

A stack of approximately ten books with various colored spines (green, brown, blue, teal, yellow, grey, light blue, dark blue, orange, and red) is positioned on the right side of the slide. The books are slightly offset, creating a sense of depth. The background is a light, neutral color.

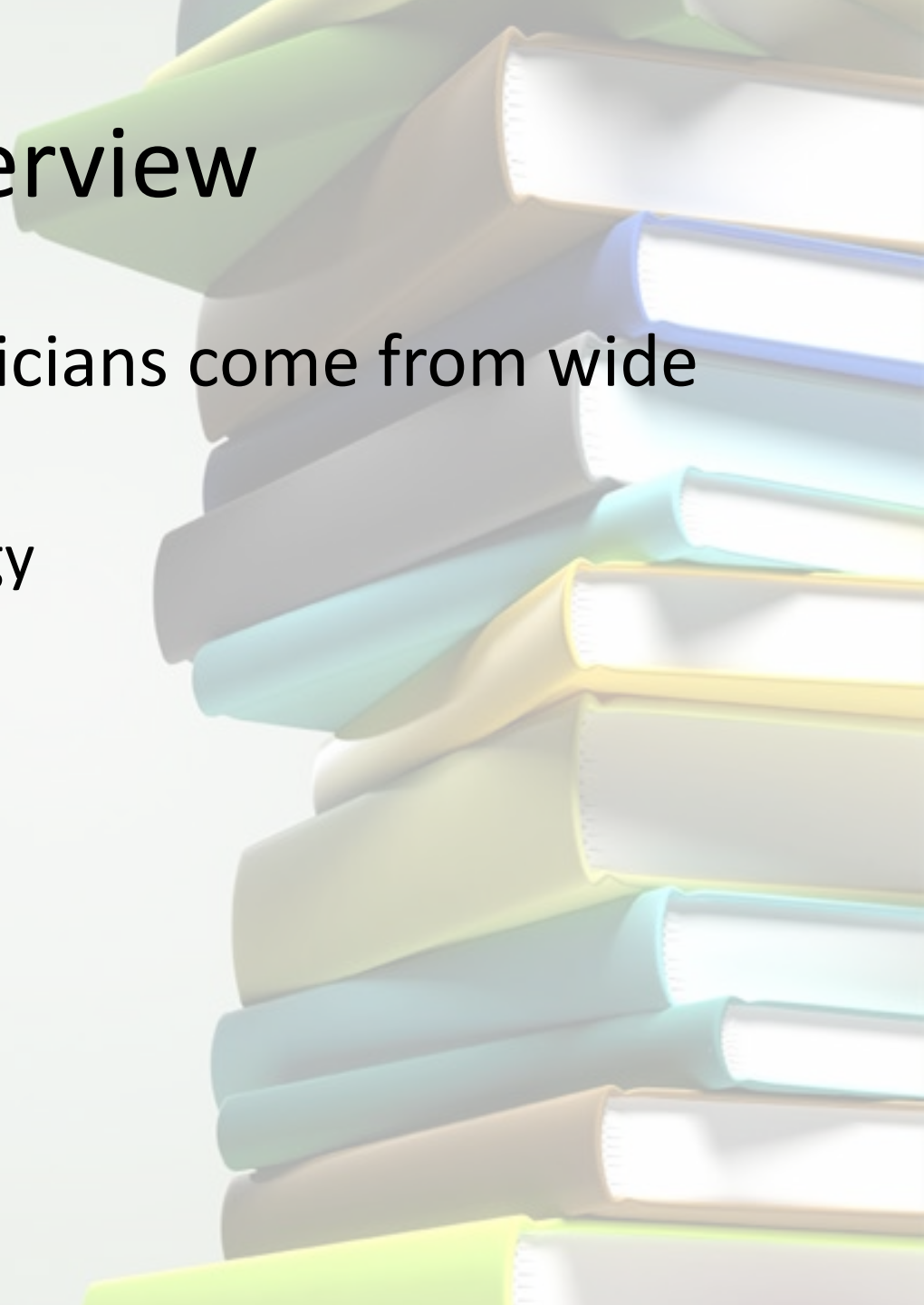
Modern Sleep Medicine

Overview

- Clinical specialty of polysomnography began in 1970
 - First sleep disorders clinic founded by William Dement at Stanford University
- Field has grown significantly since then but still significant lack of education and undiagnosed sleep disorders
- Over 1,000 sleep labs nationwide
- Over 25,000 RPSGTs worldwide

Overview

- Sleep medicine physicians come from wide range of specialties
 - Psychiatry/Psychology
 - Pulmonology
 - Neurology
 - Pediatrics
 - ENT
 - Otolaryngology



