

Practice Guidelines for Standards of Adult Sleep Medicine Services

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Abstract

Sleep disorders, i.e. diseases that affect, disrupt or involve sleep, represent major challenges for physicians and healthcare systems worldwide. The high prevalence, the complexity and the health burden of sleep disorders demand the establishment of specific clinical sleep centres where adequate and efficient diagnosis and management of patients with such diseases can be provided. This document describes practice guidelines for standards of adult sleep medicine centres in Ireland. These guidelines are the result of a consensus procedure in which all committee members of the Irish Sleep Society (ISS) were involved. The scope of these guidelines is to define the requirements of sleep medicine services, in terms of personnel, facilities, equipment and procedures.

Introduction

Sleep disorders, i.e. diseases that affect, disrupt or involve sleep, represent a major individual and socioeconomic health care burden. At least 10% of the population suffer from a clinically significant sleep disorder and the prevalence is expected to further increase, mainly due to the aging society and the obesity epidemic in Western countries¹. Insomnia, sleep-related breathing disorders, particularly obstructive sleep apnoea (OSA), and restless leg syndrome are the most common conditions but the 3rd edition of the International classification of Sleep disorders distinguishes seven major categories of sleep disorders including more than 60 specific diseases and commonly, these conditions occur in combination².

The health consequences of sleep-related disorders are far from benign including decreased quality of life, cognitive, social and professional impairments and occupational and road-traffic accidents^{3,4}. In addition, conditions such as OSA and insomnia are increasingly recognized to be associated with various cardiovascular, metabolic and neuropsychiatric disorders leading to considerable morbidity and mortality^{5,6}. Beside the direct adverse effects of these conditions to the affected patient, sleep disorders represent an increasing public health care burden with enormous direct and indirect cost implications. In the most comprehensive study to date, Hillman et al systematically evaluated the cost of sleep disorders and concluded a similar magnitude of burden as with other chronic conditions such as diabetes⁷. Importantly, increasing evidence points to a substantial cost-benefit with treatment^{8,9}. This benefit is mainly attributed to continuous positive airway pressure (CPAP) therapy as the most effective treatment for OSA which significantly improves quality of life, sleepiness and cognitive function and reduces cardiovascular morbidity and mortality^{7,9,10}.

The high prevalence, the complexity and the health burden of sleep disorders demand the establishment of specific clinical sleep centres where adequate and efficient diagnosis and management of patients with such diseases can be provided and there is strong evidence for the positive effects of such centres for the national budgets. Over the last few years, the European Sleep Research Society (ESRS) released several clinical guidelines and Practice Parameters with the primary purpose of ensuring that the highest quality of care is delivered to patients with sleep disorders¹¹. According to these guidelines, sleep centres must have

adequately trained personnel, including medical and non-medical staff, and need to provide facilities for appropriate diagnostic evaluation, including overnight testing, treatment and follow up. To improve the process of care the ESRS recommended a formalized accreditation process for sleep centres which since has been implemented in larger countries such as Germany and the United Kingdom.

In line with these recommendations and in order to provide optimal care for patients with sleep disorders in Ireland, the Irish Sleep Society (ISS), a professional body comprising physicians, technologists, physiologists, nurses and other health care professionals who specialise in the diagnosis and management of sleep disorders in Ireland, developed Practice Guidelines for Standards of adult sleep medicine services in Ireland (table 1). These guidelines are the result of a consensus procedure involving all committee members of the ISS.

Method

In order to ensure delivering of gold standard diagnostic and management procedures for patients with sleep disorders, the Irish Sleep Society (ISS) committee identified the formulation of "Practice Guidelines for Standards of Sleep Medicine Services in Ireland" as a key objective at a meeting in 2013. An extensive research process was subsequently conducted and involved a critical review of the existing literature including guidelines on sleep centre accreditation from other societies such as the European Sleep Research Society (ESRS), the American Academy of Sleep Medicine (AASM), the Australasian Sleep Association (ASA) and the British Sleep Society (BSS)¹²⁻¹⁴. Furthermore, a survey was conducted of all laboratories in the country performing sleep studies gathering data on currently existing standards on facilities, staffing and organization in addition to information on local constraints, problems and priorities. Next, a working group prepared a draft document which was reviewed by all committee members and each point was extensively discussed and agreed at dedicated meetings. The finalized guidelines were approved by all committee members in 2016.

A focus was placed on sleep centres dealing with adults primarily. The document distinguishes between minimum and ideal standards. All sleep centres need to meet the minimum standards to be able to satisfactorily diagnose and manage patients with sleep-disordered breathing such as OSA. Ideal standards are envisaged for tertiary referral centres where patients with the whole spectrum of sleep disorders can be adequately dealt with.

