OSA Reference Material

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Disease Protocols – Obstructive Sleep Apnea

Sleep apnea has significant safety implications due to cognitive impairment secondary to the lack of restorative sleep and is disqualifying for airman medical certification. The condition is part of a group of sleep disorders with varied etiologies. Specifically, sleep apneas are characterized by abnormal respiration during sleep. The etiology may be obstructive, central or complex in nature. However, no matter the cause, the manifestations of this disordered breathing present safety risks that include, but are not limited to, excessive daytime sleepiness (daytime hypersomnolence), cardiac dysrhythmia, sudden cardiac death, personality disturbances, refractory hypertension and, as mentioned above, cognitive impairment. Certification may be considered once effective treatment is shown.

This protocol is designed to evaluate airmen who may be presently at risk for Obstructive Sleep Apnea (OSA) and to outline the certification requirements for airmen diagnosed with OSA. While this protocol focuses on OSA, the AME must also be mindful of other sleep-related disorders such as insomnia, parasomnias, sleep-related movement disorders (e.g., restless leg syndrome and periodic leg movement), central sleep apnea and other hypersomnias, circadian rhythm sleep disorders, etc., that may also interfere with restorative sleep. All sleep disorders are also potentially medically disqualifying if left untreated. If one of these other sleep-related disorders is initially identified during the examination, the AME must contact their RFS or AMCD for guidance.

Risk Information

The American Academy of Sleep Medicine has established the risk criteria (utilizing Tables 2 and 3) for OSA. When applying Table 2 and 3, the AME is expected to employ their clinical judgment.

Educational information for airmen can be found in the FAA Pilot Safety Brochure on Obstructive Sleep Apnea.

Persons with physical findings such as a retrograde mandible, large tongue or tonsils, neuromuscular disorders, or connective tissue anomalies are at risk of OSA requiring treatment despite a normal or low BMI. OSA is also associated with conditions such as refractory hypertension requiring more than two medications for control, diabetes mellitus, and atrial fibrillation. Over 90% of individuals with a BMI of 40 or greater have OSA requiring treatment. Up to 30% of individuals with OSA have a BMI less than 30.
## SLEEP APNEA
### All Classes

<table>
<thead>
<tr>
<th>DISEASE/CONDITION</th>
<th>EVALUATION DATA</th>
<th>DISPOSITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstructive Sleep Apnea</td>
<td>Requires risk evaluation, per OSA Protocol. Document history and Findings.</td>
<td>If meets OSA Criteria – Issue, if otherwise qualified</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Initial Special Issuance</strong> - Requires FAA Decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Follow-up Special Issuance</strong> See AASI</td>
</tr>
<tr>
<td>Periodic Limb Movement, etc.</td>
<td>Submit all pertinent medical information and current status report. Include sleep study with a polysomnogram, use of medications and titration study results, along with a statement regarding Restless Leg Syndrome.</td>
<td>Requires FAA Decision</td>
</tr>
</tbody>
</table>
OSA QUICK-START for the AME

The AME while performing the triage function must conclude one of six possible determinations. The AME is not required to perform the assessment or to comment on the presence or absence of OSA. (For more information on this process, an instructional video is available.)

**Step 1** - Determine into which group (1-6) the airman falls.

**Applicant Previously Assessed:**
- **Group 1:** Has OSA diagnosis and is on Special Issuance. Reports to follow.
- **Group 2:** Has OSA diagnosis OR has had previous OSA assessment. NOT on Special Issuance. Reports to follow.

**Applicant Not at Risk:**
- **Group 3:** Determined to NOT be at risk for OSA at this examination.

**Applicant at Risk/Severity to be assessed:**
- **Group 4:** Discuss OSA risk with airman and provide educational materials.
- **Group 5:** At risk for OSA. AASM sleep apnea assessment required.

**Applicant Risk/Severity Extremely High:**
- **Group 6:** Deferred. Immediate safety risk. AASM sleep apnea assessment required. Reports to follow.

**Step 2** – Document findings in Block 60.

**Step 3** – Check appropriate triage box in the AME Action Tab.

**Step 4** – Issue, if otherwise qualified.

In assessing airmen for groups 4 and 5, the AME is expected to use their own clinical judgment, using AASM information, when making the triage decision.

Some AMEs have voiced the desire to perform the OSA assessment. **While we do not recommend it,** the AME may perform the OSA assessment provided that it is in accordance with the clinical practice guidelines established by the American Academy of Sleep Medicine.*

*If a sleep study is conducted, it must be interpreted by a sleep medicine specialist.
**OBSTRUCTIVE SLEEP APNEA-OSA**

**AME ACTION TAB**

Applicant Previously Assessed:
1. Has OSA diagnosis and is on Special Issuance. Reports to follow.
2. Has OSA diagnosis and is currently being treated OR has had previous OSA assessment. NOT on Special Issuance. Reports to follow.

Applicant Not at Risk:
3. Determined to NOT be at risk for OSA at this examination.

Applicant at Risk/Severity to be Assessed:
4. Discuss OSA risk with airman and provide educational materials.
5. At risk for OSA. AASM sleep apnea assessment required. Reports to follow.

