

Heated Wall Tubing: Ahead of its Time?

The benefits of CPAP heated humidification are numerous, but why hasn't the establishment fully embraced heated wall tubing as a way to minimize rainout? Sleep veteran Thomas K. Speer, PhD, D, ABSM, believes the answer lies in an all-too-familiar tendency of industry organizations to drag their feet when it comes to something new.

As the owner/founder of Houston-based Sleep Interpretations Unlimited, Speer works on the opposite end of the spectrum where he is quick to adapt what works. "If you look at the practice drivers at the American Academy of Sleep Medicine, they don't even mention heated wall tubing," says Speer. "They probably have not addressed the issue in 5 years. It's just not on their radar."

While Speer's company primarily provides sleep interpretations of polysomnographic evaluations for physicians, he also works with patients and has a vested interest in finding out what works. That interest has led Speer to several studies over the years, the latest of which explored the "effect of heated wall tubing with heated humidification on PAP usage at 30 days post CPAP initiation." In this study, Speer acknowledges that under a variety of temperature settings the problem of condensation has interrupted sleep and led to limited use. The study compared heated humidification using heated wall tubing in a closed system that adjusts temperature in the tube to a system that has constant temperature in the heated wall tubing under real-use conditions.

Study Methods

Study enrollment included 42 patients diagnosed with OSA who had been referred for initiation of PAP therapy. All randomly selected patients had successfully completed 30 days of usage.

Group one used heated wall tubing that was added to the system with its own power supply (Hybernite from Plasti-ex Healthcare), while group two used integrated heated wall tubing with auto heat control of the humidifier (ClimateLine™ from ResMed Inc). The matched control group used an integrated heated humidifier with device. The humidifier setting for group one and the control group was set at two.

Average daily use was statistically different between the two treatment groups and matched controls over the first 30 days of use. Average time of use for group two (ClimateLine) was 6.8 hours, while the average time for group one (Hybernite) and the controls was 5.8 hours.

Average CPAP pressure in the combined groups was 11.4 cm H₂O with SD = 0.29. There were no statistical differences on general demographic parameters and severity of OSA (average AHI = 28.8 and SD = 3.1).

After evaluating all data, Speer concluded that heated wall tubing *could* produce improved adherence to PAP therapy. However, temperature and humidity at the interface affect overall usage.

Hybernite Improves with Humidifier Setting

Speer determined that the Hybernite's performance could be attributed to the humidifier setting. "When you have the humidifier set at two, there is not enough heat from the plate to make it that much different than the control," explains Speer. "We had the ResMed ClimateLine on the auto setting, which means the heated plate would increase and decrease automatically based on a hose setting at 82 to 85 degrees.

"In a follow-up, we increased the temperature on the Hybernite from two to four, and we got much better results," continues Speer. "The takeaway is that most people don't turn the humidifier up above two."

The existence of both brands points to the fact that people need humidification and rainout must be controlled for maximum compliance. "If you take away humidity, you are going to have to increase pressure because of nasal resistance over time," says Speer, who also serves as a sight visitor for AASM accreditation. "If you increase humidity without rainout, you lower pressure and increase usage. That is a great combination."

Large Corporations Bring Marketing Muscle

With ResMed and Respironics throwing their hats into the heated tubing ring, awareness is bound to grow. While Speer believes that added visibility is a good thing, he is also convinced that smaller companies such as Plasti-ex Healthcare's Hybernite can ultimately compete.

Other companies such as Fisher & Paykel have invested in heated tube technology, but the largest corporations will inevitably transform the market. "Everybody else that makes a box is going to have to find a way to put heated wall tubing on it just to compete," muses Speer. "For the moment, there is a reimbursement differential for heated wall tubing. That is, you can make more money with it. And if you generate more money with something, it will probably thrive."

The Big Picture

Speer laments that the sleep field has not historically done well with compliance, and the big issue is usually nasal dryness, dry mouth, and oral breathing—especially now that CPAP pressures are increasing. Ultimately, CPAP borrowed from another piece of technology. "Ventilators have been using heated wall tubing for 20 years in the ICU," says Speer. "When it became available with ResMed's S9 platform, it was not available for other units. Plasti-ex came along and had a universal heated tubing that could be added to any device. The resulting Hybernite is cost effective to the patient and delivers a positive outcome.

Ultimately, heated tubing is another option, one of many, that can boost crucial compliance rates. More options, says Speer, will lead to more patient diversity. "The average patient in the sleep labs is an overweight male in his 50s with comorbidities," he says. "Various things such as provent therapy and

oral appliances are of value in getting these patients into the stream of treatment. I'll use breathe right strips or whatever it takes to get a patient into treatment. There is no need for turf wars. This is about helping patients and there are plenty of patients to go around."

Thomas K. Speer PhD, D, ABSM began his sleep medicine practice in Houston in 1992. He was the director of the Institute of Sleep Medicine at the Diagnostic Clinic and has served as the director of Sleep Centers of Texas. For the past ten years, he has had his own practice, focusing on therapies for sleep apnea and other therapies for insomnia (cognitive behavioral therapy – insomnia), CPAP desensitization and support, and circadian rhythm disorders, including bright-light therapy. He is a Fellow of the American Academy of Sleep Medicine and has been an accreditation site visitor for the Academy since 2007. He is board certified by the American Board of Sleep Medicine and is licensed as a psychologist by the Texas State Board of Examiners of Psychologists and a member of the American Psychological Association since 1988.



Scan this code to watch a video of Dr. Speer explain why he recommend heated tubing to his patients who are about to begin CPAP therapy.