Wow that was a cool call: Case Reviews

PRESENTED BY:
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Thank you for having me

Still a dinger

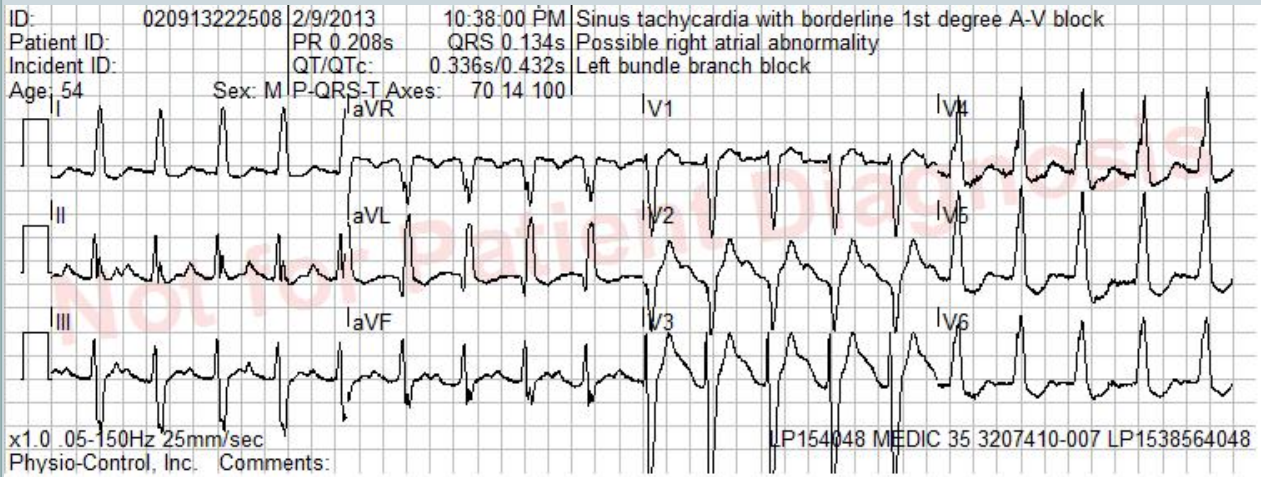
YEP

Case 1 – “I don’t feel well”

- 22:09 Hrs dispatched for a 26D1 – Sick Person Possibly Not Alert
- Residential Home
  - patient is at the home of his parents where he was celebrating his birthday. Patient and family report that he had several episodes of his internal defibrillator activating earlier in the day but he did not seek hospital treatment. Patient became progressively short of breath and then had altered mental status which prompted call to 911

Initial Vitals

- HR 127
- BP 149/102
- RR 30-36
- SpO_2 58%
- $EtCO_2$ 23 mmHg
- GCS 4/5/6 but slow
- Patient is alert and interactive – appears to have some sort of developmental disorder


ID: 020913222508
Patient ID:
Incident ID:
Age: 54 Sex: M
2/9/2013 10:38:00 PM
PR 0.208s QRS 0.134s
QT/QTc: 0.336s/0.432s
P-QRS-T Axes: 70 14 100
Sinus tachycardia with borderline 1st degree A-V block
Possible right atrial abnormality
Left bundle branch block
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
Not for Patient Diagnosis
x1.0 .05-150Hz 25mm/sec
Physio-Control, Inc. Comments:
LP154048 MEDIC 35 3207410-007 LP1538564048

