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OTORHINOLARYNGOLOGY SLEEP SERVICE GUIDELINES

MINISTRY OF HEALTH MALAYSIA

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SLEEP SERVICE
GUIDELINES

MINISTRY OF HEALTH MALAYSIA

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FOREWORD BY
THE DIRECTOR GENERAL OF HEALTH MINISTRY OF HEALTH, MALAYSIA

The constant evolution of social and industrial progress has led to a paradigm shift in managing sleep-related breathing disorders. Once thought a rare entity, it has undoubtedly become a topic of interest amongst the various specialities in the field of medicine.

Estimates of the prevalence of sleep-related breathing disorders vary widely from region to region depending on methodology, with studies reporting the prevalence of patients at risk of Obstructive Sleep Apnea (OSA) in the Asian population ranging between 5.0% and 27.3%. As the years' progress, the numbers, unfortunately, show an inclination towards a rising figure.

The Ministry of Health is cognizant of the consequences of sleep-related breathing disorders and the burden exerted on the healthcare system. Therefore, to accelerate progress and reduce the number of incidences is to provide a comprehensive guide towards improving the standards of care on these disorders.

The Ministry of Health Malaysia is proud to present the inaugural guidelines for the otorhinolaryngology sleep services. This document is simplified in its approach and firmly rooted in evidence. It prepares the readiness for future growth whilst providing guidelines on quality control and consistency. The implementation of these guidelines will enable adequate access and optimal utilization of health resources.

TAN SRI DATO' SERI DR
NOOR HISHAM BIN ABDULLAH
Director-General of Health
Ministry of Health, Malaysia

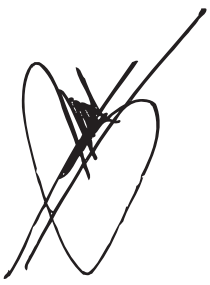
This document is simplified in its approach and firmly rooted in evidence. It prepares the readiness for future growth whilst providing guidelines on quality control and consistency.

FOREWORD BY
THE DEPUTY DIRECTOR GENERAL OF HEALTH (MEDICAL) MINISTRY OF HEALTH, MALAYSIA

Sleep related breathing disorders encompass various conditions, whereby partial or complete cessation of breathing occurs during sleep resulting in daytime somnolence or fatigue that interferes with a person's ability to function and ultimately affects quality of life. Obstructive sleep apnea (OSA) is the most common entity within this umbrella, and is often implicated in various adverse health consequences.

Therefore in line with the Ministry of Health's vision in implementing preventive, promotive, curative and rehabilitation care to the community, it is imperative that OSA and other sleep related breathing disorders are accorded equal importance as other non-communicable diseases.

The development of Otorhinolaryngology Sleep Service Guidelines is necessary to ensure all components are met; from the general requirements of a sleep facility, responsibilities and training of personnel, patient and procedural policies, quality assurance, right down to health education programs related to sleep related breathing disorders. These guidelines will serve to complement the preexisting standard operating procedure manual "Standards of Sleep Facility in Ministry of Health, Malaysia 2011".



DATO' DR NORHIZAN BIN ISMAIL
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FOREWORD BY
THE OTORHINOLARYNGOLOGY HEAD OF SERVICE MINISTRY OF HEALTH, MALAYSIA

Sleep related breathing disorders, once considered a relatively new player, is fast gaining recognition within the various subdivisions of medicine. Many disciplines such as Otorhinolaryngology, Oral-Maxillofacial Surgery, Anesthesiology, Respiratory Medicine, Neurology, Pediatrics, Psychiatry and Psychology have contributed to the development of this field in Malaysia.

Several studies have shown that patients with sleep related breathing disorders utilize higher healthcare resources due to adverse consequences associated with sleep related breathing disorders such as hypertension, stroke, cardiovascular diseases, diabetes mellitus, glucose metabolism dysregulation, neurocognitive impairment and motor vehicle accidents.

Despite the staggering statistical evidence of the putative damage caused by sleep related breathing disorders to our healthcare system, the majority of patients suffering from this disorder still remain undiagnosed. The lack of awareness and misconceptions on sleep quality and sleep hygiene coupled with the fragmented management approach adopted by many are hindering the delivery of optimal care to patients with such disorders.

Therefore it is hoped that these guidelines will be able to streamline diagnostic and management options for patients with sleep related breathing disorders.

DATO' DR SITI SABZAH BT HJ MOHD HASHIM
Otorhinolaryngology Head of Service
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Many disciplines such as Otorhinolaryngology, Oral-Maxillofacial Surgery, Anesthesiology, Respiratory Medicine, Neurology, Pediatrics, Psychiatry and Psychology have contributed to the development of this field in Malaysia.

EXECUTIVE
SUMMARY

Quality Sleep is a basic need to every human being as much as nutrition is needed in every healthy individual.

Sleep Disorder is a known medical illness which is broadly defined as having poor sleep behavior that leads to insufficient amount of sleep or poor quality sleep. Failure to meet the optimum needs of quality sleep will result with many untoward complications. This condition has great impact on quality of life, safety at work place, home and on the roads.

Obstructive Sleep Apnea (OSA), which is upper airway related, is the most dominant condition among the arrays of Sleep Breathing Disorders (SBD).

OSA is related to many co morbidities especially obesity, hypertension and metabolic syndromes. It is managed via a multidisciplinary approach which include Otorhinolaryngology, Internal Medicines, Respiratory Medicine, Oral-maxillofacial Surgery, Neurology, Paediatric, Psychiatry and others.

In 2011, The Medical Development Division, Ministry Of Health has developed a guide on STANDARDS OF SLEEP FACILITY IN MOH. However, in view of the rapid increase in number of cases, advancement in mode of therapy, surgical technique, diagnostic and therapeutic technology over the past 10 years, these guideline is long due, to provide up to date comprehensive guide to the Otorhinolaryngologist.

This guideline contents include aspect of patient policies and procedures, documentation, treatment guide, quality assurance programme, human resources, audit, and sleep facility requirement.

The roles and responsibilities of all levels of healthcare provider; Hospital director and team, ORL surgeon, medical officer and paramedics are also stated. The sleep personnel will require standardized structured training, credentialed and privileged. This structured training includes surgical and non-surgical approaches, the PAP therapy, and protocol of CPAP trial and equipment procurement. Specific needs of the younger age group are also addressed in this guideline.

Perioperative evaluation and post-operative care, plays an important role to reduce the Post-operative morbidity and mortality among OSA patient. These includes the Drug Induced Sleep Endoscopy (DISE), Perioperative CPAP, Postoperative Monitoring and Intensive Care.

This guideline will provide objective guide to members of the ORL Fraternity in the management of OSA in an effective manner in order to achieve a better outcome.

1.0

INTRODUCTION

1. INTRODUCTION

Sleep disorder is a health issue that affects a significant proportion of the Malaysian community. While there is worldwide agreement on the significance of the problem, the complexity of the condition is further contributed by the:

- Differences in the nature of sleep disorders which range from minor to severe;
- Differences in the causes of sleep disorders which can be medical and behavioural;
- Differences in the outcomes of sleep disorders which vary from serious medical and social problems; and
- Financial implications.

"Sleep Disorder" is a known medical illness which is broadly defined as having poor sleep behaviour that leads to insufficient amounts of sleep or poor-quality sleep. The latest published International Classification of Sleep Disorder-3(ICSD3), classified sleep disorder into few categories, mainly Insomnia followed by Sleep Breathing Disorder and others (Figure 1.0).

The commonest sleep disorder that is related to sleep breathing disorder is the Obstructive Sleep Apnoea (OSA). It is due to repetitive complete or partial collapse of the upper airway [(1)]. In obstructive sleep apnoea, the airways are collapsed or blocked during sleep. The blockage may cause shallow breathing or breathing pauses. Attempt to breathe may cause turbulent airflow through the blockage or narrowed airway to produce loud snoring. The prevalence of patients who at risk to have OSA in Asian Population ranged between 4.98% to 27.3%[(1)]. The cause of obstruction can also be due to anatomical blockage at the level of the nose till the upper airway. This requires assessment by otorhinolaryngologists and in a proportion of patients, surgery is required to complement the overall management.

Untreated OSA will lead to multiple life-threatening comorbidities. The complications include daytime fatigue, sleepiness, poor performance in school, attention or behaviour problems and they are of higher risk towards work-related accidents.

Another major group of complications are cardiovascular problems. Sudden drops in blood oxygen levels that occur during obstructive sleep apnoea increase blood pressure and strain the cardiovascular system. Many people with obstructive sleep apnoea develop high blood pressure (hypertension), which can increase the risk of heart disease. The more severe the obstructive sleep apnoea, the greater the risk of coronary artery disease, heart attack, heart failure and stroke. Obstructive sleep apnoea increases the risk of abnormal heart rhythms (arrhythmias). These abnormal rhythms can lower blood pressure. If there's underlying heart disease, these repeated multiple episodes of arrhythmias could lead to sudden death.
Throughout the community, very few people regularly enjoy the amount of quality sleep they need. In United States of America, The American Academy of Sleep Medicine, reported that 46% of the people having at least mild sleep apnoea, 34% have frequent snoring, 30% have insomnia symptoms and 25% reported to have excessive daytime sleepiness[(2)]. It is highlighted that 50-70 million Americans were estimated to suffer chronically from sleep disorders that adversely affect their health and mortality[(3)].

In Singapore, sleep related disturbances affect an estimated 20% of adults and children, and are commonly encountered in general practice[(4)]. A survey among medical student in University of Malaya, in 2007; it was found that 35% had daytime sleepiness especially among

those undergoing clinical postings and 16.1% reported to have poor sleep quality[5]. In a similar study, it was found that there was moderate prevalence of sleep disturbance among nurses working in Melaka Hospital which was not associated with the work shift[6]. Meanwhile, the prevalence of Sleep Disordered Breathing among Malaysian children is reported as 14.9%[7].

The causes of sleep disorders vary from medical to behavioural and social.

Medical causes include:

- Sleep Disordered Breathing (SDB) comprises of Upper Airway Resistance Syndrome (UARS), Obstructive Hypoventilation (OH) and the most common and severe form is Obstructive Sleep Apnoea (OSA).
- Dyssomnias such as narcolepsy, periodic limb movement disorder (PLMD), restless legs syndrome (RLS), insomnias, drug, alcohol dependent disorders and REM behavioural sleep disorder (RBD).
- Parasomnias such as sleep walking, nocturnal leg cramps and sleep enuresis.
- Psychiatric disorders such as mood and anxiety disorders.
- Neurological conditions such as dementia and Parkinsonism.

Behavioural and social causes of sleep disorders are in part driven by modern lifestyles, which include:

- Shift work.
- Increased working hours.
- A broader choice of leisure activities during what were once considered hours of rest (e.g., city night life, Internet, 24-hour television).
- Major life events (e.g., divorce, death of a family member, unemployment).
- Minor psychological disturbances.
- Poor sleep hygiene.

In the Ministry of Health (MOH), there is room for improvement in the aspect of Sleep care especially in Obstructive Sleep Apnoea. Treatment of OSA being the commonest and most severe form in the spectrum of sleep disordered breathing, is still under-resourced. The two major needs that should be fulfilled are the provision of training in sleep medicine and provision of funds to procure equipment for sleep facility in accordance to international standards. Efforts to address the problems of sleep disorders would significantly benefit the community.

Awareness of sleep disorders among the general public needs to be in place. This includes the misconceptions about the hours and quality of sleep that each individual person needs. The public need to be made known on the importance of adequate good quality sleep, sleep hygiene as well as treatment options that are available for sleep disorders. These educational measures will change the misperceptions that sleep intrudes on the time available to complete daily activities and help remove the stigma associated with snoring.

There is also a need to provide the healthcare providers and members of the medical profession with adequate knowledge of sleep disorders. Subject on sleep disorders should be emphasized in the curriculum of undergraduate education and given due practical exposure as well as in the relevant field for postgraduate medical practitioners.

Given the burden of cost on the community imposed by sleep disorders, funding for sleep research should also be considered as it is still lacking in Malaysia. Future research should include studies on the economic and social impact of sleep problems among the Malaysian community and the treatment cost/benefit analyses.

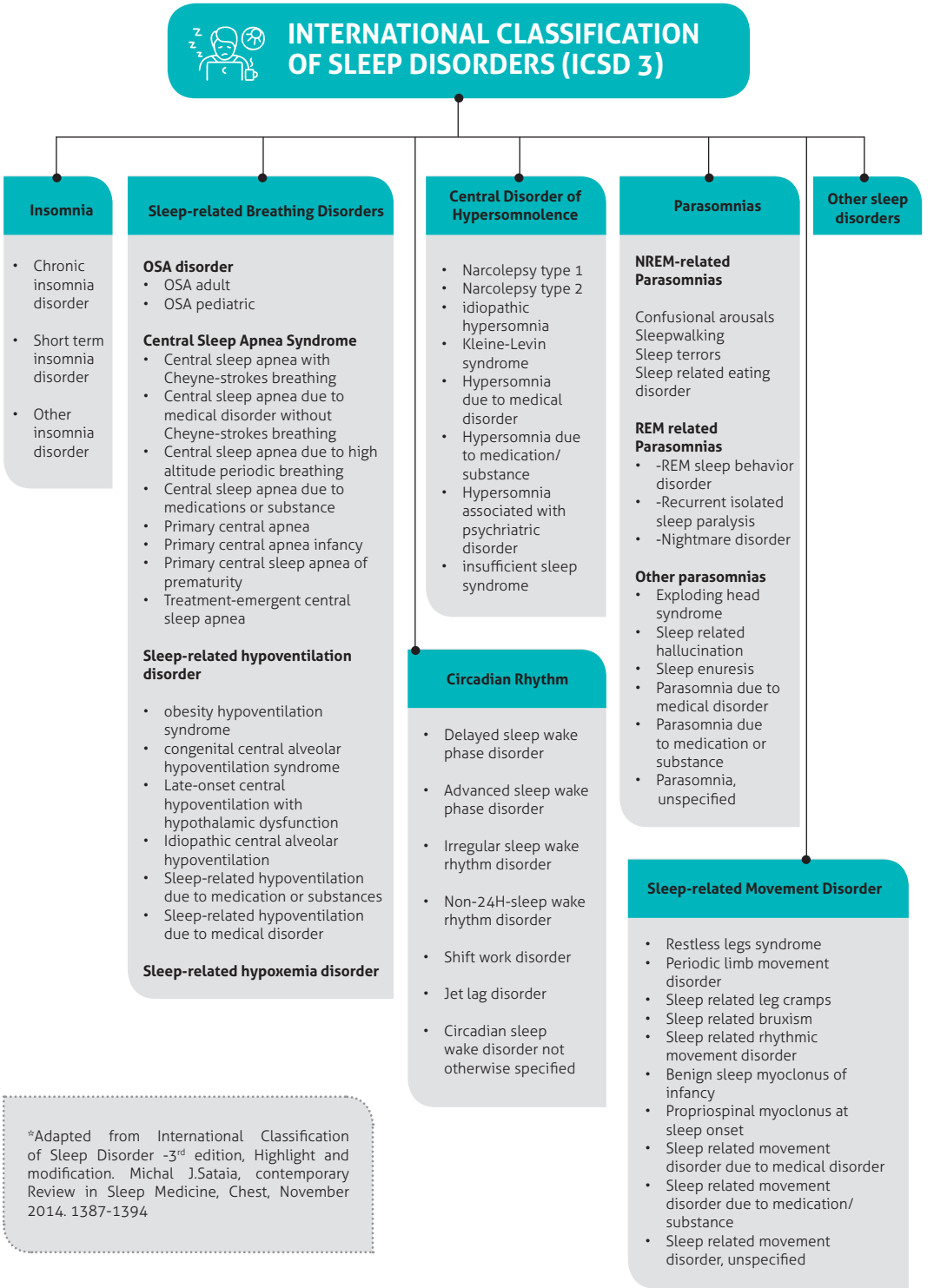
The guide on sleep facility standards have been developed with the primary aim to ensure the highest quality of care be delivered to patients with sleep disorder. This document will use the term "sleep facility" when referring to sleep disorder centres and/or laboratories for sleep-related breathing disorders.

