Syncope & Altered Consciousness
Occupational Risk Assessment

Scott Hardy, MD, MPH, FACOEM
UCI Occupational Medicine
December, 2016
Background & Disclosures

• UCI Faculty-Occupational Medicine-part time.
• Medical Director, Employee Health, County of Orange-Santa Ana
• Private practice in Santa Ana
• OM and Medical Toxicology

• No conflicts to disclose.
• Details and identifiers of clinical cases changed for confidentiality.
Objectives

• Review risk assessment strategies of syncope for serious outcomes—admission decisions and for evaluating future occupational demands.

• Appreciate guidelines recommended evaluate patients with syncope & their limitations.

• Present strategies for conducting fitness for duty occupational, athletic and driving fitness evaluations, that may involve impaired consciousness.
Objectives

• Understanding of patient job task demands needed to make recommendations for occupational restrictions related to transient loss of consciousness (T-LOC).

• Review for Wards, Boards-ABIM, and Community

• Discuss state requirements for reporting T-LOC

• Audience to participate in a fitness for duty evaluation today.
Syncope

• **Symptom complex** composed of:

1. Transient loss of consciousness

2. Inability to maintain postural tone

3. Secondary to a brief decrease in cerebral blood flow

4. Spontaneous resolution
“The only difference between syncope and sudden death syncope and sudden death is that in one you wake up”.

Figure 1. Incidence Rates of Syncope According to Age and Sex.
The incidence rates of syncope per 1000 person-years of follow-up increased with age among both men and women. The increase in the incidence rate was steeper starting at the age of 70 years. Syncope rates were similar among men and women.
Case-Police Officer-Mr. J.R.

- 34 year old police officer for past 5 years, was working patrol on the ‘graveyard shift’-6 pm to 6 am.
- On patrol, J.R. made a 3 a.m. arrest, for DUI, and cuffed the suspect.
- Shortly thereafter, while standing, J.R. experienced a few seconds of lightheadedness, narrowed vision.
- J.R. fell & struck his head on concrete and sustained an occipital scalp laceration, w/LOC.
Case-Police Officer-Mr. J.R.

- Mr. J.R. was medic transported to ED
- A & O, 6’3”, 193 lbs., 129/56, P 52, RR 14.; orthostatic BP not noted; fluids received.
- GCS-15; Neuro-WNL; HEENT-WNL; CV RRR w/o murmur; general exam normal.
- Glucose 122, lytes-WNL, Ca-9.1
- H/H initially reported low at 9.6/29%…follow up 13.7/40%…platelets, WBC 6,800, diff.-normal
- ECG-sinus brady with early repolarization V1 & V2.
- CXR-WNL; Head and Neck CT-WNL
- Occipital Scalp laceration treated with 8 staples
Mr. J.R.

- **PMH:** No meds, NKA.
- **No neuro hx.; prior syncope 2 years ago.**
- **FH:** no history early CAD, arrhythmia, sudden death or seizures.
- **PSH:** scalp lac, otherwise negative.
- **ROS:** obese in high school; lost 270-190 lbs. w/diet & exercise, otherwise negative.
- **Social history:** Bachelor’s degree in Social Ecology, married, 1 child; No Tob, EtOH, or drugs.
- **Hobbies:** hiking, surfing, kite boarding, and running.
Mr. J.R.

- **Occupational Duties** – variety-community policing, pursue/chase in vehicle and on foot, arrest and control, surveillance, traffic law enforcement, emergency care, wear gear-- “supra” physiologic.

- **Occupational History** - worked in CA for selling solar panels and worked in HI started a business, Kite and Surfing School for 3 years each prior to entering police academy.
Mr. J.R.