Recent Happenings in the Field

- April 2003 – Polysomnography recognized by CAAHEP and CoA PSG formed
- 2003 – First behavioral sleep medicine board exam administered
- 2003 – AMA awarded Resident Recognition of Excellence to AASM for efforts with “Sleep, Fatigue, and Medical Training” conference
- 2005 – NIH hold second consensus conference on management of insomnia

Recent Happenings in the Field

- 2007 - Juliane Winkelman found through a genome-wide association that single nucleotide polymorphisms with the BTBD9, MEIS1, and MAP2K5/LBXCOR1 region are associated with RLS. Hreinn Stefanson, David Rye, and colleagues found independently that the BTBD9 polymorphism was associated with PLMs and low ferritin levels.
- 2007 – American Board of Medical Specialties offers first exam for certification in subspecialty of sleep medicine

Recent Happenings in the Field

- 2008 – Centers for Disease Control and Prevention (CDC) establish sleep as one of its areas of interest
- 2008 – NBRC introduced SDS credential
- 2009 – BRPT developed CPSGT credential
- 2011 – American Board of Sleep Medicine introduced new credentialing exam for polysomnographic technologists, the Registered Sleep Technician (RST) exam
- 2014 – BRPT introduced CCSH credential

Recent Happenings in the Field

- 2016 – World Sleep Society is formed
- 2018 – BRPT and AAST celebrate their 40th Anniversaries
- 2019-2020 – Polysomnography loses two of its pioneers with the deaths of Christian Guilleminault (July 2019) and William Dement (June 2020)
- 2020 – SLEEP conference held virtually for the first time

Potential Setbacks

- Sleep medicine not systematically taught in medical schools
 - Med students typically receive 20 min to 2 hours of sleep education during entire time in school
- General population doesn't think of sleep problems as legitimate medical complaint

