**Identification of Sleep Medicine and Anesthesia Core Topics for Anesthesia Residency – A Modified Delphi Technique Survey**

**Round 1:**

**Invitation to Participate in a Survey Study:**

You are invited to participate in a research project. This research project involves a two-step survey seeking to identify the core topics of **Sleep Medicine** that should be included in the **Core Curriculum for Anesthesia Residency Training**. As an expert in the field, your participation is paramount for the successful completion of this endeavour.  
  
This online survey should take approximately **5 minutes** of your time.   
  
The results from this study may have a significant positive impact on the development of a Sleep Medicine Core Curriculum for Anesthesia Residency Training. It may help lead to improvements in the anesthetic management of patients with sleep related disorders undergoing anesthesia and increase patient safety.  
  
Your consent to participate in this study will be assumed upon completion and submission of this survey. Your participation is voluntary and you can withdraw from the study at any time by simply closing your browser and not submitting the questionnaire.   
  
Thank you very much for your support in making this a success,  
  
Dr. Frances Chung, MBBS, FRCPC (Principal Investigator)  
Toronto Western Hospital, University Health Network

University of Toronto  
[Frances.chung@uhn.ca](mailto:Frances.chung@uhn.ca)

**Demographic Information:**

**1. What is your sex?**

|  |
| --- |
| 🔾 Male |
| 🔾 Female |
| 🔾 Other |
| 🔾 Prefer not to say |

**2. What is your specialty?**

|  |
| --- |
| 🔾 Anesthesia |
| 🔾 Sleep Medicine |
| 🔾 Internal Medicine |
| 🔾 Hospitalist |
| 🔾 Respirology |
| 🔾 Otolaryngology |
| 🔾 Neurology |
| 🔾 Family Medicine |
| 🔾 Surgery |
| 🔾 Respiratory Therapist |
| 🔾 Other (please specify:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) |
| 🔾 Prefer not to say |

**3. How many years have you been in practice?**

|  |
| --- |
| 🔾 0-10 |
| 🔾 11-20 |
| 🔾 21-30 |
| 🔾 31-40 |
| 🔾 40+ |
| 🔾Prefer not to say |

**4. What is the location of your practice?**

|  |
| --- |
| 🔾 Canada |
| 🔾 United States |
| 🔾 Europe |
| 🔾 Other (please specify:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 🔾 Prefer not to say |

**Proposed Curriculum Topics:**

In your opinion, which of the following topics and subtopics on Sleep Medicine should be included in the Core Curriculum of every Anesthesia Residency Program?

**5. Definition and physiology of sleep:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Sleep stages and sleep cycle | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Circadian rhythms | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Overview of functional neuroanatomy of sleep | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Cardiovascular and respiratory regulation during sleep |  |  |  |  |  |

**6. Pharmacology and sleep**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Hypnotic medications: mechanisms of action and pharmacologic effects | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Wake-promoting medications: mechanisms, efficacy and adverse events | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Potential interactions with anesthetic agents | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Influence of opioids and anesthetics on control of breathing and upper airway obstruction | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**7. Sleep physiology and anesthesia**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Similarities and differences between sleep, anesthesia, and coma | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| EEG activity in sleep stages and anesthesia | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Effects of anesthetic drugs on respiratory control | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Effects of sleep and anesthesia on upper airway patency | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Sleep and circadian rhythm in the preoperative period | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Pain, analgesia, and sleep | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Effects of anesthesia and surgery on sleep and circadian rhythms | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**8. Effects of anesthesia and surgery on sleep and circadian rhythms**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Acute and chronic sleep deprivation | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Interaction between sleep deprivation and anesthesia | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**9. Methods to assess sleep**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Sleep-related history and physical examination | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Questionnaires and scales (STOP-BANG, the Berlin Questionnaire, Epworth sleepiness scale etc.) | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Actigraphy, Respiratory Polygraphy, Polysomnography | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Potential methods to use in the perioperative setting | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**10. Obstructive sleep apnea (OSA)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Definition, epidemiology and risk factors | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Clinical presentation | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Anesthetic considerations | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| OSA in children and pregnant patients | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Pathophysiology of upper airway collapse in OSA | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Co-morbidities and complications | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Treatment options (surgery, CPAP and oral appliances) | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Perioperative guidelines and management | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**11. Central sleep apnea and periodic breathing**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Definition, epidemiology and risk factors | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Clinical presentation | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Anesthetic considerations | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Treatment | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Perioperative management | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**12. Obesity hypoventilation syndrome**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Definition, epidemiology and risk factors | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Clinical presentation | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Anesthetic considerations | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Perioperative implications and management | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**13. Anesthetic implications of other sleep disorders**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Overview and anesthetic implications of non-respiratory sleep disorders | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Central disorders of hypersomnolence: Narcolepsy | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Central disorders of hypersomnolence: Idiopathic hypersomnia | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Circadian rhythm sleep-wake disorders | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Parasomnias | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Restless legs syndrome | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**14. Sleep in he hospialized patient:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Implications of sleep disturbances to patient health | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Sleep hygiene in perioperative and critical care setting | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Sleep and strategies to improve sleep in ICU | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Pain, analgesia, and disrupted sleep | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**15. Impact of sleep deprivation on physician wellness**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Performance deficit during sleep deprivation | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Strategies for good sleep hygiene | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Sleep, stress, and burn out | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Effects of shift work on sleep | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**16. Are there any topics NOT listed in this survey that should be included in the Sleep Medicine and Anesthesia Core Curriculum for Anesthesia Residency?**

