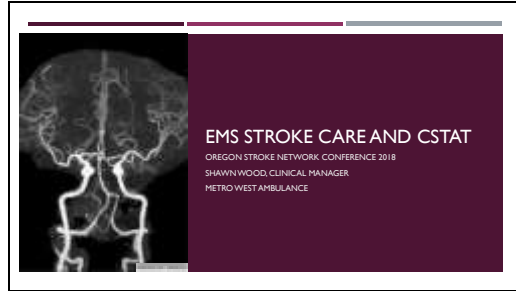
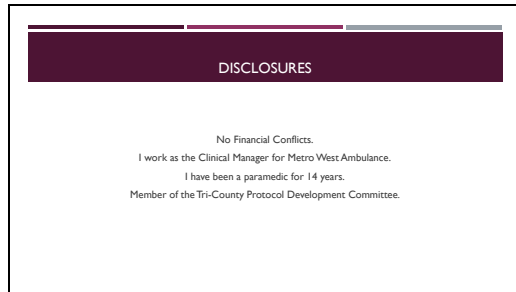


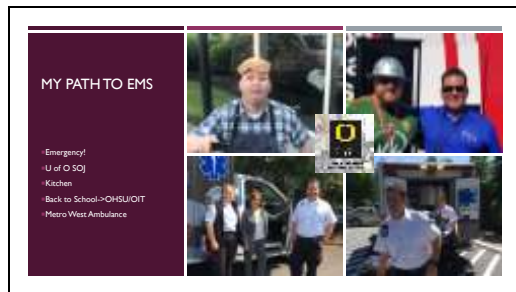
Slide 1



Slide 2




Slide 3



Slide 4


EMS: EMERGENCY MEDICAL SERVICES

- Respond, provide emergency stabilization and transport...usually to the closest hospital.
- That changed with **TRAUMA**. Specifically with the publication of The 2011 Guidelines for Field Triage of Injured Patients: Recommendations of National Expert Panel on Field Triage (Although here in the Portland area we were already doing this)
- STEMI Care**: In the early 2000's with the increased use of field 12-lead EKGs, and advances of cardiac catheterization, it began to matter where we brought our STEMI patients.



Slide 5

EMS: STROKE CARE



STROKE Care:

- There are about **795,000** strokes that occur annually. **87%** of these strokes are ischemic strokes.
- Prompt identification and **TIME** of onset is what mattered.
- "The 3 Hour Window"**: tPA (Tissue plasminogen activator) administration. Some benefit at 90 days post-treatment. (NINDS Trial, 1995)
- Anything beyond 3 hours**.... "I am sorry, you should have called sooner"....code 1. Transporting for rehabilitation purposes.

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EMS STROKE SCREENS-PROTOCOL

Cincinnati Pre-Hospital Stroke Screen:

- Facial Droop**: Smile and show your teeth.
- Arm Drift**: Hold arms out with palms up and close eyes.
- Speech**: "You can't teach an old dog new tricks" or "It never rains in Oregon."

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EMS STROKE SCREEN- PROTOCOL

Los Angeles Pre-Hospital Stroke Screen

Screening Criteria:

- Over 45 years old
- No history of seizures
- Neurologic symptoms started to present within the last 24 hours
- Pt is ambulatory prior to the event; Patient is not hospitalized
- Blood sugar is 60 - 400 mg/dL
- Unilateral (and not bilateral) exhibition of Facial Droop, Grip weakness, Arm weakness or other observable motor asymmetries

IF criteria was met, EMS would consider calling a "stroke activation," and transport code 3 to the closest primary stroke center.

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EMS STROKE CARE

- On the streets, there seemed to be some word of extending that 3 hour window to 4.5 hours.
- 2015- Endovascular thrombolytic and thrombectomy trials being performed.
- For EMS, it is a BIG "Well, now what is the window?!"




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STROKE: LARGE VESSEL OCCLUSION

Acute ischemic stroke related to intracranial large vessel occlusion constitutes about 10% of all stroke patients. Intracranial large vessel occlusion is life-threatening and symptoms are typically profound. These patients are **less** likely to respond to IV-tPA because of the significant clot burden. Recanalization rates for this subgroup of patients are between 13 and 50%

-Vivek Deshmukh, M.D., FACS



Slide 10

MECHANICAL THROMBECTOMY MATURES

- SWIFF PRIME randomized trial of ischemic stroke patients treated with tPA alone versus thrombectomy using the new SOLITAIRE revascularization device (Stent retrieval) with and without IV tPA: 60% of those who received both thrombectomy and IV tPA gained functional independence versus only 30% with tPA alone.

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POSITIVE EMBOLECTOMY TRIALS


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HOW DOES THIS IMPACT EMS?