22:40 – In Ambulance, After CPAP

- HR 115
- BP 124/94
- RR 30-36
- SpO_2 73%
- $EtCO_2$ -- mmHg
- GCS 4/1/5

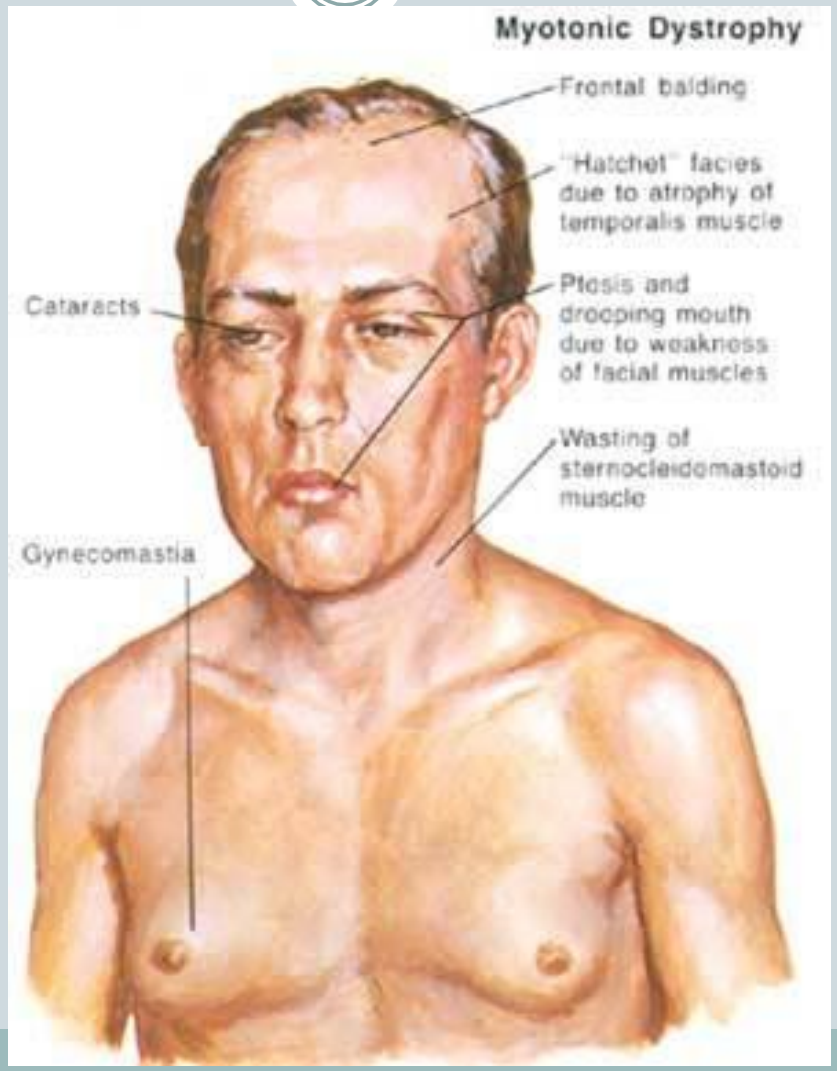
22:50 – Not Getting Better…RSI?

- Field Standing Order Indications:
  - GCS <8
  - SpO_2 <90% on 100%
  - Transport time >10 minutes

  - Contraindications?

Myotonic Dystrophy?

- Myotonic Dystrophy Type I and II
  - DM 1 – Congenital, juvenile, adult onset
  - DM 2 – Adult onset
- Autosomal Dominant Inheritance
- Skeletal muscle weakness, muscle pain (DM2), myotonia, cardiac conduction abnormalities (DM1), iridescent cataracts (DM1)


Myotonic Dystrophy
Frontal balding
"Hatchet" facies due to atrophy of temporalis muscle
Ptosis and drooping mouth due to weakness of facial muscles
Cataracts
Wasting of sternocleidomastoid muscle
Gynecomastia

Myotonic Dystrophy

- No disease modifying therapy available
- Life expectancy reduced for DM1
  - 31% - Cardiac
  - 43% - Respiratory

RSI in Myotonic Dystrophy?

- High risk
  - Increased aspiration
  - Often pre-existing conduction system abnormalities
  - Risk for precipitating myotonia
  - ? Risk of Malignant Hyperthermia
  - Risk of hyperkalemia with Depolarizing NMB's
- Recommendations
  - Propofol over midazolam
  - Rocuronium over Succinylcholine

22:55 - After NPA/BVM

- HR 113
- BP 141/83
- RR 40 Assisted
- SpO_2 88%
- $EtCO_2$ 36 mmHg
- GCS 4/2/6

23:05 - ED Arrival

- HR 117
- BP 156/97
- RR 35 Assisted
- SpO_2 83%
- $EtCO_2$ 25 mmHg
- GCS 4/5/6

Key Points

- Never be afraid to call for an extra hand
- Treat patient, not numbers
  - But do not ignore what the numbers tell you
- Know limitations of CPAP/BiPAP
- The BVM is HIGHLY underappreciated

Case 2 - Dispatch

- 17D1 Fall: extreme fall - > 30 feet
- 3rd party call: male fell down elevator shaft – caller not at location
- Priority 1: BLS ambulance, ALS fly car and fire department

What Are Your Thoughts?

