Take A Breath:
Pulmonary Management of the Organ Donor

Whitni Noyes, RN, CPTC
Midwest Transplant Network

Objectives

- Recognize MTN referral criteria.
- Be familiar with the apnea test for brain death pronouncement.
- Be familiar with basic ventilator donor management goals.
- Know why YOU are so important to donation!

Let’s talk numbers…

- National Waiting List
  - 118,549
- Lung waiting list
  - 1,391
- Transplants in 2016
  - 33,600
- Lung transplants in 2016
  - 2,327

Why?

- Every 10 minutes, someone is added to the waiting list.
- On average, 22 people die a day while waiting for a transplant.

Keeping it close to home

- MTN 2016 donors
  - 228
- 2016 Lungs
  - 103
- Wichita area hospitals (WMC, VCSF, SRHC)

–25 lungs!!

How do we know about your patient?

- Imminent Death Criteria
  - Neuro injury
    - Anoxia, trauma, CVA
  - GCS ≤ 5
    - Assessment of eye opening, painful response and awareness
  - Ventilated
- Referred to MTN from hospital staff within 60 minutes
  - 24/7 call center

Imminent Death

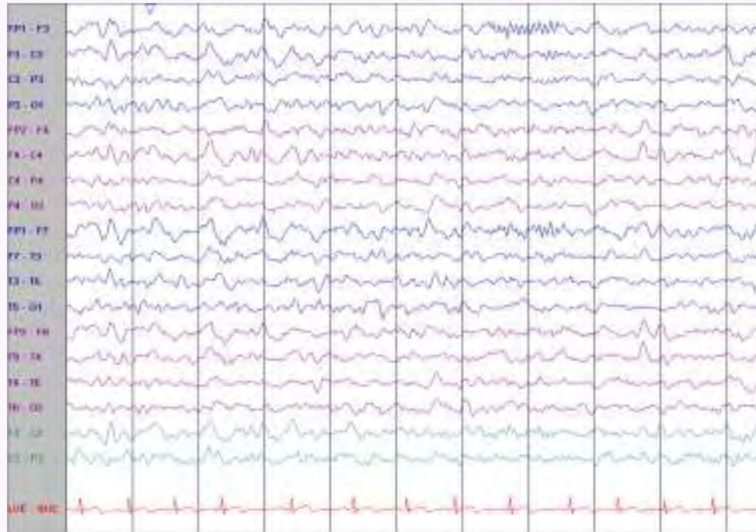
Death by
Neurological Criteria

- American Academy of Neurology guidelines (2010)
  - Must have cause of death
  - Absence of brainstem reflexes
    - Pupils
    - Oculocephalic reflex (doll's eyes)
    - Facial Sensation
    - Tracheal & pharyngeal reflexes
    - Oculovestibular reflex (cold calorics)
  - Coma
  - Apnea
    - Assure pressure trigger setting
  - Ancillary tests

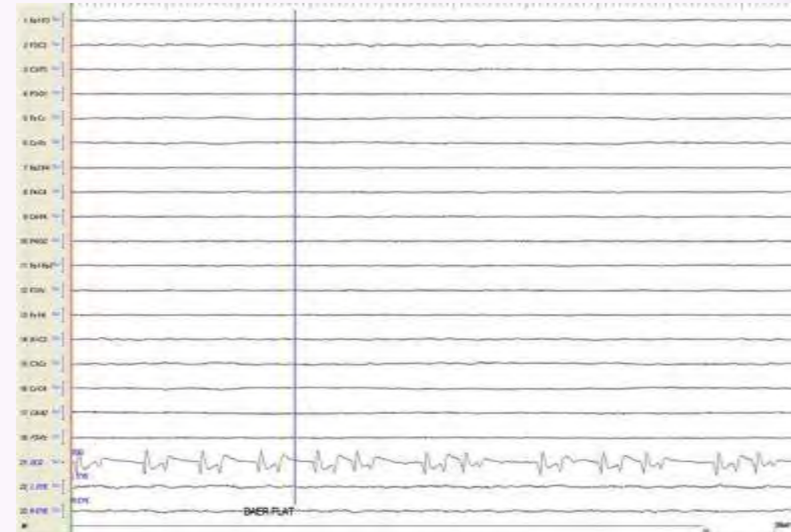
Ancillary tests…

- EEG
  - Isoelectric line (flat)
- CBF
  - No uptake of isotope
- Angiography
  - 4 vessel angio
- Transcranial Doppler
  - Flow to cerebral vessels