Each Sleep facility should achieve an acceptable standard to be recognized and accredited in the MOH as a sleep centre.

MOH recognizes that the practice of Sleep Medicine is vital, dynamic, complex and requires precise clinical judgment and must conform to acceptable standards. These standards are designed to provide guidance to clinicians to assist in their patient's sleep management.

To this date, less than fifty percent of MOH hospitals have developed their own sleep facility. With increasing awareness among healthcare workers and the public on the importance of sleep hygiene and its grave complications, the need to increase the number of sleep facilities is deemed necessary.

Figure 1.0: *INTERNATIONAL CLASSIFICATION OF SLEEP DISORDERS (ICSD3)



*Adapted from International Classification of Sleep Disorder -3rd edition, Highlight and modification. Michal J.Sataia, contemporary Review in Sleep Medicine, Chest, November 2014. 1387-1394

2.0

ABBREVIATIONS AND TERMINOLOGIES

2.0 ABBREVIATIONS AND TERMINOLOGIES

2.1 LIST OF ABREVIATION

AHI	Apnoea-Hypopnea Index
RDI	Respiratory Disturbance Index
RERA	Respiratory Effort Related Arousals
RPSGT	Registered Polysomnography Technician
OSA	Obstructive sleep apnoea
PSG	Polysomnography
MOH	Ministry of Health
DISE	Drug Induce Sleep Endoscopy
CPAP	Continuous Positive Airway Pressure
NIPPV	Non-Invasive Positive Airway Pressure

2.2 TERMINOLOGIES

2.2.1 Apnoea

Literally means "no breath", the cessation of airflow at the nostril and mouth, decrease of air flow >90% for at least 10 seconds.

10-second duration measured from nadir preceding the first reduced breath to beginning of first breath approximating baseline.

2.2.2 Obstructive Sleep Apnoea

10-second duration measured from nadir preceding the first reduced breath to beginning of first breath approximating baseline with presence of or increased inspiratory effort throughout the entire period with decrease in airflow of >90%.

2.2.3 Central Apnoea

10-second duration measured from nadir preceding the first reduced breath to beginning of first breath approximating baseline with absence of inspiratory effort throughout the entire period with decrease in airflow of >90%.

Absence of airflow and inspiratory effort; apnoea caused by irregularity in the brain's control of breathing (inability of the brain to sense breathing signal).

2.2.4 Hypopnoea

Shallow breathing in which the airflow in and out of the airway is less than of normal, usually associated with oxygen desaturation.

10-second duration measured from nadir preceding the first reduced breath to beginning of first breath approximating baseline with decrease in airflow by 30% to 90%.

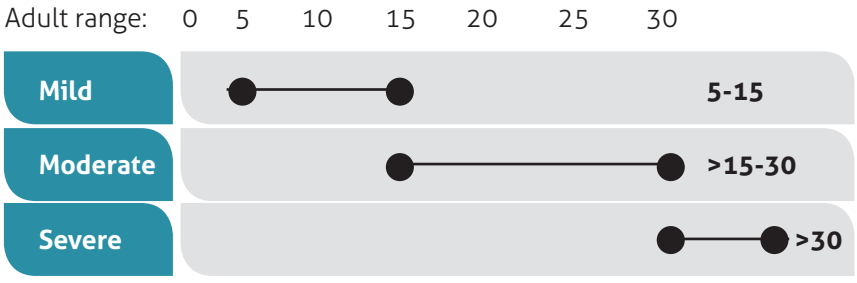
There is a >3% oxygen desaturation from pre-event baseline and/or the event is associated with an arousal or there is a >4% oxygen desaturation from the baseline.

2.2.5 Apnoea Index

A measure of the severity of sleep apnoea; the number of apnoea events per hour.

2.2.6 Apnoea Hypopnea Index (AHI)

The number of apnoea and hypopneas per hour.



2.2.7 Paediatric Obstructive Apnoea

An obstructive apnoea is scored when there is a 90% drop in the signal amplitude of airflow of 90% of the entire event, compared with the pre-event baseline amplitude, and the event lasts for at least two breaths (or the duration of two baseline breaths) with continued inspiratory effort throughout the entire period of decreased airflow. Diagnostic of OSA AHI > 1.

2.2.8 Paediatric Central Apnoea

A central apnoea is scored if the respiratory event is associated with absent inspiratory effort throughout the duration of the event and one of the following is present: *(1)* the event lasts >20 seconds or *(2)* the event lasts at least two missed breaths (or the duration of two baseline breaths) and is associated with an arousal, an awakening, or a 3% desaturation.

2.2.9 Paediatric Hypopnea

An event may be scored as a hypopnea if there is a 50% drop in airflow signal amplitude compared with the baseline amplitude for at least 90% of the duration of the event. In addition, the event must last at least two missed breaths (or a duration of two baseline breaths) and should be associated with an arousal, awakening, or a 3% desaturation.

2.2.10 Respiratory Disturbance Index (RDI)

Respiratory disturbance index, includes all respiratory events per hour namely Apnoeas, hypopneas and RERAS.

2.2.11 Snoring

Noise produced primarily with inspiratory respiration during sleep due to vibration of the soft palate and the pillars of the oropharyngeal inlet.

2.2.12 Continuous Positive Airway Pressure (CPAP)

CPAP is used to treat sleep apnoea by sending positive airway pressure conventionally delivered through a mask at optimized pressure that remains constant throughout the respiratory cycle. The mechanism of action of CPAP therapy is that it acts as a pneumatic splint that maintains the patency of the upper airway in a dose-dependent fashion. It does not exert its effects by increasing upper airway muscle activity and acts only as a treatment, and not a cure, for the disorder.

2.2.13 Polysomnography

Polysomnography is a test used to diagnose sleep disorders by means of analysis of records of brain waves, the oxygen level, heart rate, breathing and limb movements during sleep.

2.2.14 Sleep Technologist

Sleep technologist is an allied health professional who works as part of a team under the general supervision of a physician to assist in the education, evaluation, treatment and follow-up of sleep disorders patients of all ages. These professionals are specially trained to perform polysomnography and other tests used by a physician to diagnose and treat sleep disorders.

2.2.15 Arousal

Abrupt change from sleep to wakefulness or from a "deeper" stage of non-REM sleep to a "lighter" stage.

2.2.16 Arousal Disorder

Parasomnia disorder presumed to be due to an abnormal arousal function. Classical arousal disorders: sleep walking, sleep terrors and confusional arousal.

2.2.17 Bruxism

Teeth grinding during sleep.

2.2.18 Respiratory Effort-Related Arousal (RERAS)

Breathing disordered characterized by upper airway flow reduction (which does not meet the criteria of apnoea or hypopnoea), associated with increase respiratory effort that resoles with the appearance of arousals (RERAS).

3.0

OBJECTIVES

3.0 OBJECTIVES

3.1 To provide a standard guideline on ORL related sleep services in MOH hospitals, with emphasis on high quality of care based on the available resources and technology of the individual institution.

3.2 To empower clinicians and sleep personnel with a standardized mechanism for diagnosis and investigations of ORL related sleep disorders.

3.3 To ensure that the MOH ORL sleep service centres are equipped with adequate facilities and human resource.

3.4 To provide clinicians and patients with relevant health awareness and promotion materials pertaining to OSA.

3.5 To determine the appropriate choice of surgical or non-surgical intervention based on a standard set of guidelines.

3.6 To establish OSA data base for research, audit and monitoring.

4.0

GENERAL MOH REQUIREMENTS OF SLEEP FACILITY

4.0 GENERAL MOH REQUIREMENTS OF SLEEP FACILITY

4.1 All ORL Sleep Service committee will be guided by standardized protocol, patient documentation & satisfactory, quality programme and audit.

4.1.1 The Formation of ORL Sleep Service committee chaired by the ORL surgeon, under Advisory of Hospital Director. (Appendix 1.0).

4.1.2 The committee will meet at a regular basis to discusses operational issues such as staffing, training, planning, performance and feedbacks.

4.1.3 The Hospital Director facilitates human resources and infrastructure needs.

4.1.4 All ORL Sleep facilities to practice annual audit.

4.1.5 Each Sleep facilities will provide display help line contact.

4.1.6 Conduct Patients' satisfaction survey twice a year.

4.1.7 Implements incident reporting practice upon any unforeseeable/ unanticipated incidence.

4.1.8 The waiting time for sleep facility should not exceed 8 weeks.

4.1.9 The waiting time for all surgical cases should not exceed 8 weeks.

4.1.10 All data documentation must be recorded in the hospital information/ record systems.

4.2 The requirement standards of equipment and facilities:

4.2.1 Building requirement: All sleep facilities must be of easy access and convenience.

4.2.2 Phone line: The hospital is encourage to have a separate phone line(s)/ direct line into the sleep facility; at least a Line B in addition to internal phone and intercom system.

4.2.3 Signage: An appropriate signage identifying the "sleep facility" and it should be disabled-friendly.

4.2.4 Use of Space: A single sleep facility is generally defined by the physical space used primarily for conducting sleep study. All of the elements required to conduct sleep study must be available within the defined testing space.

4.2.5 The administrative office(s) and / or specialist office(s) of the sleep facility may be separate from the laboratory testing site. In circumstances of mixed use, testing rooms being used for other medical testing or examination during non-sleep testing(daytime) hours, the testing room(s) must meet all of the space and equipment standards of a single use sleep testing.

4.2.6 Testing Bedrooms-physical characteristics:

4.2.6.1 All full PSG testing bedrooms must be for single occupancy, private and comfortable, sound treated, a privacy door that opens directly to a corridor or common use area such as that the patient can access the testing bedroom without having to pass through another testing bedroom.

4.2.6.2 The patient testing rooms:

a. Must be of sufficient size to accommodate emergency personnel access with a minimum of 24 inches of clear space available on 3 sides of the bed.

b. Must include a testing bed with a mattress not smaller than a standard Intensive Care Unit (ICU) bed.

4.2.7 Testing Bedrooms and Emergency Care: Testing bedrooms are free from any obstructions for delivery of emergency care.

4.2.8 Bathroom Facilities: Provision of clean bathroom with a minimum ratio of one bathroom for every three testing rooms; these bathrooms must each contain a toilet and a sink and has a working privacy door. It is strongly advised access to a shared bathroom is not through a testing bathroom.

4.2.9 Testing Bedroom and Bathroom for the Disabled: At least one testing bedroom and bath room is disabled-friendly.

4.2.10 Each sleep facility to facilitate recognise space for purpose of real time monitoring.

4.2.11 Communication: The facility must maintain a two-way communication system between the patient bedroom and the control room and /or sleep facility personnel.

4.2.12 Video Recording: Each testing bedroom in the facility must have a mechanism for visual monitoring and video recording of patients during testing. The recordings must be kept in safe and secure space for at least 7 years.

4.2.13 Polygraph Equipment: The facility must maintain polygraph equipment capable of recording and storing physiologic parameters using sensor recommended or alternative derivations in digital format or manual form which can be easily reproduced.

5.0

POLICIES AND PROCEDURES

5.0 POLICIES AND PROCEDURES

5.1 Patient Policies

5.1.1 Patient Consent

The sleep facility's Policy and Procedures Manual must include written patient acceptance policies which comprise of:

- Patient/Legal Guardian written consent.
- Type of Procedure.
- Risk and complication of procedures.

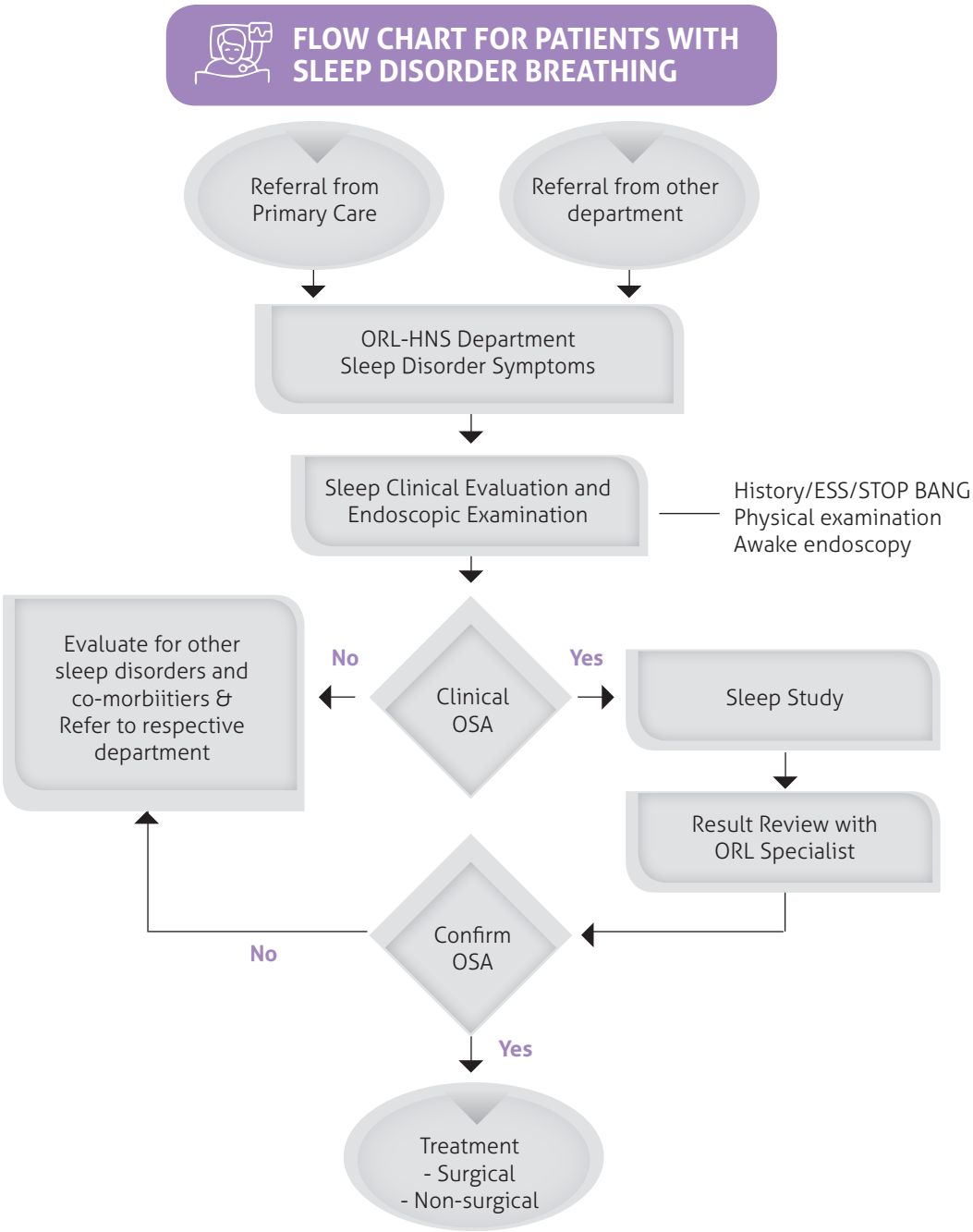
5.1.2 Practice Parameter Requirements

The clinical evaluation of patients accepted for sleep testing to be conducted in the sleep facility must be standardized and documented in Snoring/Obstructive Sleep Apnoea clerking form (Appendix 2.0).