- Mechanism of injury?
- Anticipated injuries?
- Anticipated interventions?
- Any concerns?

- Update – confirmed person trapped in elevator shaft

Upon Arrival

- Power out in building due to high winds
  - Minimal lighting
- Guided to basement by facility staff

You see this:

What Do You Do Now?

- What /where is your scene
- Is it safe?
  - For you? For victim?
- Fire fighters working on unlocking the elevator doors

- “Remote Medical Assessment”
- “Medicine Across the Barricade”

Medicine Across the Barricade

- Can you hear me? What is your name?
  - "Yes, I'm John Doe and I am stuck in the elevator shaft"
  - What does that tell us?
  - Conscious, a/o to person and place
- Where is the elevator?

Medicine Across the Barricade

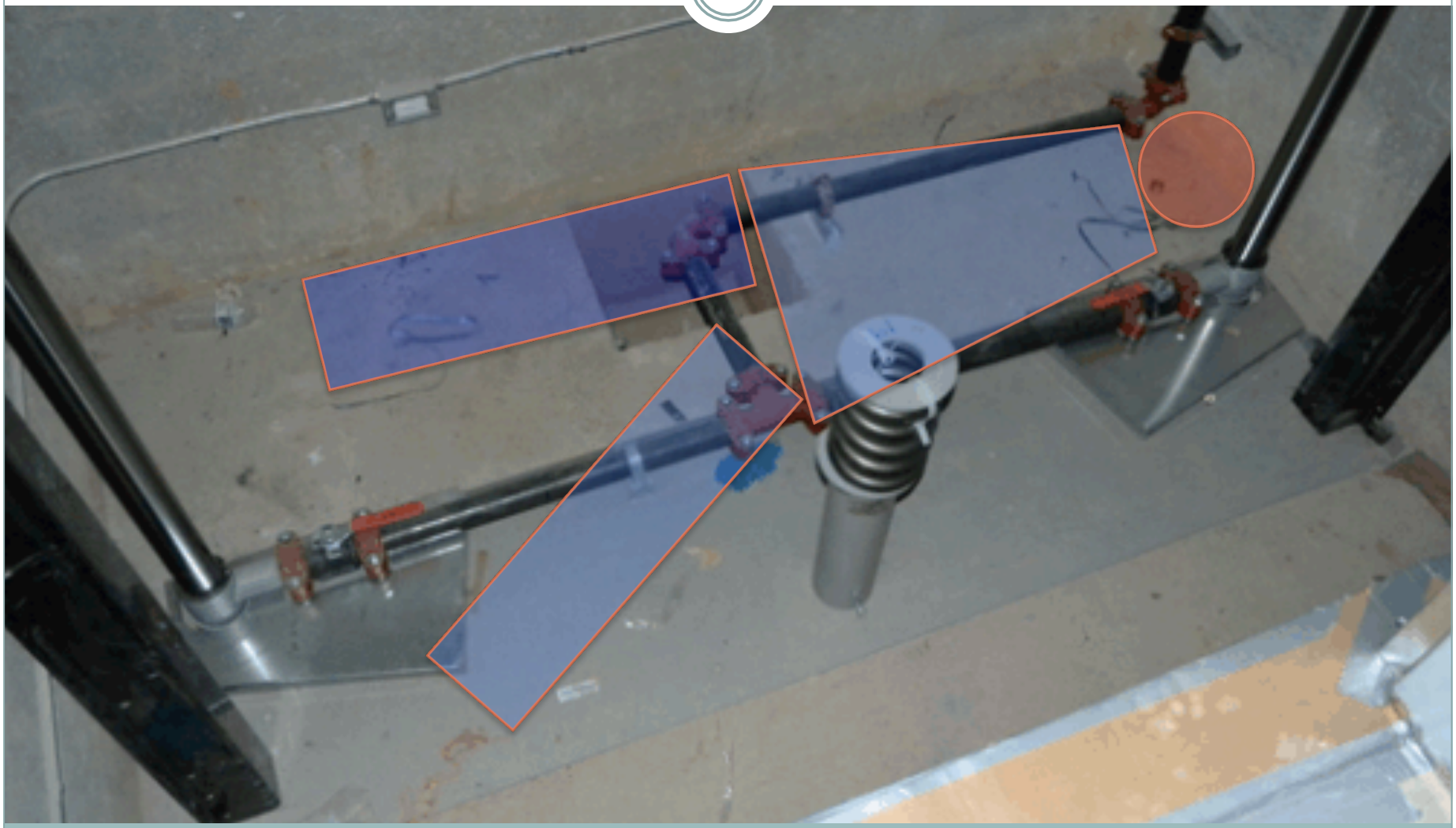
- Are you hurt? Are you bleeding?
  - "Yes, I am laying in a !@#$ ton of my blood"
- Where are you bleeding?
  - "My head"
- Sir, take your hand, find the bleeding, and push on the bleeding as hard as you can and keep holding
  - "I can't, I can't move my arms or my legs"