- High vagal tone, bradycardia and asystolic pauses, and hypotension.
- Hx of positive tilt table test with NTG or 2 years ago.
- Further: 3 prior syncopal episodes at work over 4 years, beginning in Police Academy. Minor injuries—all while standing—1 ED & 2 paramedic evals.
- Patient reluctant historian—denied “heart problem” associated all episodes with decreased food/fluid, late night work/study.
Impact of Syncope

Mr. J.R.-Cardiology

- Fit for Duty Evaluation with cardiology
- He underwent a tilt table that reportedly included IV nitroglycerin which was positive hypotensive and bradycardic with brief syncope—complained of not enough fluids
- Had and external event recorder (Zio patch), which was negative
Mr. J.R.-Cardiology

- Pulse 56, BP 110/70 both arms without orthostatic changes. 6’3”, 195 pounds
- CV-RRR physiologically split S2 no murmur, JVD, or bruit, symmetric pulses in upper and lower extremities
- Lungs-Clear
- Echo-M mode 2D and Doppler-WNL
- ECG-58 bpm, NSR
- Holter-min rate with sleep 35, maximum 127, rare PACs, no PVCs or atrial fibrillation.
Mr. J.R.-Cardiology

- TMST-15 METs, 93% max HR @ 176 BPM, max 142/70, No ST/T changes, no ectopy. Excellent exercise tolerance.
- Repeat tilt test (HUT) positive without medication:
  - Supine HR 60-70 with systolic BP 110-120.
  - 70 degrees head up x 16 minutes with HR at 90-110. HR acutely dropped to low 30s w/several 3-4 second pauses, with systolic to the 70s, and a syncopal response.
HUT (Head Up Tilt Table)
HUT (Head Up Tilt Table)

• Unexplained syncope, particularly in patients with structurally normal hearts; pharmacologic augmentation in those with high probability of reflex mediated syncope.
• May use isoproterenol, nitro, isosorbide to augment.
• Positive results are the reproduction of typical syncopal symptoms, hypotension and/or bradycardia.
• Not for monitoring response to care
HUT RESULTS

[Graph showing heart rate (HR) and blood pressure (BP) over time.]
Mr. J.R.-Cardiology

• Dx: ?

• Vasovagal, abnormal tilt table study consistent with cardio-inhibitory (decrease of heart rate) syncope with component of vasodepressor (drop in blood pressure) syncope.

• Always exacerbated by outside factors including lack of sleep and significant volume depletion.
California Government Code 1031

- Each class of public officers or employees declared by law to be peace officers shall meet the following minimum standards...
- Be found to be free from any physical, emotional, or mental condition that might adversely affect the exercise of the powers of a peace officer.
- Each evaluated by physician and surgeon and psychologist or psychiatrist.
Cardiology Evaluation

- Mr. J.R. FIT FOR DUTY AS A POLICE OFFICER?

- Fit?  

- Not Fit?
Mr. J.R.-Cardiology

- **Treatment:** In light of slender stature, gain weight, increase fluids, and salt intake. Improve sleep. Wear support stockings constantly.

- Midodrine and fludrocortisone have been used for orthostatic hypotension with some success, but mostly with vasodepressor type of syncope.
Occupational Duties

- Job tasks, Job title, detailed history from patient, description, worksite visit, company contacts.
- What are the essential tasks?
- Is commercial or personal vehicle driving involved? Heavy equipment? Transporting clients, students, coworkers?
- Working a heights or around machinery?
- Is solo work required?
- Shift work? Rotating shifts?
Circulating Hypovolemia 

Activation Ventricular Afferents 

Exaggerated Sympathetic Activation 

Vagal Tone 

Bradycardia 

Hypotension 

Vasodilation 

Sympathetic Withdrawal 

Syncope
Stimulation of medullary vasodepressor region

- Gastrointestinal and genitourinary receptors (defecation, micturition)
- Cardiac C fibres (hypovolaemia, dehydration, Valsalva manoeuvre)
- Cardiopulmonary receptors (cough, head turning, carotid massage)
- Cranial nerves (glossopharyngeal neuralgia)
- Cerebral cortex (panic, fright, pain)

Increase in vagal tone (bradycardia) and decreased sympathetic tone (vasodilation)

Reduced venous return and decreased cardiac output, with resultant cerebral hypoperfusion