5.2 Patient flow

All referred patients will be subjected to a comprehensive ORL assessment. (Figure 2.0)

Figure 2.0: Flow Chart of Patient with Sleep Disordered Breathing



5.3 Sleep Study Protocol and Flow Chart

Each individual undergoing sleep study will be subjected to preliminary counselling and clinical assessment to ensure the objectives are fulfilled. Patients are advised to adhere to the following pre admission checklist and instructions.

The attending sleep personal / technician shall brief the patients on the flow of the procedure (Figure 3.0) and also ensure on the presence of chaperone at all time during the procedure.

5.3.1 Practice Parameter Requirements

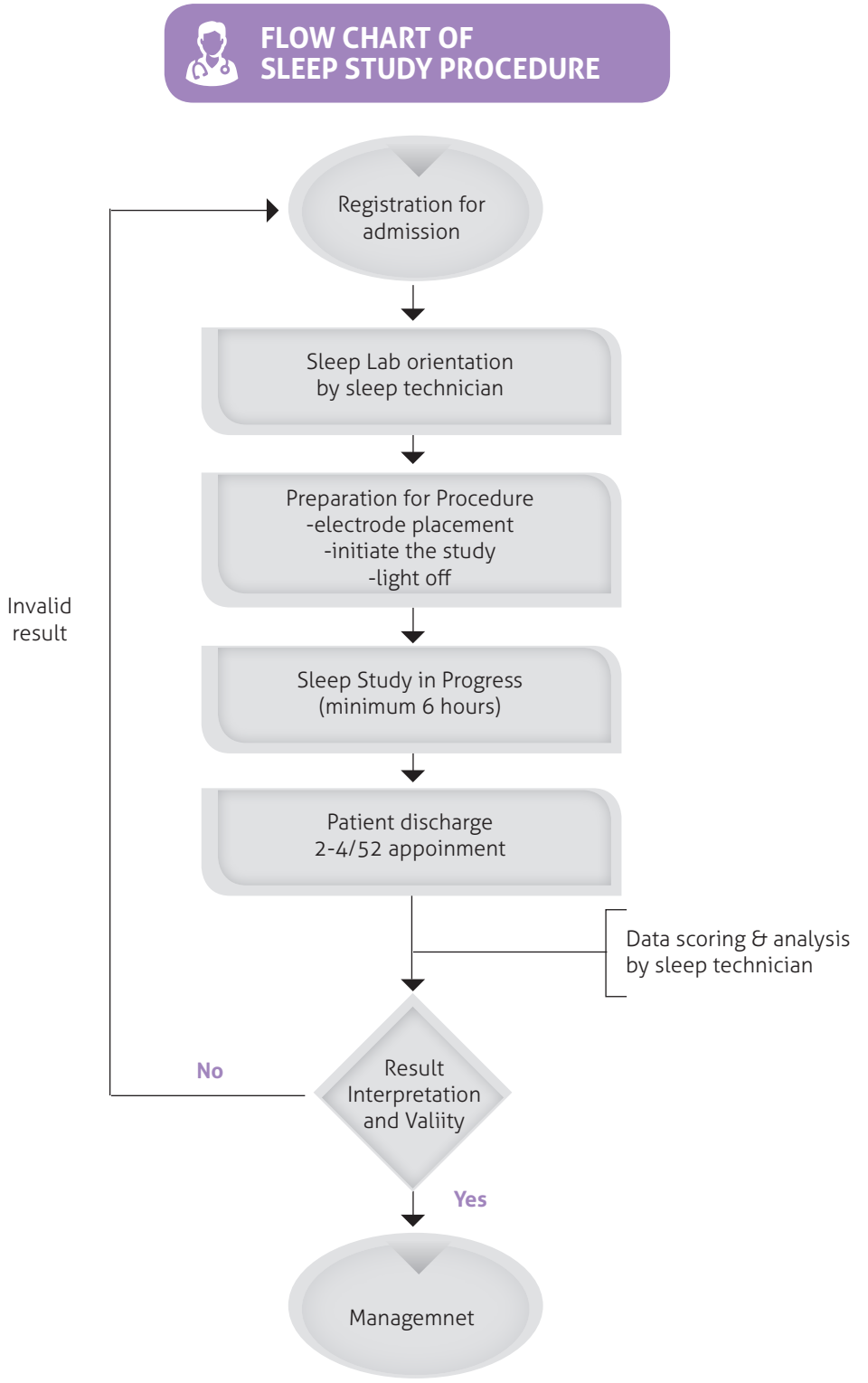
The checklist is as follows:

- Completion of ORL Sleep Service Biodata Form. (Appendix2.0).
- Explanation to patients regarding procedure based on standardized Instructional Brochure. (Appendix 3.0).
- Consent- procedure and video recording. (Appendix 4.0).
- Payment. (Appendix 5.0).
- Pre admission sleep study instructions. (Table 1.0).

Table 1.0: The Pre-admission Sleep Study Instruction

PRE-SLEEP STUDY INSTRUCTION	
DO'S	**DON'TS**
• Continue current medication (Anti-hypertension, OHA/Insulin etc)	• Sedatives (unless under special requirement)
• Appropriate sleep wear	• Caffeine/ carbonated drinks/tea/ smoking/vaping

Figure 2.0: Flow Chart of Patient with Sleep Disordered Breathing



6.0

ROLES AND RESPONSIBILITIES OF PROFESSIONALS

6.0 ROLES AND RESPONSIBILITIES OF PROFESSIONALS

6.1 Personnel Requirements

The ORL sleep service SOP requires the participation of a multi-disciplinary team of professionals.

6.1.1 Hospital Director

To facilitate the followings:

i. Manpower (sleep lab manager, sleep technician, medical officers and supporting staff).
ii. Space for sleep laboratory.
iii. Equipment & consumables.
iv. Health Promotion: pamphlets, brochures, videos, CME and roadshows.

6.1.2 ORL Surgeon In Charge

- Oversees the running of the sleep service centre and the overall management.
- Responsible for the validation and training of all medical personnel who are involved in the sleep service.
- Create public and patient awareness related to ORL sleep disorders and collaborate with other health professionals.
- Promote research and development in ORL related sleep disorders.
- Advice on the appropriate choice of surgical or non-surgical treatment of patients and be involved in the long-term management and follow up.

6.1.3 Medical Officers

- Assessment of patients with suspected ORL related sleep disorders using validated Screening tools as incorporated in the clerking form (Appendix 2.0).
- To take complete history and conduct physical examination.
- To participate in continuous medical education in the field of Sleep Medicine.
- To be involved in sleep scoring and patient management of ORL related sleep disorders.

6.1.4 Sleep Lab Manager

- Sleep Lab Manager post should preferably be held by a Senior Paramedic and comply to the need of credentialing and privileging in ORL Sleep Service.
- Ensure adequate staffing to address the workload.
- Ensure the sleep technicians are appropriately trained to provide optimum care and safety of the patients.
- Oversee the maintenance of records with regards to the workload, asset and financial expenses of the sleep service centre.
- Ensure all technical staff is equipped with BLS certification regardless of their duties.
- Able to perform full attended PSG including labelling in real time and scoring.

6.1.5 Sleep technicians

- Sleep Technician are paramedics who are credentialed and privileged in ORL Sleep Services.
- Must be BLS certified.
- Ensure facilities and equipment is well maintained at all times.
- Provide information to the client on sleep study and CPAP trial procedure.
- Be able to do a full attended PSG single-handedly.
- Participate in Continuous Medical Education and awareness programs.

6.2 Training

6.2.1 Sleep Personnel: ORL Specialist, Medical Officer and Paramedic

6.2.1.1 Training of ORL Specialist, Medical Officer and Paramedic

- To attend minimum of 7 days of sleep related CME per year.
- Received exit certification from National ORL Sleep Committee.

6.2.1.2 Training Content:

- Basic structured programme for all ORL Sleep Personnel.
- 6 months structured course.
- Log book.
- Exit exams.
- Clinical Attachment/Hands-on.
- Basic Life Support certified (American Heart Association).

6.2.1.3 Exit certification: criteria for trainer

- Minimal RPSGT or CCSH certificate or International Sleep Disorder Specialist certification or MOH Certification.
- ORL Surgeon/Senior ORL Doctor/Certified Sleep technician.

6.2.1.4 ORL Sleep Special Interest: refer to National ORL Sleep Special Interest programme 2021

6.2.2 Credentialing and Privileging

This can be divided into paramedic, medical officer and ORL specialist.

6.2.2.1 Paramedic: Medical Assistant/Staff Nurse

Based on assessment form which comprise of the following:

- Competency to use STOP BANG and Epworth Sleepiness Scale.
- Able to do Full hook-up for complete attended PSG: at least 5 properly done.
- Able to do PAP titration – auto and manual: at least 5 properly done.
- Ability to educate patient with regards to PAP therapy.
- Able to do labelling of PSG in real time.
- Scoring of full PSG.
- Ability to give emergency response as needed (Safety Guideline protocol).

6.2.2.2 Medical Officer

A trained medical officer should master the following:

- Take full history and able to do sleep disorder assessment.
- Able to do complete physical examination including endoscopic evaluation.
- Able to Read and score PSGs.
- Tailor the basic treatment modalities as per PSG & clinical finding.

6.2.2.3 ORL Specialist

In ORL fraternity, the clinician managing obstructive sleep apnoea are ORL specialists who are credentialed and privileged as a trained sleep specialist to overseer the overall management. The management includes clinical assessments, sleep analysis, PAP therapy, surgical and non surgical intervention, as guided by National ORL Sleep Special Interest. The completion of training should be inclusive of accredited log book and exit interview at the MOH level.

A trained sleep specialist should master the following:

- Read and score PSGs.
- PAP titration and split night study.
- Manage/ trouble shoot complex PAP treatment.
- Tailor the treatment modalities as per PSG & clinical finding.
- Able to recognize non ORL related sleep disorder breathing and refer accordingly.

6.2.2.4 Criteria For Training Centre:

- Has an established designated team with optimum facilities.
- Centre with accredited trainer (certified technician).
- Centre with reasonable volume of clients for PSG.
- Good organisation structure with effective data management system.
- Practices Multidisciplinary Collaboration (E.g.: Respiratory, Endocrine, General Surgery, Psychiatry, Dietician, Physiotherapy, Anaesthesia, Paediatric, Paediatric Respiratory).

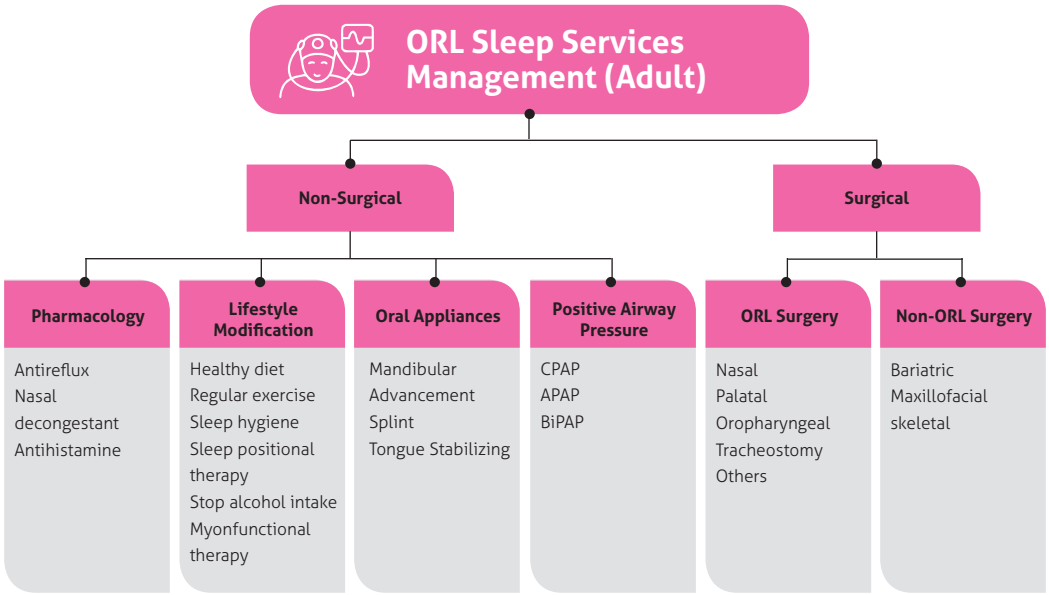
7.0

ROLES AND RESPONSIBILITIES OF PROFESSIONALS

7.0 ORL SLEEP SERVICES MANAGEMENT

The goals in OSA management are to resolve sign and symptoms of OSA, improve sleep quality, normalized AHI and thus prevent further OSA related complications. OSA should be approached as chronic disease with multidisciplinary approach. The collaborating team involves multidisciplinary department to manage the co-morbidities and complications related to OSA which includes:

Figure 4.0: Summary of ORL Sleep Service Management (Adult)



7.1 Adult OSA

There are two modalities of management namely non- surgical and surgical. These are individualized towards patient needs, severity and compliance. In some individual a combination of surgical and non-surgical approach is required to optimise the outcome.

Common to all guidelines, all patients diagnosed with OSA should be offered Positive Airway Pressure as initial therapy. Upper airway surgery may supersede or compliment other modalities in patients with surgically correctable and obstructive lesion of the upper airway [8].

7.1.1 Non Surgical

7.1.1.1 Lifestyle Modification

- Dietary and weight loss should be combined with the primary treatment for OSA [9-10].
- Successful dietary weight loss may improve the Apnoea-hypopnea index (AHI) in obese obstructive sleep apnoea (OSA) patients [11-14].
- Referral to a rehabilitation physician and dietician to facilitate weight reduction is encouraged [14].

7.1.1.3 Positional Therapies

Patients who have a high AHI in the supine position, they can be advised to alter their sleeping position by Positional therapy methods [18-20].

Studies have shown that this secondary therapy is an effective supplement to primary therapy. This seems to be effective in patients who have a low AHI in the non-supine versus that in the supine position [21].

Examples include "tennis ball technique" and "Sleep Position Trainer Device" [22].