**Submission**

You have now completed the survey. Your consent to participate in this study is implied upon completion and submission of this survey.

**Thank You!**

Thank you for taking the time to complete Part 1 of “Development of a Sleep Medicine and Anesthesia Core Curriculum for Anesthesia Residency – A Modified Delphi Technique-Based Survey”. The second round of this survey will be sent to you in **4 weeks**and we anticipate this survey to be significantly shorter.    
  
Your participation in this study will help to inform the development of a sleep medicine core curriculum for anesthesia residency training and may lead to improvements in patient safety and the anesthetic management of patients with sleep related disorders. On behalf of the study team, we deeply appreciate your contribution.  
  
Thank you,  
Dr. Frances Chung, MBBS, FRCPC (Principal Investigator)  
Toronto Western Hospital, University Health Network

University of Toronto  
Frances.chung@uhn.ca

**S3: Round 02**

1. **Obstructive Sleep Apnea**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Differences between the clinical presentation of OSA in pediatric vs. adult populations | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| When questionnaires (eg. STOP-BANG, Berlin Questionnaire, Epworth Sleepiness Scale) are not applicable | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Indications and efficacy of various surgical airway modification options to treat OSA (eg. Drug Induced Sleep Endoscopy and genioglossus stimulation) | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Anesthesia for the fiberoptic diagnosis of OSA and its anatomical location | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Role of oxygen therapy in patients at risk for OSA | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

1. **Impact of Sleep Deprivation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Impact of sleep derivation on the immune system | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Impact of sleep derivation on pulmonary muscle dysfunction | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Sleep deprivation and delirium | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Effect of alcohol and other recreational drugs on sleep | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

1. **Non-invasive Ventilation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Different non- invasive ventilation modalities and their indications in sleep-disordered breathing | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| CPAP therapy compliance strategies | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Pressure considerations in sleep-disordered breathing | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Mask/interface options | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Advanced PAP therapies for complicated sleep-disordered breathing | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

1. **Peri-operative consideratins in sleep-disordered breathing**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Post-operative respiration monitoring strategies | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Pre-operative considerations in sleep-disordered breathing | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Indications for and appropriate use of high care and intensive care facilities | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Indications for Sleep Medicine consultation | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

1. **Future pathways in Sleep Medicine and Anesthesia**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Strongly Disagree** | **Somewhat**  **Disagree** | **Neutral** | **Somewhat**  **Agree** | **Strongly Agree** |
| Sleep medicine fellowship training | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Pathways to certification in Sleep Medicine | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |
| Whata Sleep Medicine practice could look like (eg. in academics vs. in private practice) | 🔾 | 🔾 | 🔾 | 🔾 | 🔾 |

**S3: Weighted mean for Likert Scale Data Calculation:**

***(x*1*w*1 + *x*2*w*2 + *x*3*w*3 ... *xnwn* ) / total number of votes**

***Where: w = weighting of answer choice  
x = number of votes for answer choice***

Formula from: https://help.surveymonkey.com/articles/en\_US/kb/Matrix-Question