



Brief Communication

Uncharted territory: challenges and opportunities in pediatric sleep medicine during the COVID-19 pandemic and beyond part I: clinical services and teaching and training issues



Judith Owens^{a, *}, Umakanth Katwa^b, Stephen Sheldon^c, Maida Chen^d, Eric Zhou^a, Bobbi Hopkins^e, Regina Palomo^c, Maile Moore^a

^a Neurology, Boston Children's Hospital, Boston MA, USA

^b Pulmonary Medicine, Boston Children's Hospital, Boston MA, USA

^c Pulmonary Medicine, Lurie Children's Hospital, Chicago IL, USA

^d Seattle Children's Hospital, Seattle, WA, USA

^e Child Neurology, Johns Hopkins All Children's Hospital, St. Petersburg, FL, USA

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1. Introduction

The COVID-19 pandemic has resulted in profound changes in virtually all aspects of pediatric sleep medicine. Many of these situational alterations in delivery of care for pediatric patients during COVID-19 are likely to result in permanent changes to future clinical practice that have the potential to improve delivery and quality of care. In order to encourage an ongoing dialogue among our pediatric sleep medicine colleagues in the US and around the globe regarding both challenges *and* opportunities, we outline below a summary of pandemic experiences and lessons learned from a number of pediatric sleep centers in the US. We also view this exercise as part of a much-needed impetus to reform and update the field of pediatric sleep medicine for 2021 and beyond.

2. Challenges and opportunities: clinical services

Although telemedicine services have long been promoted as a cost-effective method of provision of health care services over the

past 40 years [1–9], widespread incorporation into most pediatric sleep medicine centers was slow until the pandemic. The emergent COVID-19 crisis required academic centers, affiliated ambulatory facilities, and free-standing pediatric sleep services to rapidly design, teach, and realize this new pediatric sleep health care delivery system. Additional logistical issues concerned reimbursement from insurance providers for virtual services, and interstate licensure and practice issues that are still being navigated by hospital administrators and legislators. Thus, in general, rapid roll-out of telehealth programs required both substantial and coordinated institutional efforts with cooperation of the entire staff *and* state and federal government efforts to expand coverage of telehealth services.

Experience on the individual institutional level during the pandemic suggests the following steps should be considered in establishing and maintaining a robust telehealth response:

- Development of a working group of clinicians who become the telehealth “champions” from each division (pulmonary, neurology, etc).
- Particularly on initiation of telehealth services, regular interface (eg, “daily huddle”) with administration and the core telehealth team to address stated problems in a timely manner, develop solutions and present feedback to the larger group.

Establishment of visit classifications and schedule templates based on provider's assessment of patients' clinical needs: in-person, telehealth video/audio or phone visits, email/patient portal communication. There should also be a clear delineation of presenting complaints (such as snoring, hypersomnias or possible nocturnal seizures vs parasomnias) that may require either an in-person visit including a physical exam, or access to telemedicine platforms that provide a limited but targeted virtual physical examination. These include online instructions for conducting and documenting self (or caregiver-directed) exams and new

* Corresponding author.

E-mail address: judith.owens@childrens.harvard.edu (J. Owens).

technologies utilizing platforms/hand-held devices for provider-guided synchronous physical exams (including physiologic data such as a heart rate and respiratory rate).

- Conducting telehealth video/audio visits on campus in identified office space or at a remote site utilizing secure software (such as that required for compliance with the U.S. Health Insurance Portability and Accountability Act (HIPAA)).
- Provision of virtual telehealth training for all providers by hospital and medical staff office administration, with a period of “virtualization” of pediatric sleep medicine telehealth services before they are instituted.
- Adaptation of electronic medical records by health information management services and creation of an adaptable workflow while maintaining quality health care documentation.
- Participation of members of the institution's quality improvement (QI) team. For example, creation of a “dashboard” detailing selected metrics such as billing and clinic volume of telemedicine and in-person clinic visits and tools to track these key metrics from a variety of sources are extremely helpful in assessing progress in and making adjustments to a phased-in approach. This also presents opportunities for development of Clinical Pathways and QI projects for Maintenance of Certification (MOC) as required by professional organizations such as the American Academy of Pediatrics.

Finally, from a clinical standpoint, the impact of COVID-19 as well as the public health measures implemented to address the pandemic, have had a profound economic and lifestyle impact on families, often resulting in delayed bedtimes, increased screen time, irregular sleep-wake scheduling, and increased prevalence of depression, anxiety, and stress contributing to the development of insomnia. Thus, the demand for pediatric sleep medicine services has increased and will likely remain at high levels for the foreseeable future.

Serendipitously, the component of pediatric sleep medicine clinical care that may be the most conducive to conversion to telemedicine visits are those services that fall under the umbrella of behavioral sleep medicine (BSM) as they usually do not require physical interaction. For example, there is already an expanding literature documenting the efficacy of telemedicine cognitive-behavioral therapy for insomnia protocols for adolescents [10–12] (an excellent resource regarding the role of behavioral sleep medicine providers during the pandemic, “The Society of Behavioral Sleep Medicine (SBSM) COVID-19 Task Force: Objectives and Summary.