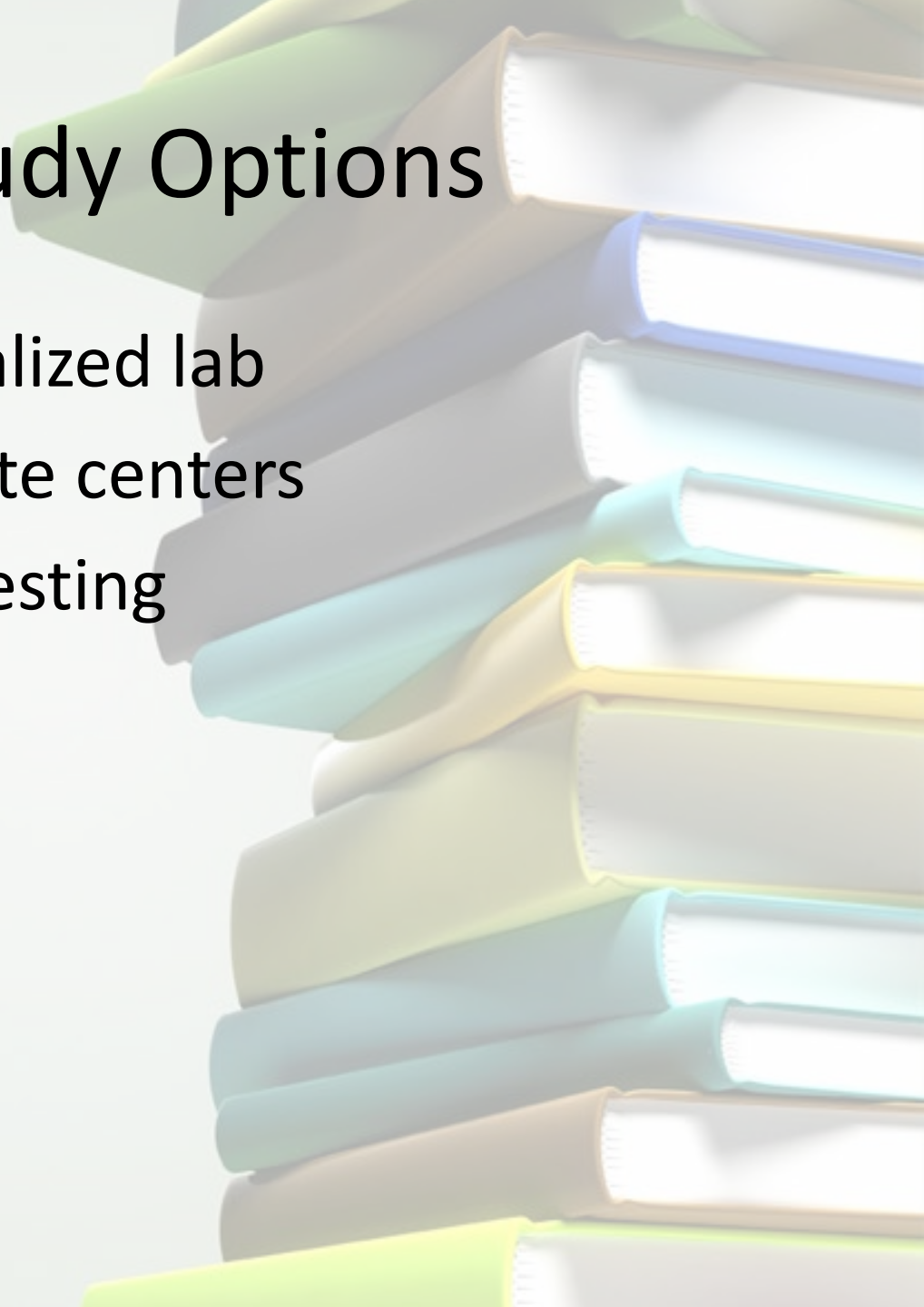
Ideal Model of Practice

- Consultation
- Physical Exam
- Polysomnographic Evaluation
- Treatment
- Follow Up / Patient Education



Sleep Study Options

- Sleep study at centralized lab
- Sleep study at satellite centers
- Home sleep apnea testing



Evolution of Sleep Studies – How It Was Done in the Past

- First studies performed on analog equipment, using paper and ink EEG machines with DC capabilities and limited channel availability
 - Well devised montages
 - Common battle scars
 - Ink-stained clothing from unclogging polygraph pens, changing broken galvanometers or ink splatter from abrupt patient movement
 - Paper cuts from keeping 15-20 lbs of paper folded and aligned from a single overnight recording

Evolution of Sleep Studies – How it was done in the Past

- Scoring performed manually
- Data tabulation done with pencil and paper
- Could hear sound of sleep spindles, REM sleep, slow wave sleep, arousals, cardiac dysrhythmias, and PLMs
- Polygraphs were large
 - 5' to 6' high, 4' wide, 2.5' to 3' deep, weighing several hundred lbs
- Storage of data expensive
 - Paper for 4 recordings cost over \$200 & required about 2.3 cubic ft of storage for 7 yrs
- Treatment commonly used was tracheotomy

Evolution of Sleep Studies – How it was done in the Past



Evolution of Sleep Studies – Modern Times

- Late 1980s-early 1990s – computer technology led to digital polysomnography
- 30-50 Mb hard drives were standard
- Raw data stored on optical media at cost of approx. \$100 per optical disc
- Processor speeds slow (<100 MHz/sec)
- Frequent computer crashes
- Waveform definition was mediocre
- Automated sleep staging and scoring algorithms very inaccurate

Evolution of Sleep Studies – Modern Times

- Late 1990s – Computer technology made digital polysomnography the rule rather than the exception
- Several hundred Gb hard drives
- Processor speeds up to several GHz/sec
- Media storage very inexpensive (<\$1/patient)
- Several years of data can be stored in space used for 1 or 2 nights worth of paper studies

Evolution of Sleep Studies – Modern Times



Evolution of Sleep Studies – Modern Times

- High quality snore sensors, thermocouples and thermistors, respiratory effort sensors
- CPAP invented in 1981 by Colin Sullivan and colleagues
 - Initial flow generators were noisy and weighed close to 16 lbs
 - Competition between manufacturers leading to smaller, less noisy flow generators and more comfortable interfaces

Evolution of Sleep Studies – Modern Times

- CPAPs now are becoming about as customizable as cell phones
 - CPAP machines now have “skins” that can make the unit more fashionable—cartoons for kids, leopard print, etc.
 - CPAP masks becoming increasingly smaller and more comfortable—different materials being used
 - Fashionable elements being used as well to encourage patient compliance—different color headgear for women, cloth masks with prints