SYNCOPE
Pathophysiological basis of the classification

Reflex Syncope
- Mixed
- Cardio-inhibitory
- Inappropriate reflex
- Vaso-depressor
- Drug-induced ANF
- Normal ANS
- Structural damage
- Primary ANF
- Secondary ANF
- Low peripheral resistance
- Low cardiac output
- Adequate venous return
- Volume depletion
- Venous pooling
- Arrhythmia

Cardiac Syncope
- Structural cardiac
- Others
- Syncope secondary to OH

low BP/global cerebral hypoperfusion
Guidelines for the diagnosis and management of syncope (version 2009)

The Task Force for the Diagnosis and Management of Syncope of the European Society of Cardiology (ESC)

Developed in collaboration with, European Heart Rhythm Association (EHRA)\textsuperscript{1}, Heart Failure Association (HFA)\textsuperscript{2}, and Heart Rhythm Society (HRS)\textsuperscript{3}
TLOC: Syncope or Seizure?
Faint vs. Fit vs. Fall?

**Syncope vs.**

- Prodrome +/- yes w/VVS
- Few seconds w/arrhythmia
- May see myoclonic jerks in 20-30% of cases
- Lasts seconds to less than a minute typically
- May recover quickly—with VVS may be fatigued up to 30 seconds
- May see incontinence. May see tongue biting less common—typically on the tip of the tongue.

**Seizure**

- Aura +/-
- Tonic Clonic movements
- May last minutes
- Extended post ictal phase common
- Incontinence, 20-30% of tonic clonic szs.
- Lateral tongue biting common—oral exam
Syncope-Annual Incidence

- Variable stats
- 3% of ED Visits
- -6% of Hospital Admissions
- >1 million ED visits for TLOC
- 170K have recurrent syncope.
- Many unexplained cases remain.

Explained~53-62%
Unexplained~38-47%
Differential Etiologies Syncope

- Neurally Mediated (Reflex Syncope)
- Cardiogenic
- Medication Related
- Miscellaneous
Figure 2. Overall Survival of Participants with Syncope, According to Cause, and Participants without Syncope.

P<0.001 for the comparison between participants with and those without syncope. The category “Vasovagal and other causes” includes vasovagal, orthostatic, medication-induced, and other, infrequent causes of syncope.
Causes of Syncope

• Neurally mediated syncope
  - Vasovagal attack 18% (8-37)
  - Situational syncope 5% (1-8)
  - Carotid sinus syncope 1% (0-4)
• Psychiatric disorders 2% (1-7)
• Medications 3% (1-7)
• Neurologic disease 10% (3-32)
• Cardiac syncope
  - Organic heart disease 4% (1-8)
  - Arrhythmias 14% (4-38)
• Unknown 34% (13-41)

From-NEJM, Vol 343, No, 25, pg 1857  W. Kapoor, MD, MPH
Neurally Mediated

- Vasovagal aka Neuro-cariogenic (“common faint”)
- Situational (cough, swallow, micturition, defecation, post-exercise, post prandial, others-brass instrument playing, weightlifting).
- Peripheral neuropathy (alcoholic, diabetes, malnutrition, amyloid deposition).
- Carotid sinus sensitivity (head turning, necktie, shaving.
- Glossopharyngeal/Trigeminal neuralgia.
- Idiopathic postural hypotension.
Medication Related

- Alpha & beta blockers.
- Calcium channel blockers.
- Other anti-hypertensives.
- Nitrates.
- Diuretics.
- PDE5 inhibitors—erectile dysfunction and pulmonary hypertension meds. (sildenafil, etc., riociguat).
Cardiovascular: arrhythmias

- Amiodarone toxicity
- Atrial Fibrillation and WPW Syndrome
- Atrial flutter, Atrial surgery
- AV block-Second degree Mobitz II, Complete HB
- Sinus node dysfunction-sick sinus syndrome
- SVT
- Ventricular tachycardia
- Pacemaker or AICD dysfunction
- Brugada syndrome
- Catechoaminergic tachycardia
- Long QT syndrome
ECG monitoring-arrhythmogenic syncope

