

Instructions for Scoring Using Sleep ISR

Use the rules from the *AASM Manual for the Scoring of Sleep and Associated Events* to score all 200 epochs. This program uses actual record samples from patients and research subjects. Each exam consists of 200 consecutive 30-second epochs from a single recording.

The montage used in each of these epochs is the standard from the Manual. There are three EEG channels, two standard EOG channels, chin EMG and EKG. Snoring is recorded from a microphone. Left and right leg EMG channels are provided. There are 2 flow channels: an oral-nasal thermal signal (which may be identified as Flow or Thermal) and a nasal pressure signal (which may be identified as Pressure or PTAF). Separate chest and abdominal respiratory inductance plethysmography channels are shown. The bottom tracing is oxygen saturation with numerical readings.

EPOCH DURATION: Use the Space Bar or right click and select an epoch duration from the scoring menu to toggle the duration of the record that appears in your window. The default 30-second view allows you to closely examine a single epoch and is useful for scoring sleep stages and arousals. The alternative 120-second view provides a look at four continuous epochs. This view is ideal for scoring respiratory and limb movement events. **In the 120-second view you will only score the epoch that appears in a red box.** Extra epochs will appear at the beginning and end of the records, you cannot score these epochs.

STAGE SCORING: Choose 1 stage for each epoch: W, N1, N2, N3 or R. **If you mark an epoch as W, do not score any respiratory events or limb movements for that epoch.**

There are three ways to score each stage:

- Use the numerical keypad on the right side of your keyboard to mark your stage and automatically advance epochs. This is ideal for "two-pass" or "multi-pass" scoring. Use 0 for stage W, 1 for stage N1 sleep, 2 for stage N2 sleep, 3 for stage N3 sleep and 5 for stage R sleep.

- Use the numerical keys at the top of the keyboard for "single-pass" scoring. The epoch will not advance when you mark your stage.
- Open the scoring menu by right-clicking the mouse (you can change this command to left-click in the "Settings" menu). Under "Stage", left-click your stage selection to score the epoch.

RESPIRATORY SCORING: **Score any event that appears in an epoch, even if the event appears across multiple epochs, and only a portion of the event occurs in the current epoch.** For example, if an obstructive apnea starts in epoch 97 and ends in epoch 98, score obstructive apnea for both epochs 97 and 98. If there is an obstructive apnea and a central apnea in epoch 125, score both the obstructive apnea and the central apnea. Score up to 2 respiratory events for each epoch. Only 1 event of each type may be scored. If there are 2 obstructive apneas in epoch 36, score an obstructive apnea only once for the epoch.

Score hypopnea when there is at least a 30% reduction in the amplitude of the nasal pressure signal or PAP flow signal that lasts for 10 seconds or more and is accompanied by a **$\geq 3\%$ oxygen desaturation or the event is associated with an arousal.** Events that meet criteria for apnea and hypopnea should be scored as apneas.

The FAQ page states that "Although it is recognized that apneas and hypopneas can occur during drowsiness preceding stage N1 sleep, these should not be scored because of the difficulty of defining the denominator to calculate an apnea hypopnea index." **Therefore, enter "None" as the respiratory score for all epochs scored as W.**

There are two ways to enter respiratory event scores:

- Use the keyboard to score respiratory events. Use Q for obstructive apnea, W for mixed apnea, E for central apnea and R for hypopnea. Press T to clear your selection.
- Open the scoring menu by right-clicking the mouse. Under "Respiratory", select up to two events.

LIMB MOVEMENT SCORING: Score all periodic limb movements that are part of a series, in the epoch in which they start. Your selection will be limited to a single choice of between 0 and 3 limb movements. **If there are more than three limb movements, select 3. Do not score isolated limb movements.** The AASM Scoring Manual states that a limb movement must last from 0.5 to 10 seconds; there must be at least five seconds and no more than 90 seconds between limb movements to be included in a series. There must be at least four limb movements in a series. If limb movements occur in both legs they are scored as a single movement unless they are separated by at least 5 seconds. Do not score limb movements that occur 0.5 seconds before or after a respiratory event. Do not score limb movements that occur during a respiratory event. Score 0 if there are no limb movements in an epoch.

Two methods can be used to enter limb movement scores:

- Use the keyboard to score limb movement events. Use S to add a limb movement. Use A to reduce the number of limb movements.
- Open the scoring menu by right -clicking the mouse. Under "Limb Movements", select the number of limb movements that appear in the epoch.

AROUSAL SCORING: Score all arousals that start in an epoch. Your selection will be limited to a single choice of between 0 and 3 arousals. **If there are more than three arousals, select 3.** The AASM Scoring Manual states that arousals must last at least three seconds. Arousals must be preceded by at least 10 seconds of continuous sleep. Arousals during stage R sleep must also have an increase of chin EMG lasting at least 1 second. Arousals may occur during stage W and may occur with respiratory events. Score "none" if there are no arousals in an epoch.

Two methods can be used to enter arousal scores:

- Use the keyboard to score limb movement events. Use X to add an arousal, press Z to reduce the number of arousals.
- Open the scoring menu by right -clicking the mouse. Under "Arousals", select the number of arousals that appear in the epoch.

NAVIGATING THE RECORD: There are several ways to navigate through the record:

- Use the right arrow key to advance epochs, use the left arrow key to go to the previous epoch.
- Use the "Next" and "Previous" buttons at the top right of the page.
- Open the scoring menu by right- or left-clicking the mouse and select "Next Epoch" or "Previous Epoch."
- Rotate the mouse wheel upward to advance, or downward to move backward through the record (this feature can be disabled in the "settings" menu).
- Use the numerical keypad to score sleep stages and advance to the next epoch automatically.
- Use the drop down menu at the upper-right hand corner to select any epoch within the record.
- Use the "Review" button at the top of the screen to go directly to epochs that need to be scored, or are marked for review.