Evolution of Sleep Studies – Modern Times

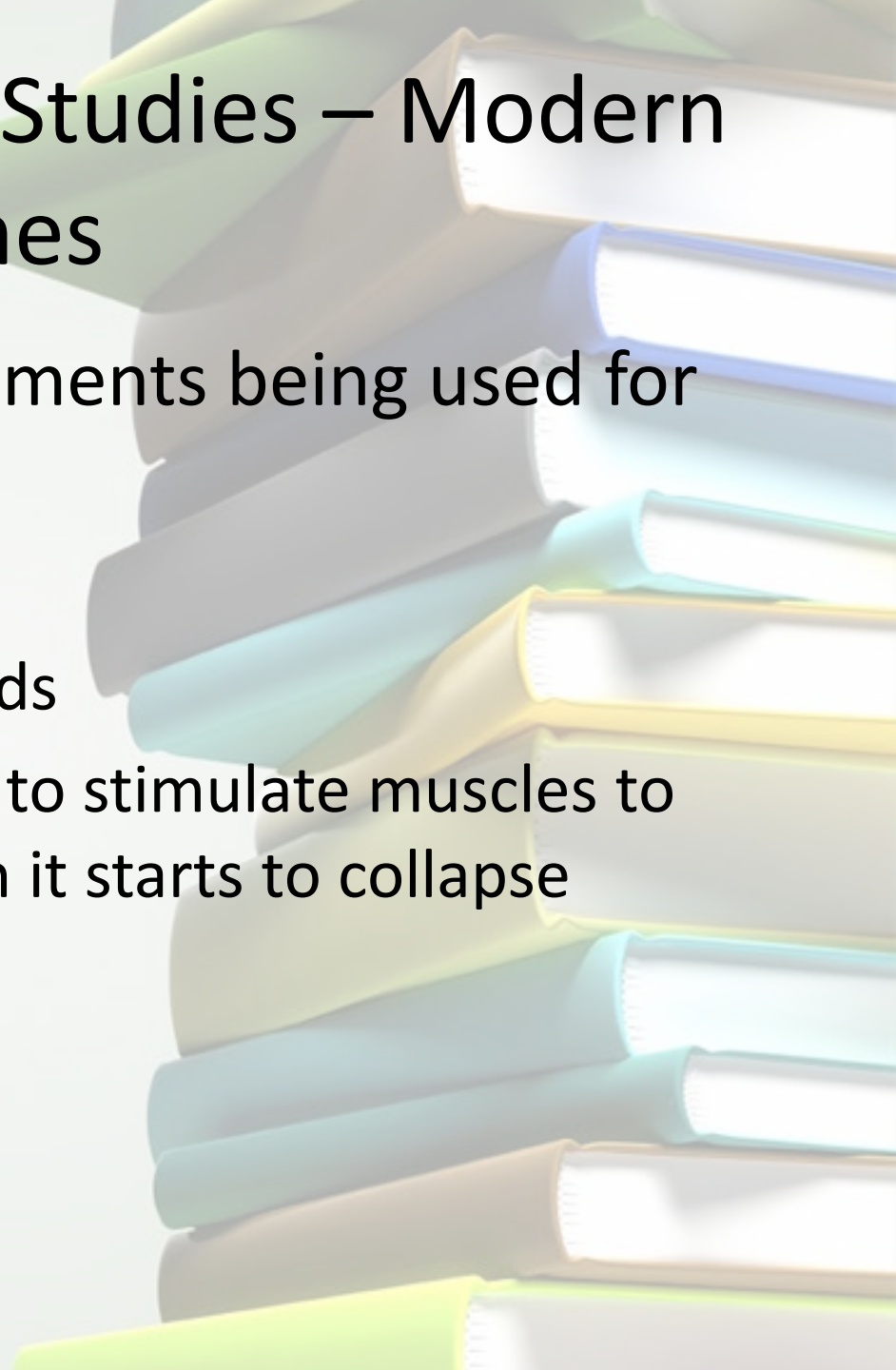


Evolution of Sleep Studies – Modern Times



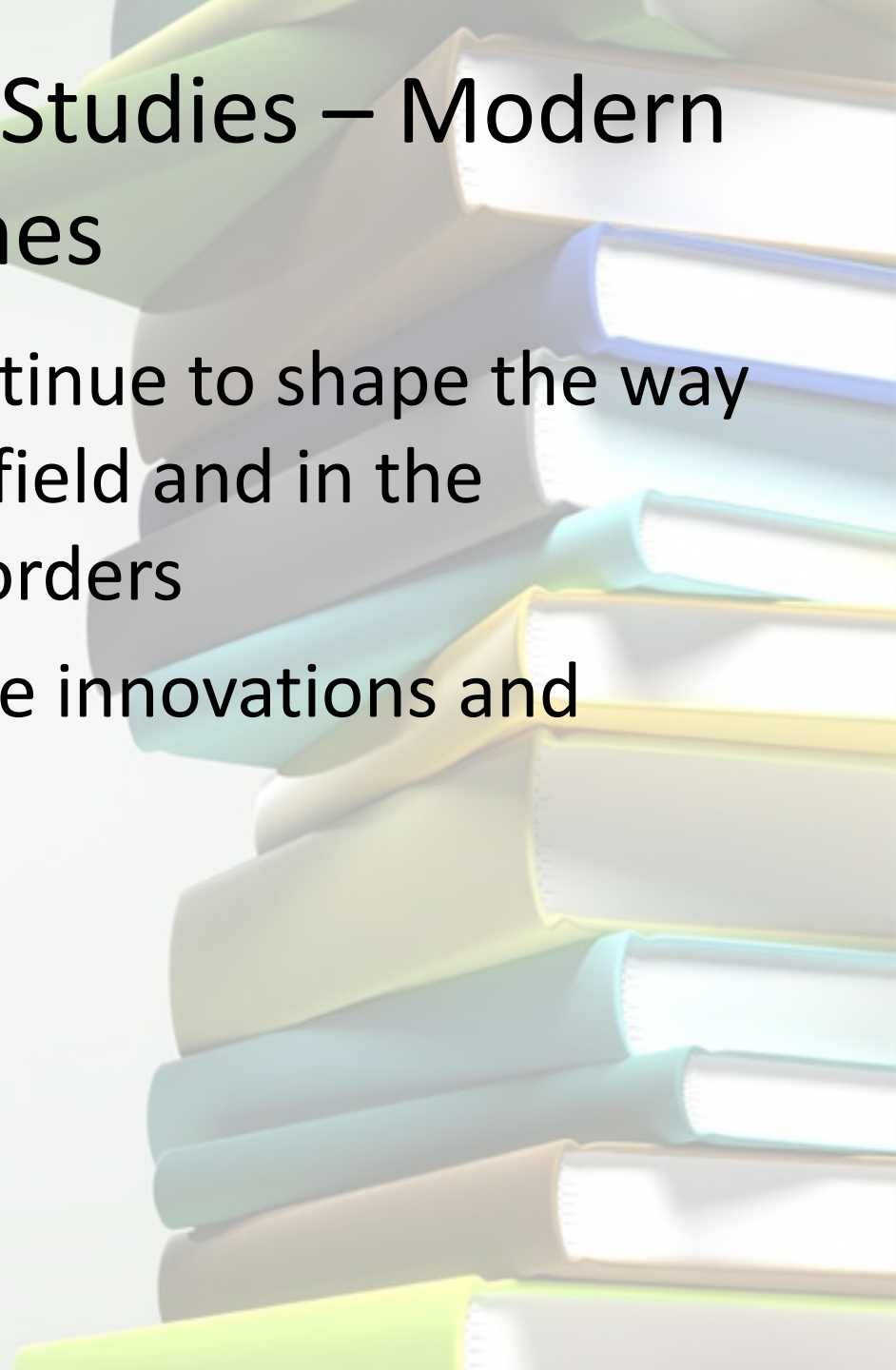
Evolution of Sleep Studies – Modern Times

- Different types of treatments being used for milder cases of OSA
 - Dental devices
 - Contour pillows and beds
 - Pacemaker type device to stimulate muscles to keep airway open when it starts to collapse
 - Special surgeries



Evolution of Sleep Studies – Modern Times

- Sleep research will continue to shape the way things are done in the field and in the treatment of sleep disorders
- Will see more and more innovations and therapies introduced