Applicant Risk/Severity high

---

**Diagnosed with OSA and is on AASl/Si**

YES - Follow AASI/SI protocol

NO - Treated for OSA but NOT on AASI/SI OR Previously assessed for OSA**

YES - Give airman FAS OSA Spec Sheet A
- Submit all documentation
- Airman has 90 days to comply
- ISSUE, if otherwise qualified

NO - AASM * RISK FACTORS

YES - Self-reported * Severe symptoms which represent an immediate safety risk

NO - AASM OSA * high risk

YES - Discuss OSA risk
- Provide educational material
- Notate in Block 60 - "OSA Risk Educated"
- ISSUE, if otherwise qualified

NO - DEFER Immediate safety risk
- Give airman OSA Spec Sheet B

YES - AT RISK FOR OSA
- Give airman FAS OSA Spec Sheet B
- Airman has 90 days to comply
- ISSUE, if otherwise qualified

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* See AASM Tables 2 and 3. AME must use clinical judgment in applying AASM criteria. The risk of OSA is determined by an integrated assessment of history, symptoms, and physical/clinical findings. No disqualification of airmen should be based on BMI alone.

** If the applicant has been previously assessed, has previously provided the information, was negative for evidence of OSA, AND has no changes in risk factors since the last exam, proceed with the flow chart as with any other applicant.
American Academy of Sleep Medicine
Guidance on Obstructive Sleep Apnea

http://www.aasmnet.org/Resources/clinicalguidelines/OSA_Adults.pdf

**AASM Table 2**

Patients at High Risk for OSA Who Should Be Evaluated for OSA Symptoms:

- Obesity (BMI > 35)
- Congestive heart failure
- Atrial fibrillation
- Treatment refractory hypertension
- Type 2 diabetes
- Nocturnal dysrhythmias
- Stroke
- Pulmonary hypertension
- High-risk driving populations
- Preoperative for bariatric surgery

**AASM Table 3**

Questions about OSA that Should Be Included in Routine Health Maintenance Evaluations:

- Is the patient obese?
- Is the patient retrognathic?
- Does the patient complain of daytime sleepiness?
- Does the patient snore?
- Does the patient have hypertension?
A. AME Actions - On every exam, the Examiner must triage the applicant into one of 6 groups:

- If the applicant is on a Special Issuance Authorization for OSA (Group/Box 1 of OSA flow chart), select Group 1 on the AME Action Tab:
  - Follow AASI for OSA
  - Notate in Block 60; and
  - Issue, if otherwise qualified

- If the applicant has had a prior OSA assessment (Group/Box 2 of OSA flow chart), select Group 2 on the AME Action Tab:
  - If the airman is under treatment, provide the requirements of the AASI and advise the airman they must get the Authorization of Special Issuance;
  - Give the applicant Specification Sheet A and advise that a letter will be sent from the Federal Air Surgeon requesting more information. The letter will state that the applicant has 90 days to provide the information to the FAA/AME;
  - Notate in Box 60;
  - Issue, if otherwise qualified

- If the applicant does not have an AASI/SI or has not had a previous assessment, the AME must:
  - Calculate BMI; and
  - Consider AASM risk criteria Table 2 & 3
  - If the AME determines the applicant is not currently at risk for OSA (Group/Box 3 of OSA flow chart), select Group 3 on the AME Action Tab:
    - Notate in Block 60; and
    - Issue, if otherwise qualified
  - If the applicant is at risk for OSA but in the opinion of the AME the applicant is at low risk for OSA, the AME must (Group/Box 4 of OSA flow chart), select Group 4 on the AME Action Tab:
    - Discuss OSA risks with applicant;
    - Provide resource and educational information, as appropriate;
    - Notate in Block 60; and
    - Issue, if otherwise qualified

- If the applicant is at high risk for OSA, the AME must (Group/Box 5 of OSA flow chart), select Group 5 on the AME Action Tab:
  - Give the applicant Specification Sheet B and advise that a letter will be sent from the Federal Air Surgeon requesting more information. The letter will state that the applicant has 90 days to provide the information to the FAA/AME
  - Notate in Block 60; and
  - Issue, if otherwise qualified

- If the AME observes or the applicant reports symptoms which are severe enough to represent an immediate risk to aviation safety of the national airspace (Group/Box 6 of OSA flow chart), select Group 6 on the AME Action Tab.
  - Notate in Block 60
  - THE AME MUST DEFER
Obstructive Sleep Apnea Specification Sheet A
Information Request

Your application for airman medical certification submitted this date indicates that you have been treated or previously assessed for Obstructive Sleep Apnea (OSA).

You must provide the following information to the Aerospace Medical Certification Division (AMCD) or your Regional Flight Surgeon within 90 days:

- All reports and records regarding your assessment for OSA by your primary care physician and/or a sleep specialist.
- If you are currently being treated, also include:
  - A signed Airman Compliance with Treatment form or equivalent;
  - The results and interpretive report of your most recent sleep study; and
  - A current status report from your treating physician indicating that OSA treatment is still effective.

  ▪ **For CPAP/ BIPAP/ APAP:**
    - A copy of the cumulative annual PAP device report. Target goal should show use for at least 75% of sleep periods and an average minimum of 6 hours use per sleep period.

  ▪ **For Dental Devices or for Positional Devices:**
    - Once Dental Devices with recording / monitoring capability are available, reports must be submitted.

- To expedite the processing of your application, please submit the aforementioned information in one mailing using your reference number (PI, MID, or APP ID).

