

LETTERS TO THE EDITOR

Practicing sleep medicine amidst a pandemic: a paradigm shift

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INTRODUCTION

The field of sleep medicine lends itself to innovative practice models but adoption to standardized continuous care models and virtual delivery formats has been suboptimal due to the focus on facility-based centers and on variation in practices driven by diverse structures in health care and reimbursement. The American Academy of Sleep Medicine's long track record in practice standardization and its pivot to continuing care quality metrics and virtual care have set the stage to optimize continuous virtual models. Actual implementation of virtual components has been slow-paced until recently when conventional practice came to a grinding halt in the wake of the COVID-19 pandemic.

GENERAL NEEDS ASSESSMENT

Several factors hinder efficiency, care continuity, and timely care in the traditional facility-based model. Access to diagnostic strategies has been limited by uneven distribution of sleep laboratories and home studies. Chronic disease management has been constrained by incomplete integration of durable medical equipment, as well as the limited allocation of resources to the specialty care continuum of a comprehensive *virtual* sleep medicine. Conventional sleep practice in facilities has inherent inefficiencies for many medically stable patients, including extensive physical spaces, expenditure of time in travel and rooming of patients, and limited geographic distribution of fixed resources. The realities of the COVID-19 health risk has exerted a force for re-examining the ability of virtual care to meet safety realities and perhaps even solve existing access and cost issues.

There are three areas of need to be addressed in the transformation of sleep medicine: (1) a vision of a permanent virtual continuous care model to supplement physical visits, (2) a transformational map for re-entry of patients into diagnostic pathways, and (3) standardization of relaxed telemedicine rules moving forward. We propose transitional strategies with components that can continue the transformation of sleep medicine.

TRANSFORMATION OF CARE STRATEGIES

In order to efficiently and safely provide effective care to our patients while containing the risk of COVID-19 spread, the

following methodological formats could be incorporated into sleep practice.

Synchronous interaction

Real-time virtual encounters using video-based technologies such as Zoom, Video Connect, AmWell, or Doximity should be integrated into existing clinic workflows, existing asynchronous patient portals, electronic health records, and internal health record messaging. Telephone visits also can be conducted, especially when patients are identified as having obstacles to video connections. Both visit types can be employed for initial encounter, therapeutic initiation, and interval assessment and monitoring.

Asynchronous interaction

Temporally separated interaction including (1) E-consult, whereby clinical decision making is based on electronic chart review and structured reporting, (2) online self-assessment tools forwarded through patient portals, and (3) storage and forward interpretation of sleep diagnostics, including polysomnography (PSG), home testing, actigraphy, and oximetry.

The current guidance issued by AASM regarding COVID-19 mitigation strategies and reopening of sleep services suggest using a carefully cogitated multiphase approach in accordance with state executive orders, local public health statements, and health care system directives in the context of the magnitude of local spread of the corona virus. We share our implemented approach in 2 major academic sleep centers in Minnesota under different local healthcare systems.

