

UK CAA Briefing Sheet: Certificate Holders with Diabetes Treated with Potentially Hypoglycaemic Medication

Briefing requirement

All pilots or air traffic controllers (ATCO) who are required to undertake blood sugar testing to monitor their diabetes whilst flying / controlling, shall brief the other member(s) of the crew (or ATC watch) before each flight / duty period. The briefing shall include:

- Why they are testing and when tests are required. Reference should be made to the flight / duty plan.
- What test results are acceptable, and actions to be taken if the results are 'out of range.'
- Whether, when and how any medications will be taken during flight / duty.
- The possible symptoms of high or low blood sugar, and actions to be taken by the pilot / ATCO.

Background

Diabetes is a condition caused by a failure of the pancreas to produce enough of the hormone insulin to properly regulate blood sugar, and hence energy delivery to the brain and other body tissues. Some of the medicines used (tablets or by injection) to treat diabetes can, if not balanced by carbohydrate intake, cause low blood sugar. Alternatively, if diabetes is poorly controlled, by not enough medicine or too much carbohydrate, sugars can run high. Both ends of the spectrum can cause partial or complete incapacitation if appropriate action is not taken. Possible symptoms are tabulated below:

Low blood glucose (hypoglycaemia) (if level less than 3)	High blood glucose (hyperglycaemia) (if level greater than 20)
Sweaty	Thirst
Pale skin	Excess urine output
Mood changes	Dehydration
Poor concentration	Mood changes
Distraction	Excessive tiredness / sleepy
Confusion	Blurred vision

All diabetic patients monitor their blood sugars at a frequency appropriate to the type of diabetes they have, the treatment they take and their food intake and exercise pattern. To ensure flight safety, diabetic medical certificate holders with diabetes treated with medicines that can cause low blood sugar are required to perform additional tests to a schedule set out under **testing requirements** according to the medicines they take. This is to ensure that a flight or duty period is not commenced with too high or too low a sugar level, and that the blood sugars are maintained within the range 5-15 mmol/l during the flight / duty period.

If tests results are outside this range, actions are required by the certificate holder. These are set out in **testing requirements**. If a briefed crew member / colleague observes symptoms of

concern, then this should be fed back to the pilot / ATCO. Symptoms / behaviour of concern should be dealt with in the same way as any other presenting acute medical condition in a crew member / colleague.

Blood glucose monitoring can be undertaken by either finger-prick testing or using a continuous glucose monitoring (CGM) device. The former involves a small finger prick to produce a drop of blood that is then applied to a meter / test strip. Each test takes between 20 and 60 seconds depending on the equipment used. It is the responsibility of the tester to dispose of any clinical waste appropriately, but most machines currently used are self-contained. A spare serviceable meter should be carried in case of breakdown.

CGM utilises a sensor placed just under the skin that relays measurements wirelessly to a monitoring device and / or smart phone. Pilots using CGM devices should also carry a meter to undertake finger-prick testing in the event of a low or high reading or a device failure.

If both meters / devices become unserviceable, a solo pilot should land without delay, a pilot in a multi-pilot environment should relinquish command or an ATCO cease controlling within 30 minutes.

Testing requirements

The result of testing should be shown to the other crew member / watch member to confirm the result and any appropriate actions.

Testing should be performed using either an ISO certified glucometer or a CGM device with a non-adjunctive licence (that is, a device approved for making treatment decisions without confirmatory finger-prick testing).

Pilots should annotate the results of testing in their logbook, documenting any action taken, for easy reference.

Pilots who have to take action for a high or low reading should **always** make an entry in their logbook.

The test meter memory will be periodically reviewed by an aeromedical examiner (AME) or the CAA Medical Department against the flying / controlling log to ensure protocol compliance. Failure to demonstrate compliance with the schedule of testing is likely to result in suspension of the medical certificate.

Template for recording blood glucose results

The following is an example of a log for recording the time of blood glucose testing, phase of flight or duty being undertaken, and the result and any action taken:

Time	Flight phase / duty	Result & comments

Testing schedules and actions to be taken in the event of high or low blood sugar

Medication includes	Minimum frequency of testing relating to flight / controlling	Actions
Schedule A: All insulins	At least 1 hour before reporting for flight or at least 2 hours before commencing flight. <30 minutes before take-off. At least every hour whilst flying. (Note 1) Within 30 minutes of anticipated landing time. If any diabetic symptoms are experienced.	If >15 mmol/l should not commence flight and / or cease carbohydrate ingestion until blood sugar reduces. If level is less than 5 mmol/l then 10-15g of carbohydrate (for example, glucose tablets) should be ingested and a re-test performed within 30 minutes. If a measurement is missed for operational reasons (for example, high workload), 10-15g of carbohydrate should be ingested and a re-test performed within 30 minutes.
Schedule B: Sulphonylureas Glinides	At least 1 hour before reporting for flight / duty period or at least 2 hours before commencing flight / controlling. <30 minutes before take-off / controlling. At least every 2 hours (4 hours ATCO) whilst flying / controlling. (Note 1) Within 30 minutes of anticipated landing time for pilots. If any diabetic symptoms are experienced.	As above.
Schedule C: Glitazones Gliptins GLP-1 analogues Biguanides Alphaglucohydrolase inhibitors	At least 1 hour before reporting for flight / duty period or at least 2 hours before commencing flight / controlling: mandatory for Classes 1 and 3, recommended for Class 2 and LAPL.	If >15 mmol/l should not commence flight / controlling and / or cease carbohydrate ingestion until blood sugar reduces. If level is less than 5 mmol/l then 10-15g of carbohydrate (for example, glucose tablets) should be ingested and a re-test performed within 30 minutes.

