Case Study: Telemedicine

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PHYSICIAN PROFILE

Jaspal Singh, MD, MHA,MFS

Associate Professor of Medicine

Carolinas HealthCare System

Dr. Singh practices and teaches sleep, pulmonary and critical care medicine at Carolinas Medical Center in Charlotte, North Carolina. He began using telemedicine to treat patients with sleep disorders in 2015. Below is a case study that exemplifies how Dr. Singh uses telemedicine to treat patients living in distant communities.

Telemedicine for Obstructive Sleep Apnea

HISTORY OF PRESENT ILLNESS

Mr. J is a 58-year-old gentleman living in rural North Carolina who is being referred for evaluation of possible obstructive sleep apnea.

Mr. J's health was reasonably good until about the age of 50 when he began to have back pain from factory work, causing him to limit his physical activity. He was then moved to a managerial position. In this role and with limited exercise or change in diet he gained roughly 50 pounds over a few years, and was diagnosed shortly thereafter with hypertension and type 2 diabetes. He was adherent to his therapies but then suffered a minor heart attack two years ago from which he recovered nicely. His internist then placed him on a lipid-lowering agent. However, his weight still slowly climbed and he found he had no energy whatsoever; his internist noted his snoring had also increased dramatically over the past eight years as well.

Mr. J was then referred for a sleep evaluation but the closest sleep physician is over 100 miles away, so he has been unable to complete this evaluation. He was very busy with his full-time job, has difficulty driving long distances due to back pain, has limited income, and really did not feel this sleep medicine evaluation was so critical to his health; so he simply did not pursue an evaluation. His wife, however, was quite concerned when Mr. J's witnessed apneas and nocturnal choking sensations were becoming worse, and he was so sleepy he was losing attention in the daytime. So she researched and discovered an online tele-health evaluation for sleep medicine through Carolinas HealthCare Sleep Services and arranged for Mr. J to have an appointment at an office setting near his work.

THE TELEMEDICINE VISIT

Mr. J was not too keen with technology and was skeptical already about this arrangement. Still he went because his wife and his internist were insistent, and in the back of his mind he knew something was not quite right. When Mr. J arrived the receptionist gave him the usual forms to complete about his demographics, insurance, and medical history. He then answered a number of questions regarding his sleep history, snoring, and subjective sleepiness. After he completed these, the receptionist asked him to sign a consent for treatment form, and noted that though Mr. J had signed up for a telemedicine visit, there was no guarantee all his care would be delivered entirely via telemedicine. The receptionist explained to him that if there are complexities to his case then the telemedicine physician may insist he be treated face-to-face with a physician.

Mr. J was then greeted by a technician, who escorted him to a private exam room with a computer cart and a monitor facing him. The technician took his vital signs, medication history, and ensured the forms the receptionist had taken from Mr. J were in the computer. While doing so the technician had Mr. J review a basic video about obstructive sleep apnea, which really resonated with him and helped him to understand how treating OSA could help his symptoms and manage his health. The technician then turned the computer screen on, placed

Dr. Singh appeared on the screen and introduced himself to Mr. J, explaining he was a board-certified sleep physician living miles away from Mr. J. He explained that Mr. J should otherwise treat this like any regular doctor visit. Mr. J then related his story and the two had a brief conversation over the telemedicine interface. Dr. Singh then asked Mr. J to stare right into the camera and open his mouth and noted a Modified Mallampati Class IV airway from his high-resolution video camera. Then Dr. Singh asked the technician to locate the stethoscope on the cart, which was connected to a computer. The technician then placed the electronic stethoscope over Mr. J's heart and lungs. After Dr. Singh was satisfied the heart sounds were normal and lungs were clear, he also viewed Mr. J's ankles to ensure no leg swelling was noticeable. He then explained to Mr. J that he needed to be evaluated for possible obstructive sleep apnea, and the two had a conversation about how this could be evaluated expediently. As Mr. J was quite concerned about costs, Dr. Singh offered him a home sleep apnea test (HSAT). He explained the next steps for coordinating the testing, and then logged off the screen. Immediately following the encounter with the physician, the technician gave a HSAT device to Mr. J, demonstrated how to apply the device and provided instructions on how to return the device for interpretation.