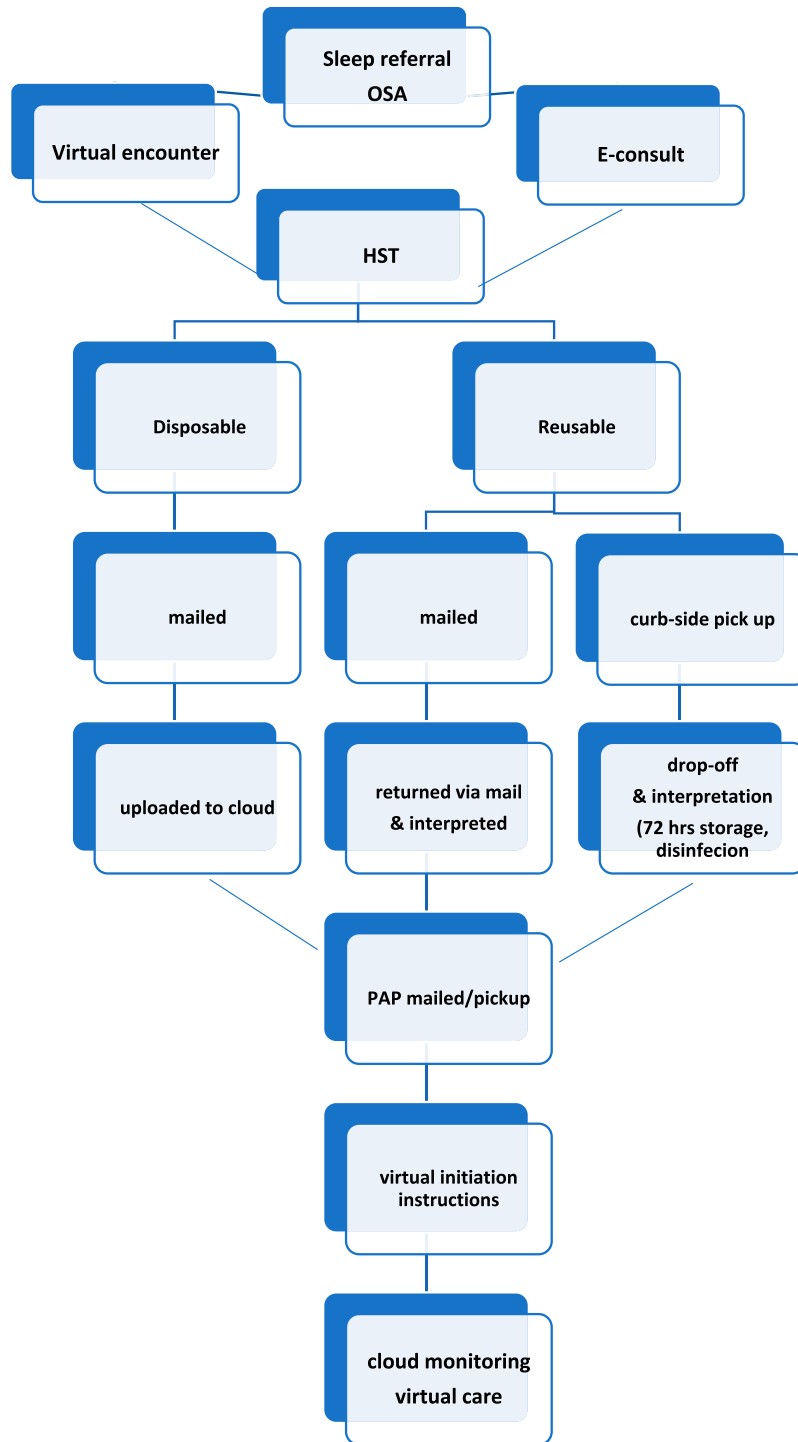
The clinical pathways are represented in [Figure 1](#) and [Figure 2](#).

Management of sleep-disordered breathing

Consults are triaged—based on locally established criteria—into either the virtual sleep clinic for complex concerns or into E-consult for the appropriate candidate based on self-assessment tools or screening by referring provider. Two home sleep testing (HST) pathways include:

- For appropriate candidates, disposable HST equipment is mailed to the patient with instructional brochures, video

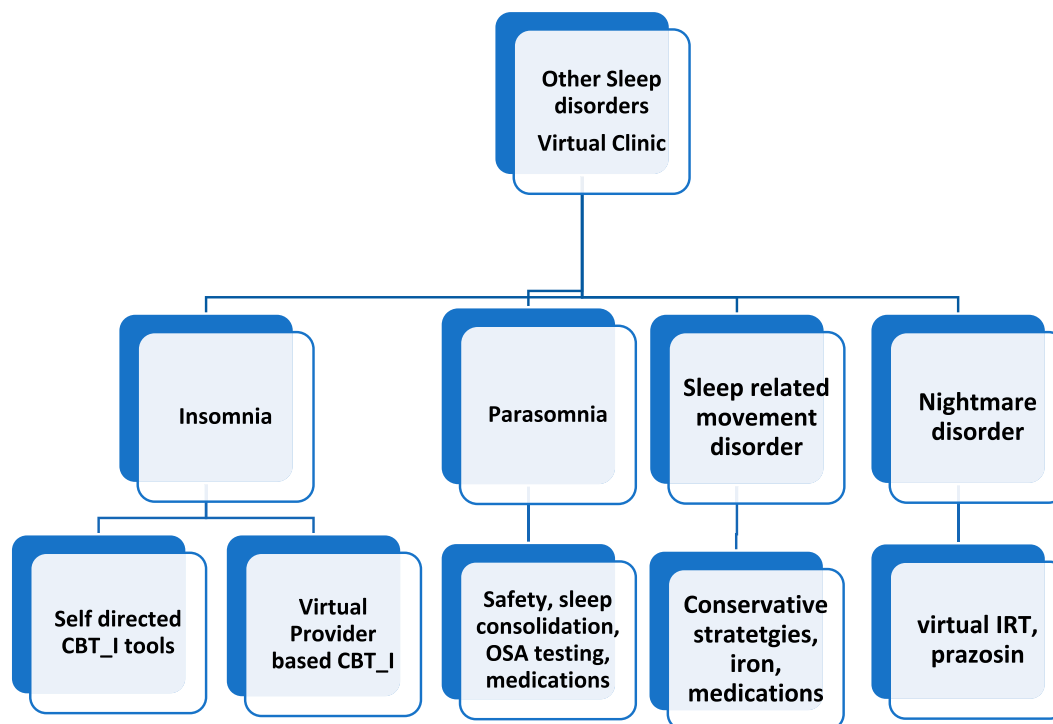
Figure 1—Pathway for management of sleep-disordered breathing.