- In hospital monitoring
- Holter monitoring 24-48 hours
- External loop recorders—results mixed
- Implantable loop recorders—3 years +
Diagnostic Yield of Very Prolonged ILR Observation
Arrhythmologic Center - Lavagna 2001-2010

Cumulative Incidence, %

Number at risk
157 108 84 68 45 30 15 9 4

Months

Structural Cardiovascular

- Acute coronary syndrome
- Aortic valve stenosis
- Hypertrophic cardiomyopathy (HOCM)
- Cardiac tamponade
- Aortic dissection
- Mitral regurgitation
- Pulmonic Stenosis, Pulmonary HTN, amyloid
- Atrial myxoma
- Vertebral basilar insufficiency, subclavian steal
Aortic Stenosis or HOCM murmur?

**Aortic Stenosis**
- Systolic m. heard right 2\textsuperscript{nd} intercostal space
- Radiates to carotids
- May obliterate A2
- Decrease with valsalva

**HCM**
- Systolic harsh crescendo diamond shaped, starts well after S1
- LLSB, apex
- Ususally no radiation to neck
- Increases with valsalva
Cardiovascular: Pulmonary Embolism

- Saddle embolus resulting in outflow obstruction and/or severe hypoxia.
Prevalence of Pulmonary Embolism among Patients Hospitalized for Syncope

Paolo Prandoni, M.D., Ph.D., Anthonie W.A. Lensing, M.D., Ph.D., Martin H. Prins, M.D., Ph.D., Maurizio Ciammaichella, M.D., Marica Perlati, M.D., Nicola Mumoli, M.D., Eugenio Bucherini, M.D., Adriana Visonà, M.D., Carlo Bova, M.D., Davide Imberti, M.D., Stefano Campostrini, Ph.D., and Sofia Barbar, M.D., for the PESIT Investigators*

97/560 pts. admitted 1st bout of syncope had PE-17.3% The rate was 25% among those without an alternative explanation for syncope.
### Wells Score Pulmonary Embolism + D dimer

**Table 1. Simplified Wells Score for Assessment of the Pretest Clinical Probability of Pulmonary Embolism.***

<table>
<thead>
<tr>
<th>Variable</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Clinical signs or symptoms of deep-vein thrombosis</td>
<td>3.0</td>
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<tr>
<td>Alternative diagnosis less likely than pulmonary embolism</td>
<td>3.0</td>
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<tr>
<td>Heart rate &gt;100 beats/min</td>
<td>1.5</td>
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<tr>
<td>Immobilization or surgery in the previous 4 wk</td>
<td>1.5</td>
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<tr>
<td>Previous venous thromboembolism</td>
<td>1.5</td>
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<tr>
<td>Hemoptysis</td>
<td>1.0</td>
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<tr>
<td>Active cancer</td>
<td>1.0</td>
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* A total score of 4.0 or lower indicates that pulmonary embolism is unlikely, and a score higher than 4.0 indicates that pulmonary embolism is likely. This table was adapted with permission from Wells et al.⁸
Cardiogenic: Hemorrhage/Anemia

• Trauma with significant blood loss.
• GI bleed
• Tissue rupture-aortic aneurysm, spleen, ovarian cyst, ectopic pregnancy
• Retroperitoneal hemorrhage
• Anemia-multiple etiologies
Syncope: Miscellaneous etiologies

- Subarachnoid hemorrhage
- Volume loss, dehydration
- Deconditioning, prolonged bed rest
- Malnutrition, anorexia, bariatric surgery **
- Autonomic dysfunction
- Dysautonomias:
  - multiple system atrophy (MSA), Parkinson’s disease, postural orthostatic tachycardia syndrome (POTS), pure autonomic failure-Shy Drager syndrome
Carotid Sinus Hypersensitivity-Syncope

- Uncommon, may be associated with shaving, tight collar, or activities with neck rotation.
- Screen with appropriate history for >40 yr. old.
- Carotid sinus massage. Do right then left with ECG monitoring, 3-5 seconds.
- Contraindicated w/in 3 months of MI, TIA, stroke, carotid bruit, V.tach.
- Positive with AV block, asystole of at least 3 seconds, 50 mmHg systolic decrease or 30 mmHg diastolic decrease, syncope or pre-syncope.
San Francisco Syncope Rule

• “CHESS Acronym” from Quinn & colleagues
  
  C ---History of congestive heart failure.
  
