

congenital malformations

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Teratology : is the study of frequency ,etiology ,and development of congenital malformations



Thalidomide disaster 1961

Lenz , W (1962) Thalidomide and congenital abnormality .
Lancet, 1:1219



Amelia



Meromelia



Grain - Mercury accident in Iraq 1971-1972

Bakir F , Damluji S , Amin - Zaki L , Murtadha M , Khalidi A ,
Al - Rawi N , Tikriti S , Dhahir HI , Clarkson TW , Smith JC , &
Doherty RA (1973) : Methyl - mercury poisoning in Iraq . Science
. 181 : 230



Dr. N Gregg (1952)

- The first to discover that German measles infection of pregnant women leads to congenital malformations in the fetus (Congenital Rubella Syndrome CRS)



Incidence of congenital malformations

- Major anomalies : 4-6 % live born infants
- Minor anomalies : 15 % live born infants

Etiology of Malformations

- 50 % : Unknown causes
- 15 % : Genetic factors (chromosomal abnormalities & gene mutations)
- 10 % : Environmental factors
- 25 % : Multi - factorial

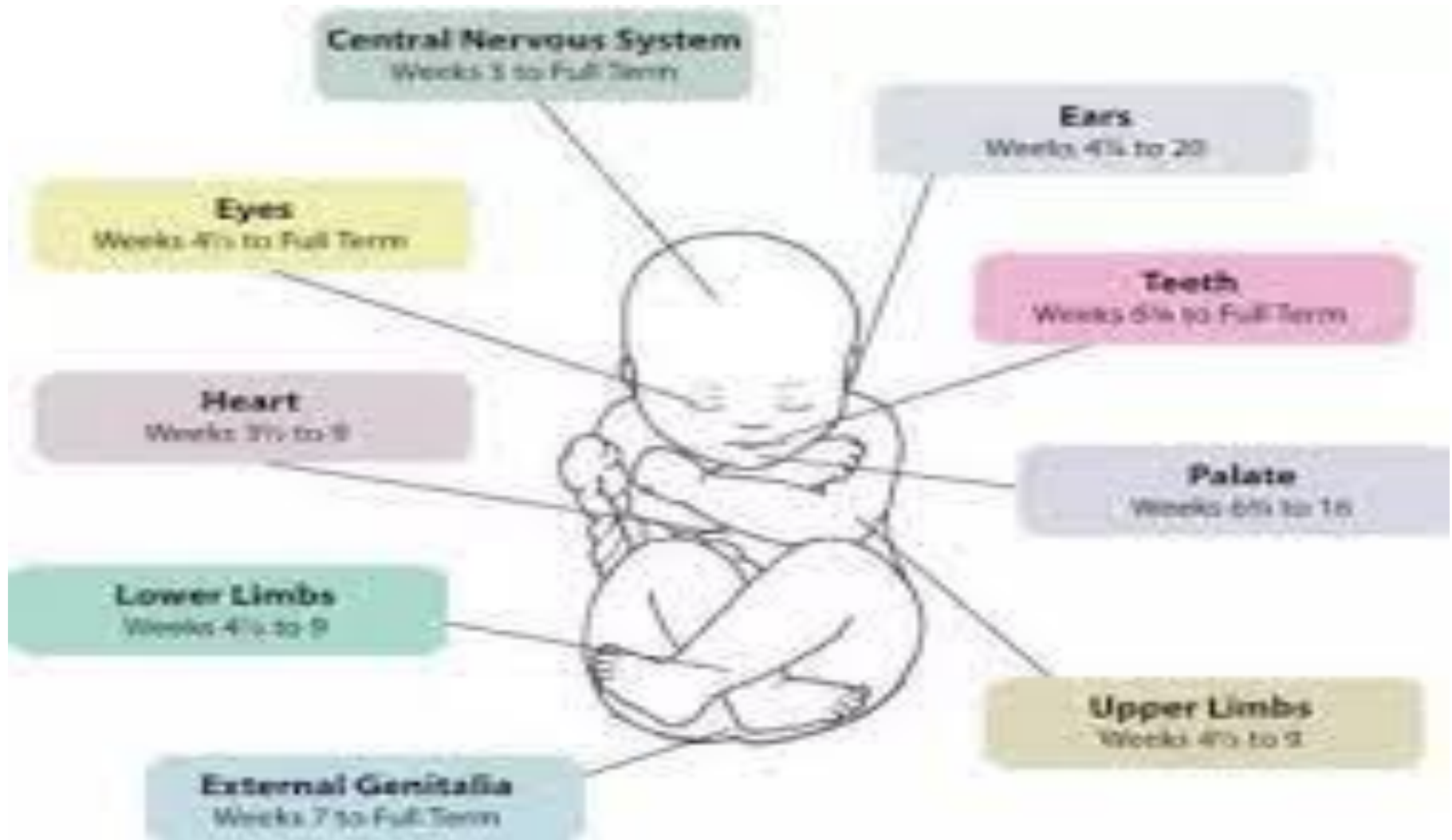
Teratogens

Substances that cause defects
or abnormalities in fetal
development

Teratological Studies

1. Experimental teratology & new drugs testing
2. Retrospective studies & pregnancy registries of exposures .
3. Prospective controlled multi - center studies
4. Molecular research .

Critical periods of development



Teratogens

1. Infectious agents
2. Physical agents
3. Chemical agents

Infectious Agents as Teratogens

Bacteria

Syphilis



Treponema pallidum Spirochetes of Syphilis



Congenital syphilis Hutchinson's Triad

1. Hutchinson Teeth
2. Saddle nose
3. Deafness

Congenital Syphilis

1. Hutchinson Teeth
2. Saddle nose
3. Deafness



Hutchinson teeth of Congenital Syphilis

- Notched upper central incisors



Viruses

Rubella German measles

Congenital rubella Syndrome (CRS)

- Congenital heart defects (VSD , ASD)
- Deafness
- Cataract

Vaccine Development



Cataract in congenital rubella syndrome (CRS)