Assessment so far…

- Single patient
  - Male, alert, oriented, speaking in complete sentences
  - Bleeding from head
  - Unable to move: paralysis vs entrapment
- FD is unable to unlock door and is preparing to force door if necessary
- Do I have the resources that I need?
  - Request E906

Doors Opened: Remote Assessment

- See patient at bottom of elevator shaft
  - Prone position with head between two pipes, with his arms at his sides
  - Broken fragments of flashlight around him



Initial Hands-On Assessment

- Very limited due to nature of the scene and the patients' positioning
- **A**irway/**B**reathing: still intact talking
- **C**irculation: Palpable radial pulses and no obvious life threatening bleeding
- Neck and back palpated: no obvious deformity
- Pelvis stable

Now What?

- Immobilization?
- Extrication?
- Neuro/sensory exam?
  - Can you shrug your shoulders?
  - What are you able to feel?
  - Are you having trouble breathing?

Extrication/Immobilization

- Goal to get him immobilized and out of the shaft without making anything worse
  - Moved by 3 person vertical lift with 4th maintaining cervical spine immobilization and monitoring airway status
    - Now note made of open skull fracture
  - Once head is clear of the pipes, rolled onto back board and cervical collar is applied

Extrication/Immobilization

- Back board is dead-lifted over head and passed to waiting FD and EMS personnel
- Patient is placed into waiting Stokes Basket at which point monitor is applied and vitals are taken
- Patient now carried out of basement and to the ambulance