Key areas of the guidelines

Staff

The lead Consultant of the sleep centre should have a permanent position in the institution to ensure continuity of care, should be a member of the ISS and needs to demonstrate comprehensive knowledge of a wide range of sleep disorders. He/she is also responsible for the continual quality assurance in the sleep laboratory. Medical emergency care must be ensured at all times. The operation of a sleep centre requires adequate technical staff. Physiologists and nurses must have sufficient knowledge of diagnostic and therapeutic procedures of patients with sleep disorders, including polysomnographic and polygraphic measuring methods. Technical staff present during night examination must also be able to continuously monitor the patient's vital signs and take appropriate measures in case of an emergency. The ratio of night time staff and patients should not exceed 1:4. Furthermore, permanent administrative staff is required to manage and direct patient enquiries.

Facilities

For the initial consultation, the outpatient facility must be accessible to all patients and must ensure sufficient space for private consultation and access to basic anthropometric measurements. For night tests, bedrooms need to be equipped to allow professional

diagnosis and therapy of sleep disorders, at the minimum of sleep-related breathing disorders and need to be of adequate size in case of emergencies. A separate room, which ensures undisturbed working conditions, must be available for the monitoring equipment and the technical staff.

Equipment and Procedures

Polysomnography is a diagnostic technique comprising the simultaneous recording of neurophysiological, cardiorespiratory and other biosignals during an entire nocturnal sleep period. The minimum montage necessary to detect sleep-disordered breathing is listed in the guidelines. Polygraphy comprises of a montage to monitor cardiorespiratory data, but electroencephalogram (EEG) is not recorded. It is particularly useful for the diagnosis of OSA without significant comorbid conditions and in the absence of other sleep disorders.

All sleep studies must be manually scored by experienced technical staff according to AASM guidelines¹⁵. For patients diagnosed with OSA, adequate facilities and/or access to various treatment pathways need to be guaranteed. In particular, the facility must be able to perform standard continuous positive airway pressure (CPAP) therapy for OSA, including patient education, CPAP initiation and maintenance.

Conclusion

The high prevalence, complexity and enormous individual and public health burden of sleep disorders require the need for adequately trained personnel, facilities, equipment and procedures where appropriate diagnosis and management of patients with such conditions can be ensured. The goal of the Irish Sleep Society (ISS) is to warrant that all sleep centres dealing with adults with sleep disorders in Ireland meet the minimum standards parameters as outlined in the presented Practice Parameters.

Conflicts of Interest

The authors have no conflicts of interest to declare.

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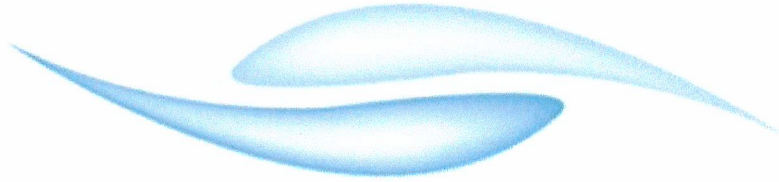
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IRISH **SLEEP** SOCIETY

Cumann Codhladh na hÉireann

**Practice Guidelines
for Standards of
Adult Sleep Medicine Services**

	Minimum Standard	Ideal Standard
Premises and Procedures		
Out-patient/Clinic Rooms	<p>A basic medical out-patient facility to include:</p> <ul style="list-style-type: none"> • A reception and waiting area • Private consulting room with sufficient space to examine the patient comfortably • Access to interpreter if required • An examination couch • Access to routine clinic tests (bloods/ECG/x-ray) • Ability to record basic anthropometric measurements • Fully accessible for disabled patients 	<p>A sleep-dedicated facility</p> <ul style="list-style-type: none"> • with own dedicated-to the service administrative staff • Access to CPAP software for download • Reading materials available to include information about the clinic, its staff, activities and disease-specific Patient-Information Leaflets
Sleep bedroom for PSG/PG	<ul style="list-style-type: none"> • Availability of single rooms • Sound and light attenuated • Adequate sanitary facilities near the bedroom • Adequate size with sufficient access for two-person cardiopulmonary resuscitation/crash calls 	<ul style="list-style-type: none"> • A two-way communication system to allow patient and technical staff to communicate with each other and to enable bio-signal calibration • Video-monitoring system • For daytime assessments rooms must be available for the patient to stay in throughout the day
Monitoring/Analysis/Scoring room	<ul style="list-style-type: none"> • Separate room, which is sufficiently large and which ensures undisturbed working conditions at day/night 	<ul style="list-style-type: none"> • Dedicated, single purpose monitoring/control room
PSG equipment	<ul style="list-style-type: none"> • Sleep analysing equipment capable of reliably measuring the minimum montage of bio-signals (3-channel EEG, EOG, chin EMG, snoring, body position, airflow [by 	<ul style="list-style-type: none"> • Sleep analysing equipment capable of reliably measuring the full montage of bio-signals according to AASM guidelines (in

