Diagnostic Evaluation

- Variable approach depending on
  - Time of onset
    - Infancy (prelingual), childhood, adult, older adult
  - Physical anomalies
    - External, middle and inner ear
  - Inheritance pattern
  - Audiogram profile
  - Type of HL: neural, conductive, cortical
  - Environmental factors
    - Infection, prematurity, hypoxia
Genetic Testing is Complicated

- Enormous number of genes cause HL
- A given gene can cause different types of HL
- Social and cultural factors important
- Access to testing may be limited
Prelingual Deafness Approach

• Assumptions
  – Diagnostic evaluation, <12 months age
  – Availability of physical examination and clinical testing (e.g., CT/MRI scans)
  – Genetic testing is offered to the family
Infant with HL

Unknown (presumed genetic)

- Environmental
  - Prematurity, hypoxia
  - CMV; infections
  - Oto-toxic drugs

Negative or non-informative family history (FH)

- Informative FH
  - AR (recessive)
  - AD (dominant)
  - X-L, Other

Non-syndromic

- Syndromic features on physical exam
  - Waardenburg
  - CHARGE
  - Noonan, Other

Unknown (presumed genetic)
- **Multiple screen**
  - Cx26
  - SLC26A4
  - Cx30 deletion

- **Non-syndromic HL**
  - Get more information
    - **Type of HL**
      - Conductive, sensory neural, auditory neuropathy, central (cortical/brainstem)
    - CT/MRI temporal bone
    - Gait disturbance/vestibular function
    - Audiogram profile
    - Ethnic background

- **Cx26 sequencing** (50% detection rate in AR HL)

- **Candidate gene**
  - Cx26, Cx30
  - SLC26A4
  - Others

- **No candidate gene**
  - Cx26 (if no anomalies and AR suspected)
  - DNA screen for multiple genes
• Except for Cx26, no other major gene in pre-lingual onset AR deafness
• Multiplex DNA screening platforms needed