7.1.1.4 Sleep Hygiene

- Fix a bedtime and an awakening time.
- Avoid napping during the day.
- Avoid alcohol 4-6 hours before bedtime.
- Avoid caffeine 4-6 hours before bedtime.
- Avoid heavy, spicy, or sugary foods 4-6hours before bedtime.
- Exercise regularly, but not right before bed.
- Use comfortable bedding.
- Find a comfortable temperature setting for sleeping and keep the room well ventilated.
- Block out all distracting noise and eliminates much light as possible.
- Reserve the bed for sleep and sex.
- Practice relaxation techniques before bed.
- Don't take your worries to bed.
- Establish a pre-sleep ritual.
- Get into your favourite sleeping position.

7.1.1.5 PAP Therapy

The most common form of treatment today for OSA is the use of Positive airway pressure (PAP) device. The PAP device holds the airway opened by using the air pressure that is introduce through the nasal mask or similar device.

The amount of the air pressure set on the PAP device is determine during the sleep study or via automated technique setting within the PAP device.

Continuous Positive Airway Pressure (CPAP) is indicated for the treatment of mild, moderate and severe OSA [23-27].

CPAP has been shown to improve self-reported sleepiness, quality of life, and to lower blood pressure in hypertensive patients with OSA. Bilevel Positive Airway Pressure (BiPAP) is an optional therapy in some cases where high pressure is needed and the patient experiences difficulty exhaling against a fixed pressure or coexisting central hypoventilation is present [28]. PAP applied through a nasal, oral, oronasal interface during sleep is the preferred treatment for OSA.

CPAP and BPAP therapy are safe; side effects and adverse events are mainly minor and reversible [29]. A major issue with CPAP is non-compliance.

This poor compliance is variable and have reported as high as 50% of OSA patient whom discontinued CPAP therapy after one year [30].

Airflow required for some patients can be vigorous. There are reports dry nasal mucosal, tissue irritation, dry mouth, increased number of awakenings, blocked up nose, mask pressure or leaks and claustrophobia during CPAP used [31].

Some patients adjust to the treatment within a few weeks, others struggle for longer periods, and some discontinue treatment entirely. PAP manufacturers frequently offer different models at different price ranges, and PAP masks have many different sizes and shapes, so that some users need to try several masks.

before finding a good fit. These different machines may not be comfortable for all users, so proper selection of PAP models may be very important in furthering adherence to therapy.

7.1.1.5.1 CPAP Trial and Procurement

7.1.1.5.1.1 The ORL specialist will discuss the results of the PSG with the patient and the repercussions of not treating the OSA and its possible complications are explained. The patient who requires PAP treatment will be given an appointment for a CPAP trial.

7.1.1.5.1.2 Pap-Nap session may precede a CPAP trial. PAP-Nap session usually requires a duration of 2 hours, whereby the patient is fitted with the appropriate type and size of mask to meet the patient's comfort. It is recommended that patient should undergo trial with three different models.

7.1.1.5.1.3 The CPAP trial is recommended for period of at least 5 days for the optimal course effective [32].

7.1.1.5.1.4 The CPAP trial result and patient feedback is documented and discussed to assist on decision making with regards to the usage, model and CPAP procurement.

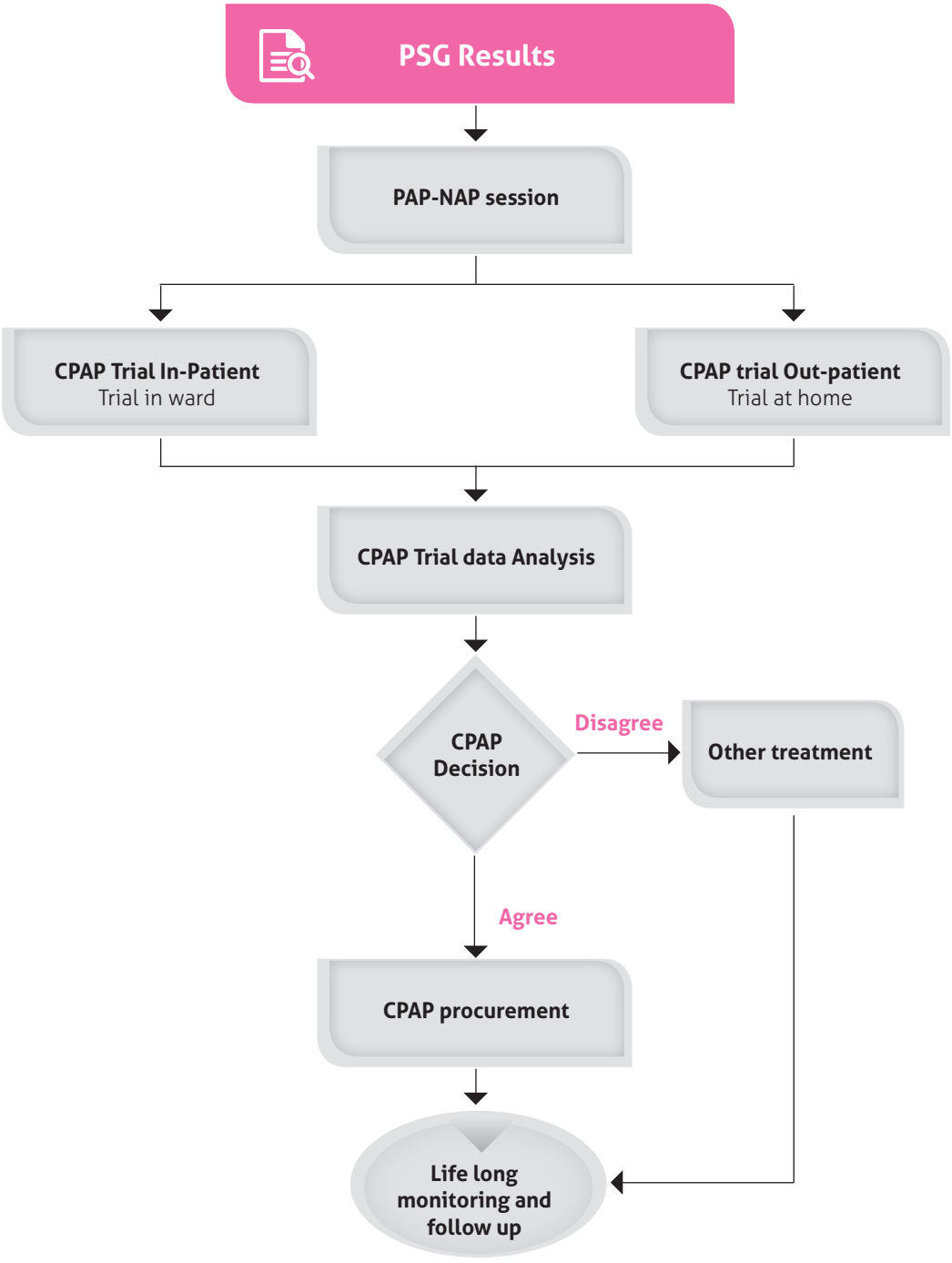
7.1.1.5.1.5 The purchasing of the CPAP machine will follow the standard method of acquiring medical products not supplied by the government hospitals. This depends on the patient source of funding i.e self-funded or non-welfare organisations (JPA, SOCSO, EPF etc) (Appendix 6.0) and welfare organisations (TBP/zakat/etc). (Appendix 7.0).

7.1.1.5.1.6 Supplier Performance Evaluation Form (*Borang Penilaian Prestasi Pembekal)*, is a tool to measure and monitor the supplier performance in the aspect of after sale services, competency, adherence of the policy and etc. (Appendix 9.0a-b).

7.1.1.5.1.7 Supplier who display poor performance based on the evaluation will be advised/ blacklisted/ dismissed from the supplier list accordingly.

7.1.1.5.1.8 Patient is given lifelong follow up to monitors efficacy, compliance and complications.

Figure 5.0: Flow Chart of CPAP Prescription



7.1.1.6 Oral Appliances

Oral appliances are devices that are worn during sleep to maintain the patency of the upper airway by increasing its dimensions and reducing its collapsibility [33]. It offers an alternative to CPAP in the treatment for OSA.

It is Categorized into two design types; the mandibular advancement splint (MAS) and the tongue stabilizing device (TSD) [34].

The clinical practice parameters of the American academy of Sleep Medicine recommend the use of MAS for the treatment of mild to moderate OSA and for severe OSA when patients refuse or unable to tolerate CPAP.

OA should not be considered as first choice therapy for OSA, where symptoms and sleep disruption are severe. There has not been a sufficient amount of research that examines the effects of OA compared with CPAP in terms of symptoms and quality of life. Although CPAP was clearly more effective at reducing the disruption to sleep, some people with OSA may prefer using OA due to their user-friendliness and fewer side effect [35].

7.1.2 Surgical

Surgery plays an important role in the treatment plan among surgically correctable and obstructive lesion of the upper airway among OSA patients [8].

The two main objectives of surgery are to alleviate the obstruction of the airway and to increase the compliancy of the PAP therapy [36].

The type of surgical intervention is determined by the site and level of obstruction. The types of procedure may range from a single operation to multilevel procedures.

Listed below are the type of procedures available based on the level of obstruction. The surgical option may change with time in concordance with the latest evolution of surgical technique and technology.

Table 2.0: List of surgeries for Obstructive Sleep Apnoea

Level of Obstruction	Procedure
Nasal Surgery	• Turbinoplasty • Septoplasty • Radiofrequency Volumetric Reduction of Turbinates • Endoscopic Sinus Surgery
Palatal	• Laser Asisted Uvulopalatoplasty • Cautery Assisted Palatal Stiffening Operation • UvuloPalatal Flap • Pillar Implant • Modified Uvulopalatopharyngoplasty With Uvula Preservation • Expansion sphincter pharyngoplasty
Oro-hypopharyngeal	• Tonsillectomy • Tongue Base Reduction • Submucosal Glossectomy • Glossectomy • Hyo-Mandibular Expansion
Maxillofacial	• Maxillomandibular Advancement • Distraction osteogenesis
Upper trachea and above	• Tracheostomy
Innovative procedure	• Hypoglossal Nerve Stimulation

7.2 Paediatric OSA

Obstructive sleep apnoea (OSA) is a common condition in childhood and can result in severe complications if left untreated. OSA in children is a "disorder of breathing during sleep characterized by prolonged partial upper airway obstruction and/or intermittent complete obstruction (obstructive apnoea) that disrupts normal ventilation during sleep and normal sleep patterns.

Symptoms can be divided into **daytime** and **nocturnal** symptoms and are used to help screen patients suspected of OSA. Complications include neuron-cognitive impairment, behavioural problems, failure to thrive, and cor pulmonale, particularly in severe cases. Risk factors include adenotonsillar hypertrophy, obesity, craniofacial anomalies, and neuromuscular disorders. [37-40].

Parents play an important role in providing the necessary information required to facilitate the diagnosis. Audio and video recordings from parents can provide a more comprehensive picture of the child's breathing pattern during sleep.

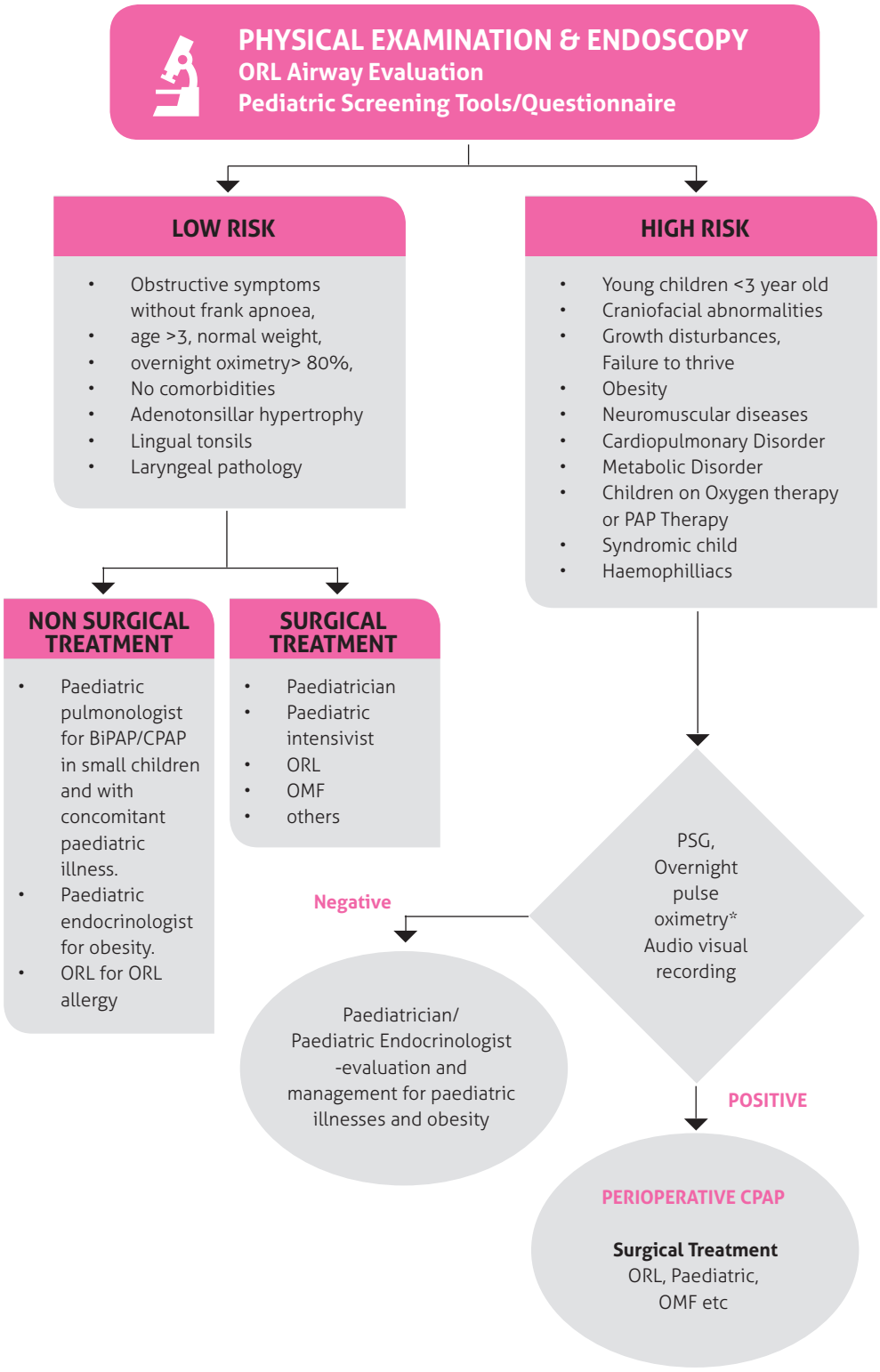
DAYTIME SYMPTOMS

- Mouth breathing.
- Hypersomnolence.
- Poor school behaviour/ performance.
- Weight problems such as failure to thrive or obesity.
- Frequent URTI.
- Chronic rhinorrhoea.
- Feeding difficulties.
- school and learning problem.
- Abnormal daytime behaviour: Irritability, aggression, hyperactivity, discipline problems, short attention span.
- Morning headaches.
- Pulmonary hypertension, cor pulmonale.

NOCTURNAL SYMPTOMS

- Apnoea.
- Snoring.
- Pauses with breathing at night.
- Choking/Gasping for air.
- Frequent awakenings from sleep or restless sleep.
- Nightmares.
- Nocturnal enuresis.
- Nocturnal diaphoresis.
- Cyanosis.
- Near sudden death syndrome.