Note 1: Professional pilots / ATCOs who are taking formal rest and not seated at the controls / controlling position may suspend testing but must restart testing prior to resuming flying / controlling.

Commercial air operations and training (see also Appendix 1 of the ARA.MED.330 Medical Assessment Protocol)

It is the responsibility of an individual who holds a medical certificate with an operational restriction relating to diabetes to ensure that the other pilot and, where necessary, other crew members, are aware of the restriction(s). Testing should be performed in such a way as to maintain compliance with standard operating procedures. Companies who employ pilots, and crew members, with diabetes are encouraged to review their relevant manuals as appropriate and the same applies to training organisations.

The principle, as with all medical restrictions, is that the risk associated with the potential diabetic hazard is mitigated by the medical monitoring procedures detailed above, the type of operation / training undertaken by the pilot and awareness of the risk within other operating crew. The required level of awareness is established, and maintained, by the additional briefing requirement, and reference to normal incapacitation procedures established by the operator / training organisation.

If a need for amended procedures is identified, issues for consideration are:

- The pilot holding a diabetic operational restriction should advise the other crew member(s) at the start of the flying duty period.
- The actions (see **testing requirements**) that a pilot holding a diabetic operational restriction will take during the flying duty period to ensure that their blood sugar level remains within the prescribed limits.
- Cross-checking by the other crew member(s) of the blood glucose values obtained.
- In the unlikely event of the symptoms of hypoglycaemia or hyperglycaemia occurring, confirmation of the actions to be taken relating to standard incapacitation procedures.

It would be appropriate for pilots subject to the operational restrictions above to discuss with their employer / training organisation the interaction of operational duty / training with management of their condition.

Considerations for operation manuals

In addition to the items that are likely to be included already concerning pilot responsibility when their medical fitness decreases, incapacitation of a pilot and training for pilot incapacitation, there should be:

- Appropriate references to additional briefing requirements during the pre-flight preparation.
- In-flight monitoring and carriage of equipment required for this.
- Reporting of instances when crew intervention was required to assist a pilot controlling their blood sugar level, or a failure to comply with the testing schedule. In either case an MOR should be raised.
- Awareness or inclusion within existing crew training of material for identifying the signs of pilot incapacitation to include either hypoglycaemia or hyperglycaemia.
- Management of diabetes during emergency situations.

Training / examining

If a pilot is acting as an instructor and / or examiner, for which a valid licence is required, then testing shall be carried out in accordance with the protocol. For other duties, for example, simulator work, then following the testing protocol is recommended.

Flying instruction

Flying instructors with a Class 1 medical certificate flying under these protocols will have an OML restriction ('as / with co-pilot') applied to their medical certificate. Pilots with an OML endorsement on their medical certificate who instruct or examine in non-multi-pilot aircraft under 5,700kg can ask to be considered for an additional endorsement that could allow this activity to continue. Under the UK regulations, flying instruction may also be undertaken with a PPL and Class 2 medical certificate. The same principles of good practice and professionalism shall be applied in both cases with respect to adherence to the testing requirements, their inclusion in flight planning, and briefings.

The principle, as with all medical limitations, is that the risk associated with the diabetic hazard is mitigated by the medical procedures detailed above, the type of operation undertaken by the pilot and awareness of the risk within the operating crew, in this case the student or pilot under instruction or test. This includes a raised level of awareness by pre-flight briefing, and its maintenance by additional briefings and sharing of results of mandatory testing. Student and other pilots should be briefed using this information sheet as a minimum before flights.

PPL, NPPL and LAPL

Private pilots who take medications (see **testing requirements**) which require in-flight testing will have operational restrictions applied to their medical certificates until they have demonstrated safe testing in flight to a Chief Flight Instructor or CAA Flight Instructor / Examiner. The principles of good self-care and good airmanship should be applied with respect to adherence to the testing requirements, their inclusion in flight planning briefings and in-flight testing.

The principle, as with all medical limitations, is that any risk associated with the potential diabetic hazard is mitigated by the medical procedures detailed above, the type of operation undertaken by the pilot and awareness of the risk within the operating crew. This includes a raised level of awareness by pre-flight briefing of other pilots and any passengers, and its maintenance, by additional briefings and sharing of results of mandatory testing.

Air traffic control

Controllers should ensure that taking medication and testing during duty periods do not affect operational safety. This will normally be achieved by taking meals and any medication, and testing during rostered breaks. For longer periods of controlling, for example, at night, controllers should discuss working / testing arrangements.

Further information is available in the [diabetes guidance material](#).