Recommendations for Managing Sleep Concerns during a Pandemic” includes a discussion of potential etiologic and risk factors, case presentations, practical approaches and patient handouts [13]).

Virtual protocols could also be developed to improve positive airway pressure (PAP) adherence for patients with obstructive sleep apnea, especially during the initial stages of treatment as the clinician educates the family about sleep apnea and PAP therapy, and to guide desensitization with appropriate exposure techniques remotely. Given increasing familiarity and comfort with technology and the decreased travel burden of attending virtual appointments, the consequences of the pandemic may end up being a net positive for many families. However, it is also critical to recognize that disadvantaged families who may be the most vulnerable to sleep problems are potentially the least able to access appropriate care due to a lack of basic resources such as computers and reliable internet access, as well as a home environment conducive to virtual visits that can require participation from multiple family members.

Similarly, virtual visits may not be available if internet access is limited or unavailable in some areas of the world, disproportionately impacting geographically isolated and poor families; thus, advocating for patients without digital literacy is a critical piece in striving for equity in pediatric sleep clinical care. Finally, the increased exposure to and reliance on social networking for both patients and caregivers during the pandemic may be viewed as a positive (eg, provision of support networks) but also a potential negative (eg, spreading of misinformation, encroachment on sleep time due to networking activities) that will need to continue to be monitored post-pandemic.

3. Pediatric sleep medicine training and education: challenges and opportunities

Given the limited availability of many pediatric sleep medicine programs, the pandemic could have led to a catastrophic halt for pediatric training, leading to sub-optimally trained new sleep medicine graduates, and losing potential future trainees. Within an Accreditation Council for Graduate Medical Education (ACGME) accredited sleep medicine fellowship, pediatric patient requirements generally constitute 15–30% of the fellowship, including minimums for new and return pediatric clinic patient visits, and scoring and interpretation of pediatric studies. Clearly, with lab closures and decreased adult and pediatric PSG acquisition, programs struggled to reach those required minimums, especially in situations in which a pediatric rotation happened to coincide with a period of complete sleep lab shut down. Thus, future planning of the design and allocation of pediatric training within fellowships will need to be carefully considered, including potentially distributing exposure to pediatrics across the year to allow for unanticipated changes in resources.

Despite these challenges, the adoption of synchronous and asynchronous telemedicine communications has allowed clinicians, teachers, scientists and leaders in pediatric sleep medicine the opportunity for much farther-reaching influence and improved accessibility. Via telemedicine, patient referrals are no longer limited by proximity, keeping practices busy for trainees and providers alike. Although not completely replicating or replacing in-person interactions, telemedicine platforms can lead to more frank, direct conversations between parent, trainee and attending; non-pediatrician trainees may be particularly likely to learn more about pediatric and family sleep dysfunction as a result. Future innovations like digital physical exams may further expand and refine access to pediatric care. Likewise, video communication platforms allow for both synchronous and asynchronous PSG review between attending and fellow.

Teledidactics taps into a larger pool of lecturers and volume of presentations, as well as increasing exposure to national and international sleep meetings, whereas previous limitations on travel time and expense reduced access for trainees. Academic and research networks are more easily explored using a telemedicine platform. Looking forward, building digital teaching files, a global “master” class lecture series, including archived studies for teaching purposes within and across institutions should be considered. Real or simulated videotaped patient encounters and PSG set ups could also be archived for distance learning. Furthermore, continuing education efforts using virtual platforms such as the Extension for Community Health Care Outcomes (ECHO) have been developed in order to improve clinical outcomes of children with sleep problems by empowering primary care providers with knowledge and skills regarding effective assessment and initial management [14]. By conducting video-based chart rounds, hub specialists can maximize

effectiveness and productivity by mentoring primary care providers using a case-based model of education on how to assess and initially manage children with sleep related complaints.

Finally, we acknowledge that many of the challenges and solutions discussed above regarding both sleep clinical services and medical education are relatively “US-centric”, and that the needs, knowledge and service gaps and feasible range of approaches to addressing these identified needs and gaps are likely to vary widely across the globe. Cultural differences, the level of government support of (and payment for) pediatric sleep services, the size of the pool of clinicians trained to diagnose and treat sleep problems in children and the “pipeline” of future sleep medicine providers, and the availability of both technology and technical support services are among the many critical factors to consider in developing and implementing post-pandemic changes world-wide. Looking forward, global pediatric sleep medicine organizations such as the International Pediatric Sleep Association (IPSA) have the potential to provide mechanisms through which both the range of needs can be identified and basic “best practices” developed in order to meet the challenges of the coming decades in our field.

Credit author statement

All listed authors were involved in the preparation and editing of and approved the attached revised manuscript.

Conflict of interest

None declared.

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: <https://doi.org/10.1016/j.sleep.2021.06.018>.

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