Transport

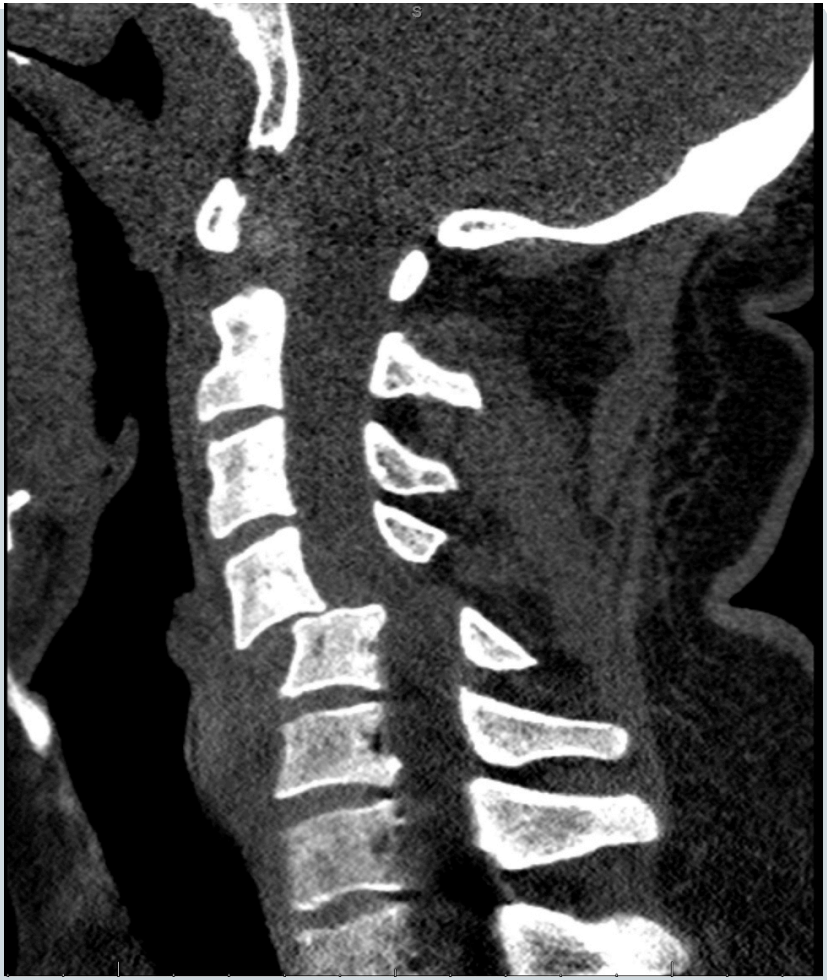
- Pt loaded into ambulance in Stoke's Basket
- IV access obtained
- Pt reassessed and femur fracture identified
  - Traction applied
- Antiemetic and pain management

- What about the airway?

Arrival to ED

- Pre-arrival notification by on-scene physician
- Level 2 Trauma Activated
- Vitals upon arrival:
  - BP 95/55 P 72 RR 16 SPOx 94% on 3L NC
- Neuro exam:
  - Insensate from nipple line down
  - Unable to move legs, arms
  - Able to shrug shoulders

ED Imaging



ED Findings

- C4/C5 subluxation with bilateral jumped facets
- Right parietal comminuted depressed skull fracture
- Left femur fracture
- Left pelvic hematoma
- Filling defects in bilateral vertebral arteries

Hospital Course

- Emergently intubated shortly after arrival to BTICU (11/01)
  - Began having respiratory difficulties and mental status changes
  - Fiber optic intubation by anesthesiology
- Cervical spine fusion 11/2 after a trial of cervical traction
- PEG/Trach on 11/14
- Pacemaker for SSS and autonomic dysreflexia on 11/15

Hospital Course

- Has required significant vasopressor support throughout ICU course
- Developed anemia without clear etiology
  - Difficult transfusion candidate due to antibodies
- Acute renal failure
- Has some movement against gravity of Left upper extremity/bicep
- Mental status is at baseline

Spinal Cord Injuries

Spinal Cord Injuries

- Incidence of Traumatic Spinal Cord Injury (TSCI) in the US is 40 per million persons per year
  - 47% due MVC
  - 23% due to falls
- Most spinal cord injuries are associated with injury to vertebral column
  - Fracture*
  - Dislocation*
  - Tearing of ligament
  - Disruption or herniation of intervertebral disc

Complete Cord Injury

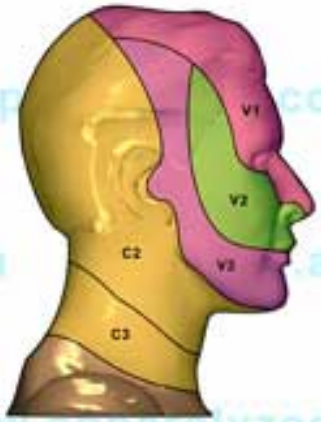
- Dermatomes above injury are spared
- Reduced sensation and muscle power in the dermatome immediately below the injury
  - Complete paralysis and sensory loss below that level
  - Physical exam findings can help determine level of injury