Electroencephalography



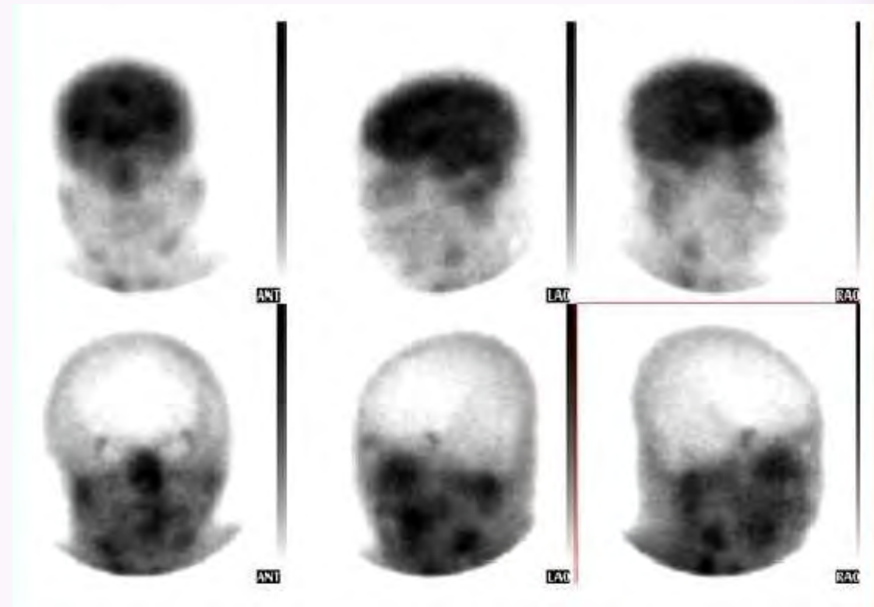
Normal



Flat

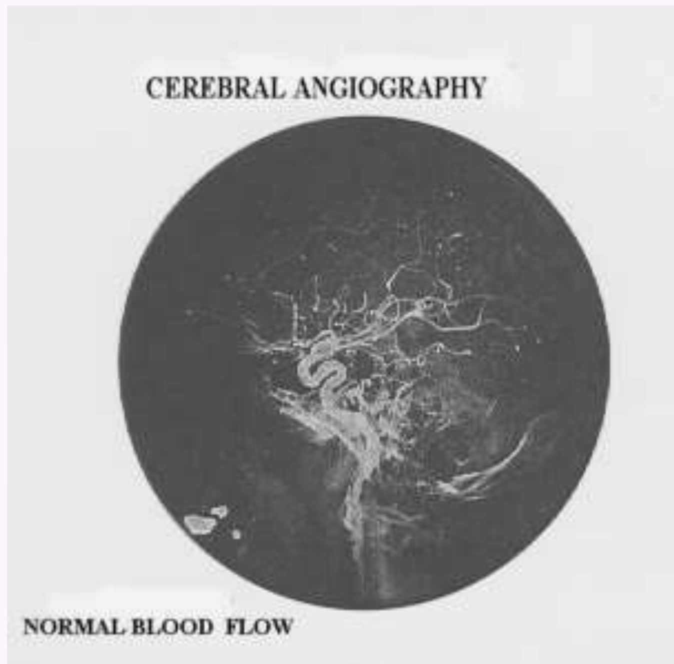
Cerebral Scintigraphy

Negative



Normal on top, Negative on bottom

Cerebral Angiography



MIDWEST TRANSPLANT NETWORK

Apnea Exam

- Hospital protocols mirror the AAN guidelines
- Preoxygenate with 100% fiO2
- Normal ABG
  - pH 7.35-7.45
  - pCO2 35-45
- Remove vent & provide “blow by” O2
- Observe for respiratory effort, 8-12 minutes
  - Any instability, exam is aborted and reconnected to vent
- Recheck ABG
  - pCO2 >60 and >than 20 from baseline

Apnea Exam

- Case #1
  - Baseline ABG: 7.32/41/456
  - 10 minutes: 7.14/67/426
- Case #2
  - 6.98/97/65
  - Cerebral angiogram
- Case #3
  - 7.44/34/59
  - 8minutes: 7.23/59/89
  - 14 minutes: 7.13/72/99

Vent Management

- Initial consultation with RT
  - 10 minutes of “playing” to get the right settings
  - Modified SALT
    - PC, IP 25 and wean to achieve 8ml/kg TV IBW
    - Switch to AC/VC+ after recruitment
    - Recruitment maneuvers: 40x40 Q2
      - Staircase Recruitment
    - Breathing treatments as needed
- Minimal vent settings
  - AC/VC+, 40%, PEEP 8

Vent Management, cont'd

- Bronchoscopy
  - Therapeutic
  - Visual
- O2 Challenge
  - ABGs on 40% & 100%
  - PFR, goal is >350
- Patient positioning
  - Prone
  - High side positioning

Additional considerations

- Limited suctioning
  - Once recruitment starts, suction only with obvious need
- Clamp ETT with disconnection
  - Do not want to lose recruitment
- Transport vent
  - Use transport vent for road trips and trip to OR
- Speak up!!
  - This is still your patient! If you have questions or concerns, let's talk!

