, mostly from the balance organs of the inner ear.
- The **empty-field myopia** and other visual limitations mean a clear sky can hide traffic; a systematic lookout scan is essential.
- **Situational awareness** is an accurate mental picture of the aircraft, its state and its environment, and a forecast of what happens next.
- The **error chain** is the sequence of small errors and events that, unbroken, leads to an accident; breaking any link prevents it.
- **Stress** is the body's response to demand; short-term arousal can help performance, but too much or chronic stress degrades it (the arousal-performance curve).

◆ KEY NUMBERS, LIMITS AND VALUES

- Air is about **21% oxygen** and **78% nitrogen**, constant with altitude; it is the falling **pressure** with height that starves you, not a change in mix.
- TUC: **20,000 ft about 30 min, 30,000 ft 1 to 2 min, 35,000 ft 30 to 90 s, 40,000 ft 15 to 20 s**. A rapid decompression roughly halves these.
- Dark adaptation takes about **30 minutes** for the rods; a bright light resets it, so protect night vision.
- Alcohol clears at about **one unit per hour** and cannot be sped up; **8 hours** bottle to throttle is a minimum, not a target.
- **Blood donation**: wait about **24 hours** before flying; after scuba diving, at least **12 hours** (no-stop dive) or **24 hours** if decompression stops were needed.
- The three semicircular canals sense **angular (rotational)** acceleration; the otoliths sense **linear** acceleration and gravity.
- The **leans** is the most common disorientation illusion: a slow roll goes unnoticed, so wings-level feels like a bank.
- Trust the instruments, not the seat: in cloud or at night the **instruments override** conflicting bodily sensations.

◆ MNEMONICS AND MEMORY ITEMS

- Hypoxia types **HASH**: Hypoxic, Anaemic, Stagnant, Histotoxic.
- The **IMSAFE** self-check: Illness, Medication, Stress, Alcohol, Fatigue, Emotion (or Eating).
- Hazardous attitudes and antidotes: **Anti-authority** (follow the rules), **Impulsivity** (think first), **Invulnerability** (it can happen to me), **Macho** (taking chances is foolish), **Resignation** (I can make a difference).
- Aviate, Navigate, Communicate: **fly the aircraft first**, then work out where you are, then talk.
- Ear pressure clears easily on the **climb** but needs active clearing on the **descent**; a head cold makes this painful.

◆ COMMON EXAM TRAPS

- **Hypoxia has no reliable warning**; euphoria and good feeling are symptoms, not safety. Use oxygen before judgement fails.
- Do not confuse **hyperventilation** with hypoxia; the fix is opposite (slow the breathing versus add oxygen), but at altitude treat for hypoxia first.
- Carbon monoxide is **colourless and odourless**; a headache with the cabin heater on is a warning, so shut off the heat and ventilate.
- Rods, not cones, do the night work, and the **fovea is night-blind**; staring straight at a faint light at night makes it vanish.
- The inner ear cannot tell a **coordinated turn from level flight**; without visual reference it lies. Believe the instruments.
- Fatigue degrades performance like alcohol; a **microsleep** can occur without you noticing the gap.
- Do not fly soon after **scuba diving**; nitrogen can come out of solution as pressure falls and cause decompression sickness.

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