Herpes Virus group

1. Herpes simplex (Herpes labialis)
2. Varicella virus (Chicken Pox)
3. Cytomegalovirus (CMV)

Herpes Simplex Herpes labialis



Varicella virus Chicken Pox

Causes an incidence of 20 % of birth defects if contracted during pregnancy



Cytomegalovirus Mental retardation

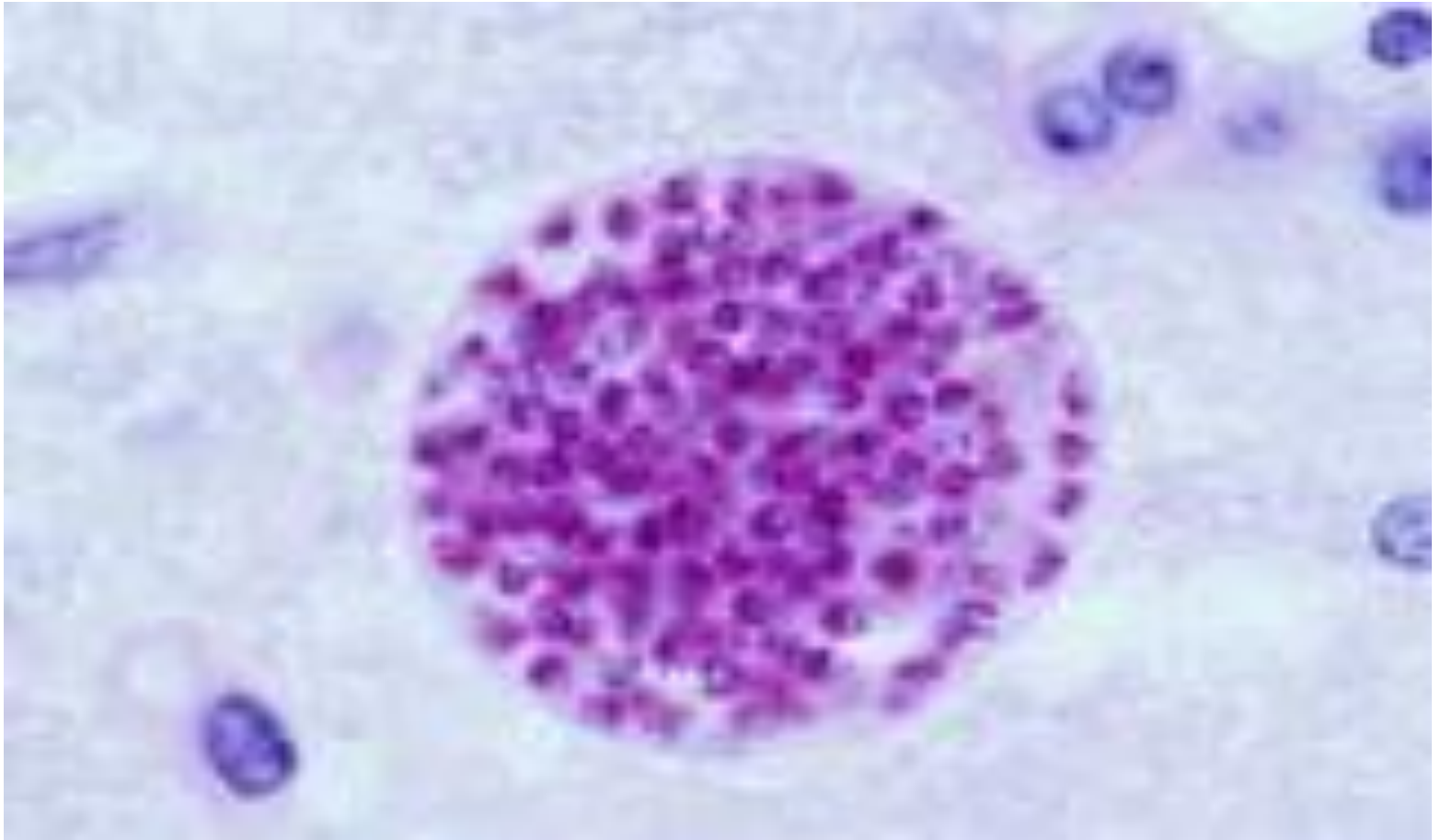
- " Silent "

" asymptomatic "

infection of pregnant women

Protozoa

Toxoplasma gondii



Congenital Toxoplasmosis



A fetus may contract toxoplasmosis through the placental connection with its infected mother

The mother may be infected by:

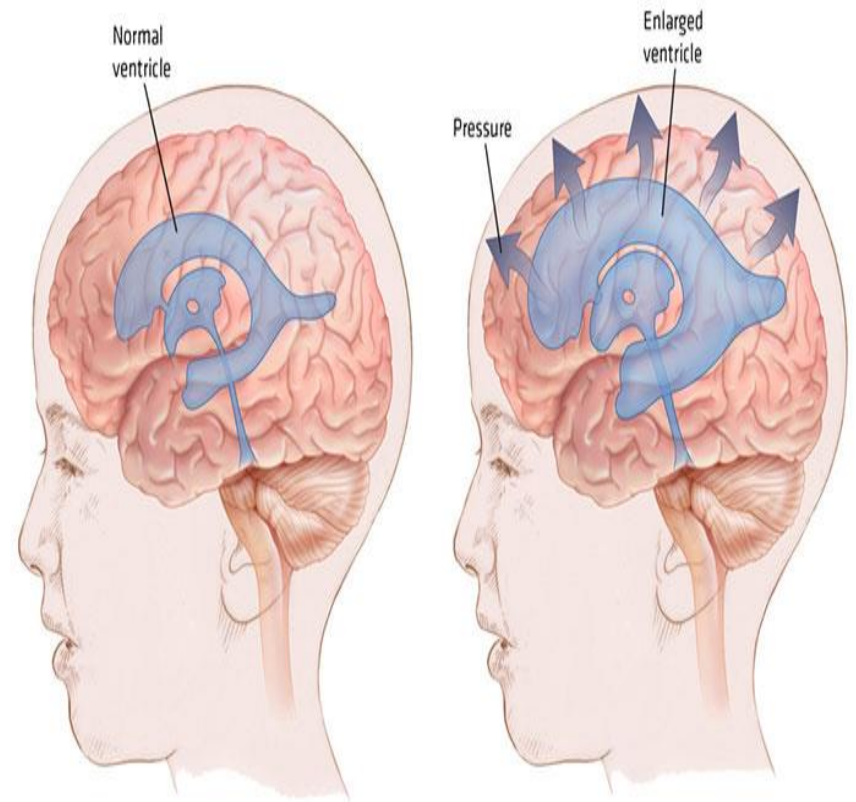
Improper handling of cat litter



Handling or ingesting contaminated meat



Hydrocephalus



Toxoplasmic Chorioretinitis



Hydrocephalus



Physical Teratogens

Hyperthermia

Hot tubs



Hot Sauna



Anencephaly



Spina bifida



Spina bifida (occulta)