Using Regular Mail (US Postal Service) or Using Special Mail (FedEx, UPS, etc.)
Federal Aviation Administration
Aerospace Medical Certification Division AAM-300
Civil Aerospace Medical Institute
PO Box 25082
Oklahoma City, OK 73125-9867

Federal Aviation Administration
Aerospace Medical Certification Division AAM-300
Civil Aerospace Medical Institute, Bldg. 13
6700 S. MacArthur Blvd., Room 308
Oklahoma City, OK 73169
Due to your risk for Obstructive Sleep Apnea (OSA), and to review your eligibility to have a medical certificate, you must provide the following information to the Aerospace Medical Certification Division (AMCD) or your Regional Flight Surgeon's Office for review within 90 days:

- A current OSA assessment in accordance with the American Academy of Sleep Medicine (AASM) by your AME, personal physician, or a sleep medicine specialist.

- If it is determined that a sleep study is necessary, it must be either a Type I laboratory polysomnography or a Type II (7 channel) unattended home sleep test (HST) that provides comparable data and standards to laboratory diagnostic testing. It must be interpreted by a sleep medicine specialist and must include diagnosis and recommendation(s) for treatment, if any.

If your sleep study is positive for a sleep-related disorder, you may not exercise the privileges of your medical certificate until you provide:

- A signed Airman Compliance with Treatment form or equivalent;

- The results and interpretive report of your most recent sleep study; and

- A current status report from your treating physician addressing compliance, tolerance of treatment, and resolution of OSA symptoms.

If you are not diagnosed with a sleep-related disorder or the study was negative for a sleep-related disorder, you may continue to exercise the privileges of your medical certificate, but the evaluation report along with the results of any study, if conducted, must be sent to the FAA at the address below. All information provided will be reviewed and is subject to further FAA action.

In order to expedite the processing of your application, please submit the aforementioned information in one mailing using your reference number (PI, MID, or APP ID).

Using Regular Mail (US Postal Service) or
Federal Aviation Administration
Aerospace Medical Certification Division AAM-300
Civil Aerospace Medical Institute
PO Box 25082
Oklahoma City, OK 73125-9867

Using Special Mail (FedEx, UPS, etc.)
Federal Aviation Administration
Aerospace Medical Certification Division AAM-300
Civil Aerospace Medical Institute, Bldg. 13
6700 S. MacArthur Blvd., Room 308
Oklahoma City, OK 73169
AME Assisted - All Classes – Obstructive Sleep Apnea (OSA)

Examiners may re-issue an airman medical certificate to airmen currently on an AASI for OSA if the airman provides the following:

- An Authorization granted by the FAA;
- Signed Airman Compliance with Treatment form or equivalent from the airman attesting to absence of OSA symptoms and continued daily use of prescribed therapy; and
- A current status report from the treating physician indicating that OSA treatment is still effective.

  o **For CPAP/ BIPAP/ APAP:**
    - A copy of the cumulative annual PAP device report which shows actual time used (rather than a report typically generated for insurance providers which only shows if use is greater or less than 4 hours). Target goal should show use for at least 75% of sleep periods and an average minimum of 6 hours use per sleep period.
    - For persons with an established diagnosis of OSA who do not have a recording CPAP, a one year exception will be allowed to provide a personal statement that they regularly use CPAP and before each shift when performing flight or safety duties.

  o **For Dental Devices and/or for Positional Devices:**
    No conditions known to be co-morbid with OSA (e.g., diabetes mellitus, hypertension treated with more than two medications, atrial fibrillation, etc.). Once Dental Devices with recording / monitoring capability are available, reports must be submitted.

  o **For Surgery:**
    For successfully treated surgical patients, a statement attesting to the continued absence of OSA symptoms is required.

Defer to the AMCD or the Region for further review if:

- Concerns about adequacy of therapy or non-compliance;
- Significant weight gain or development of conditions known to be co-morbid with OSA (e.g., diabetes mellitus, hypertension treated with more than two medications, atrial fibrillation, etc.).

**Note:** The Examiner may request AMCD review to discontinue the AASI if there are indications that the airman no longer has OSA (e.g., significant weight loss and a negative study or surgical intervention followed by 3 years of symptom abatement and absence of significant weight gain or co-morbid conditions). In most cases, a follow-up sleep study will be required to remove the AASI.
AIRMAN COMPLIANCE WITH TREATMENT
OBSTRUCTIVE SLEEP APNEA (OSA)

I ___________________________ (print name) certify that (check one):

___ I have been using _____________ (CPAP/ Dental / or Positional Device)
for OSA as prescribed. I am tolerating the therapy well and have no symptoms of
OSA (e.g., daytime sleepiness or lack of mental attention or concentration).

___ I have been surgically treated for OSA and I have no symptoms of OSA (e.g.
daytime sleepiness or lack of mental attention or concentration).

I understand and acknowledge that I will receive the new requirements for
continuation of my special issuance of Obstructive Sleep Apnea and I will comply
with the requirements at my next FAA medical certificate renewal or reapplication.

Applicant Name: ____________________________________________

Date of Birth: _____________________________________________

Reference Number: (PI, MID, or APP ID): _______________________

Applicant Signature ___________________________________________ Date _______
OSA – FREQUENTLY ASKED QUESTIONS (FAQS)
(Updated: 02/24/2021)

**GENERAL:**

1. Where can I view the video explaining the process?
The instructional video for AMEs is available [here](#).

2. Where can I find the specification sheets and educational material?
See [OSA reference materials](#).

3. Does this process involve other sleep disorder conditions? (e.g., Period Limb Movement Disorder, narcolepsy, central sleep apnea, etc.)
   No. This process is for obstructive sleep apnea only. If it is clear that the airman suffers from a different sleep disorder, DEFER and submit any supporting documentation for FAA decision.