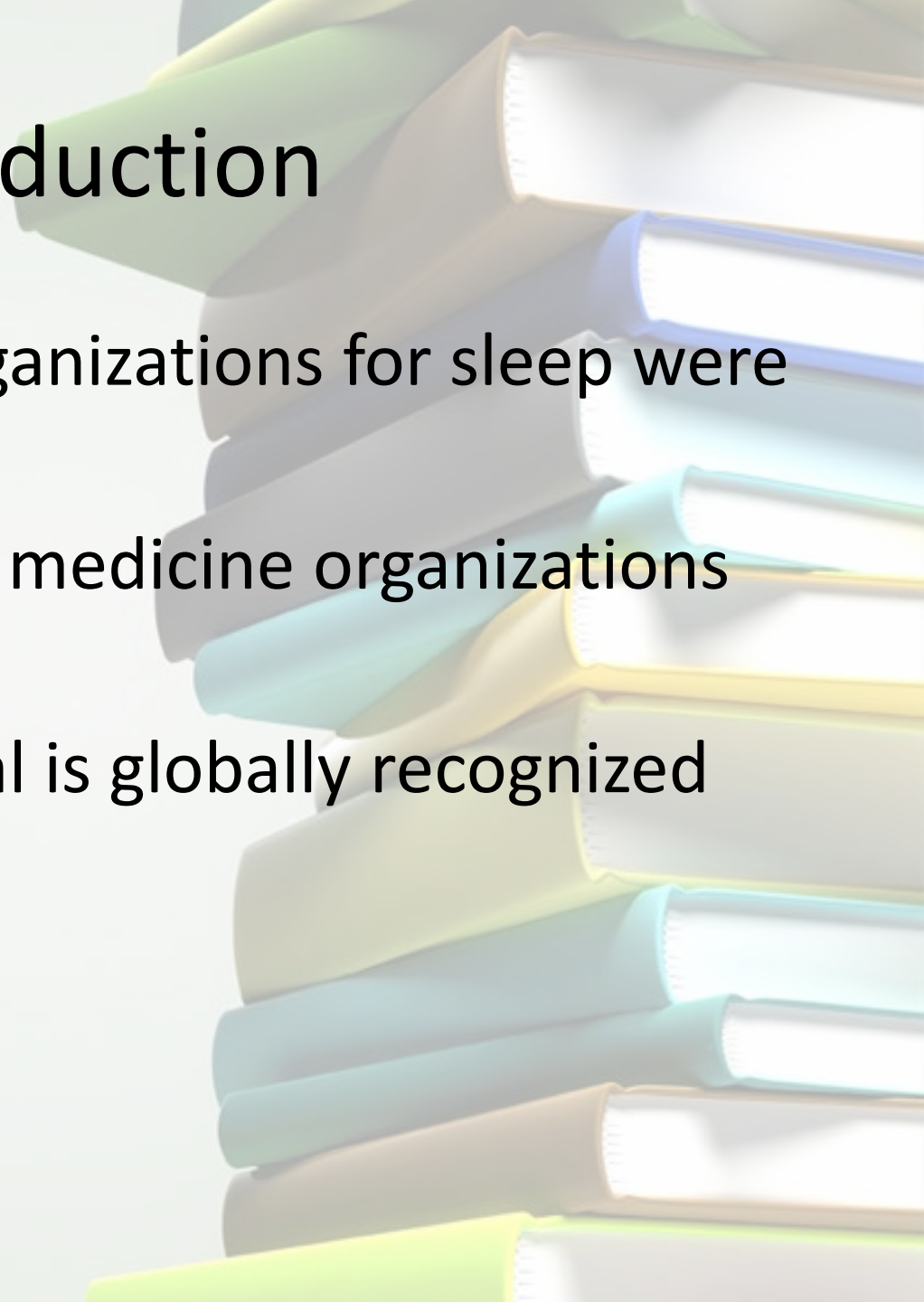


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Global Sleep Medicine

Introduction

- First professional organizations for sleep were in US and Europe
- Now there are sleep medicine organizations across the globe
- The RPSGT credential is globally recognized