  H ---Hematocrit less than 30%.
  
  E ---Abnormal findings on 12-lead ECG or cardiac monitoring “new changes or non-sinus rhythm”—plus all available ECGs & monitoring
  
  S ---History of shortness of breath.
  
  S ---Systolic blood pressure < 90 mmHg in triage at presentation.
San Francisco Syncope Rule

• Serious outcomes defined: Death, MI, arrhythmia, pulmonary embolism, stroke, subarachnoid hemorrhage, significant hemorrhage or any condition causing or likely to cause a return visit to the ED and admission to the hospital for a related event.

• 50 predictors, multivariate analysis analyzed to create a minimal set of predictors that are highly sensitive and specific for prediction of a serious outcome.

• For 791 syncope patients the rule was 98% sensitive (95% confidence interval [CI] 89% to 100%) and 56% specific (95% CI 52% to 60%) to predict serious events; other studies slightly less predictive; clinical judgement is still central.

CONFIDENTIAL MORBIDITY REPORT

PLEASE NOTE: Use this form for reporting lapses of consciousness, Alzheimer's disease or other conditions which may impair the ability to operate a motor vehicle safely (pursuant to H&S 103900).

<table>
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<th>CONDITION BEING REPORTED</th>
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<tr>
<th>Field</th>
<th>Space for Entry</th>
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<td>Patient Name - Last Name</td>
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<td>First Name</td>
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<td>MI</td>
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<td>Ethnicity (check one)</td>
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<td>Non-Hispanic/Non-Latino</td>
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<td>Race (check all that apply)</td>
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<td>African-American/Black</td>
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<td>Occupation or Job Title</td>
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<td>Occupational or Exposure Setting (check all that apply)</td>
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<td>Food Service</td>
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(Obtain additional forms from your local health department.)
## DEPARTMENT OF MOTOR VEHICLES (DMV)

**California Driver License or Identification Card Number** (eight characters):  

1. If this report is based upon episodic lapses of consciousness, when was the most recent episode?  
   
   (mm/dd/yyyy)

2. If there have been multiple episodes of loss of consciousness or control within the past three years, please indicate the dates if they are known to you.

   (a): (mm/dd/yyyy)  
   (b): (mm/dd/yyyy)  
   (c): (mm/dd/yyyy)  
   (d): (mm/dd/yyyy)  
   (e): (mm/dd/yyyy)  
   (f): (mm/dd/yyyy)

3. Within the past 12 months, has there been an episode of loss of consciousness or control while driving?  
   
   □ Yes  □ No  □ Uncertain

4. Are additional lapses of consciousness likely to occur?  
   
   □ Yes  □ No  □ Uncertain

5. If the patient has had episodes of nocturnal seizures, is there likelihood of lapses of consciousness occurring while he/she is awake?  
   
   □ Yes  □ No  □ Uncertain

6. Has this patient been diagnosed with dementia or Alzheimer's disease?  
   
   □ Yes  □ No  □ Uncertain

7. Would you currently advise this patient not to drive because of his/her medical condition?  
   
   □ Yes  □ No  □ Uncertain

8. Does this patient's condition represent a permanent driving disability?  
   
   □ Yes  □ No  □ Uncertain

9. Would you recommend a driving evaluation by DMV?  
   
   □ Yes  □ No  □ Uncertain

---

**Remarks:**
DMV Reporting Requirements

- Must report lapses in consciousness
- Diagnoses of Alzheimer’s disease and dementia.
- Whether you have advised the patient not to drive because of her/his medical condition.
- Whether it is a permanent driving disability.
- Whether you recommend a driving evaluation by DMV.
REPORTABLE COMMUNICABLE DISEASES §2500(j)(1)