Mental retardation



Facial Abnormalities



Chemical agents

Radiation

1. Atomic radiation
2. Radio - therapy & radioisotopes
3. X - ray exposure

Atomic Radiation

Atomic bomb on Nagasaki August 1945



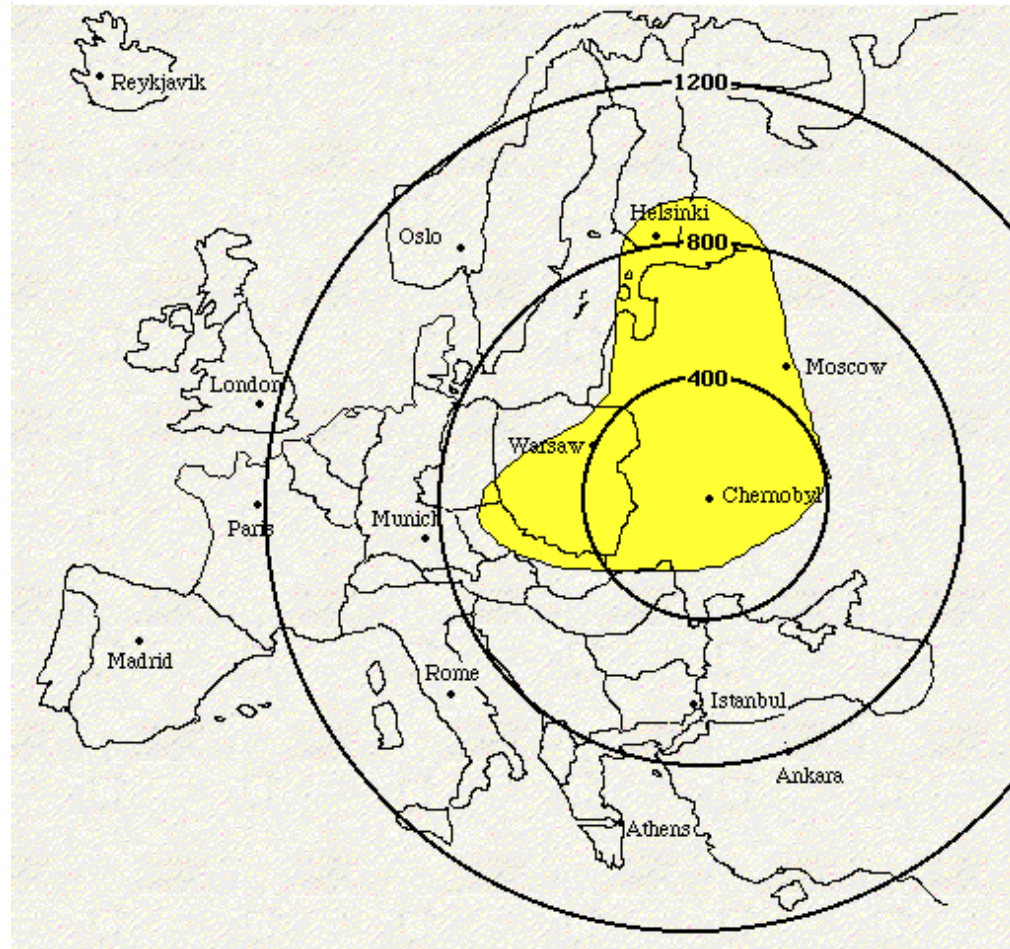
Nagasaki After Atomic bombing



Chernobyl (1986)