link, and individual telephone or group teleconference for equipment use instructions. Data is uploaded through blue tooth to the cloud where it is accessed and interpreted by a physician.

- Alternatively, patients utilize mail-in or pickup/drop-off reusable HST equipment. Preemptive screening for symptoms suggestive of COVID-19 is done, followed by

curbside HST equipment pickup and drop-off during designated times. Staff handling of equipment follows local implementation of Centers for Disease Control guidelines for disinfection, with equipment storage for 72 hours before reuse. Proper personal protective equipment for the staff handling the equipment and a disinfection protocol are ensured.

Figure 2—Pathway for management of other sleep disorders.

Clinical decision making is supplemented by patient self-assessment tools and sleep questionnaires. Auto-titrating positive airway pressure (APAP) equipment is mailed to a patient with OSA. Therapy initiation is facilitated by instructional brochures, video link, and telephone or video-based communication.

Virtual cloud-based therapy efficacy and adherence monitoring is performed.

Other considerations

In-home capnography and overnight oximetry to monitor therapy can also be performed. Training of the clinician and laboratory and scheduling staff in the established policies is critical.

Management of other sleep disorders

Patients who are referred for other sleep concerns such as insomnia, parasomnia, or sleep-related movement disorders are evaluated via virtual encounter and then, depending on local services available, a clinical decision is made to use either a conservative, behavioral, or pharmacological strategy. For insomnia, self-directed cognitive behavioral therapy-I instruments and a virtual cognitive behavioral therapy-I care model are both employed depending on the patient's needs. Other behavioral strategies such as desensitization and image rehearsal therapies for nightmares are also provided virtually. A telehealth coordinator and a virtual case manager play essential roles in ensuring that the process works smoothly. Weekly meetings to discuss challenging cases and provide a platform for supervision, discussion, and quality

improvement constantly enhance care delivery in the current dynamic medical environment.

PROPOSAL FOR MULTIPHASE RESUMPTION OF THE POLYSOMNOGRAPHY LABORATORY

Timing of graded opening depends on local healthcare organization policy and state directives.

- Preemptive screening of patients who need a PSG will be done. Screening will be repeated on the day of the diagnostic testing. COVID-19 testing can be considered if feasible.
- An increased patient-to-sleep technologist ratio will minimize contact exposure and allow rotation of available staff. Proper personal protective equipment will be provided for the lab staff.
- Only a diagnostic PSG will be performed initially. Increased virtual monitoring and adjustment of devices will replace most titration studies. For complex patients for whom a titration PSG is required—and after discussion of the risk/benefit balance—a preprocedural screen will include COVID-19 testing before the PSG. If possible, titration PSGs will be conducted in a negative pressure room. Laboratory staff will be screened daily for development of any symptom of concern.
- Follow-up virtual-care coaching with review of residual disease and remote adjustment of CPAP and respiratory-assist devices will be leveraged to optimize subjective and objective targets, including utilization of repeat home monitoring when appropriate.

- The PSG laboratory at will resume at full capacity once the risk of COVID-19 transmission is deemed to be minimal to none.

Alternative approach

- Enhanced type II PSG with real-time remote diagnostic and therapeutic monitoring and intervention is a viable option that can potentially expand our clinical management capabilities and ease the bottleneck in therapeutic PSGs currently being performed in laboratories for complex sleep disorders.
- While the models suggested are approved by the local governing body for launch in a preliminary phase in May, we are prepared to adjust processes with the expectation that modifications or intermittent short-term restrictions may be required in response to any surge in local community transmission.

These times call for collective endeavors, as the best interest of the patient is the driving force motivating us to come together as one community.

CITATION

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