Amebiasis
Anaplasmosis

> Anthrax, human or animal

Babesiosis
Botulism (Infant, Foodborne, Wound, Other)

> Brucellosis, animal (except infections due to Brucella canis)

> Brucellosis, human

Campylobacteriosis
Chancroid

FAX  Covid-19 (outbreaks, hospitalizations and deaths)

Chickenpox (Varicella) (outbreaks, hospitalizations and deaths)
Chikungunya Virus Infection

Chlamydia trachomatis infections, including lymphogranuloma venereum (LGV)

Cholera
Ciguatera Fish Poisoning
Coccidioidomycosis
Creutzfeldt-Jakob Disease (CJD) and other Transmissible Spongiform Encephalopathies (TSE)

Cryptosporidiosis
Cyclosporiasis
Cysticercosis or taeniasis

Dengue Virus Infection
Diphtheria

> Domestic Acid Poisoning (Amnesic Shellfish Poisoning)

Ehrlichiosis
Encephalitis, Specify Etiology: Viral, Bacterial, Fungal, Parasitic

E. coli shiga toxin producing (STEC) including E. coli O157

> Flavivirus infection of undetermined species

Foodborne Disease
Giardiasis

Gonococcal Infections
Haemophilus influenzae, invasive disease, all serotypes (report an incidence of less than five years of age)

Hantavirus Infections
Hemolytic Uremic Syndrome

> Hepatitis A, acute infection

Hepatitis B (specify acute case or chronic)
Hepatitis C (specify acute case or chronic)

Hepatitis D (Delta) (specify acute case or chronic)

Hepatitis E, acute infection

Human Immunodeficiency Virus (HIV) infection, stage 3 (AIDS)

> Human Immunodeficiency Virus (HIV), acute infection

Influenza, deaths in laboratory-confirmed cases for age 0-64 years
Influenza, novel strains (human)

Legionellosis
Leprosy (Hansen Disease)

Leptospirosis
Listeriosis
Lyme Disease

> Malaria

> Measles (Rubella)

> Meningitis, Specify Etiology: Viral, Bacterial, Fungal, Parasitic

> Meningococcal Infections

Mumps

> Novel Virus Infection with Pandemic Potential

> Paralytic Shellfish Poisoning

Pertussis (Whooping Cough)
Plague, human or animal

Poliomyelitis
Poliomyelitis

Psittacosis

> Q Fever

> Rabies, human or animal

Relapsing Fever
Respiratory Syncytial Virus (only report a death in a patient less than five years of age)

Rickettsial Diseases (non-Rocky Mountain Spotted Fever), including

> Typhus and Typhus-like illnesses

Rocky Mountain Spotted Fever
Rubella (German Measles)
Rubella Syndrome, Congenital

Salmonellosis (Other than Typhoid Fever)

> Scombroid Fish Poisoning

> Shigella toxin (detected in feces)

Shigellosis

Smallpox (Variola)

Streptococcal Infections (Outbreaks of Any Type and Individual Cases in Food Handlers and Dairy Workers Only)

Syphilis
Tetanus

Trichinosis
Tuberculosis

> Tularemia, animal

> Tularemia, human

Typhoid Fever, Cases and Carriers
Vibrio Infections

> Viral Hemorrhagic Fevers, human or animal (e.g., Crimean-Congo, Ebola, Lassa, and Marburg viruses)

West Nile Virus (WNV) Infection
Yellow Fever

> Yersiniosis

> Zika Virus Infection

> OCCURRENCE OF ANY UNUSUAL DISEASE

> OUTBREAKS OF ANY DISEASE (including diseases not listed in § 2500), Specify if institutional and/or open community.
§2806. Disorders Characterized by Lapses of Consciousness
a. Disorders characterized by lapses of consciousness” means those medical conditions that involve:

1. A loss of consciousness or a marked reduction of alertness or responsiveness to external stimuli; and
2. The inability to perform one or more activities of daily living; and
3. The impairment of the sensory motor functions used to operate a motor vehicle.

b. Examples of medical conditions that do not always, but may progress to the level of functional severity described in subsection (a) of this section include Alzheimer’s disease and related disorders, seizure disorders, brain tumors, narcolepsy, sleep apnea, and abnormal metabolic states, including hypo- and hyperglycemia associated with diabetes.