Chernobyl (1986)



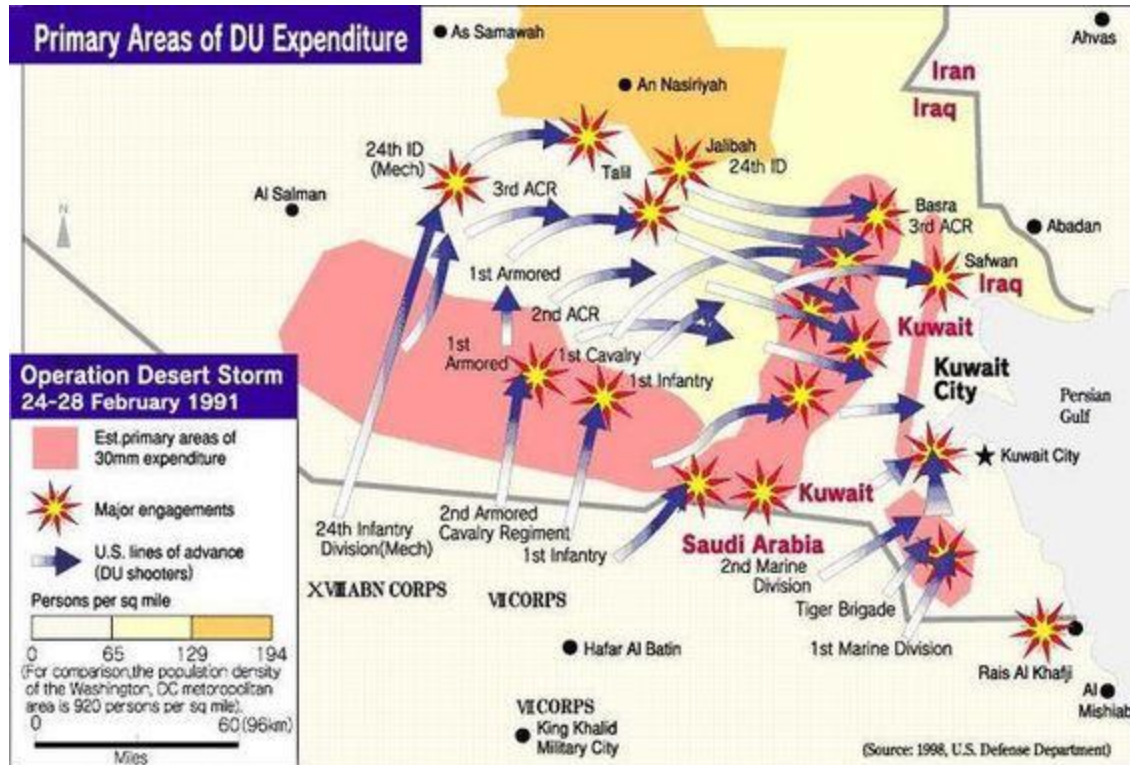
Chernobyl Victim



Depleted Uranium



Depleted Uranium - Southern Iraq (1991)



Depleted Uranium Victim



Fallujah General Hospital - Delivery room

Fukushima - Japan 2011



Radio - therapy
&
Radioisotopes

Radio - isotope imaging



Radiotherapy



X - ray radiation

First X - ray picture 1895

- The hand and ring of Roentgen wife hand



Contrast X - ray

- Barium meal & follow through



Airport X - ray Scanners



Airport X - ray Scanners

- Still controversial because of the exposure dose and its calculation .
- Banned in Europe airports 2011



Other Imaging Techniques

Fetal Ultrasound



Thank you