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EMS STROKE PROTOCOL DEVELOPMENT

- Often a **chaotic**, uncontrolled environment.
- Family sometimes not available for history gathering or consult.
- Other times family is there, but becomes more of a disruption to care.
- **Primary Stroke Centers vs Comprehensive Stroke Centers** (or other neuro-endovascular care hospitals) and location comparative to scene location.
- Early identification and early imaging are **CRITICAL!**



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DEVELOPMENT OF THE 2017 EMS STROKE PROTOCOL

- In early 2016, the **Tri-County Protocol Development Committee** began to discuss how to identify LVO in the field.
- EMS Medical Directors met with area neurologists
- Reviewed different scoring tools: CSTAT, LAMS, RACE...and others.
- Taking into consideration how to keep the protocol as operational ("easy") as possible.

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2017 EMS PROTOCOL DEVELOPMENT

Protocol	1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16	10/16	11/16	12/16
CSTAT												
LAMS												
RACE												
Other												

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NOT ALL VARIABLES ARE EQUAL

- Most Reliable Predictors:**
 - Language function
 - Motor power in the arm or leg
- Next Most Reliable Items:**
 - Facial weakness
 - Level of consciousness
- Least Reliable Items:**
 - Sensory function, speech, cerebellar signs, visuospatial dysfunction and visual fields

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CSTAT: CINCINNATI STROKE TRIAGE ASSESSMENT TOOL



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CSTAT PERFORMANCE ON DETECTION OF LVO

	Sensitivity	Specificity	Positive Likelihood Ratio	Negative Likelihood Ratio
Severe Stroke	89%	77%	3.3	0.11
Mild-to-Moderate Stroke	77%	87%	5.8	0.29

See Table 10.10 (18/01/2014)

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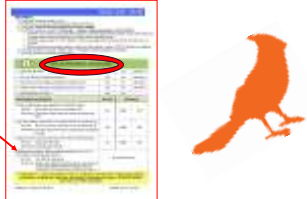
INTERRATER RELIABILITY

Greatest Interrater Reliability: Arm and leg strength evaluations

Least Interrater Reliability: Facial movement, limb ataxia, neglect, level of consciousness, and dysarthria had the least reliability.

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2017 EMS STROKE PROTOCOL: PORTLAND STROKE SCALE




Speech deficit

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2017 EMS STROKE PROTOCOL: PORTLAND STROKE SCALE

- If patient is positive for stroke using the PSS (Portland Stroke Scale), then we move to CSTAT.
- If patient is within 20 min of an interventional stroke center, patient should be transported to that center.
- If the scene is greater than 20 min from an interventional stroke center, we should transport to the closest primary stroke center.



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EMS PROTOCOL CSTAT DEPLOYMENT CHALLENGES

- How do we train 120+ MWA paramedics (Not to mention all of the fire agency paramedics and EMTs?)
- 20 min from scene to interventional facility. (Time of day, route, paramedic/EMT judgement-Subjective)
- Hedging your bets...Take everyone to an interventional facility!—WRONG
- Hospital A doesn't take strokes-WRONG
- Consistency in reporting of the CSTAT outcome over the radio

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YOU ARE NOW A PARAMEDIC!

You are called to a home in Aloha, OR
(Between Beaverton and Hillsboro). You are
halfway between Hospital A (PSC) and Hospital
B (CSC w/IR)

- Adult son was visiting his parents when his 75 y/o dad started to fall against the hallway wall while walking to the living room.
- Son asked what was happening and the father could not say any words.
- Son assisted him to the ground and called EMS (YOU)
- PMHx: A-Fib (not on thinners) , colon cancer 10 years ago.

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YOU ARE THE PARAMEDIC

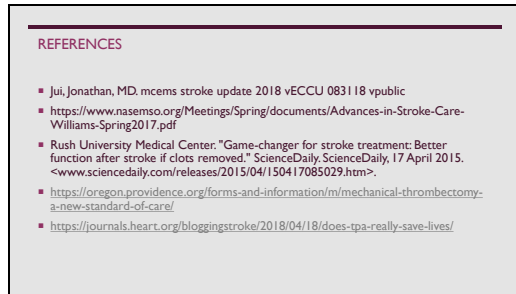
- Vital signs: 158/90, HR 72 irregular, RR 14
- CBC is 90mg/dl
- Neuro exam: Pupils equal and reactive, R sided weakness, and he cannot follow simple commands or tell you what city is in or that he is in his home.

Portland Stroke Scale: Positive or Negative?
CSTAT: Positive or Negative?
Hospital A or Hospital B? (Pt family says that he always goes to hospital A.)

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