§2808. Sensory Motor Functions
"Sensory motor functions" means the ability to integrate seeing, hearing, smelling, feeling and reacting with physical movement, such as depressing the brake pedal of a car to stop the car from entering an intersection with a green traffic light to avoid hitting a pedestrian crossing the street.


§2810. Reporting Requirements
a. Except as provided in Section 2812, a physician and surgeon shall notify the local health officer within seven (7) calendar days if every patient 14 years of age or older, when a physician and surgeon has diagnosed a disorder characterized by lapses of consciousness (as defined in Section 2806) in a patient.

b. The report prepared pursuant to subsection (a) of this section shall include:

1. The name, address, date of birth, and diagnosis of the patient, and
2. The name, address, and phone number of the physician and surgeon making report.
$2812$ Exceptions to Reporting
A physician and surgeon shall not be required to notify the local health officer of a patient with a disorder characterized by lapses of consciousness if:

1. The patient's sensory motor functions are impaired to the extent that the patient is unable to ever operate a motor vehicle, or
2. The patient states that he or she does not drive and states that he or she never intends to drive, and the physician and surgeon believes these statements made by the patient are true, or
3. The physician and surgeon previously reported the diagnosis and, since that report, the physician and surgeon believes the patient has not operated a motor vehicle, or
4. There is documentation in the patient's medical record that another physician and surgeon reported the diagnosis and, since that report, the physician and surgeon believes the patient has not operated a motor vehicle.

For information on the California Department of Motor Vehicles' guidelines for physical and mental conditions and licensure options:

$2802$. Alzheimer's Disease and Related Disorders
"Alzheimer's disease and related disorders" means those illnesses that damage the brain causing irreversible, progressive confusion, disorientation, loss of memory and judgment.

Diabetes and Driving

Monograph by the American Diabetes Association.
Diabetes Care, Volume 37, Supplement 1, January 2014.

Covers licensing requirements, medical evaluation, science related to hypoglycemia, licensing decisions, and physician reporting.
Driving Risk Comparison

<table>
<thead>
<tr>
<th>Year</th>
<th>Disease specific rates of fatal crashes (cases per 100,000 pop)</th>
<th>Prevalence rate (cases per 1,000)</th>
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<tbody>
<tr>
<td>Seizures</td>
<td>8.6</td>
<td>5.1</td>
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<tr>
<td>Diabetes</td>
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<td>Cardiovascular and hypertensive disorders</td>
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<td>Alcohol related</td>
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<td>Young drivers</td>
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<tr>
<td>Totals</td>
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</tr>
</tbody>
</table>

Powell, et al. found Obstructive sleep apnea without treatment found reaction times worse than in subjects with alcohol level of 0.057 g/dL.
Occupational Restrictions

- Requests for work restrictions must be specific, medically based and job related.
- Restrictions are based on a direct threat to the patient, coworkers or the public.
- Use multi-disciplinary approach, to facilitate accommodation being indicated, where possible.
- Temporary restrictions preferred to total disability when treatment is being assessed.
- Job change and vocational rehabilitation may be necessary if worker unable to return to regular duties.
Summary

• Syncope is a common presentation of T-LOC caused by multiple conditions—to be encountered on wards, boards, and community.

• Detailed history and physical exam, and selective use of diagnostic testing remain central to determining cause of T-LOC, stratifying short term risk and admission decisions. Diagnosis may be challenging and elusive.

• Occupational risk assessment is often a multidisciplinary individualized analysis considering diagnostic findings, essential job tasks, guidelines and clinical judgement.
Comments and Questions ?