**TRIAGE:**

4. I am not a sleep specialist. How am I supposed to determine if an airman is high risk enough to send for a sleep evaluation? How many risk factors must be present before additional testing is required?
The AME should triage the airman based on the FAA OSA Flow Chart, supporting clinical guidelines, and good clinical judgment to determine the appropriate category for the airman.

5. The airman was assessed 5 years ago for OSA but did not have a polysomnogram. The evaluation was negative. Is he required to have an updated sleep evaluation or a sleep study?
   No. If there has been NO CHANGE in his/her risk factors, follow Group/Box 2 of the flow chart and submit a copy of the previous assessment. However, if there has been a change in risk factors (e.g., elevated BMI, new atrial fibrillation, refractory hypertension, etc.), triage using the flow chart to determine if the airman needs a repeat assessment.

6. If I mark the radio button (1-6) and have no concerns, do I still need to put notes in Block 60 regarding the OSA triage?
   Yes. It is only required for Group/Box 4 to document that education was given. However, it may be useful to document the rationale for triage decisions, especially for Group/Box 2, 5, and 6.

**SLEEP EVALUATION AND SLEEP STUDY:**

7. Is a sleep evaluation the same as a sleep study?
   No. Please reference the [AASM guidelines](#). A sleep evaluation is needed when the triage process
indicates that the airman is at high risk for OSA. The sleep evaluation is used to determine if a sleep study is warranted.

8. **Do I have to turn in the “AME Assessment Statement” for every airman?**
   No. This statement page is only used by an AME who PERFORMS the sleep evaluation (in accordance with AASM guidelines) and finds that the airman does not have evidence of OSA. This is NOT to be used for the routine triage function.

9. **What are the different types of sleep studies?**
   They are:
   - Type I: Attended studies (full polysomnogram [PSG] in a sleep lab).
   - Type II: Unattended (home) studies using the same monitoring sensors as full PSGs (Type I).
   - Type III*: Unattended (home) studies using devices that measure limited cardiopulmonary parameters (two respiratory variables [e.g., effort to breathe, airflow], oxygen saturation, and a cardiac variable [e.g., heart rate or electrocardiogram].
   - Type IV*: Unattended (home) studies using devices that measure only 1 or 2 parameters (typically oxygen saturation and heart rate, or in some cases, just air flow).

   *Please note, Type III and Type IV are NOT acceptable for FAA purposes.

10. **Does the FAA require a specific type of sleep study if one is warranted?**
    Yes. The FAA requires that the test be either a Type I laboratory polysomnography or a Type II (7 channel) unattended home sleep test (HST) that provides comparable data and standards to laboratory diagnostic testing. It does not have to be a chain of custody study.

11. **What if the doctor or insurance provider is only willing to do a level III Home Sleep Test (HST)?**
    In communities where a Level II HST is unavailable, the FAA will accept a level III HST. If the HST is positive for OSA, no further testing is necessary and treatment in accordance with the AASI must be followed. However, if the HST is equivocal, a higher-level test such as an in-lab sleep study will be needed unless a sleep medicine specialist determines no further study is necessary and documents the rationale.

12. **If I do the sleep evaluation and determine the airman needs a sleep study, as the AME, can I interpret the sleep study?**
    The AME may only interpret the sleep study if he/she is a sleep medicine specialist.

**CERTIFICATE, EXTENSION, AND DENIAL PROCESS:**

13. **If an airman is in Group/Box 5 (at risk for OSA) they have 90 days to comply with getting an evaluation. Does the AME issue a time-limited, 90-day certificate?**
    No. Issue a regular (not time limited) certificate, if the airman is otherwise qualified. The AME MAY NOT issue
a time-limited certificate without an authorization from the FAA.

14. I evaluated the airman and triaged him into Group/Box 5. He had a sleep study and is doing well on CPAP treatment. Does he have to wait for a time-limited certificate before he can return to flight duties?
No. Once the airman is compliant with and doing well on treatment, he has met the requirements for 14 CFR 61.53. The airman may return to flight status with the current certificate issued by the AME, PROVIDED that ALL the required information regarding OSA evaluation and treatment has been submitted to the FAA for review.

15. Once the AME issues a regular certificate, who is responsible for keeping track of the 90 days?
The FAA will keep track of the 90 days.

16. The airman has a prior SI/AASI for OSA that only asks for a current status report. Can I issue this year if he does not bring in any other information on the OSA?
Yes. The AME may issue this year based on the previous SI/AASI if those requirements were met.

17. Can the airman continue to submit only a current status report until his current AASI expires?
No. An airman currently on an SI/AASI for OSA will receive a new SI/AASI letter this year. At that point, he/she will have to comply with the new documentation requirements.

18. What if the airman cannot get a sleep evaluation in 90 days?
The airman may request a one-time, 30-day extension by phone by calling AMCD at (405) 954-4821 and selecting Option 1 when prompted. They may also mail a request to AMCD (see Specification Sheet B for address) or by contacting their RFS office.