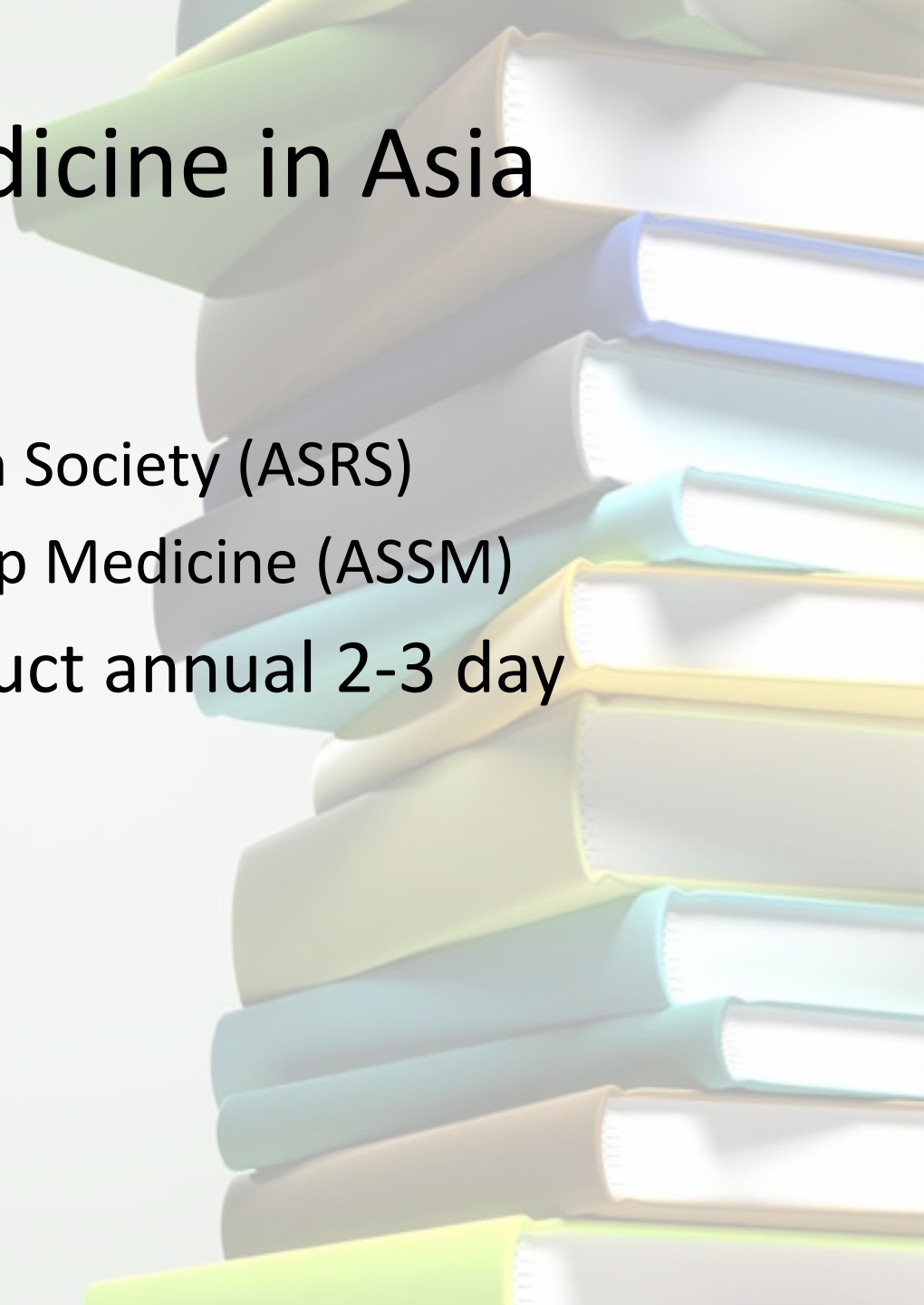


World Sleep Society

- Formed in 2016
- Merger of World Association of Sleep Medicine (WASM) and World Sleep Federation (WSF)
- 28 member organizations from across the globe
- Primary focus is education and curriculum development
- World Sleep Day held annually in March
- Recognizes sleep researchers across the globe with awards
- Holds World Sleep Congress every 2 years
- Conducts Sleep Medicine Specialist exam

Sleep Medicine in Asia

- 2 organizations:
 - Asian Sleep Research Society (ASRS)
 - Asian Society of Sleep Medicine (ASSM)
- Sleep societies conduct annual 2-3 day conference



Sleep Medicine in India

- Prevalence of OSA in India is 9.3% but less than 300 sleep labs in the country
- Sleep is a developing field in India
- 4 sleep societies:
 - Indian Society for Sleep Research (ISSR)
 - Indian Sleep Disorder Association (ISDA)
 - Indian Association of Surgeons for Sleep Apnoea (IASSA)
 - South East Asia Academy of Sleep Medicine (SEAASM)

Indian Society of Sleep Research

- Founded in 1992
- National Sleep Medicine Course (NSMC) founded in 2006
 - Held annually and comprehensive coverage of sleep medicine
- National Sleep Technology Course (NSTC) founded in 2014
 - Holds annual 1-day meeting with comprehensive coverage of sleep technology
- Conducts Transitional Board Certification Exam for Indian sleep specialists and a certification exam for sleep techs
- Conducts sleep accreditation
- Launched journal in 2016 – Sleep and Vigilance
 - Published twice a year