Figure 6.0: Paediatric OSA Risk Assessment and Management Plan



Diagnostic Criteria in Children

The severity of OSA determined by the SpO_2 nadir and by the number of these episodes during nocturnal oximetry.

Table 3.0: McGill Classification of Sleep Apnoea based on Oximetry Scoring

Oximetry Score	*OSAS Classification	Number of Events of Spo2 < 90%	Number of Events of Spo2 < 85%	Number of Events of spo2 < 80%
1	Normal/ Inconclusive OSAS	< 3	1	None
2	Mild	> 3	< 3	None
3	Moderate	> 3	> 3	< 3
4	Severe	> 3	> 3	> 3

OSAS: Obstructive Sleep Apnoea Syndrome

Table 4.0: Paediatric OSA : PSG Diagnostic Classification of Sleep Disordered Breathing[37]

Mild OSA	Modarate OSA	Severe OSA
• 1-4 events/hour (apnoea index) • EEG>11 events/hr (arousal) • SpO_2 86-91% • End tidal CO_2> 53 mmHg • PCO_2>50mmHg, occurs 10-24% of total sleep time	• 5-10 events/hour (apnoea index) • EEG>11 events/hr (arousal) • SpO_2 76-85% • End tidal CO_2> 60 mmHg • PCO_2>50mmHg, occurs 25-49% of total sleep time	• >10 events/hour (apnoea index) • EEG>11 events/hr (arousal) • SpO_2≤75% • End tidal CO_2> 65 mmHg • PCO_2>50mmHg, occurs ≥50% of total sleep time

7.2.1 Management:

7.2.1.1 Medical Therapy

- Intranasal steroids may help alleviate nasal blockage secondary to nasal mucosa hypertrophy and allergic rhinitis.
- Saline nasal douching and antihistamines are useful adjuncts to treat symptoms of nasal congestion contributed by nasal secretions and allergies.

7.2.1.2 Lifestyle Modification

- Referral to a paediatric obesity clinic or a multidisciplinary team consisting of a nutritionist/dietician, exercise therapist and paediatric endocrinologist would enable a more holistic approach towards identifying the cause of obesity and individualizing the treatment plan.

7.2.1.3 Gastroesophageal Reflix Disease/Laryngopharyngeal Reflux

- GERD/LPR has been well recognized to co-exist within the paediatric OSA group[37].
- Flexible endoscopy in a child with LPR may reveal oedema of the pharyngeal and laryngeal mucosa as well as lingual tonsillar hypertrophy which in turn contributes to sleep related breathing disorders and apnoea in children [37].
- Either a dual channel 24hr pH probe study or therapeutic trial of proton pump inhibitors is warranted should history and/or physical findings suggest presence of GERD/LPR.

7.2.1.4 Oral Appliances And Orthodontic Treatment

The indications are similar to adult population with the exception that it is only promising for a select paediatric population and specially managed by the paediatric orthodontics.

Early use of oral appliance may improve the craniofacial characteristic that predisposes children towards developing OSA.

7.2.1.5 Surgical Therapy

- Successful surgical management of paediatric OSA depends on identification and intervention at every level of obstruction i.e. from the nasal vault down to the level of glottis.
- Adenotonsillectomy is usually the first line and among the most successful treatment in paediatric OSA.
- Uvulopalatopharyngoplasty, Septoplasty, turbinate reduction and/or sinus surgery are rarely required in paediatric age group.
- Hypopharyngeal airway expansion related procedures-geniohyoid advancement /expansion, tongue reduction, lingual tonsillectomy, lingual suspension, sliding genioplasty, and maxillary/mandibular distraction – though these procedures are more common in the adult population, they do alleviate obstruction in a select group.
- Craniofacial surgery to address the OSA contributed by the midfacial obstruction is best performed in an experienced, multidisciplinary centres.
- Tracheostomy remains the most reliable and significant long term surgical intervention for OSA refractory to all other intervention.
- The surgical option may change with time in concordance with the latest evolution of surgical technique and technology.

7.2.1.6 PAP Therapy

- Initiating PAP therapy in children is usually co-managed with the paediatrician, or paediatric respiratory team in a monitored setup such as PICU/PHDW [37].

7.2.2 Criteria For Post-Operative ICU /HDW/PACU Admission:

- Obese based on National Paediatric Chart. (Appendix 10.0a-b).
- Underlying co-morbid such as cardiopulmonary diseases.
- Suboptimal pre-operative PAP therapy.
- Young children (<2yrs old).
- Severe OSA (AHI more or equal to 10 events per hour and /or overnight SpO2 <80%(41-42).

Ultimately, the final decision on the needs for post-operative intensive monitoring will have to be individualized to each patient need, anaesthetic expert, complexity of the case and the availability of resources.

7.3 Perioperative Evaluation and Care

7.3.1 PAP Therapy

Perioperative PAP therapy plays a vital role in the subsequent management of patients with OSA in particular moderate to severe subgroups. Patients with mild OSA would not require preoperative PAP therapy. The mild OSA subgroup with no respiratory events in the can be managed with routine perioperative care [43].

In a retrospective case control study, OSA patients without perioperative PAP therapy, has more post-operative complications than patients with OSA treated with CPAP [44].

Unplanned ICU transfer was also significantly higher in patient with OSA without CPAP treatment and length of stay was 1 day longer [45-46].

There have been many studies in the past to support the efficiency of CPAP usage on post-operative outcome of OSA patient [47-48].

Therefore, patients with moderate and severe OSA who have been on PAP therapy should continue PAP therapy in the perioperative period [49].

7.3.2 Sleep Endoscopy

Sleep endoscopy also known as **Drug Induce Sleep Endoscopy (DISE)** had been introduced by Croft and Pringle as an additional assessment tool for OSA. This procedure will provide a dynamic visualization of the anatomical areas responsible for the generation of noise or obstruction, under conditions which mimic the sleep [50].

This procedure will give more detail information regarding level of blockage since evidence shows that site of obstruction detected by Mullers Manoeuvre do not reliably reflect the site of obstruction [51-52].

DISE has been reported to play an important role in OSA surgical selection and outcome [53-54].

7.3.2.1 Instrument

- Video Camera System.
- Flexible Nasopharyngolaryngoscope (FNPLS) adult/ paediatric.

7.3.2.2 Patient preparation

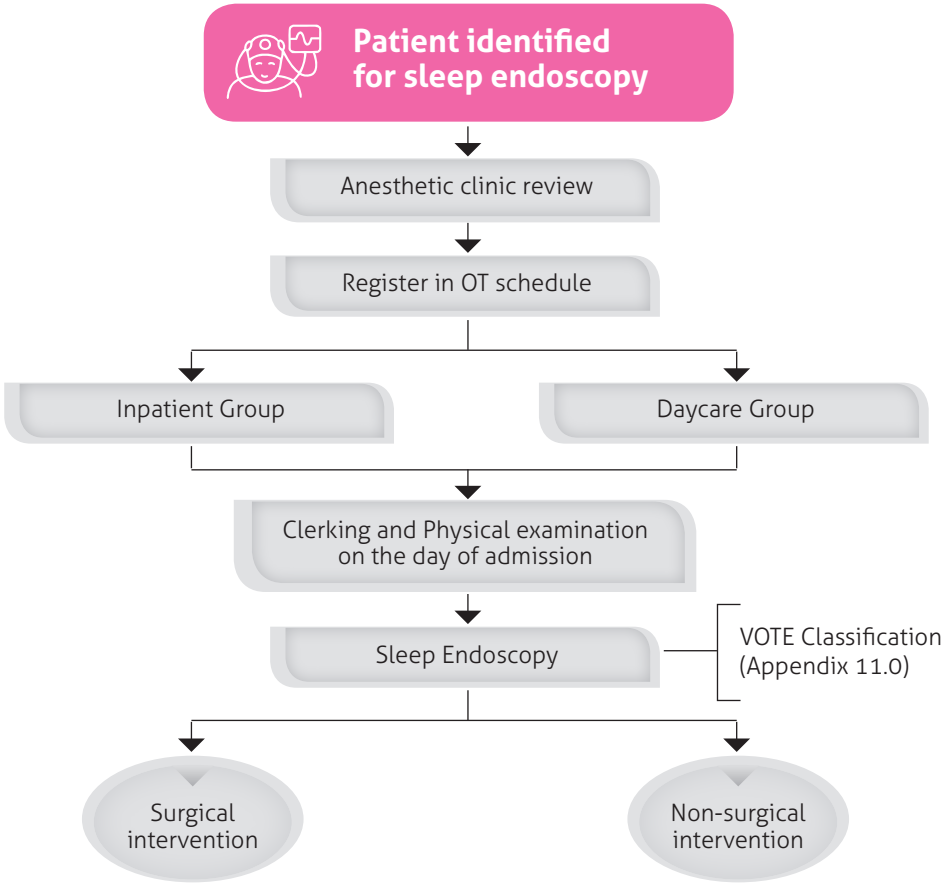
- Complete history and physical examination including Muller's manoeuvre should be done in clinic during initial consultation.
- Selected cases will be referred to anaesthetic clinic (Figure7.0).
- Patient is kept nil by mouth at least 6 hour prior to procedure.
- Topical nasal decongestion is applied prior to procedure.
- Patient should lie in a supine position and attempt to mimic the sleeping habits at home.
- In operation theatre, once patient reached a desired sleep state based on Bispectral Index (BIS) monitoring of 65-75, Flexible Nasopharyngolaryngoscope (FNPLS) is introduced to initiate assessment with simultaneous audio-visual recording [55].
- Special attention is paid to the following levels: soft palate, lateral pharyngeal wall, palatine tonsil, tongue base/lingual tonsil and epiglottis [56].

- The VOTE classification [57] is widely recognized to characterize the DISE finding that focuses on the specific structures that contribute at the following levels: velum, oropharyngeal, base of tongue and epiglottis. (Appendix 11.0).
- The positioning of the head with chin lift or jaw thrust gives added value to reflect on the effectiveness of mandibular advancement surgery [57].

7.3.2.3 Anaesthetic referral

- All selected cases must be referred to anaesthetic clinic for further evaluation and perioperative needs.

Figure 7.0: Flow Chart for Sleep Endoscopy Procedure



7.3.3 Perioperative Management

The anaesthetic perioperative management can divided into [58] :

7.3.3.1 Preoperative evaluation

7.3.3.2 Preoperative preparation

7.3.3.3 Intraoperative management

7.3.3.4 Postoperative management

7.3.3.1 Preoperative Evaluation

7.3.3.1.1 A preoperative evaluation include a comprehensive review of previous medical records (if available), an interview with the patient and/or family, and conducting a physical examination.

7.3.3.1.2 Medical records review includes history of airway difficulty, hypertension, cardiopulmonary comorbids and other congenital or acquired medical conditions.

7.3.3.1.3 The patient and family interview include focused questions related to snoring, apnoeic episodes, frequent arousals during sleep (e.g., vocalization, shifting position, and extremity movements), morning headaches, and daytime somnolence.

7.3.3.1.4 A physical examination should include an evaluation of the airway, nasopharyngeal characteristics, neck circumference, tonsil size and the tongue volume.

7.3.3.1.5 The severity of the patient's OSA, the nature of surgical interventions and the requirement for postoperative analgesics should be taken into account in determining whether a patient is at increased perioperative risk.

7.3.3.2 Preoperative Preparation

Recommendation:

7.3.3.2.1 Preoperative initiation of CPAP should be considered, among the moderate to severe OSA patient.

7.3.3.2.2 Patients who do not respond adequately to preoperative CPAP, other modes of NIPPV should be considered.

7.3.3.2.3 The preoperative use of mandibular advancement devices or oral appliances should be considered.

7.3.3.2.4 Preoperative weight loss should be considered when feasible.

7.3.3.2.5 A patient who has had corrective airway surgery (e.g., uvulopalatopharyngoplasty, CAPSO etc should be assumed to remain at risk of OSA complications unless a normal sleep study has been obtained and symptoms have not returned.

7.3.4 Intraoperative Management

Due to the propensity for airway collapse and sleep deprivation, these patients are susceptible to the respiratory depressant effects of sedatives, opioids, and inhaled anaesthetics.

Recommendations:

7.3.4.1 For superficial procedures, consider the use of local anaesthesia or peripheral nerve blocks, with or without moderate sedation.

7.3.4.2 If moderate sedation is used, respiration should be continuously monitored by capnography or another automated method if feasible (because of the increased risk of undetected airway obstruction in these patients). Consider administering CPAP or using an oral appliance during sedation to patients previously treated with these modalities.

7.3.4.3 General anaesthesia with a secured airway is preferable to deep sedation.

7.3.4.4 Unless there is a medical or surgical contraindication, patient at increased perioperative risk from OSA should be extubated while awake.

7.3.4.5 Full reversal of neuromuscular block should be verified before extubation.

7.3.4.6 When possible, extubation and recovery should be carried out in the lateral, semi upright, or other non-supine positions.

7.3.5 Postoperative Management

Recommendations:

7.3.5.1 Regional analgesic techniques should be considered to reduce or eliminate their requirement for systemic opioids in patients at increased perioperative risk from OSA.

7.3.5.2 If patient-controlled systemic opioids are used, continuous background infusions should be avoided or used with extreme caution.

7.3.5.3 To reduce opioid requirements, NSAIDs should be considered.

7.3.5.4 Concurrent administration of sedative agents (e.g., benzodiazepines and barbiturates) increases the risk of respiratory depression and airway obstruction.

7.3.5.5 Supplemental oxygen should be administered continuously to all patients who are at increased perioperative risk from OSA until they are able to maintain their baseline oxygen saturation at room air.

7.3.5.6 The administration of supplemental oxygen should be used cautiously as it may increase the duration of apnoeic episodes and hinder detection of atelectasis, transient apnoea, and hypoventilation.

7.3.5.7 Pulse oximetry should accompany administration of supplemental oxygen and during immediate post-operative period.

7.3.5.8 When feasible, CPAP or NIPPV (with or without supplemental oxygen) should be continuously administered to patients who were using these modalities preoperatively, unless contraindicated.

7.3.5.9 Patients ideally should be placed in non-supine positions throughout the recovery process.

7.3.5.10 In the event of frequent or severe airway obstruction or hypoxemia, nasal CPAP or non-invasive positive pressure ventilation should be considered.

7.3.5.11 Discharge from monitored setting (PACU/ICU/HDW/PICU/OT Recovery Bay).

The decision to discharge patient from monitored setting is following the advice and expertise of the respective team involved. The receiving team has to ensure that patient is placed in the following setting:

- Acute bay.
- Continuous pulse oximetry monitoring.
- Adequate analgesia.
- Ensure supplemental oxygen and/or usage of PAP device is in place in the indicated group.
- Person Accompanying Patient to be present.
- Close nursing observation of vital signs.
- Frequent review of patient by the ORL Medical Officers.

