Neurological Dysfunction

1. I. Assessment
   1. A. Unconscious is a state of depressed cerebral function in which the appreciation of stimuli is lost.
   2. B. Causes of Unconsciousness
   3. C. ER or Field Evaluation
   4. D. Facts
      1. Box in Brain
      2. O\textsubscript{2} 89
      3. CO\textsubscript{2} 89
      4. Brain O\textsubscript{2}
   E. Levels of Consciousness
      1. Glasgow Coma Scale
      2. In order of deterioration
   5. F. Motor and Sensory Function
   6. G. Blood Pressure & Pulse
   7. H. Pupillary Signs
   8. I. Reflexes
   9. J. Temperature
  10. K. Breathing Pattern
  11. L. Skin

II. Brain Injuries

When the moving head is brought to an abrupt stop by hitting a solid object, the brain tissue continues to move until it is stopped short by the skull bones. This action injures the brain. * Specific brain damage following cranio-cerebral injuries is related to:

1. 1. Mechanism of injury (how it occurs)
2. 2. Nature of the injury (type)
3. 3. Location of the injury

Trauma can cause the following conditions:

A. Concussion:
   4. 1. Results from violent jarring of the brain.
   5. 2. Is often associated with a loss of consciousness
   6. 3. May be followed by headache, irritability, dizzy spells, confusion and an unsteady gait.
   7. 4. Complete recovery is usual
12. **B. Cerebral Laceration and Contusion**
   1. More severe than a concussion. Multiple bruising of the brain.
   3. Permanent damage may result, causing impaired intellect, speech difficulties, epilepsy, paralysis, impaired gait and continuing stupor.
   4. Contusion:
      1. a. May cause loss of consciousness so profound that the patient dies within a few hours.
      2. b. The patient will characteristically:
         1) resent interference
         2) be disoriented
         3) be noisy
         4) be agitated or
         5) be violent (can last for days or weeks)
      3. c. Usually comes via two ways of injury, each compromised of blow and counterblow. These are:
         1) Coup and contrecoup. Bruising of the brain below site of injury and blow forcing brain against the opposite side of the skull. Injury point of impact and opposite side of brain as it rebounds.
         2) Acceleration/Deceleration. The head is hurled forward if it is slapped against an then against .
            Acceleration C head hits stationary object
            Deceleration C head is struck by a moving object
   13. **C. Epidural (Extradural) Hematoma** (between skull and dura)
   11. 1. Caused by arterial bleeding and occurs on top of the dura (Epi means above), usually middle, meningeal artery.
   12. 2. True surgical emergency, Burr holes, aspirate blood.
   13. 3. Bleeding occurs very rapidly, separating the dura from the cranium.
   14. 4. Unless the increased intracranial pressure produced is relieved, destruction of the brain substance will take place.
   15. 5. Characteristically, the patient will have a momentary lapse of consciousness.
   16. 6. He may appear perfectly alert and clear after the injury and carry on a lucid conversation.
   17. 7. Within an hour or so, he may state he feels drowsy.
   18. 8. This is one of the first signs of increasing intracranial pressure, due to arterial bleeding.
   19. 9. The patient becomes comatose.
   20. 10. The patient should be kept in the hospital 24 hours following a head injury.
   21. 11. Vital signs should be taken every 15 minutes.
   22. 12. Watch for: (these neurologic symptoms are even more important than the vital signs)
      4. a. Decreasing consciousness
      5. b. Dilated pupils (normal 2-3 mm)
      6. c. Asymmetry of the pupils
      7. d. Convulsions
      8. e. Hemiparesis
23. 13. Epidural hemorrhage may be treated by trephining the skull (perforating the skull with an instrument called a trephine), removing the clot and ligating the bleeding artery.

14. D. **Subdural Hematoma**
1. Occurs as a result of venous bleeding in the space below the dura. (Cortical veins)
2. The patient may appear to have recovered completely from a blow on the head.
3. Because the bleeding is more in the nature of oozing than gushing.
4. There may be no symptoms for as long as 2 months.
5. The clot that forms is gradually walled off, a physiologic defense not possible in a more rapid hemorrhage.
6. The wall acts as a tamponade for the bleeding.
7. Often the clot is absorbed by the body and no treatment is necessary.
8. When absorption fails to occur, the patient experiences symptoms of compression of the brain:
   a. Periodic episodes of memory lapse
   b. Confusion
   c. Drowsiness or personality change
   d. Affects motor and language centers
   e. Depress level of consciousness
   f. Seizures
   g. Motor weakness, paralysis
9. Burr holes are made into the cranium and the hematoma is aspirated.

15. E. **Basal Skull Fractures**
32. 1. May be fatal because of proximity to the brainstem. (Center of respiration and circulation)
33. 2. Direct bleeding, edema in or around the medulla may precipitate respiratory or circulatory collapse.
34. 3. Bleeding into the meninges will irritate them and cause a stiff neck.
35. 4. Bleeding from the ears is common:
   a. Bleeding from the ears and nose is advantageous because it lessens intracranial pressure.
   b. Bright red blood may indicate rupture of a major vessel. (Serious)
   c. Unobstructed drainage from the ears is desirable.
   d. The canal is not packed with gauze or cotton.
   e. No cleaning or swabbing - you may introduce bacteria resulting in meningitis.
F. Three cardinal signs and symptoms of I.C.P.
   36. 1. Headache
   37. 2. Vomiting
   38. 3. Papilledema

III. Medical Treatment
   39. 1. Establish Airway
   40. 2. Dehydration Regimen
       21. a. Limited intake
       22. b. Hypertonic solution
       23. c. Diuretic drugs
           1) Mannitol (hypertonic solution)
           2) Lasix
           3) Bumex
   41. 3. Corticosteroids
   42. 4. Barbiturates
   43. 5. Positioning
   44. 6. Hyperventilation
   45. 7. Control temperature