Indian Sleep Disorder Association

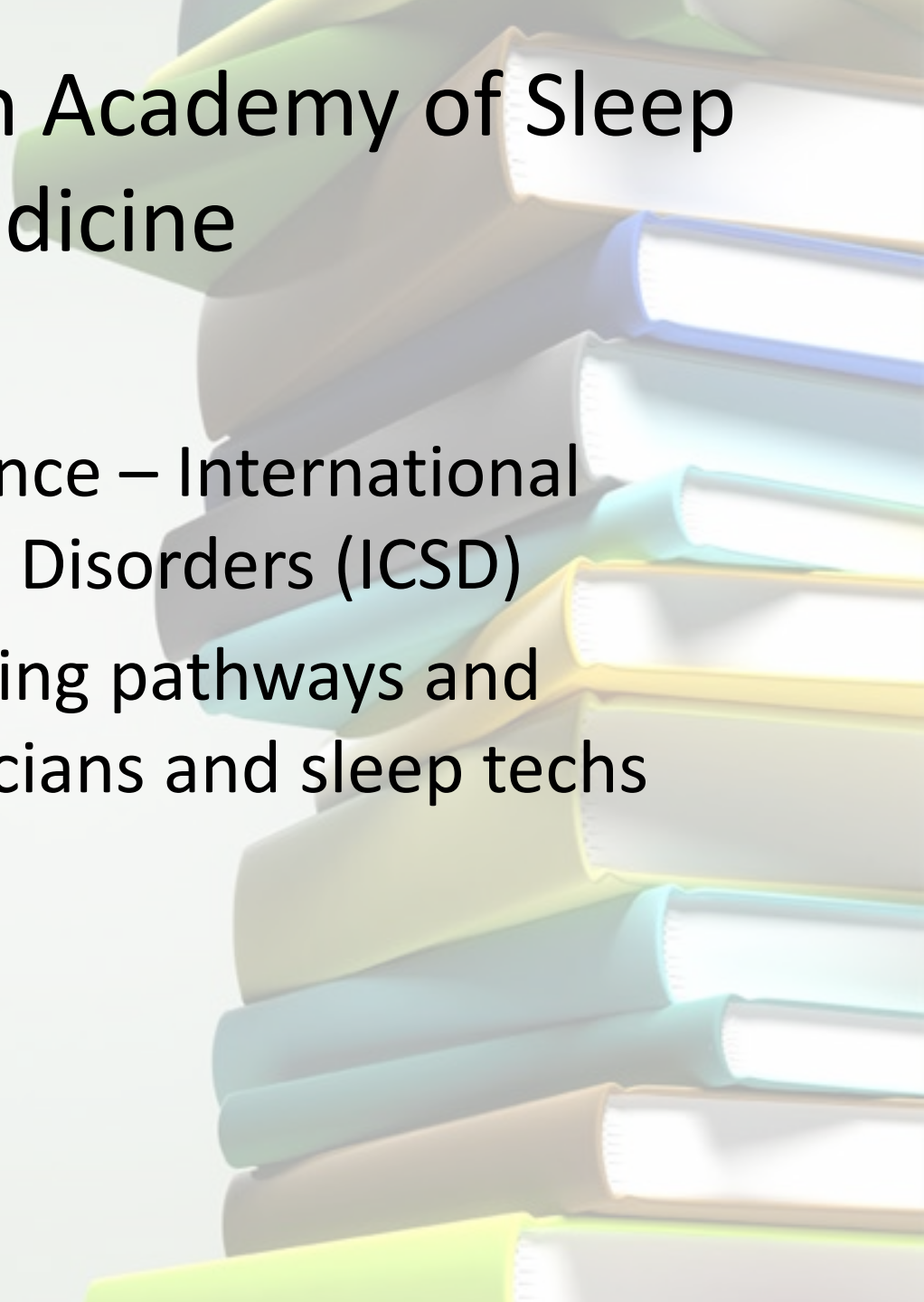
- Founded in 1995
- Conducts certification exam for sleep specialists
- Plans to begin 1-year diploma program for sleep techs
- Journal = Indian Journal of Sleep Medicine
 - Published four times a year
- Hosts annual conference - SleepCon

Indian Association of Surgeons for Sleep Apnoea

- Founded in 2012
- Comprised of mostly surgeons
- Focus is promoting and developing the role of surgery for the management of sleep apnea
- Hosts annual conference – IASSACON
- Conducts training programs in surgery for sleep apnea across India

South East Asian Academy of Sleep Medicine

- Founded in 2013
- Hold annual conference – International Conference on Sleep Disorders (ICSD)
- Goal = Develop training pathways and credentials for physicians and sleep techs



Sleep Medicine in Singapore

- Prevalence of moderate-to-severe SDB = 30.5%
- Prevalence of OSA = 18.1%
- Most sleep physicians completed a 1 year fellowship in sleep medicine
- Most sleep techs are RPSGTs
- Professional organization = Singapore Sleep Society
 - Annual conference hosted by Singapore General Hospital

Sleep Medicine in Philippines

- Most sleep specialists train in US
- 20 sleep labs here
- Professional organization = Philippine Society of Sleep Medicine (PSSM)
 - Founded in 2002
 - Founded a sleep fellowship program
 - Created Philippine Board of Sleep Medicine and sleep lab accreditation committee
 - Host annual 3-day conference

Sleep Medicine in Indonesia

- 6-8 sleep labs
- Professional organization = Indonesian Society of Sleep Medicine
- Only 2 RPSGTs here



Sleep Medicine in Thailand

- Prevalence of OSA in Thai men = 15.4%
 - For Thai women, it is 6.3%
- Have had sleep labs here since 1984 but PSG was first used here in 1974
- 1991 – Thai Sleep Research and Sleep Medicine Society formed
- Professional organization = Sleep Society of Thailand
- Have certification program in sleep medicine and master of science in sleep medicine at some universities
- Have had training courses for sleep techs since 2010
- 48 sleep labs here
- PSGs are free in public hospitals for civil servants and their families
- 2015 – Thailand Sleep Society started sleep lab accreditation program

Sleep Medicine in Korea

- OSA risk factors = Prevalence of 15.8%
- Sleep societies:
 - Korean Sleep Research Society
 - Korean Society of Sleep Medicine
 - Korean Academy of Sleep Medicine
- No formal certifications or training here for sleep techs

Sleep Medicine in Malaysia

- No formal certification program for sleep medicine here
- Professional organization = Sleep Disorder Society of Malaysia (SDSM)
 - Holds annual conference
 - 1 day program for sleep techs