Cord Syndromes

- Incomplete Cord
  - Various degrees of motor and sensory loss caudal to the injury
  - Usually sensation is preserved to a greater extent that motor
- Central Cord:
  - Disproportionately greater motor loss in upper extremities compared to lower
  - Variable sensory impairment
  - Bladder dysfunction

DERMATOME CHART

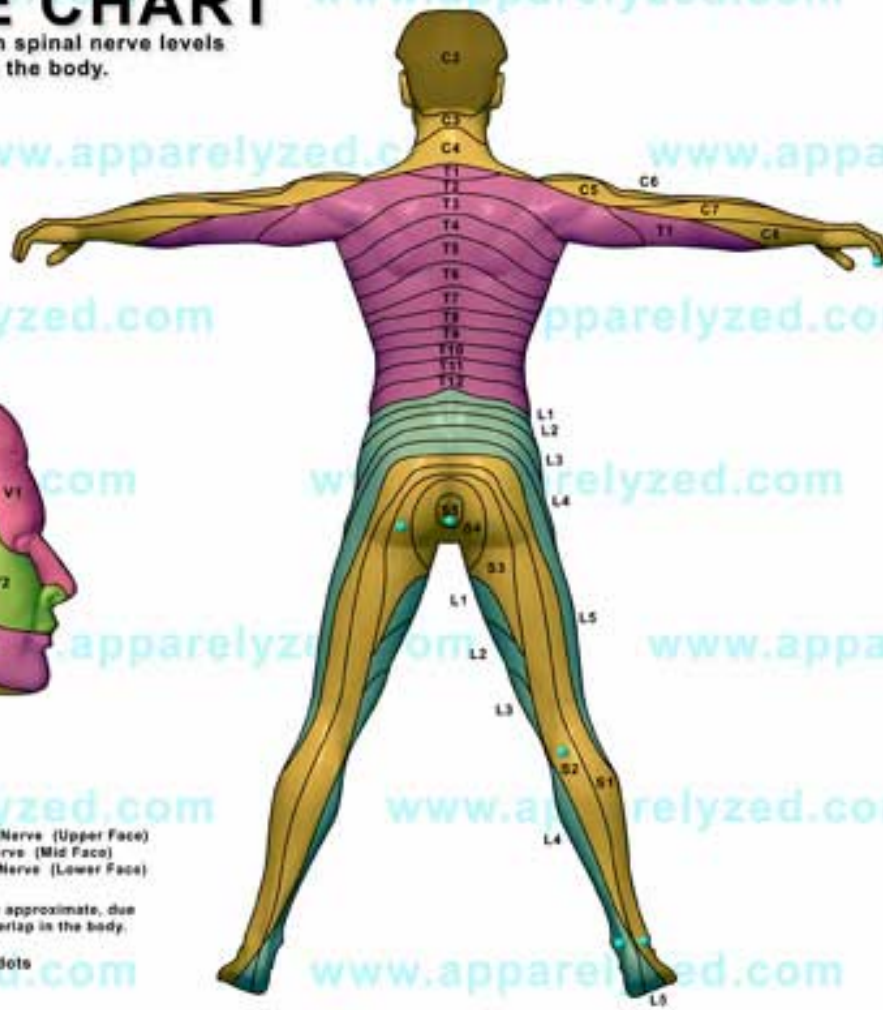
Showing the relationship between spinal nerve levels and sensory sectors in the body.

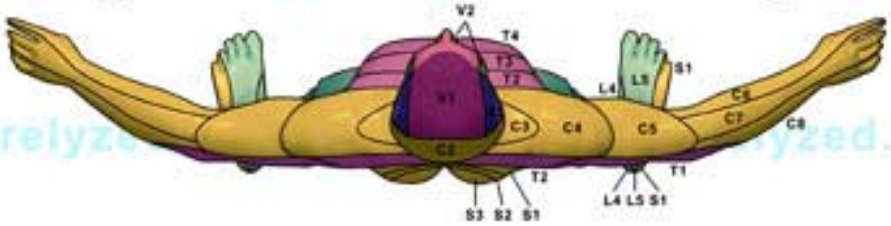


V1 - Ophthalmic Division of Trigeminal Nerve (Upper Face)
V2 - Maxillary Division of Trigeminal Nerve (Mid Face)
V3 - Mandibular Division of Trigeminal Nerve (Lower Face)

Dermatome sectors on all diagrams are approximate, due to the way sensory nerves naturally overlap in the body.

