

OCCUPATIONAL NEUROLOGY: **Fitness for Duty in Safety Sensitive** **Workers**

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I, Jonathan Rutchik, hereby declare that the content for this activity, including any presentation of therapeutic options, is well balanced, unbiased, and to the extent possible, evidence-based.

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LECTURE OUTLINE

- NEUROLOGICAL CONDITIONS AND FITNESS FOR DUTY EVALUATIONS
- HEAD TRAUMA, SEIZURES AND STROKES IN FIREFIGHTERS, POLICE AND, COMMERCIAL DRIVERS.
- MULTIPLE SCLEROSIS IN AN AIRMAN

Seizures in a firefighter, I

- A 30 year old male applies to be a firefighter. He explains that he has no medical history except for a seizure at age 15. He has no family history.
- He reports that an MRI found a “scar” on his brain.
- He remembers having a mild head injury as a child.

Seizures

- He explained that he stayed up all night the day before having this event in high school.
- Records reflect that a sleep deprived EEG was normal but an MRI did reveal right parietal encephalomalacia.
- He was placed on Dilantin and continues to take the medication with no side effects.
- His neurologist has cleared him for duty as firefighter.

First seizure risk of recurrence?

- >2.5 times greater risk for those with cerebral insult
- 208 patients with first seizure separated into those without and with prior neurological insult.
- 14%, 29%, 34% versus 26%, 41%, 48% @ 1, 3 and 5 years
- Another study: 29, 42 and 49 versus 49, 67 and 67 @ 1, 2 and 2.5 years

First seizure and recurrence

- Treatment associated with an slightly increased risk
- Stress of firefighter: heat, lack of proper sleep hygiene, dehydration.
- Challenges of compliance increased risk.
- Consider ADA issues when asked about RTW. Is there an accommodation? What are the work tasks required?

Agencies

- Federal Motor Carrier Safety Administration (FMCSA).
 - Federal Aviation Administration (FAA)
 - National Fire Protection Association (NFPA).
 - Police Officers Standards and Training (POST)
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- http://nrcme.fmcsa.dot.gov/mehandbook/part_4_guide_ep.aspx
 - https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/
 - <https://www.post.ca.gov/medical-screening-manual.aspx>
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Definitions

- Mild head injury: trauma, LOC <30 min
- Moderate LOC, >30 to <24 hrs.
- Severe, dural penetration, LOC, >24 hours
- Provoked seizure is one caused by metabolic insult such as diabetes, alcohol, or head injury
- Unprovoked is an unexplained sz
- Epilepsy is two or more seizures.

Guidelines: Provoked metabolic seizure

- FMCSA: Corrected metabolic condition, cert.
 - *Mild head injury/ stroke with risk of but without sz, 1 yr wait, normal exam**
 - Mild head injury with sz, 2 year waiting*
 - Moderate injury with sz, 5 yr wait*
 - Severe head injury non certifiable*
 - *Clearance from a “neurologist who understands the functions and demands of commercial driving.”

Guidelines: Provoked metabolic seizure

- NFPA: One year, no seizures, no meds
- FAA: One year recovery.
 - Mild head injury with early sz, 2 year recovery with no medications.
 - Mild injury with late sz (> 1 week) or moderate head injury with seizure, 5 year recovery

Guidelines: Unprovoked Seizure

- FMCSA: 5 years no seizures, off meds
- NFPA: 1 year, no medications with normal exam, imaging, EEG and neurologist note
- FAA: 4 years seizure free, 2 yrs off meds
- POST: Identifies risks with no recommendations

SEIZURE IN A FIREFIGHTER, II

- 50 year old firefighter captain presents after a seizure. His neurologist feels he can work.
- PMH is positive for a carotid dissection aneurysm and stroke with left mild hemiparesis that is functional from 7 years prior. He was out of work for 12 months before resuming duties. **He is on Dilantin.**
- Can he work? He feels he can. He does mostly desk work and supervision of firefighting, but is a trainer for HAZMAT work.

Seizure in FF

- Medical record review uncover that patient had another episode of loss of consciousness and had an negative EEG.
- Examination reveals left sided difficulty with dysdiadokinesia and left sided hyperreflexia. MRI reveals encephalomalacia in the right frontotemporal lobe.

Seizure in FF

- What is your role? Consultant.
- Decision is with the department, not consultant.
- Present best evidence for risk of recurrent seizure and question of harm to oneself or others.

What is risk of recurrent seizure in patient with prior stroke?