Case Study

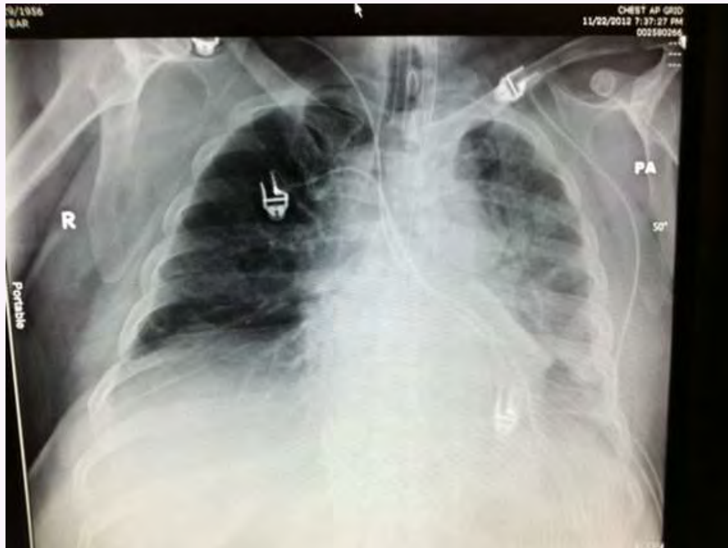
- 61/F
- Unresponsive
- Intubated in the ED
- MRI showed bilateral infarcts
- Pronounced brain dead at 1840
- Authorization at 1900

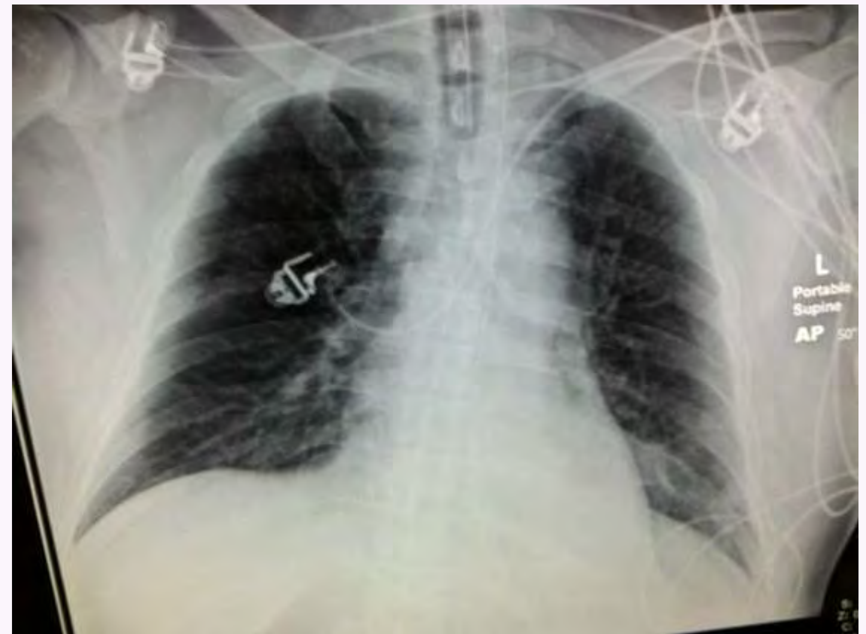
Vent Management

- Pre Apnea
  – 7.43/34/292
- Post Apnea
  – 7.21/74/318
- Vent changes
  – AC/VC+, PEEP 8, rate & volume for ABG
- Recruitment Maneuvers
- Pronation
  – 360 protocol

Additional testing

- CT chest: Mild interstitial edema, mild basilar atelectasis
- Bronchoscopy: Normal, minimal secretions
- CXR: Minimal atelectasis
- Final PO2 521


CHEST AP GRID
11/22/2012 7:37:27 PM
R
PA
Portable


L
Portable
Supine
AP

MIDWEST
TRANSPLANT
NETWORK

Outcome

- Liver recovered, but discarded due to biopsy results
- Bilateral kidneys recovered, but discarded due to biopsy results
- Bilateral lungs recovered and transplanted into a 51/M!!!!

Did I forget to mention…

Donor was a 1-1 ½ pack per day smoker for 47 years!!!!!!!!

Case Study

- 17 year old male
- MVC
- No chest trauma suspected
- Pronounced with 4 vessel angio due to pulmonary instability
- Initial PO2 was 53
- CXR: Extensive hazy opacities in bilateral lungs, likely edema.

Interventions

- Vecuronium and Narcan
- Solumedrol
- Bronch
- Recruitments started 30x30, then up to 40x40 (hourly)
- Albumin
- Lasix
- Dobutamine
- High left turn
- Positioned prone
- Repeat Vec and Narcan
- Repeat Solumedrol

Outcome

- After 12 hours, PO2 395
- Continued hourly recruitments
- Repeated bronch
- Allocated lungs to 26 year old male
- Final PO2 392
- Hourly recruitments…
  - –56 hours

Thinking outside the box…

- https://www.youtube.com/watch?v=CUUq7fLMruM&oref=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DCUUq7fLMruM&has_verified=1