Neurological Disorders

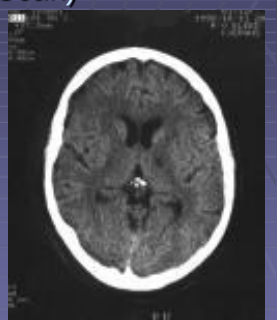
PSY 417

Schuetze

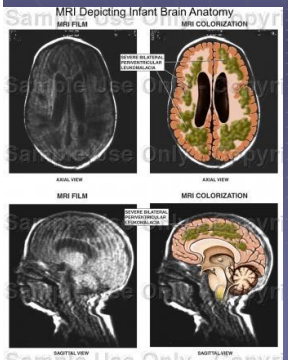
Diagnosing Neurological Problems

- Structural Imaging
- Functional Imaging

Computerized Axial Tomography (CAT Scan)



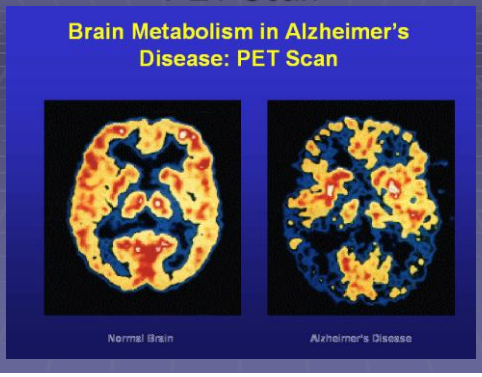
Magnetic resonance Imaging (MRI)



Positron Emission Tomography (PET Scan)

- Inject radioisotopes in blood
- Attracted to areas of tissue that are metabolically active

PET Scan

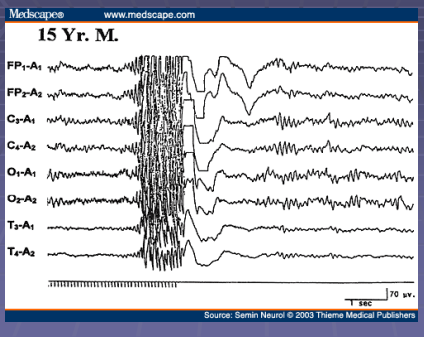


Ultrasound

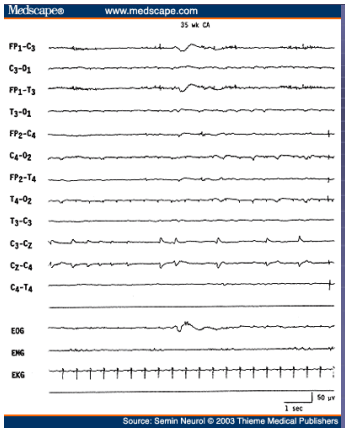
Large hemorrhage in left ventricular

Electroencephalogram (EEG)

EEG Waves



- Epilepsy



EEG Waves

- Unresponsive neonate
- Grade IV Intraventricular Hemorrhage

Areas to be Evaluated

- Mental Status
  - Awareness and interaction with the environment
- Motor Function and Balance
- Sensory Examination
- Reflexes

Reflexes

- Inborn automatic responses to particular form of stimulation
  - Gradually disappear over 1st 6 months, probably due to increase in voluntary control
  - Reflexes index health of nervous system
  - Week or absent reflexes
  - Overly exaggerated/rigid reflexes

Reflexes

- Eyeblink
- Moro
- Crawling
- Babinski
- Palmar Grasp

Evaluation of Cranial Nerves

- I. Olfactory Nerve – identification of smells
- II. Optic Nerve - eye
- III. Oculomotor – pupil of eye
- IV. Trochlear – movement of eyes
- V. Trigeminal – ability to feel face
- VI. Abducens – movement of eyes
- VII. Facial – tastes, smiling
- VIII. Acoustic - hearing
- IX. Glossopharyngeal - taste
- X. Vagus - swallowing
- XI. Accessory – moving shoulders/neck
- XII. Hypoglossal – movement of tongue

Cerebral Palsy

- Motor problems due to brain damage that occurs before, during or after birth
- Often due to anoxia
- General symptoms: muscular incoordination; postural/balance problems; secondary impairments
- Not progressive
- Hypertonia versus hypotonia

Cerebral Palsy – Affected Sites

- Hemiplegia – one side of body
- Paraplegia – lower extremities
- Quadriplegia – all extremities
- Diplegia – all extremities
- Monoplegia – one extremity
- Triplegia – three extremities

Cerebral Palsy – Types

- Spastic: muscles contract when stretched
- Athetoid: limbs flail
- Ataxia: loss of coordination
- Mixed

