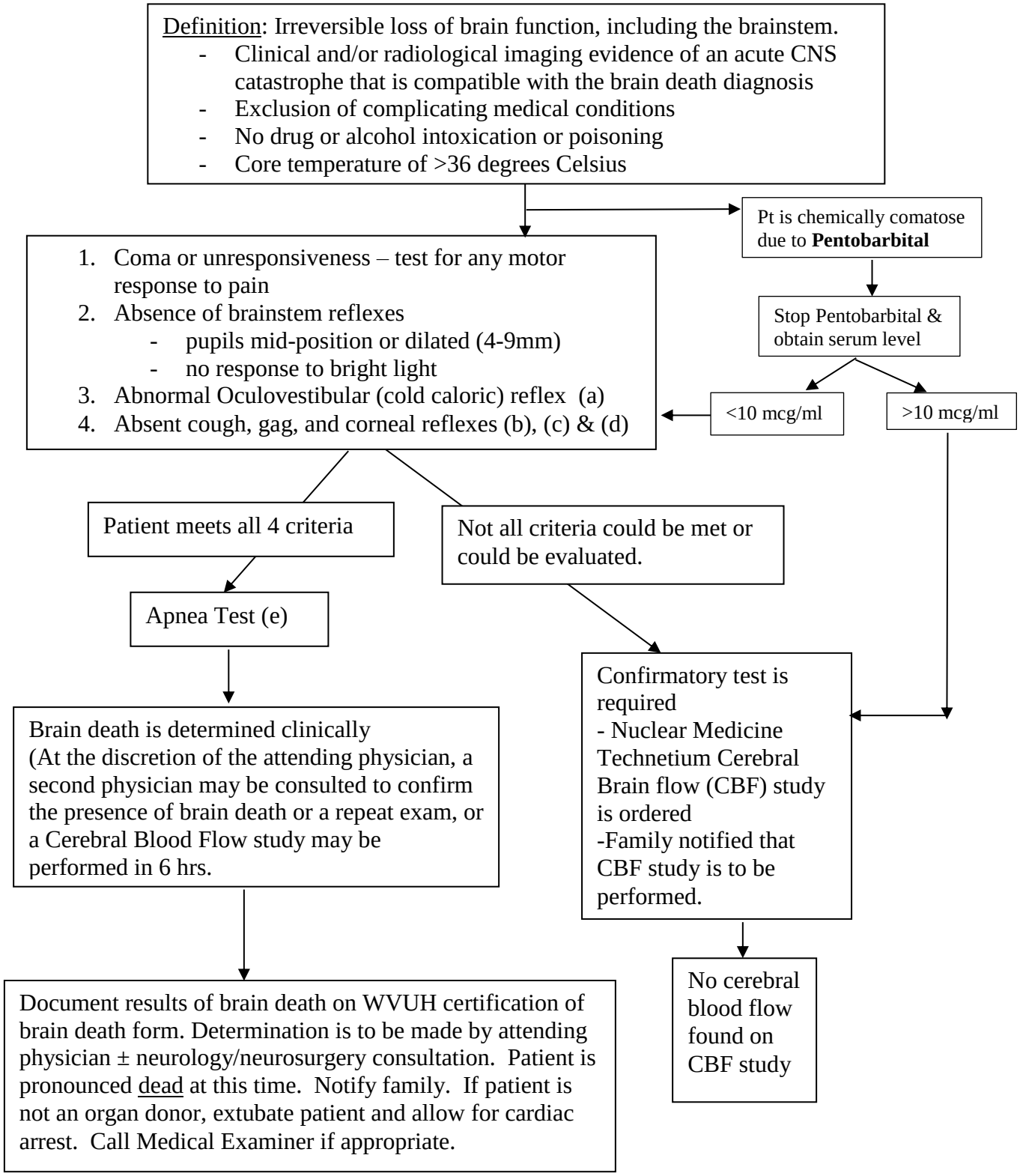
DETERMINING BRAIN DEATH in Adults at WVU Hospital *



~~Updated 2/27/19~~
Reviewed 1/28/2021

Oculovestibular Reflex (a):

1. Place patient in a 30-degree head-up position. This can be done by raising the head of the bed, or placing the entire bed in a 30-degree Reverse-Trendelenburg position.
2. Mix 200 cc tap water in ice. Place a kidney basin below the ear. Have an assistant open both eyelids.
3. Examine both external auditory canals. Clear away cerumen.
4. Using a Toomey syringe, slowly inject 50 cc into the external auditory canal on one side. Observe over 5 minutes for conjugate tonic eye movement towards the side of the stimulus. Repeat 50 cc in the same EAC.
5. After a rest period of 5 minutes, repeat the entire procedure in the other ear canal.
6. If in both cases there is no deviation of the eyes towards the stimulus side, the test is considered abnormal and may be consistent with brainstem death.

Gag and cough reflexes (b) & (c):

1. Insert an ETT suction catheter all the way into the ETT, suction, move the catheter side to side as it is withdrawn, and observe for cough, head movement, or facial expression change.
2. Wiggle the ETT. Observe for a gag reflex. Insert Yankauer suction into the oropharynx and wiggle back and forth. Observe for any gag, head movement, or facial expression change.
3. No response to either or both tests may be consistent with brainstem death.

Corneal Reflex (d):

1. With a gloved finger touch the cornea over the iris of the eye. Observe for any eyelid reflex or motion, any eye movement.
2. Repeat on the contralateral eye.
3. If there is no motion or reflex, the test may be consistent with brainstem death.

Apnea Test (e):

1. Pre-oxygenate the patient for 10 minutes with FIO2=1.0
2. Adjust ventilator so PaCO2 is 35-45 if possible. Confirm with EtCO2 or ABG # 1
3. Disconnect the ventilator. Apply 10 L/min O2 aerosol T-piece to the end of the ETT.
4. Allow a maximum of 10 minutes. Observe for any chest wall motion. Obtain ABG # 2. If there are any spontaneous breaths, stop the test. If SaO2 drops below 92%, stop the test & reconnect the ventilator.
5. If the PaCO2 on ABG # 2 is 60mm Hg or > or ≥20mmHg rise from baseline, reconnect the ventilator.
6. Test is considered positive for "absent hypercarbic respiratory drive".

*Revised in accordance with Wijdicks EF et al. American Academy of Neurology. Evidence-based guideline update: determining brain death in adults: report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology* 2010;74 (23):1911-1918. For patients on ECMO, the apnea test will be modified according to the protocol described in Smilevitch P et al. Apnea test for brain death determination in a patient on extracorporeal membrane oxygenation. Neurocrit Care. 2013 Oct;19(2):215-217

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