	nasal pressure and oronasal thermistry], oxygen saturation, validated method of respiratory effort, ECG)	addition 4-channel EEG, leg EMG) <ul style="list-style-type: none"> • Capnography • Video monitoring with possibility of recording
PG equipment	Minimum recording parameters <ul style="list-style-type: none"> • Airflow [by nasal pressure and oronasal thermistry] • Respiratory effort • Oxygen saturation • Pulse rate • Snoring 	Ability to add additional signals such as <ul style="list-style-type: none"> • ECG • Leg EMG
Analysis and reporting of studies	<ul style="list-style-type: none"> • Sleep studies are manually scored according to AASM guidelines by experienced technical staff as required • Sleep study raw data reviewed, interpreted and reported by sleep clinician as required 	
Archiving of results	<ul style="list-style-type: none"> • Safe and secure archiving facilities for all laboratory-generated patient data complying with National Data Protection Policies 	<ul style="list-style-type: none"> • Sleep service patient database
Outpatient diagnostic procedures	<ul style="list-style-type: none"> • Physical examination • Clinical investigations (blood/ECG/X-ray/PFT's) • Sleep Questionnaires (e.g. PSQI, ESS, SSS) • Sleep Diaries • Overnight Pulse Oximetry • Polygraphy (if not available as inpatient) 	<ul style="list-style-type: none"> • Actigraphy
Inpatient diagnostic procedures	In addition to outpatient diagnostic procedures: <ul style="list-style-type: none"> • PG • PSG (minimum montage as described above) • Standard Operating Procedures file for all sleep diagnostic equipment and test protocols • Access to accredited 'manual' interpretation and reporting of PSG data 	<ul style="list-style-type: none"> • MSLT • MWT

Out-patient therapeutic procedures	<ul style="list-style-type: none"> • CPAP initiation (unless carried out as inpatient) • Appropriate patient education • CPAP maintenance and 'troubleshooting' • Access to referral to ENT surgeon/Dentist 	<ul style="list-style-type: none"> • Access to referral for Cognitive behavioural therapy (CBT) • Access to Dietician/Obesity Clinic • Light therapy • Access to referral to Maxillofacial Surgeon
In-patient therapeutic procedures	<ul style="list-style-type: none"> • CPAP Titration • CPAP Initiation • CPAP education, maintenance and 'troubleshooting' • Access to referral to ENT surgeon/Dentist 	<ul style="list-style-type: none"> • Titration of oxygen supplementation to PAP • Bi-level PAP titration • ASV Initiation • Access to referral to Maxillofacial Surgeon
Staff		
Medical	<ul style="list-style-type: none"> • Lead Consultant is in a permanent position at the institution • Lead Consultant is a member of the ISS • Responsible medical staff experienced in the evaluation and management of patients with a wide range of adult sleep disorders but particularly in sleep-related breathing disorders • Medical emergency care available on site and able to attend immediately 	<ul style="list-style-type: none"> • Lead Consultant has dedicated sessions related to the sleep service
Technical	<ul style="list-style-type: none"> • Respiratory Physiologist/Sleep Physiologist staff trained and experienced in the investigation and management of patients with a full range of adult sleep disorders. • Chief Physiologist in a permanent post at the institution • Night staff: patient ratio >1:4 	<ul style="list-style-type: none"> • Senior staff dedicated full-time to their role in the Sleep Laboratory. • Senior Physiologist staff trained with a science degree or equivalent. • Senior Physiologist staff with a post-graduate qualification in sleep technology
Administrative	<ul style="list-style-type: none"> • Permanent staff able to manage and direct patient enquiries 	<ul style="list-style-type: none"> • Sleep Service dedicated administration

Patient Services		
Referrals	<ul style="list-style-type: none"> • Able to receive referrals for the investigation & management for a wide range of adult sleep disorders, but in particular for Sleep-related breathing disorders • Ability to refer to other sleep centres if the sleep disorder cannot be investigated or managed in the facility 	<p>Able to receive referrals for the investigation & management of a full range of adult sleep disorders including:</p> <ul style="list-style-type: none"> • Sleep-related breathing disorders • Hypersomnia (neurological) • Circadian rhythm sleep disorders • Parasomnias • Sleep-related movement disorders • Insomnia

Abbreviations

ASV = Adaptive servoventilation

CPAP = Continuous positive airway pressure

ECG = electrocardiogram

EEG = electroencephalogram

EOG = electrooculogram

EMG = electromyogram

PSG = polysomnography

PG = polygraphy

AASM = American Academy of Sleep Medicine

PFT's = pulmonary function testing

PSQI = Pittsburgh Sleep Quality Index

ESS = Epworth Sleepiness Scale

SSS = Stanford Sleepiness Scale

MSLT = Multiple Sleep Latency Test

MWT = Maintenance of Wakefulness Test

ENT = Ear, Nose and Throat

PAP = Positive airway pressure