19. If I give the airman Specification Sheet A or B and he does not submit the required evaluation within 90 days and after the 30-day extension (if requested), what will happen?
The airman will receive a failure to provide (FTP) denial.

TREATMENT AND FOLLOW UP:

20. How long does an airman have to be on CPAP with a new diagnosis of OSA before they can return to flying?
The airman may submit the completed compliance statement and required documents to the FAA for review as soon as they are tolerating the therapy without difficulty and have no symptoms of OSA.

21. The airman has mild or moderate sleep apnea. Is he required to use CPAP?
In most cases an AHI of 16 or more will require CPAP.

22. If the airman has a sleep study and is diagnosed with OSA does he/she get a new certificate?
Yes. Once a diagnosis of OSA is established, a Special Issuance is required. When the airman submits the required supporting documents to the FAA, he/she will be evaluated for a Special Issuance.
23. **If an airman has a previously unreported history of OSA being treated with CPAP, can the AME issue?**  
   Yes. Issue a regular certificate (Group/Box 2), if the airman is otherwise qualified, and submit the required information for FAA decision.

24. **What if the airman is high risk and has had a previous sleep study that was positive, but not one of the approved tests? He is currently on CPAP and doing well. Does he have to get a new sleep study?**  
   Follow Group/Box 2 and submit the required information for FAA decision.

25. **The airman had a sleep study in the past and did not have sleep apnea. It was not an approved test type. Will he have to get another sleep study?**  
   The AME should follow the triage flow chart. If the airman is determined to be Group/Box 5 or 6, he/she will need a sleep evaluation. If a sleep study is warranted, it will need to be an approved test type (see FAQ #9). Submit the required information for FAA decision.

26. **The airman has OSA and was on CPAP in the past. He has now lost weight and is only on a dental device. What do I do now?**  
   Follow Group/Box 2 and submit the required information for FAA decision.
### Measurement Units

<table>
<thead>
<tr>
<th>Pounds and inches</th>
<th>BMI Formula and Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formula: weight (lb) / [height (in)]² x 703</td>
</tr>
<tr>
<td></td>
<td>Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703.</td>
</tr>
<tr>
<td></td>
<td>Example: Weight = 150 lbs, Height = 5'5&quot; (65&quot;)</td>
</tr>
<tr>
<td></td>
<td>Calculation: [150 ÷ (65)²] x 703 = 24.96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kilograms and meters (or centimeters)</th>
<th>BMI Formula and Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formula: weight (kg) / [height (m)]²</td>
</tr>
<tr>
<td></td>
<td>With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters.</td>
</tr>
<tr>
<td></td>
<td>Example: Weight = 68 kg, Height = 165 cm (1.65 m)</td>
</tr>
<tr>
<td></td>
<td>Calculation: 68 ÷ (1.65)² = 24.98</td>
</tr>
</tbody>
</table>

### Body Mass Index Table

<table>
<thead>
<tr>
<th>BMI</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
<th>Extreme Obesity</th>
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<tbody>
<tr>
<td></td>
<td>Height (inches)</td>
<td>Body Weight (pounds)</td>
<td>Height (meters)</td>
<td>Body Weight (kilograms)</td>
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<td>447</td>
<td>462</td>
<td>465</td>
<td>468</td>
</tr>
<tr>
<td>100</td>
<td>465</td>
<td>480</td>
<td>483</td>
<td>486</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category 1</th>
<th>Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Do you snore?</strong></td>
<td><strong>6. How often do you feel tired or fatigued after your sleep?</strong></td>
</tr>
<tr>
<td>□ a. Yes</td>
<td>□ a. Almost every day</td>
</tr>
<tr>
<td>□ b. No</td>
<td>□ b. 3-4 times per week</td>
</tr>
<tr>
<td>□ c. Don’t know</td>
<td>□ c. 1-2 times per week</td>
</tr>
<tr>
<td><strong>If you answered ‘yes’:</strong></td>
<td>□ d. 1-2 times per month</td>
</tr>
<tr>
<td><strong>2. Your snoring is:</strong></td>
<td>□ e. Rarely or never</td>
</tr>
<tr>
<td>□ a. Slightly louder than breathing</td>
<td></td>
</tr>
<tr>
<td>□ b. As loud as talking</td>
<td></td>
</tr>
<tr>
<td>□ c. Louder than talking</td>
<td></td>
</tr>
<tr>
<td><strong>3. How often do you snore?</strong></td>
<td><strong>7. During your waking time, do you feel tired, fatigued or not up to par?</strong></td>
</tr>
<tr>
<td>□ a. Almost every day</td>
<td>□ a. Almost every day</td>
</tr>
<tr>
<td>□ b. 3-4 times per week</td>
<td>□ b. 3-4 times per week</td>
</tr>
<tr>
<td>□ c. 1-2 times per week</td>
<td>□ c. 1-2 times per week</td>
</tr>
<tr>
<td>□ d. 1-2 times per month</td>
<td>□ d. 1-2 times per month</td>
</tr>
<tr>
<td>□ e. Rarely or never</td>
<td>□ e. Rarely or never</td>
</tr>
<tr>
<td><strong>4. Has your snoring ever bothered other people?</strong></td>
<td><strong>8. Have you ever nodded off or fallen asleep while driving a vehicle?</strong></td>
</tr>
<tr>
<td>□ a. Yes</td>
<td>□ a. Yes</td>
</tr>
<tr>
<td>□ b. No</td>
<td>□ b. No</td>
</tr>
<tr>
<td>□ c. Don’t know</td>
<td><strong>If you answered ‘yes’:</strong></td>
</tr>
<tr>
<td><strong>5. Has anyone noticed that you stop breathing during your sleep?</strong></td>
<td></td>
</tr>
<tr>
<td>□ a. Almost every day</td>
<td></td>
</tr>
<tr>
<td>□ b. 3-4 times per week</td>
<td></td>
</tr>
<tr>
<td>□ c. 1-2 times per week</td>
<td></td>
</tr>
<tr>
<td>□ d. 1-2 times per month</td>
<td></td>
</tr>
<tr>
<td>□ e. Rarely or never</td>
<td></td>
</tr>
<tr>
<td><strong>9. How often does this occur?</strong></td>
<td></td>
</tr>
<tr>
<td>□ a. Almost every day</td>
<td></td>
</tr>
<tr>
<td>□ b. 3-4 times per week</td>
<td></td>
</tr>
<tr>
<td>□ c. 1-2 times per week</td>
<td></td>
</tr>
<tr>
<td>□ d. 1-2 times per month</td>
<td></td>
</tr>
<tr>
<td>□ e. Rarely or never</td>
<td></td>
</tr>
<tr>
<td><strong>Category 3</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10. Do you have high blood pressure?</strong></td>
<td></td>
</tr>
<tr>
<td>□ Yes</td>
<td></td>
</tr>
<tr>
<td>□ No</td>
<td></td>
</tr>
<tr>
<td>□ Don’t know</td>
<td></td>
</tr>
</tbody>
</table>
SCORING BERLIN QUESTIONNAIRE