For further information of perioperative management and care please refer to **Malaysian Guideline for the Peri-operative Care of Adults with Obstructive Sleep Apnoea 2018.**

8.0

EMERGENCY POLICY & PRACTICE IN SLEEP FACILITY

8.0 EMERGENCY POLICY & PRACTICE IN SLEEP FACILITY

Sleep facilities must have a written emergency plan accessible in paper or electronic format that delineates the following:

8.1 In the event of an emergency in the sleep facility, the personnel is expected to follow the Standard Operative Procedure guideline as per practice by the respective hospital.

8.2 Access to appropriate emergency equipment and drugs to address all possible medical emergencies.

9.0

HEALTH EDUCATION PROGRAMME

9.0 HEALTH EDUCATION PROGRAMME

9.1 OSA Pamphlet/Brochure (Appendix 12.0)

9.2 Counselling Manual (Appendix 13.0)

9.3 Public talk/Awareness programme

10.0

QUALITY ASSURANCE

10.0 QUALITY ASSURANCE

10.1 QA Program

Sleep facilities must have a quality assurance program:

10.1.1 Waiting Time for PSG (Standard: 80% within 2 month)

10.1.2 Waiting Time for PSG reports (Standard: 80% within 2 weeks)

Waiting Time for PSG (Standard: 80% within 2 month)

Waiting time for PSG Report (Standard: 80% within 2 weeks)

10.2 Audit

10.2.1 CPAP compliance

10.2.2 Treatment outcome

10.2.3 PAP funding and waiting time

All quality assurance metrics and audit must be reported and reviewed by the sleep facility's Clinician In-Charge or the Designated Sleep Specialist, at a minimum frequency of once in every 6 months. The reviewer of the report must sign and date the report; a copy of the signed report must be kept in file for a minimum of seven years. All annual report must be compiled at the national level and submitted to the Director of Medical Development Division.

11.0

DATABASE AND AUDIT

11.0 DATABASE AND AUDIT

The patient's information and parameters to be recorded in the standardized OSA case report form. The sleep manager, supervised by Specialist in charge will compile and manage the data entry. The data generated is analysed for purpose of annual report, audit, publication and research.

12.0

RECOMMENDATION

12.0 RECOMMENDATION

12.1 Ideally all ORL sleep facilities should have a multidisciplinary team to provide a holistic one stop sleep centre.

12.2 Sleep Breathing disorder and its management should be included in the curriculum for ENT paramedic post basic training.

12.3 Advocate an appraisal system which is practical and/or exam based to encourage paramedic participation in the field.

12.4 To establish area of special interest for ORL Sleep Disorder Specialist in the Ministry of Health.

12.5 Every sleep facility is encouraged to follow the Standard practice from the recognised International Organization such as American Academy of Sleep Medicine.

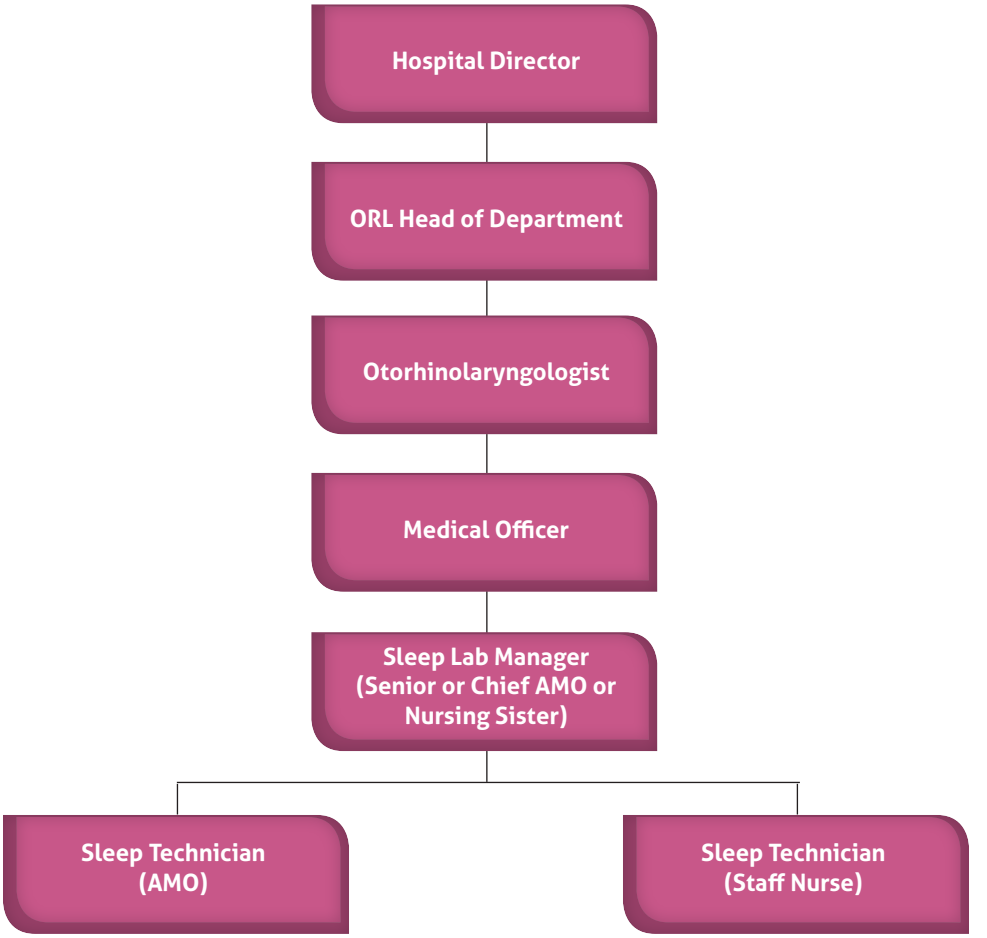
12.6 To establish National Sleep Medicine/Disorder committee to coordinate a standardised ORL sleep programmes which includes training, audit and certification of personnel.

13.0

APPENDIXES

Appendix 1.0

ORGANIZATIONAL CHART



Appendix 2.0

ORL SLEEP SERVICE BIODATA FORM

DEMOGRAPHICS:

NAME: …… NRIC: …….....

RN: …… AGE: ……. GENDER .....CONTACT NUMBER: …….....

CHIEF COMPLAINT:

……
……
……....

OSA SYMPTOMS

- LOUD SNORING
- APNOEA
- CHOKING
- MORNING HEADACHE
- DRY MOUTH
- SOMNOLENCE
- IRRITABLE/ MOOD INSTABILITY
- ENEURESIS
- TIREDNESS
- PRONE TO ACCIDENT
- NIGHT SWEATING
- HYPERACTIVE- CHILDREN
- IMPOTENCE
- OTHERS (SPECIFY) …….

MEDICAL HISTORY:

……
……
……....

SOCIAL HISTORY:

OCCUPATION :……

SMOKING : YES/NO

ALCOHOL : YES/NO

Use the following scale to choose the most appropriate number for each situation:
0 = would never doze
1 = slight chance of dozing
2 = moderate chance of dozing
3 = high chance of dozing

ESS Score: > 10 risk of OSA

	SCORE
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g. a theatre or in a meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after lunch without alcohol	
In a car, while stopped for a few minutes in traffic	

EPWORTH SLEEPINESS SCALE
Total score:…….

STOP BANG QUESTIONARE

S	Snoring: Do you snore loudly (louder than talking or loud enough to be heard through closed doors?)	Y	N
T	Tired: Do you often feel tired, fatigued or sleepy during the day time?	Y	N
O	Observed: Has anyone observed you stop breathing during your sleep?	Y	N
P	Blood Pressure : Do you have or are you being treated for high blood pressure?	Y	N
B	BMI : BMI more than 35kg/m2	Y	N
A	Age : Age over 50 years	Y	N
N	Neck circumference : Neck circumference greater than 40cm	Y	N
G	Gender : Male	Y	N

For general population:

Low Risk : Yes to 0 - 2 questions
Intermediate Risk : Yes to 3 – 4 questions
High Risk :
Yes to 5 - 8 questions
or
Yes to 2 or more of 4 STOP questions + male gender
or
Yes to 2 or more of 4 STOP questions + BMI >35kg/m2
or
Yes to 2 or more of 4 STOP questions + neck circumference 17 inches / 43cm in male or 16 inches / 41cm in female

PHYSICAL EXAMINATION:

WEIGHT : ……
HEIGHT: ……
BMI: ……..
NECK CIRCUMFERENCE: ……
WAIST CIRCUMFERENCE: ……
DATE OF PSG: …….....
GENERAL EXAMINATION:
i)Blood Pressure.....
ii)Pulse Rate.....
iii)Cardiovascular.....
iv)Respiratory.....
v)GI system.....

CRANIOFACIAL EXAMINATION:

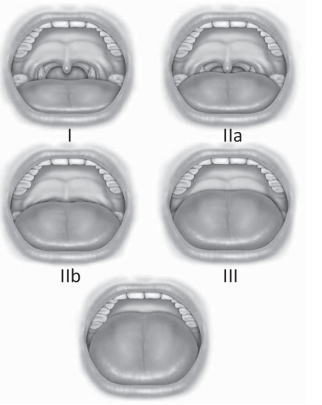
…….....

UPPER AIRWAY EXAMINATION:

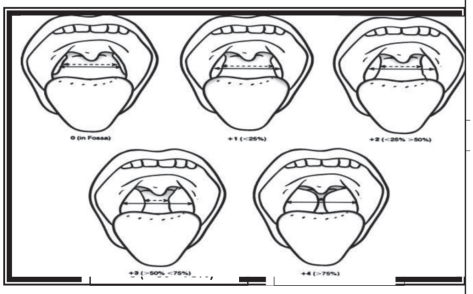
i) Adenoids:
……
ii) Turbinates:
……
iii) Septum:
……..
iv) Nasal polyp/mass:
Grade:……

vi) TONGUE:

(FRIEDMAN CLASSIFICATION)



vii) TONSILS
(BRODSKY CLASSIFICATION)



MULLER'S MANUEVER & DRUG INDUCE SLEEP ENDOSCOPY: VOTE CLASSIFICATION

Table 1 The VOTE classification

STRUCTURE	DEGREE OF OBSTRUCTION[a]	CONFIGURATION[c]		
		A-P	LATERAL	CONCENTRIC
Velum				
Oropharynx lateral walls[b]				
Tongue Base				
Epiglottis				

INVESTIGATIONS:

Sleep Endoscopy
Date:……
Result:……..
……..
……..

Blood investigation:

- FBC:…….
- FSL:…….
- RP:……..
- FBS:……..

Echocardiography:……
……..
……..

Imaging:……

SLEEP STUDY RESULT
Date:……

I. Sleep Efficiency:……
II. AHI:……
III. RDI:……
IV. ODI:……
V. Minimal SpO_2:……
VI. Baseline O_2 saturation:……..
VII. Others:……

Item	DATE	DATE	DATE	DATE	DATE	DATE	DATE	MANAGEMENT /REMARKS
Weight								
Bmi								
Neck Circumference								
Waist Circumference								
Ess Score								
Sleep Study								
Pulse Oxymetry								
Dise								
Dietician								
Physiotherapy								
Combine Clinic								
Cpap Trial								
Pap Nap								
*Cpap Funding: *Specify Date/ Source Of Funding/Model &Price*								
Date Of Cpap Comencement								
Cpap Compliance								
Surgery: *Specify Date/ type of Surgery*								
Group Therapy/ Counselling								
Referrals To Relevant Department: *Specify Date*								
Others								

ORL SLEEP SERVICE
OUTPATIENT PROGRESS AND SUMMARY

Appendix 3.0

Instructional Brochure for Sleep Study Page 1

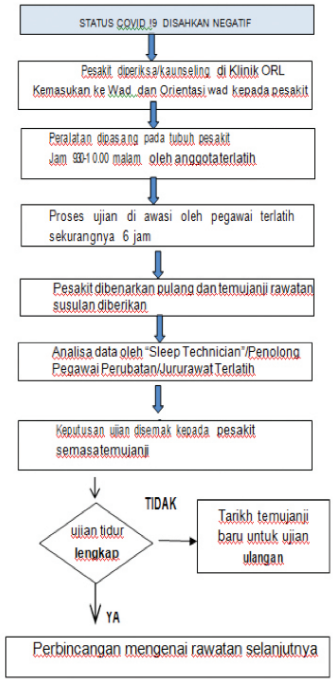
UJIAN ANALISA TIDUR

- Mesin Polysomnogram (PSG) adalah alat khas yang digunakan dalam Ujian Analisa Tidur "Sleep Study"
- Kajian ini di wad pada waktu malam di antara jam 09.30 malam — 6.30 pagi (8-9jam) atau sekurang-kurangnya 6 jam.
- Tujuan Ujian untuk mengesan penyakit pernafasan semasa tidur supaya rawatan awal dapat dilakukan.

KELENGKAPAN UJIAN

- Dilengkapi katil size queen dan tilam yang selesa.
- Lampu tidur yang boleh dimalapkan.
- Selimut dan comforter disediakan.
- Bantal disediakan.
- Bilik berhawa dingin yang boleh dikawal.
- Tandas yang lengkap dengan shower.

CARTA ALIRAN "SLEEP STUDY"



PROSES PEMASANGAN PERALATAN SLEEP STUDY

Pemasangan elektrod pada kepala pesakit

Pemasangan mesin PSG

Selesai pemasangan dan ujian dimulakan

Appendix 3.0

Instructional Brochure for Sleep Study Page 2

PERHATIAN

PERKARA YANG BOLEH & TIDAK BOLEH DILAKUKAN

BOLEH	TIDAK BOLEH
Bawa ubatan sekiranya ada seperti darah tinggi, kencing manis dan lain-lain	Jangan ambil minuman kafien, teh, kopi dan minuman bergas
Bawa barang keperluan asas dan yang biasa digunakan semasa tidur Bagi kanak kanak, saperti seperti bantal, anak patung	Jangan tidur waktu siang
Pakaian tidur yang selesa dan sopan beserta *mask*.	Dilarang menghisap rokok

PERINGATAN

Sekiranya Anda mengalami gejala selsema atau tidak sihat, sila terus mendapatkan pemeriksaan di klinik berdekatan, dan dapatkan temujanji **UJIAN ANALISA TIDUR** yang baru.

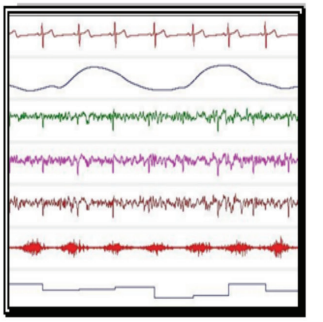
Kami Sedia Membantu

Disediakan oleh
PERKHIDMATAN
OTORINOLARINGOLOGI
KEMENTERIAN KESIHATAN
MALAYSIA

PERKHIDMATAN PERMASAALAHAN TIDUR
JABATAN OTORINOLARINGOLOGI

PERSEDIAAN PESAKIT MENJALANI

UJIAN 'SLEEP STUDY'



Appendix 4.0

PER/CONSENT/2016

Sleep Study Consent Form

KEIZINAN PEMBEDAHAN/PROSEDUR

Saya, _ beralamat _ dengan ini bersetuju dan memberi keizinan untuk:

* (A) menjalani pembedahan/prosedur_ _
* (B) menyerahkan *anak/jagaan saya, _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _, No. KP/ID _ _ _ _ _ _ _ _ _ _ _ _
Untuk menjalani pembedahan/prosedur_ _

di bawah (jenis anestesia) *anesthesia umum/setempat/lain-lain_ yang maklumat/tatacara, tujuan dan risikonya telah diterangkan kepada saya oleh Dr. _ _ _ _ _ _ _ _ _ _ melalui penterjemah (jikaada) _ _ _ _ _ _ _ _ _ _ _ _ _. Saya mengaku bahawa saya faham akan penerangan yang diberikan dengan sepenuhnya dan saya juga faham ebab, akibat dan risiko pembedahan/prosedur berkenaan.