● Test Dermatomes at dots





Upper Quarter Screen

C2 - Occipital Protuberance
C3 - Supraclavicular Fossa
C4 - Acromioclavicular Joint
C5 - Lateral Antecubital Fossa
C6 - Thumb
C7 - Middle Finger
C8 - Little Finger
T1 - Medial Antecubital Fossa
T2 - Apex of Axilla

Lower Quarter Screen

L1 - Upper Anterior Thigh
L2 - Mid Anterior Thigh
L3 - Medial Femoral Condyle
L4 - Medial Malleolus
L5 - Dorsum 3rd MTP Joint
S1 - Lateral Heel
S2 - Popliteal Fossa
S3 - Ischial Tuberosity
S5 - Perianal Area

Key Physical Exam Findings

- Spinal cord segments don't correlate to vertebral column
  - C1-C8 between C1 through C7 vertebral levels
  - T1-T12 between T1-T8 vertebral bodies
  - L1-L5 between T9-T11 vertebral bodies
  - S1-S5 between T12-L1 vertebral bodies
- Thorax
  - C3-5 = Phrenic nerve – innervates the diaphragm
    - Complete injuries above C3 lead to severe respiratory compromise and usually fatal

Key Physical Exam Findings

- Upper extremity nerve roots
  - C5 = Shoulder abduction (axillary nerve)
  - C5-6 = Elbow extension (musculocutaneous nerve)
  - C6-7 = Wrist extension (radial nerve)
  - C7-8 = Wrist flexion (radial nerve)
  - C8 = Finger flexion
  - C8 = Finger extension
  - T1 – Finger abduction

Key Physical Exam Findings

- Lower extremity nerve roots
  - L2-3 = Hip flexion (femoral nerve)
  - L3-4 = Knee extension (femoral nerve)
  - L4-5 = Ankle dorsiflexion (peroneal nerve)
  - L4-5 = Hip extension (gluteal nerve)
  - L5-S1 = Knee flexion (sciatic nerve)
  - S1-2 = Ankle plantar flexion (tibial nerve)