- *Stroke, 2004:*
- **Early post stroke seizures 2% to 33%.**
- **Late (6 -24 mo)3% to 67%.**
- **Post stroke epilepsy 2% and 4%, higher in those who have a late seizure.**
- **Patients with late seizures, 66% developed epilepsy by 4 1/2 years**
- **Another paper: sz recurrence in 55% of patients, with late post stroke seizures.**

Seizures and CVA

- Risk for unprovoked sz first 2 years, 15%
- CVA pts with fixed deficits have sz, 12%.
- **Incr risk with lesions, imaging or exam**
- Same risk for those with ICH and SAH
- *FMCSA: 1 year wait for CVA w/o deficit, and w/o seizure. 5 year wait if seizure.
- *Coumadin disqualifies
- *Meclizine disqualifies for dizziness

Medical guidelines for epilepsy:

Two or More Seizures

- FMCSA: 10 years seizure free, no medications
- NFPA: 5 years seizure free controlled with medications, negative EEG and MRI and neurological evaluation
- FAA: 10 years seizure free, no medications for 3 years, negative neurological examination and EEG

Seizure in Peace Officer, III

- 28 year old accepted into Police Dept
- Post offer, asked to take physical examination
- Uncovers history of Complex Ptl sz since 2000
- PMH also notable for ADHD on Ritalin
- Neurology evaluation of EEG was negative, no MRI done
- **MVA leads to CT and ID of grade I glioma-resected in 2005.**
- Placed on Dilantin

Case Three- continued

- One year later asks to be taken off Dilantin. EEG slowing noted.
- 6 Months later has more CPS like sx, restarted on Dilantin. Later changed to Carbamazepine.
- Tics noted, saw movement specialist who suggested Klonipin; he refused
- Presently involved in Police Academy
- Neurologist wrote that he had no limitations

Type of seizures

- Remote symptomatic seizures, occur from a brain injury or lesion, higher risk of recurrence c/w idiopathic (likely genetic etiology).
- Pedley: Recurrence rate at two years, 40%. Higher risk noted abnormal EEG or a known cause such as a remote major head trauma.
- Berg: 40-50% recurrence of an initial seizure if untreated in 2 years; medications may cut this risk by as much as half.

Case three continued

- It is clear that the patients risk for recurrence slowly lessens but little literature is available about what the risk is to date.
- Risk remains more than 11% until at least 5 years post event.
- High risk category: abnormal EEG, PMH Ritalin, on medication
- *Ritalin not disqualification under FMCSA

Peace office and risks

- Increased risk: Heat, dehydration, emotional or physical stress.
- Lack of sleep/insomnia; intended or required
- Poor eating habits when working late hours
- Dehydration during working under stressful conditions
- Heat, non compliance or disruption of his medication routine.
- Significant risk to himself or others including the public, because of his responsibilities for his job is clear.
- Responsibility of the medical director to decide whether this risk is within the realm of accommodation for this position.

Case IV, Commercial Driver

- 43 year old male reports history of strange episodes since 2005 related to speaking and walking.
- Works as Sanitation worker; needs to be on call 24 hours on occasion.
- PMH positive for mother with febrile seizures.
- Mother and wife sent him to physician due to speaking difficulties.
- Absent left vertebral artery found in workup. Otherwise negative

Case IV continued

- Told he had anxiety. Workup of MRI and EEG normal. Thought to be somatiform illness.
- Began on SSRI.
- Saw specialist neurologist who placed him on Dilantin.
- Pulled over by police for swerving while driving at work. Treated harshly as if drunk. Negative ETOH.

Case IV, continued

- Sleep deprived EEG for certain prior to considering this somatiform.
- Frequent follow up.
- Required psychology treatment, frequency?
- Psychiatry assessment?

US DOT and Psychogenic Seizures

- **FMCSA:**
- **“A 6 month period of time for waiting is recommended along with a complete neurological examination. If these are negative and if the patient requires no antiseizure medication, then he may be qualified.”**
- **With regard to psychological conditions, the DOT document does mention “that disorders of periodic incapacitating nature ... may warrant disqualification.”**

Psychological conditions

- **FMCSA:**

Seizure medications for pain or other conditions not necessarily DQ.

Active depression: 6 month waiting. Benzodiazepines and TCAs DQ. Second generation OK.

Suicide attempt or mania: one year waiting

Psychosis and phenothiazines disqualifiable

- **FAA and NFPA: consider sudden incapacitation and medications**

Case V

Multiple Sclerosis in a Pilot

- 43 year old RH male commercial pilot develops body numbness and left leg dragging. After steroid infusion and Betaseron, he is able to resume normal physical activity and is qualified to work by the FAA contingent on neurology evaluations and MRI every 6 months.
- 3 years later: develops left hand numbness.

