

# CONGENITAL ZIKA VIRUS INFECTION AND THE BRAIN

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## The TORCH Concept

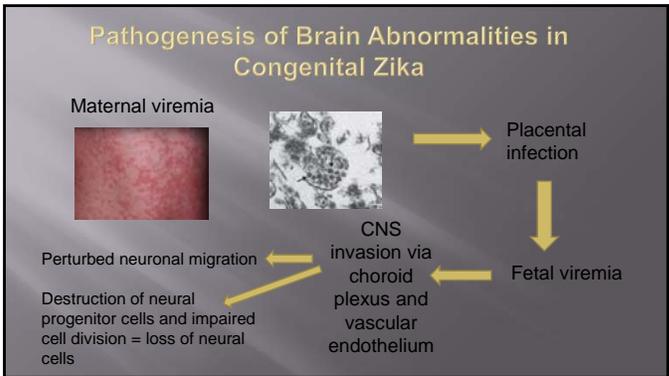
- ▣ The concept of congenital viral infection emerged in 1947 with the observations of Gregg. In the 1970s scientists at the CDC and Emory University coined the term “TORCH” to signify that certain symptoms and signs were common to congenital infections:
  - *Toxoplasma gondii*
  - Rubella virus
  - Cytomegalovirus (CMV)
  - Herpes simplex virus

\*Gregg NM. Congenital defects associated with maternal rubella. Aust Hosp 1947;14:7-9.

## Updates to TORCH

- ▣ **T** = Toxoplasmosis
- ▣ **O** = Other
  - Varicella zoster virus
  - Lymphocytic choriomeningitis virus (LCM virus)
  - Zika virus\***
- ▣ **R** = Rubella
- ▣ **C** = Cytomegalovirus
- ▣ **H** = Herpes simplex virus

\*Schuler-Faccini L, et al. Possible association between Zika virus and microcephaly-Brazil 2015. MMWR 2016;65:59-62



## The spectrum of brain abnormalities attributed to Zika

- Microcephaly
- Polymicrogyria/cortical dysplasia
- Lissencephaly
- Brain atrophy
- Passive hydrocephalus
- Fetal brain disruption
- Intracranial calcifications

## Representative Head Computed Tomographic (CT) Scans

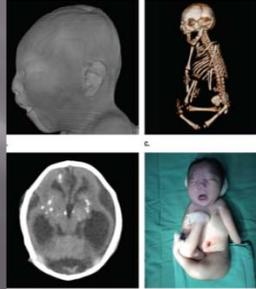
### What Else?

Arthrogryposis (congenital contractures)

Sensorineural hearing loss

Guillain-Barré syndrome (demyelination of peripheral nerves)

Infection of the adult brain and neural cell death?



### NUMEROUS UNANSWERED QUESTIONS

- ▣ What is the relationship between the timing and severity of maternal infection and fetal outcome?
- ▣ How long is the period of fetal vulnerability?
- ▣ Do infants shed virus postnatally? If so, is there ongoing damage to the developing brain?
- ▣ What is the long term neurodevelopmental outcome for infants with congenital Zika?
- ▣ What are the potential neurological complications of Zika virus infections in children and adults?

US REGIONS AT RISK FOR ZIKA