The questionnaire consists of 3 categories related to the risk of having sleep apnea. Patients can be classified into High Risk or Low Risk based on their responses to the individual items and their overall scores in the symptom categories.

Categories and Scoring:
Category 1: Items 1, 2, 3, 4, and 5;
Item 1: if ‘Yes’, assign 1 point
Item 2: if ‘c’ or ‘d’ is the response, assign 1 point
Item 3: if ‘a’ or ‘b’ is the response, assign 1 point
Item 4: if ‘a’ is the response, assign 1 point
Item 5: if ‘a’ or ‘b’ is the response, assign 2 points
Add points. Category 1 is positive if the total score is 2 or more points.

Category 2: items 6, 7, 8 (item 9 should be noted separately).
Item 6: if ‘a’ or ‘b’ is the response, assign 1 point
Item 7: if ‘a’ or ‘b’ is the response, assign 1 point
Item 8: if ‘a’ is the response, assign 1 point
Add points. Category 2 is positive if the total score is 2 or more points.

Category 3 is positive if the answer to item 10 is ‘Yes’ or if the BMI of the patient is greater than 30kg/m². (BMI is defined as weight (kg) divided by height (m) squared, i.e., kg/m²).

High Risk: if there are 2 or more categories where the score is positive.
Low Risk: if there is only 1 or no categories where the score is positive.
EPWORTH SLEEPINESS SCALE

The original version of the ESS was first published in 1991. However, it soon became clear that some people did not answer all the questions, for whatever reason. They may not have had much experience in some of the situations described in ESS items, and they may not have been able to provide an accurate assessment of their dozing behavior in those situations. However, if one question is not answered, the whole questionnaire is invalid. It is not possible to interpolate answers, and hence item-scores, for individual items. This meant that up to about 5% of ESS scores were invalid in some series.

In 1997, an extra sentence of instructions was added to the ESS, as follows:

“It is important that you answer each question as best you can”.

With this exhortation, nearly everyone was able to give an estimate of their dozing behavior in all ESS situations. As a result, the frequency of invalid ESS scores because of missed item-responses was reduced to much less than 1%.

The 1997 version of the ESS is now the standard one for use in English or any other language. It is available in pdf here.

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**Epworth Sleepiness Scale**

Name: ___________________________ Today’s date: __________________

Your age (Yrs): __________ Your sex (Male = M, Female = F): ________

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired?

This refers to your usual way of life in recent times.

Even if you haven’t done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the most appropriate number for each situation:

- 0 = would never doze
- 1 = slight chance of dozing
- 2 = moderate chance of dozing
- 3 = high chance of dozing

It is important that you answer each question as best you can.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chance of Dozing (0-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td></td>
</tr>
<tr>
<td>Watching TV</td>
<td></td>
</tr>
<tr>
<td>Sitting, inactive in a public place (e.g. a theatre or a meeting)</td>
<td></td>
</tr>
<tr>
<td>As a passenger in a car for an hour without a break</td>
<td></td>
</tr>
<tr>
<td>Lying down to rest in the afternoon when circumstances permit</td>
<td></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td></td>
</tr>
<tr>
<td>Sitting quietly after a lunch without alcohol</td>
<td></td>
</tr>
<tr>
<td>In a car, while stopped for a few minutes in the traffic</td>
<td></td>
</tr>
</tbody>
</table>

**THANK YOU FOR YOUR COOPERATION**

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STOP BANG QUESTIONNAIRE

Height inches/cm:

Age:

Male/Female

BMI: ______

Weight lb./kg:

Collar size of shirt: S, M, L, XL, or inches/cm neck circumference:

1. Snoring
   Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?
   Yes No

2. Tired
   Do you often feel tired, fatigued, or sleepy during daytime? Yes No

3. Observed - Has anyone observed you stop breathing during your sleep?
   Yes No

4. Blood pressure
   Do you have or are you being treated for high blood pressure? Yes No

5. BMI - BMI more than 35 kg/m2?
   Yes No

6. Age - Age over 50 years old?
   Yes No

7. Neck circumference - Neck circumference greater than 40 cm?
   Yes No

8. Gender – Male?
   Yes No

* Neck circumference is measured by staff

High risk of OSA: answering yes to three or more items
Low risk of OSA: answering yes to less than three items

Adapted from:
STOP Questionnaire
A Tool to Screen Patients for Obstructive Sleep Apnea
Anesthesiology 2008; 108:812–21 Copyright © 2008, the American Society of Anesthesiologists, Inc. Lippincott Williams & Wilkins, Inc.
Obstructive Sleep Apnea

Asleep at the controls

On a February flight in 2008, a commercial aircraft with two engines and 304 passengers flew past its destination airport after both the captain and first officer fell asleep. The pilot woke and turned back to the destination airport, where all passengers safely disembarked. The National Transportation Safety Board determined that contributing factors to the incident were the captain and first officer’s undiagnosed obstructive sleep apnea (OSA) and the flight crew’s recent work schedules, which included several days of early-morning departures.

An obscure condition tackles a pro lineman

With the shocking death of NFL lineman Reggie White, the problem of OSA was thrust into the limelight. Up to that time, OSA was relatively unknown outside the medical community. Today, OSA is recognized as a major contributor to many health-related ailments. In some estimates, it has been suggested that OSA affects:
- 4 - 7% of middle-aged people
- 70% of clinically obese patients
- 54% of all NFL linemen

A costly problem on the ground

The National Sleep Foundation (NSF) estimates that sleep deprivation and sleep disorders cost Americans more than $100 billion annually in lost productivity, medical expenses, and property and environmental damage. In addition, the NSF estimates that
- About 70 million people in the U.S. have some sort of sleep problem
- 40 million suffer from chronic sleep disorders
- As many as 30 million are affected by intermittent sleep-related problems

The National Highway Traffic Safety Administration conservatively estimates that
- 100,000 accidents are caused by drowsy drivers each year, resulting in more than 1,500 fatalities, 71,000 injuries, and $12.3 billion in damaged property and property loss.
- People with OSA have a six times greater risk factor for automobile accidents

A potential problem in flight?

The implications for pilots and crewmembers are significant. It has been suggested that people with mild to moderate OSA can show performance decrements equivalent to 0.06 to 0.08% blood alcohol levels, which is the measure of legal intoxication in most states. Most pilots will not be intoxicated, but OSA sleep deprivation may be causing the so-called “sleep debt.” Furthermore, the problem is time zone changes and post-flight alcohol consumption, which can inhibit wakefulness. Normally, when you stop drinking while sober, the brain automatically sends a wake-up call about 10 minutes, and you wake up, spitting for air. Multiple time zone changes and alcohol consumption both inhibit normal mechanisms and may result in oxygen deprivation of 30 seconds or longer before you heed the wake-up call. When you add up the oxygen starvation resulting from many occurrences per night, along with the cobwebby arousals, the effect is significant fatigue.

- 30% - 50% of patients with heart disease
- 60% of patients suffering strokes

The pathophysiology of OSA

Apnea is a medical term that means “breath without respiration.” Obstructive sleep apnea is characterized as a repetitive upper airway obstruction during sleep, as a result of narrowing of the respiratory passages. Most people with this disorder are overweight and have higher deposits of subcutaneous fat in their respiratory passages, and the size of their soft palates and tongues are larger than average. These conditions decrease the size of the upper airway and decrease airway muscle tone, especially when sleeping in the supine (back down and horizontal) position. Gravity can pull tissue down and over the airway, further decreasing its size, impeding air flow to the lungs during inspiration.

The major impact of OSA

Snoring can result when the airway becomes partially obstructed. With further tissue obstruction of the airway, there may be complete occlusion. Whether the obstruction is partial (hypopnea) or total (apnea), the subject struggles to breathe and is aroused from sleep. Often, these sleep interruptions are unconsolable, even if they occur hundreds of times a night. The real danger is that the OSA sufferer may not realize the condition and is only aware that they typically awaken feeling sleepy and tired. Losing sleep is more than a simple inconvenience. Good, sound sleep is essential for good health and clear mental and emotional functioning. Additionally, OSA is associated with a reduction in blood oxygen levels feeding the brain, which, of course, is a major health concern. Repetitive decreases in blood oxygen levels associated with OSA may eventually increase:
- Blood pressure
- Stress on the cardiovascular system
- Risk of heart attack
- Risk of stroke

Recognizing OSA

Typically, a person suffering from OSA is not aware of the condition. The only way it can be detected is through a sleep study. A complaint of loud and excessive snoring may be an important clue, since that is characteristic of the first signs of OSA. Other symptoms suggesting OSA include:
- Difficulty in concentrating, thinking, or remembering
- Daytime sleepiness, fatigue, and the need to take frequent naps
- Headaches
- Insomnia
- Short attention span

Treating OSA

Once recognized and identified, OSA is highly treatable, either with surgical or non-surgical approaches. Obviously, non-surgical methods should be tried first:
- Behavioral changes
- Change sleeping position (sleep on side or stomach)
- Change sleeping environment (matress, light level, temperature, etc.)
- Lower body fat (10% weight loss will decrease the OSA index by 20%)
- Dental appliances

Dental appliances that thrust the lower jaw forward or otherwise open the airway are an excellent treatment for mild-to-moderate OSA and are about 75% effective.
CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) MACHINE
- Probably the best, non-surgical treatment for any level of OSA.
- Uses air pressure to hold the tissues open during sleep.
- Decreases sleepiness, as measured by surveys and objective tests.
- Improves cognitive functioning on tests.