FAA and MS

- Steroid infusion leads to mild improvement.
- Patient complained of subtle dysesthesia in the left tips of fingers
- MRI did reveal cortical and cord lesions over the last three years but were stable
- Examination revealed no motor or sensory deficit other than clonus in the left foot.

MS and FAA

- Neurologist arranged an Aviation Medical Examination (AME) and he was granted a special certificate.
- MS may be disqualifiable but left up to discretion of AME (FAA)
- Issues related to physical and mental capacity along with potential for sudden incapacitation

2014 Guide for Aviation Medical Examiners

- Consult FAA Medical bulletin for Neurological Conditions
- Denial if symptoms not explained by a diagnosis, or physical findings are limiting.
- Some medications unacceptable: baclofen, clonazepam, amitriptyline
- 2000: 167 certified, 29 denied in category
- When is neuropsych eval warranted?

Multiple Sclerosis

- FMCSA: 2009 Neurological Conference including PD. Likely disqualifiable. Can be certified if benign course or with mild symptoms, 5 years post diagnosis, no sign of relapse, MRI and EP are negative with no new lesions, no excessive fatigue
- NFPA: potentially certified if no activity or evidence of progression over last 3 years.

Multiple Sclerosis

- No clear consensus on whether brain imaging or symptoms should herald neuropsychological evaluations, or motor reaction time. This is a controversial issue.
- The patient was routinely athletic, had no cognitive complaints and no motor challenges other than LLE hyperreflexia

Case VI:

Tremor in the workplace

- 39 male presents with a tremor.
- Given diagnosis of Wilson's disease which is familial in his sister.
- Worked successfully as a butcher and meat packer. In 1995, he cut his finger and was unable to work.

Wilson disease

- Rare condition, 1-2 in 100,000.
- Congenital inability to metabolize copper. Presents often with liver failure.
- Movement disorder with postural tremors, dystonia, parkinsonism, seizures, chorea, dysarthria; occasionally mild dementia.
- Kayser Fleisher rings noted on slit lamp.
- Most improve over time with chelation.

Can the patient work?

- No prior difficulties, had been promoted many times. When he returned to work, he continued to perform well.
- Two years later, he was informed by the company that he could no longer work because of his problem.
- Six months after he was layed off, asked to determine if this person can do the work of a butcher and meat packer.

Tremor localization

- A resting tremor suggests parkinsonism and localization to the basal ganglia. An increase in motor tone, with distraction may help confirm.
- An intention or action tremor normally suggests cerebellar dysfunction. Check tandem gait and dystaxia with heel- knee- shin testing for confirmation. A loss of check also suggests cerebellar localization.

Tremor localization

- Postural tremors either proximal or distally may be secondary to medications or may suggest either of the above localizations.

Tremor etiologies

- Recent neurological trauma
- Drugs, anxiety, depression, hyperthyroidism, PN
- CVA or tumor: Sudden onset or stepwise progression
- Orthostatic tremor (lower extremities)
- Peripheral or muscle related: Position or task specific
- Multi system atrophy: Isolated voice, tongue, chin or legs

Examination of tremor

- Describe tremor: What is and when is it occurring, and in what position. Amplitude?
- Assess motor tone, quickness of movement
- Assess finger nose finger and heel knee shin
- Assess normal and tandem gait
- Romberg assesses ability to proprioceptn; a sensory function.
- Assess check. With arms out in front of patient, assess ability to withstand a rapid pushing of the arms down.

Essential tremor

- Bilateral Postural/kinetic tremor of hands
- Isolated head tremor without dystonia
- Alcohol suppression not sufficient to include or exclude

ET

- ET is the most common Neurological disease
- Etiologies unknown
- Prevalence: 4% >39, 4.6% >65, 21% > 95.
- Neurodegeneration in Purkinje cells of cerebellum
- Estimates 50% of all non familiar form
- 2% of total population; non familiar form

Psychogenic tremor

- Changes amplitude or frequency with distraction or action.
- May or may not be associate with stressful discussion.
- Variable presentation in frequency and or amplitude.

Case specifics-Wilson's Disease

- Is diagnosis appropriate? Have medical specialists been consulted. Is the patient compliant with medications?
- Can the worker perform the duties of his job? Assess abilities while performing examination.
- Arrange for functional capacity evaluation.
- Sudden incapacitation/ medications?

Tremor and Work

- FMCSA: 2009 Neurological Conference. Likely disqualifiable. Non Progressive and a fixed deficit.
- Skilled performance evaluation: Ortho or
Physiatry evaluation
- NFPA: potentially certified if no activity or evidence of progression over last 3 years.

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