Autonomic Dysfunction

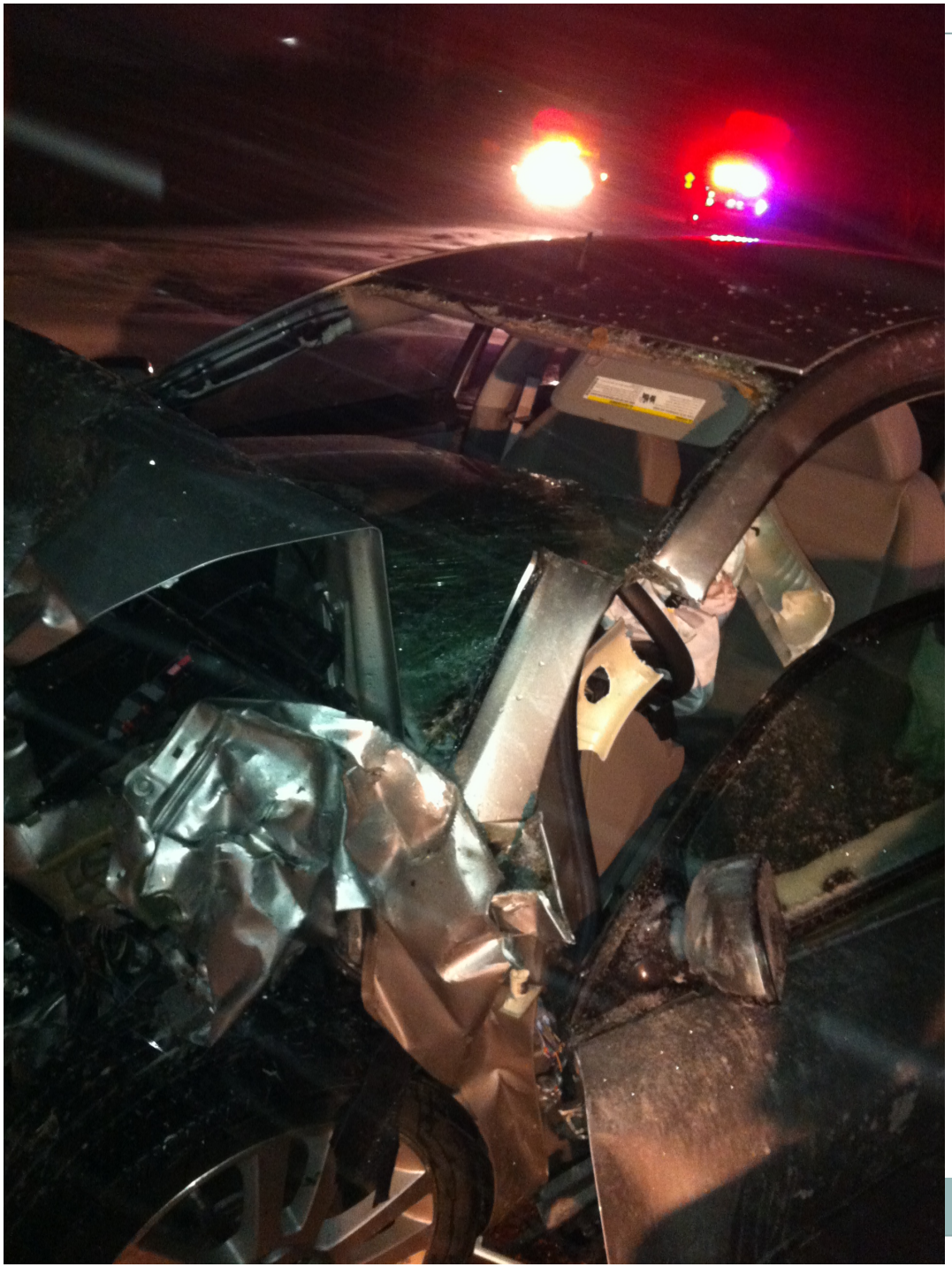
- "Spinal shock"
  - Physiological loss of all spinal cord function caudal to level of injury
    - Flaccid paralysis, anesthesia, bowel/bladder incontinence , loss of reflexes
    - Males may demonstrate priapism
    - Bradycardia and hypotension
      - Decreased vascular resistance
      - Bradycardia may require atropine and/or external pacing
        - Usually a result of high cervical lesions (C1-C5)

Treatment: Cardiovascular

- Neurogenic shock
  - Consensus guidelines recommend MAP goal of 85-90mmHg
  - IV fluids
    - Excess fluid resuscitation can lead to cord edema leading to further neurological complications
  - Vasopressors
    - Norepinephrine, phenylephrine

Case 3 – Car Accident

- Dispatch-
  - 1715
  - Minor facial injury at a motor vehicle accident
- Scene
  - 1730
  - Heavy snow
  - Cold wind
  - Two vehicles
  - One reported patient still in a car



Other vehicle

Patient

- In driver seat
- CAO x 3
- Unable to get out
- Leg is broken and it hurts

Priority

- What is first priority?
- Unable to extricate – what changes

Extended Extrication

- 20 Minutes – 1750
  - Still unable to move patient out of car
  - Any changes to plan

Ready Heat

Continued

- 30 minutes
  - 1800

    - door removed, dash rolled, roof cut

  Discover several other injuries

  Unable to move patient due to extreme pain

    - Nasal Fentanyl administered

Extrication

- 40 minutes after arrival at patient
  - 55 minutes after event
  - Bilateral Tib/Fib fractures
  - Right femur fracture
  - Possible rib injury

Review

- Several different situations:
  - Number one focus is on the patient
    - Immediate Life Threats
      - Often managed by excellent BLS Techniques
  - Don't Treat numbers – but don't ignore them either
  - Think outside the box
- Review your skills
  - Never stop learning
  - Practice often
- Collaborate