MEDICATIONS
- Any medication taken for OSA must be approved by the FAA.
- Nasal steroid sprays are effective.
- Medications that have been studied include medroxyprednisone, acetazolamide, and theophylline.

SURGICAL METHODS
These can be very significant (painful) surgeries that don’t always succeed. They should be used only after non-surgical methods have failed.
- Nasal airway surgery: Corrects for swelling of the turbinates, septal deviation, and nasal polyp.
- Palate expander: Stiffens the palate to prevent it from collapsing.
- Uvulopalatopharyngoplasty: Prevents collapse of the palate, tonsils, and pharynx.
- Tongue reduction surgery: Decreases the size of the base of the tongue.
- Genioglossus advancement: Pulls the tongue forward to enlarge the airway.

The Bottom Line
If you experience one or more symptoms of obstructive sleep apnea, it is recommended that you consult a physician, since OSA treatment scores a very high success rate. What about your medical certificate? If your OSA is treatable, you can maintain your airman medical certificate and continue to enjoy your aviation career. However, flying with untreated OSA constitutes an unnecessary risk and can become a safety-of-flight issue.

It’s up to you! So...sleep on it?

Medical Facts for Pilots
Publication No. AM-400-101
Written by
J.R. Brown
Federal Aviation Administration
Civil Aerospace Medical Institute
To request copies of this brochure, contact:
FAA Civil Aerospace Medical Institute
Shipping Clerk, AAM-400
P.O. Box 25082
Oklahoma City, OK 73125
(800)464-401

Physiological Training Classes for Pilots
If you are interested in taking a one-day aviation physiological training course with altitude chamber and vestibular demonstration or a one-day survival course, learn about how to sign up for these courses that are offered at 13 locations across the U.S. by visiting this FAA Web site.
www.faa.gov/pilots/training/human_performance/aerospace_physiology/index.cfm

OK-12595
For AMEs Who Elect to Perform the OSA Assessment

Evaluating the risk of Obstructive Sleep Apnea (OSA) requires clinical judgment based on an integrated assessment of history, symptoms, AND physical/clinical findings. If an AME elects to perform the assessment for OSA, he/she must follow the American Academy of Sleep Medicine guidelines.

After completing the assessment, if the diagnosis of OSA is not made, the AME must sign and submit the OSA AME Assessment Statement. If the AME confirms the presence of OSA, then full clinical note with test results, if performed, must be submitted.

History of findings that suggest increased risk of OSA include:
- Hypertension requiring more than 2 medications for control or refractory hypertension
- Type 2 Diabetes
- Atrial fibrillation or nocturnal dysrhythmias
- Congestive heart failure
- Stroke
- Pulmonary hypertension
- Motor vehicle accidents, especially those associated with sleepiness/drowsiness
- Under consideration for bariatric surgery

Symptoms that suggest an increased risk of OSA include:
- Snoring
- Daytime sleepiness
- Witnessed apneas
- Complaints of awakening with sensation of gasping or choking
- Non-refreshing sleep
- Frequent awakening (sleep fragmentation) or difficulty staying asleep (maintenance insomnia)
- Morning headaches
- Decreased concentration
- Problems or difficulty with memory or memory loss
- Irritability

Physical/clinical findings that suggest increased risk of OSA include:
- High score on an OSA screening questionnaire (e.g., Berlin, Epworth)
- Increased neck circumference (>17 inches in men, >16 inches in women)
- A Modified Mallampati score of 3 or 4 (assessment of the oral cavity)
- Retrognathia
- Lateral peritonsilar narrowing
- Macroglossia
- Tonsillar hypertrophy
- Elongated/enlarged uvula
- High arched/narrow hard palate
- Nasal abnormalities such as polyps, deviation, and turbinate hypertrophy
- Obesity (AASM guidelines)
AME ASSESSMENT STATEMENT – OSA

AMEs who elect to perform an OSA assessment and find that the applicant does not meet the American Academy of Sleep Medicine (AASM) diagnostic criteria for OSA, must submit this statement to the FAA.

Airman/ Patient Name __________________________ DOB: ____________

Reference Number (PI, MID, or App ID): ________________________

______ (initial) I have performed an OSA assessment in accordance with AASM guidelines and have determined that there is no evidence of OSA requiring treatment at this time. (If a sleep study was performed it must be attached).

________________________________________________________________

____________________________________________________________________________________

________________________________________________________________

PHYSICIAN NAME ________________________________

Address: ____________________________________________________________________________

Office Telephone Number: ________________________________________________________________

PHYSICIAN SIGNATURE ___________________________ DATE ____________

Using Regular Mail (US Postal Service) or Using Special Mail (FedEx, UPS, etc.)

Federal Aviation Administration
Aerospace Medical Certification Division AAM-300
Civil Aerospace Medical Institute
PO Box 25082
Oklahoma City, OK 73125-9867

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