Saya juga bersetuju dan memberi keizinan untuk sebarang pembedahan/prosedur tambahan atau alternative sebagaimana yang didapati perlu semasa pembedahan/prosedur tersebut di atas dan pemberian anestesia umum, setempat atau lain-lain bagi tujuan ini.

Tidak ada jaminan yang telah diberi kepada saya bahawa pembedahan/prosedur/rawatan bius itu akan dijalankan oleh mana-mana pengamal tertentu.

Ditandatangani : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
(*Pesakit/Ibu/Bapa/Penjaga)
Hubungan/Tali Persaudaraan: _ _ _ _ _ _ _ _ _ _ _
No. KP/ID : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Tarikh : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Peringatan:
Keizinan Pembedahan/ Prosedur dan Lampiran A hendaklah ditandatangani oleh individu yang sama.
Cap Jawatan :

Peringatan: Sebarang pindaan kepada borang ini hendaklah dibuat sebelum penerangan diberi dan borang dikemukakan untuk ditandatangani.

Saksi:
Tandatangan : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Nama : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
No. KP/ID : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Jawatan : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Tarikh : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Penterjemah (jikaada):
Tandatangan : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
No. KP/ID : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Tarikh : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Bahasa yang digunakan : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Saya mengakui bahawa saya telah menerangkan maklumat/tatacara, tujuan dan risiko pembedahan/prosedur ini kepada *pesakit/ibu/bapa/penjaga.

Ditandatangani: _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
(Pengamal *Perubatan/Pergigian)
No. MPM : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Tarikh : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Nama Pesakit : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
No. MRN :

Peringatan:
Keizinan Pembedahan/Prosedur dan Lampiran A hendaklah ditandatangani oleh individu yang sama.
Cap Jawatan :

Peringatan: Sebarang pindaan kepada borang ini hendaklah

Appendix 4.0

PER/CONSENT/2016

Sleep Study Consent Form

KEIZINAN PEMBEDAHAN/PROSEDUR

Saya, _____ beralamat _____
_____ dengan ini bersetuju dan memberi keizinan untuk:

* (A) menjalani pembedahan/prosedur_____ _____
* (B) menyerahkan *anak/jagaan saya, _____, No. KP/ID _____
Untuk menjalani pembedahan/prosedur_____

di bawah (jenis anestesia) *anesthesia umum/setempat/lain-lain_____
yang maklumat/tatacara, tujuan dan risikonya telah diterangkan kepada saya oleh Dr. _____ melalui penterjemah (jikaada) _____. Saya mengaku bahawa saya faham akan penerangan yang diberikan dengan sepenuhnya dan saya juga faham ebab, akibat dan risiko pembedahan/prosedur berkenaan.

Saya juga bersetuju dan memberi keizinan untuk sebarang pembedahan/prosedur tambahan atau alternative sebagaimana yang didapati perlu semasa pembedahan/prosedur tersebut di atas dan pemberian anestesia umum, setempat atau lain-lain bagi tujuan ini.

Tidak ada jaminan yang telah diberi kepada saya bahawa pembedahan/prosedur/rawatan bius itu akan dijalankan oleh mana-mana pengamal tertentu.

Ditandatangani : _____
(*Pesakit/Ibu/Bapa/Penjaga)
Hubungan/Tali Persaudaraan: _____
No. KP/ID : _____
Tarikh : _____

Peringatan:
Keizinan Pembedahan/ Prosedur dan Lampiran A hendaklah ditandatangani oleh individu yang sama.
Cap Jawatan :

Peringatan: Sebarang pindaan kepada borang ini hendaklah dibuat sebelum penerangan diberi dan borang dikemukakan untuk ditandatangani.

Saksi:
Tandatangan : _____
Nama : _____
No. KP/ID : _____
Jawatan : _____
Tarikh : _____

Penterjemah (jikaada):
Tandatangan : _____
No. KP/ID : _____
Tarikh : _____
Bahasa yang digunakan : _____

Saya mengakui bahawa saya telah menerangkan maklumat/tatacara, tujuan dan risiko pembedahan/prosedur ini kepada *pesakit/ibu/bapa/penjaga.

Ditandatangani: _____
(Pengamal *Perubatan/Pergigian)
No. MPM : _____
Tarikh : _____
Nama Pesakit : _____
No. MRN :

Peringatan:
Keizinan Pembedahan/Prosedur dan Lampiran A hendaklah ditandatangani oleh individu yang sama.
Cap Jawatan :

Peringatan: Sebarang pindaan kepada borang ini hendaklah

No. KP/ID : _____
Jantina : _____
Tarikh : _____

Lampiran A: **Penjelasan tentang pembedahan/prosedur** _____
_____

Maklumat/Tatacara:

_____
_____
_____
_____
_____

Tujuan:

_____
_____
_____

Risiko:

1. _____
2. _____
3. _____
4. _____
5. _____

Nota penjelasan tambahan yang diberi (jikaada) bertajuk: _____
_____

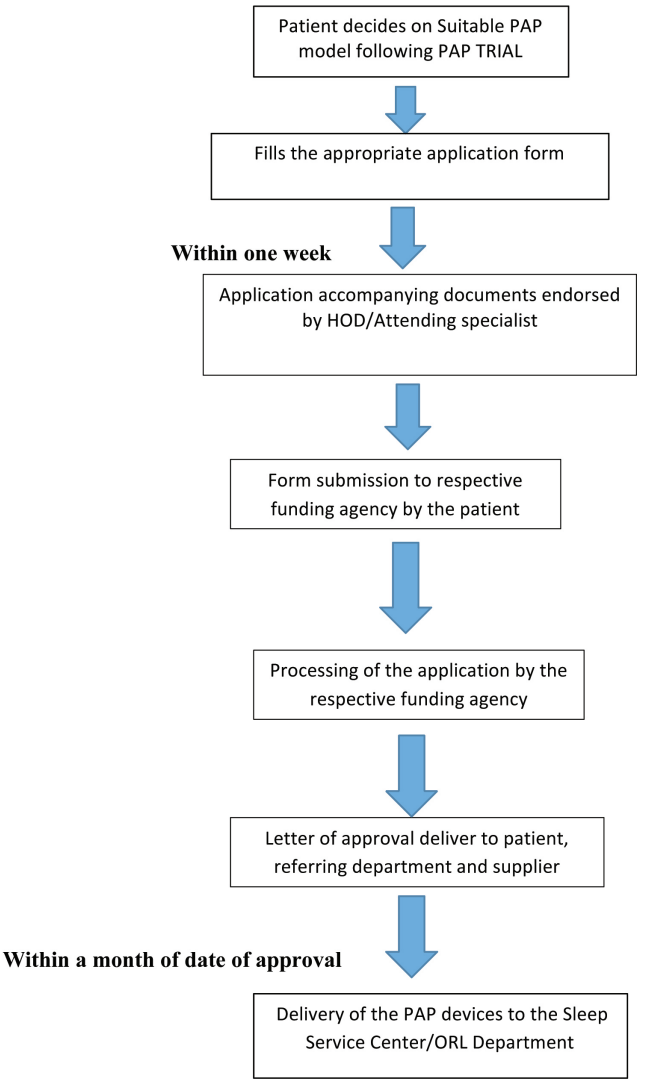
Tandatangan *Pesakit/Ibu/Bapa/Penjaga:

_____

Peringatan: Keizinan Pembedahan/Prosedurdan Lampiran A hendaklah di tandatangani oleh individu yang sama.
Cap Jawatan :

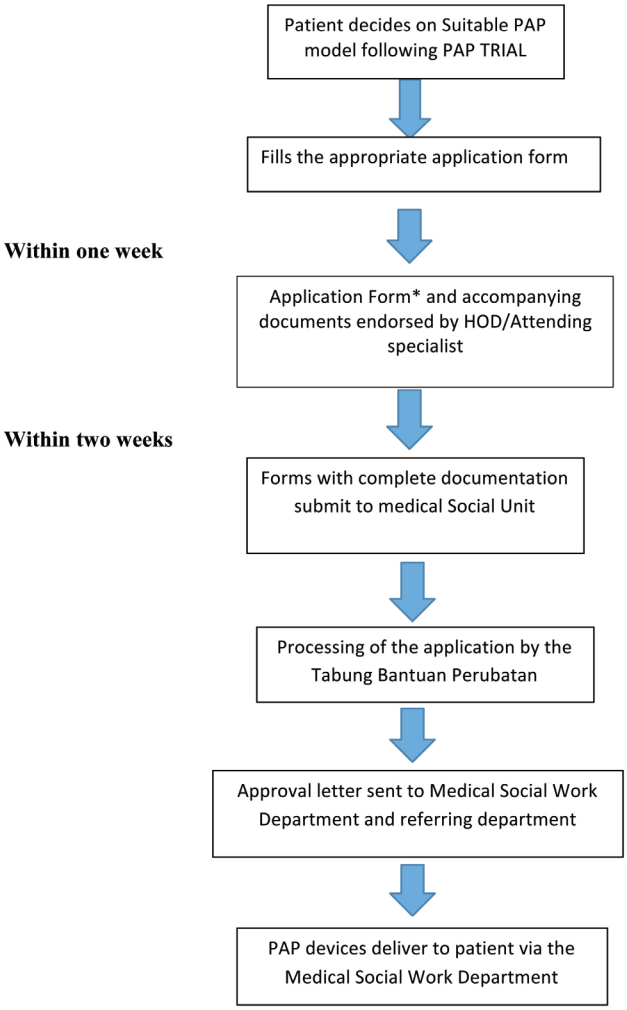
Appendix 5.0

NON-WELFARE FUNDING FLOW CHART FOR PROCUREMENT OF PAP MACHINE (ie JPA, EPF, SOCSO, ATM, Universities etc)



Appendix 6.0

FLOW CHART FOR PROCUREMENT OF PAP MACHINE FROM MEDICAL AID FUND (TABUNG BANTUAN PERUBATAN)



**Appendix 7.0 for Application checklist*

Appendix 7.0

SENARAI SEMAK KEPERLUAN DOKUMEN BAGI PERMOHONAN MESIN CPAP MELALUI TABUNG BANTUAN PERUBATAN & SOKONGAN JABATAN PERKHIDMATAN AWAM

TABUNG BANTUAN PERUBATAN

1. Borang Rujukan ke Perkhidmatan Kerja Sosial Perubatan
2. Borang C :Laporan dan Pengesahan Pegawai Perubatan/ Pakar termasuk diagnosis dan latar belakang pesakit beserta maklumat berikut:
    - o BMI
    - o AHI
    - o AHI AFTER CPAP TRIAL
    - o CO MORBID
    - o Lampiran *Sleeps Study Result* (PSG)
    - o Lampiran CPAP *Trial* ≥ 5 hari beserta laporan lengkap keberkesanan penggunaan
    - o Sebut harga alatan CPAP*(mestilah sama seperti model CPAP yang digunakan semasa sesi "CPAP trial")*

JABATAN PERKHIDMATAN AWAM

1. Borang Perbelanjaan Kemudahan Perubatan Dibawah Pekeliling Perkhidmatan Bil 21/ Tahun 2009 Borang Perubatan 1/09.

2. Borang 1/09 – Diagnosis dan latar belakang pesakit beserta maklumat berikut:
    - • BMI
    - • AHI
    - • AHI AFTER CPAP TRIAL
    - • CO MORBID
    - • Lampiran *Sleeps Study Result* (PSG)
    - o Lampiran CPAP Trial minimal ≥ 5 hari beserta laporan lengkap keberkesanan penggunaan
    - • Sebut harga alatan CPAP *(mestilah sama seperti model CPAP yang digunakan semasa sesi "CPAP trial")*

Appendix 8.0

BORANG PENILAIAN PRESTASI PEMBEKAL UNTUK PENERIMA PAP HOSPITAL ..... , KEMENTERIAN KESIHATAN MALAYSIA

A. MAKLUMAT PEMBEKAL DAN PEROLEHAN

(*Silaisikansemuamaklumatdenganlengkap*)

Nama Syarikat : _____

Nama Penerima/Pesakit : _____

Kaedah Perolehan _____

Tarikh Penerimaan _____

B. PENILAIAN PEROLEHAN

Sila jawab bagi kategori perolehan yang berkaitan berdasarberdasarkan skala berikut :

1 = Sangat tidak memuaskan	**4 = Baik**
2 = Tidak memuaskan	**5 = Sangat Baik/Cemerlang**
3 = Memuaskan	

B1. PEROLEHAN PERKHIDMATAN

(*Sila tandakan √ bagi skor yang berkaitan*)

BIL	PERKARA	1	2	3	4	5
1	Maklumat mengenai peralatan					
2	Khidmat nasihat mengenai perkhidmatan					
3	Kesesuaian dengan kepakaran					
4	Ketepatan tarikh dan masa					
5	Kualiti perkhidmatan					
6	Pematuhan kepada spesifikasi bekalan peralatan					
7	Perkhidmatan sebelum jualan					
8	Perkhidmatan selepas jualan					
9	Memenuhi kehendak pelanggan					
10	Sikap kakitangan syarikat					
11	Keupayaan syarikat bagi perkhidmatan berkaitan					
Ulasan :						

Appendix 8.0b

BORANG PENILAIAN PRESTASI PEMBEKAL ALAT POSITIVE AIRWAY PRESSURE (PAP)

HOSPITAL:

NAMA SYARIKAT:

A) KETIDAKPATUHAN POLISI (MARKAH 50%)

BIL	KETERANGAN	YA/ DEMERIT	TIDAK	CATATAN
1	PAP dibeli tanpa PAP-NAP trial daripada pembekal dan pesakit memohon tuntutan bayaran balik daripada agensi kerajaan	-10	+10	
2	Pembekal mengambil deposit daripada pesakit yang ingin memohon dana kerajaan	-10	+10	
3	Memberikan PAP yang tidak sesuai dengan apa yang disyorkan oleh pakar yang merawat	-10	+10	
4	Melaksanakan jualan tunai tanpa khidnat nasihat pakar	-10	+10	
5	Pakej penyelenggaran PAP tidak lengkap	-10	+10	
	JUMLAH			

B) TANGGUNGJAWAB PEMBEKAL (MARKAH 30%)

BIL	PERKARA	MARKAH	CATATAN
1	**Pengurusan** – beri komitmen baik dan berterusan kepada jabatan	/10	
2	**Personel** – layanan dan komunikasi baik, kerjasama, maklum balas cepat dan tepat	/10	
3	**KhidmatPelanggan** – mudah dihubungi, mengambil perhatian terhadap masalah pesakit selepas jualan	/10	
	JUMLAH MARKAH	/30	

PENGHASILAN KERJA PEMBEKAL (MARKAH 20%)

BIL	PERKARA	MARKAH	CATATAN
1	**Harga** – menawarkan harga berpatutan	/5	
2	**Kualiti** – membekal PAP berkualiti dan memenuhi spesifikasi	/5	
3	**TepatiMasa**– membekal PAP/Aksesori pada masa yang dijanjikan	/5	
4	**KelayakanPembekal** – mempunyai kakitangan berkelayakan untuk membekal PAP	/5	
	JUMLAH MARKAH	**/20**	

PRESTASI KESULURUHAN:

A + B + C = ……/100

JUMLAH MARKAH	PRESTASI
80% dan keatas	Sangat Memuaskan
60 – 79%	Baik
50 – 59%	Sederhana
49% Kebawah	Tidak Memuaskan

Bagi prestasi<60%, atau melakukan kesalahan A1/A2/A3, pembekalakan diberi teguran bertulis dan tempoh pemerhatian bersyarat selama 3 bulan. Pembekal boleh disenaraihitamkan selama 1 tahun sekiranya masih berprestasi rendah (<60%) selepas teguran diberikan.

