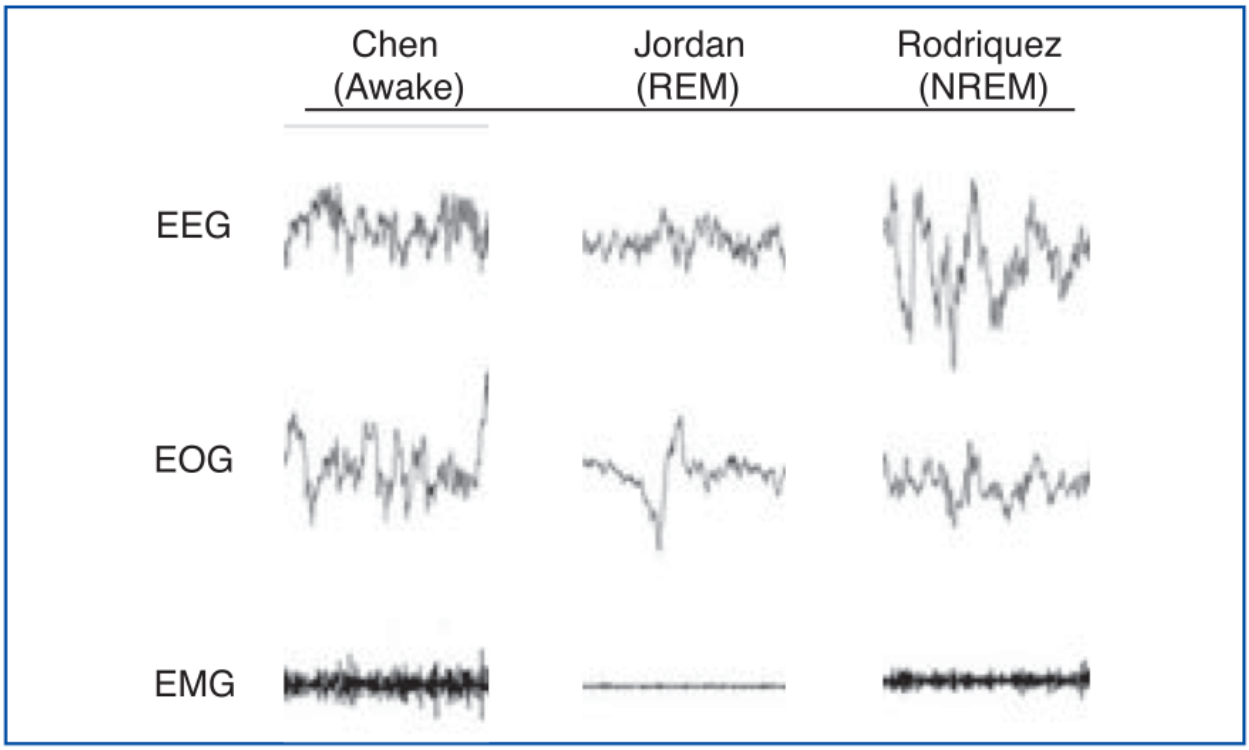
ANS KEY_Astronaut_Scenario

- Astronaut Jordan is in REM-stage sleep.
- Astronaut Rodriguez is in NREM-stage sleep.
- Astronaut Chen is awake.



- First consider astronaut Jordan. Jordan's EEG does not appear to represent NREM sleep, although students may have difficulty distinguishing between REM and wakefulness EEGs. However, the lack of muscular activity (EMG) during REM as compared with activity during NREM or wakefulness is the key for determining that this individual is in REM-stage sleep.
- Rodriguez and Chen can be distinguished from each other based on their EEGs (that is, the increased amplitude and decreased frequency of brain waves during NREM compared with the pattern during REM and wakefulness) and their EOGs (that is, large eye movements during wakefulness as compared with little or no eye movements during NREM).
- The important parameters for distinguishing between sleep states and wakefulness are EEG, EMG, and EOG. The other four parameters—heart rate, blood pressure, respiratory rate, and body temperature—might be useful in combination with EEG, EMG, and EOG data, but they are not sufficient by themselves. For instance, heart rate increases during REM, but it also may increase with physical activity during wakefulness.