AFTER THE INITIAL TELEMEDICINE VISIT

Mr. J completed his HSAT and returned it the next day. He went back to the same telemedicine clinic the following week to go over the results with Dr. Singh, who explained the results of the HSAT including how a Respiratory Event Index of 46 and oxygen desaturations at various points down to as low as 78% confirmed a diagnosis of severe obstructive sleep apnea.

Since Mr. J had no known heart or lung disease, Dr. Singh explained that he would recommend starting auto continuous positive airway pressure (CPAP) therapy immediately. Mr. J then watched a video about CPAP therapy. 3 days later he then picked up his CPAP device from a nearby durable medical equipment (DME) provider.

After a few weeks of use Mr. J really acclimated to his CPAP and noticed his energy level was better. He returned for another telemedicine visit with Dr. Singh. Dr. Singh reviewed the CPAP settings via modem and remote download while Mr. J was there, shared his screen so Mr. J could see it, and even adjusted the CPAP range from his computer. Regular follow ups were then scheduled. Mr. J, his wife, and his internist, left quite satisfied.

TELEMEDICINE FOR OBSTRUCTIVE SLEEP APNEA

This case study illustrates the growing recognition, value and need for telemedicine for sleep disorders. Many patients with OSA do not have access to sleep specialist care for a variety of reasons including lack of financial resources and geographic barriers. Clearly in cases such as these, expedient diagnostic evaluation with a board-certified sleep medicine physician can improve patients' health in a high-quality manner.

CAN TELEMEDICINE FOR SLEEP REALLY BE DONE IN A MANNER THAT PROVIDES QUALITY?

Many providers have a hard time conceptualizing that the care provided via telemedicine can be sufficient to provide accurate diagnoses and treatments. In sleep medicine, and in particular in evaluating obstructive sleep apnea, much of the information needed to make a clinical decision can be derived through basic telemedicine-ready tools:

- A video camera can be used to converse live with patients and/or family members.
- Providers have access to electronic health records, charts, and forms completed which can be emailed or scanned digitally.
- Diagnmostic studies such as polysomnography, home sleep apnea testing and actigraphy are often accessed and interpreted remotely.
- PAP downloads, in particular those with modem access, are easier to obtain. In areas with limited connectivity, technicians can print the cards and scan data into the record for the interpreting physician.
- Electronic stethoscopes, high-resolution cameras, and other digitally-based tools are increasingly being developed to fulfill the remote physical examination evaluation for a variety of disciplines.

In summary, for relatively straightforward cases, such as the one described, telemedicine can be an effective and efficient way to diagnose and treat sleep disorders. It is important to note that in this case if either the patient or the provider felt that the telemedicine visit was insufficient, either party was able to request a live office visit with a provider.

SO WHY SHOULD I DO SLEEP TELEMEDICINE CONSULTS?

There is a shortage of sleep specialists and a vast portion of the population is underserved in regards to sleep disorders which may have effects on patients' health. In this case you will have noticed that the sleep provider who was originally referred the case never saw this patient since that provider was unable to meet the telemedicine needs. The telemedicine sleep provider who was able to see this patient (Dr. Singh) evaluated and treated this patient well and actually performed this consultation from his own home. Increasingly, more patients are looking for such services.

The recommendations and tactics described in the Evolve Sleep case studies reflect the best practices of AASM members and are not the official position or policy of the AASM.

Key Takeaways:

- Telemedicine services can be a very effective method of delivering service to many patients; however patients with complex medical conditions may still require an in-person office visit. It should be clearly communicated to the patient that they may request an in-person visit if they feel the telemedicine visit was unsatisfactory
- Patients may be skeptical of using telemedicine. Properly trained staff members who clearly communicate expectations of how the telemedicine visit will occur can greatly improve the patient experience.
- Telemedicine services are being used in a wide variety of medical settings. Due to a shortage of sleep specialists, the field of sleep medicine is a perfect opportunity to take advantage of these technologies.