Bagi kesalahan A1/A2/A3 untuk kali kedua, pembekal akan terus disenarahitam selama 1 tahun

KOMEN/CADANGAN……
……
……
……
……

Disediakan oleh,

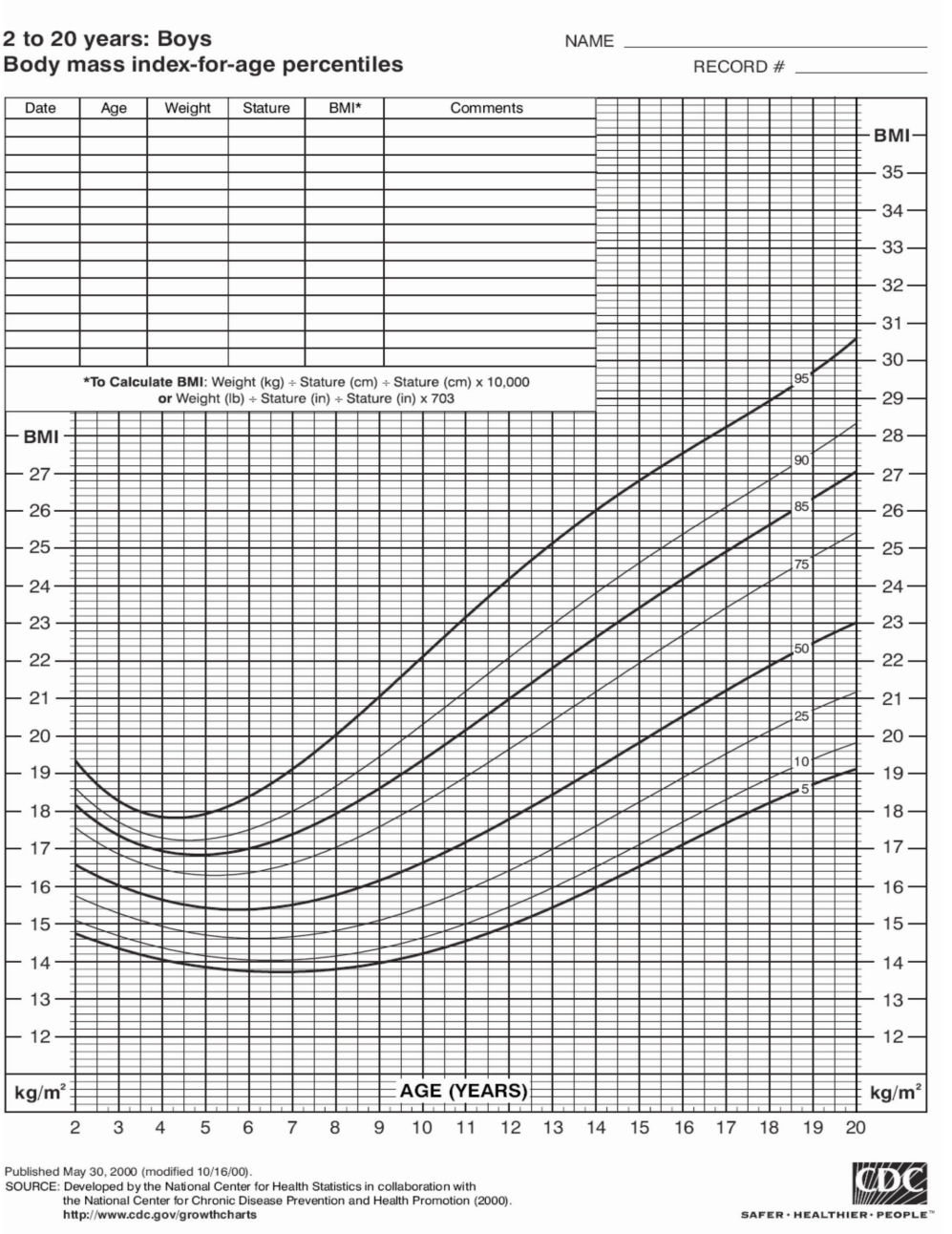
……..
(Tandatangan dan cop pegawai)

Disahkan oleh,

……
(Tandatangan dan cop pegawai)

Appendix 9a-b

PAEDIATRIC GROWTH CHART



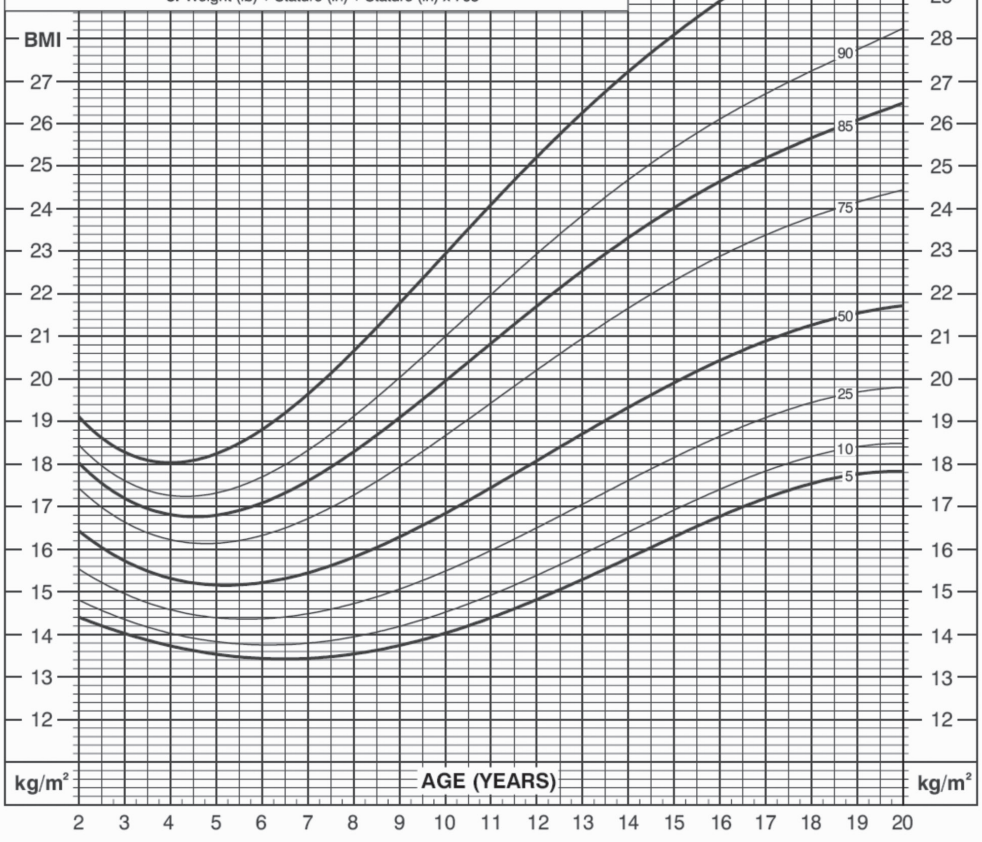
2 to 20 years: Girls
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

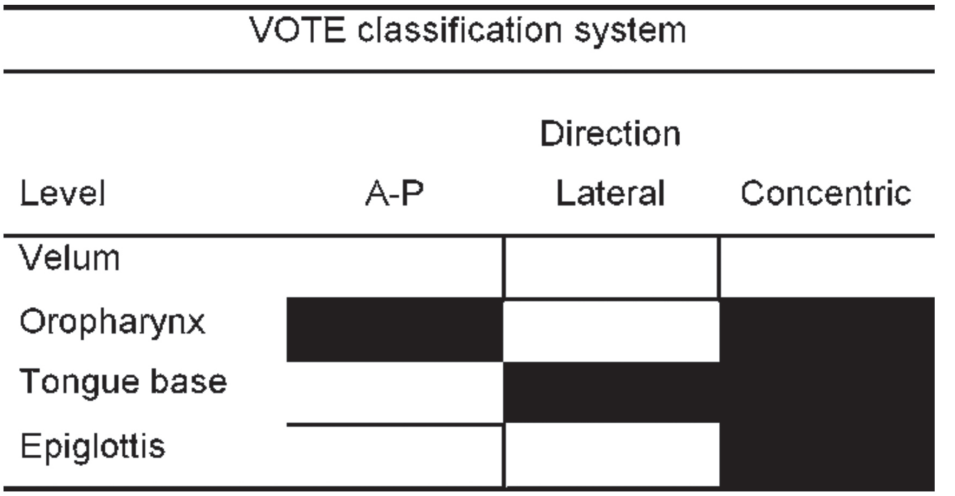
***To Calculate BMI:** Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

CDC
SAFER · HEALTHIER · PEOPLE™

Appendix 10.0VOTE classification



**E. J. Keziran at el, Drug-induce sleep endoscopy: the VOTE classification, Eur Arch ORL 2011 268: 1233-1236*

Appendix 11.0

Pamplet informasi Kesihatan Page 1

Obstructive Sleep Apnea Syndrome

(OSAS)

BERDENGKUR & SINDROM TIDUR BERAPNEA

Berdengkur adalah pernafasan berbunyi semasa tidur. Ia disebabkan oleh **saluran pernafasan sempit** di bahagian hidung atau kerongkong.Berdengkur boleh mengganggu kualiti tidur anda.Ia boleh membahayakan, jika pernafasan tersumbat semasa tidur.

Keadaan ini di panggil **SINDROM TIDUR BERAPNEA** atau ***"OBSTRUCTIVE SLEEP APNOEA SYNDROME" (OSAS).***

Apnea bermaksud pernafasan berhenti melebihi10 saat semasa tidur.

Pesakit yang mengalami OSAS mengalami kesukaran bernafas semasa tidur dan akan sering terjaga . Ini akan menyebabkan pesakit mengantuk disiang hari dan berasa letih.
Di Malaysia prevalen OSAS dianggarkan 2-4%.

SIAPA BERISIKO UNTUK MENDAPAT OSAS?

- Obesiti : Tisu Lemak Menyempitkan Salur Pernafasan.
- Leher Yang Pendek Serta Gemuk
- Lidah Yang Besar
- Kelenjar Tonsil/Adenoid Besar
- Hidung Tersumbat
- Rahang Yang Kecil

APAKAH PETANDA OSAS?

Dewasa
•Berdengkur
•Nafas Terhenti Semasa Tidur.
•Mengantuk Di Waktu Siang /Tertidur Semasa Memandu Atau Semasa Bekerja
• Keletihan, Cepat Marah, Kemurungan
•Sakit Kepala Di Waktu Pagi
• Kerap Kencing Malam
•Kegagalan Fungsi Seksual

Kanak-kanak
•Tidur Yang Lasak Dan Kerap Bertukar Posisi
•Kencing Malam
•Hyperaktif/Gangguan Tingkahlaku
•Kurang Tumpuan Menyebabkan Pelajaran Merosot.
•Masaalah Berat Badan

BAGAIMANAKAH UNTUK MENGESAN OSAS?

1.Pemerhatian Semasa Tidur Oleh Ibubapa / Suami /Isteri/Rakan/Kaum Keluarga.

2.Analisa Epworth Sleepiness Scale (ESS) Atau Lain Skala Yg Berkaitan

3. Analisa Overnight Pulae Oxymetry/ Lain Analisa Yg Berkaitan

4. Menjalani Ujiam Analisa Tidur(Sleep Study Analysis)

EPWORTH SLEEPINESS SCALE (ESS)

Berapakah skor anda?

Kemungkinan mudah Terlelap
(Skor 0-3)
0- tidak terlelap
1- Boleh terlelap
2- Mudah terlelap
3- Sangat mudah terlelap

Kemungkinan terlelap	Skor
Duduk dan membaca	
Menonton TV	
Duduk di tempat awam (mesyuarat)	
Penumpang kereta selama sejam tanpa berhenti	
Semasa baring atau berehat waktu tengahari	
Semasa duduk berbual	
Duduk sendirian selepas makan	
Semasa memandu / berhenti di lampu isyarat	
*Jumlah keseluruhan	

Jika Skor anda lebih dari 10, Anda perlu mendapat Khidmat nasihat Doktor segera

Appendix 11.0

Pamplet informasi kesihatan Page 2

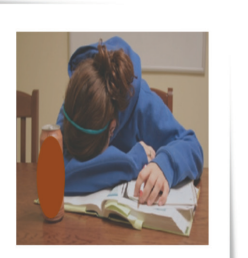
Obstructive Sleep Apnea Syndrome

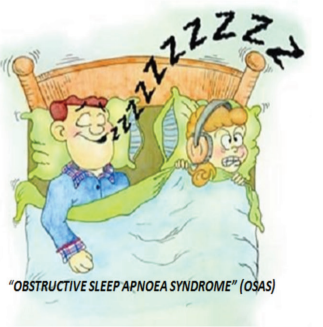
(OSAS)

APA BERLAKU JIKA OSAS TIDAK DIRAWAT?

- Serangan Dan Komplikasi Jantung
- Arrythmia - Denyutan Jantung Tidak Stabil
- Angin Ahmar
- Darah Tinggi
- Risiko Kemalangan.
- Mati Pucuk
- Gangguan Emosi/Tingkahlaku
- Prestasi Pembelajaran/Kerja Menurun

BERDENGKUR
&
SINDROM
TIDUR
BERAPNEA





MERBAHAYA

APAKAH RAWATAN OSAS?

•Mesin Cpap

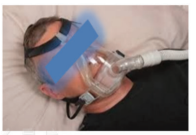
Mesin CPAP *(Continous Positive Airway Pressure)*Membantu Membuka Ruang Pernafasan Semasa Tidur.

•Amalan Cara Hidup Sihat

- oPengawalan Berat Badan Yang Ideal
- oElakkan Makan Berlebihan
- oTabiat Makanan Sihat Dan Seimbang
- oMenjauhi Minuman Beralkohol

•Pembedahan

- oTonsillektomi
- oAdenoidektomi
- oSeptoturbinoplasty
- oPembedahan Lidah Dan Lelangit
- oPembedahan Kerangka Tulang Muka/Leher (Bony Framework)



Disediakan Oleh
Perkhidmatan Otorinolaringologi
Kementerian Kesihatan Malaysia

Utamakan Kesihatan
Sihat Sepanjang Hayat

Kami Sedia Membantu

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