Seizures

- Abnormal electrical discharges in cerebral neurons
- Imbalance between excited versus inhibited neurons
- Epilepsy: recurrent seizures
- 3 Categories
  - Partial: activation of one area of brain
  - Generalized: activation of entire brain
  - Unclassified

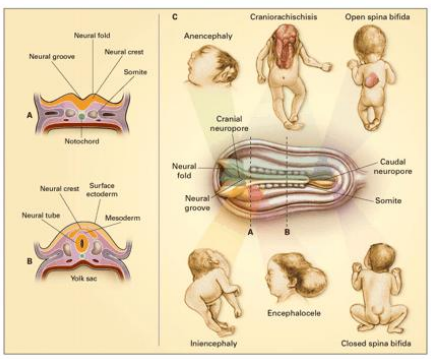
Types of Seizures

Tonic – rigid muscle contraction
Clonic: alternate contraction/relaxation of muscles
Tonic-clonic/grand mal: contraction followed by clonic activity
Myoclonic: sudden, brief, shock-like muscle contractions
Atonic: sudden reduction in muscle tone
Infantile: poor long-term prognosis
Febrile: tonic-clonic from high fever

Traumatic Brain Injury

- Physical Symptoms
- Cognitive Symptoms
- Behavioral Symptoms

Neural Tube Defects



Spina Bifida

Other Neural Tube Defects

- Anencephaly
- Microcephaly
- Hydrocephaly

Shaken Baby Syndrome

- Approximately 50,000/year
  - 25% die
- Mental retardation
- Cerebral Palsy

Sudden Infant Death Syndrome (SIDS)

□ □ The sudden death of an infant under 1 year The sudden death of an infant under 1 year of age, which remains unexplained after a of age, which remains unexplained after a thorough case investigation, including thorough case investigation, including performance of a complete autopsy, performance of a complete autopsy, examination of the death scene, and review examination of the death scene, and review of the clinical history." of the clinical history." – Willinger Willinger 1991

Characteristics of SIDS

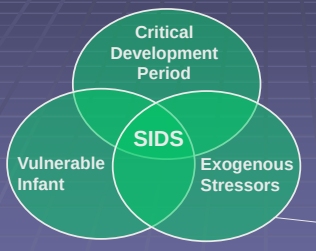
- Peak incidence 2 to 4 months of age
- Slight male predominance
- More prevalent in cold, winter months
- Not considered genetic or hereditary
- Not due to suffocation, aspiration, abuse or neglect

Characteristics of SIDS

- Leading cause of postneonatal death (28 to 364 days of age)
- Occurs suddenly without warning, often during periods of sleep
- Occurs during critical development period
- Triple-risk hypothesis

What Causes SIDS?

Triple-Risk Model



Some infants are born vulnerable, with certain brain stem abnormalities that make them susceptible to sudden death during a critical developmental period once an exogenous stressor or environmental challenge is presented.

- overheated
- exposed to second-hand smoke
- entrapment from stuffed animals or pillows
- environmental challenge

Source: Filiano JJ, Kinney HC. Biology of the Neonate, 1994

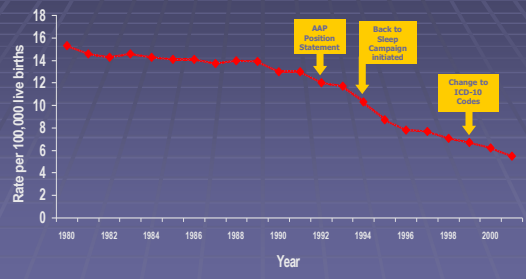
Risk Factors for SIDS

- Prone sleep position
- Preterm birth
- LBW
- No/late prenatal care
- Maternal smoking during pregnancy
- ETS exposure
- Young maternal age
- Single marital status
- Soft bedding
- Co-sleeping (possibly)
- Infections (possibly)

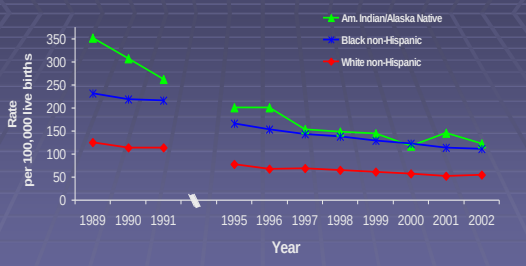
"Back to Sleep" Campaign

- 1992 – American Academy of Pediatricians (AAP) recommendation
- 1994 – National public education campaign begins
- Prone sleep position drops from 62% in 1993 to 20% in 1998
- SIDS incidence has fallen 30-50%

Mortality Rates Due to SIDS, U.S., 1980-2001



SIDS* mortality rates by race of mother



*SIDS – Sudden Infant Death Syndrome
SOURCE: CDC/NCHS, National Vital Statistics System, Linked Birth-Infant Death data set. Data not available for 1992-94.