

# The Five Essential Concepts of Developmental Medicine

Henry Hood, DMD

## **Henry Hood, DMD**

**Associate Professor, University of Louisville School of Medicine  
Chief Clinical Officer, Lee Specialty Clinic  
Chief Clinical Officer, Advantage Medical Corporation  
Co-Founder, American Academy of Developmental Medicine & Dentistry**

### **Disclaimer:**

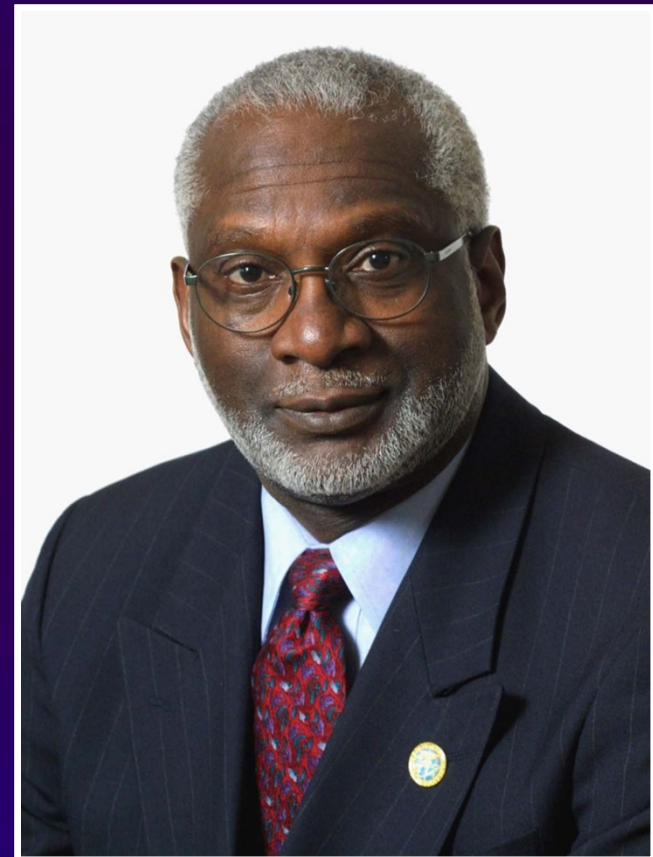
**I have no financial interests in, or with any commercial entities  
or governmental agencies relative to this continuing education program.**

**Lee Specialty Clinic (502) 368-2348  
henryhood@admed.us**

## 16<sup>TH</sup> Surgeon General David M. Satcher

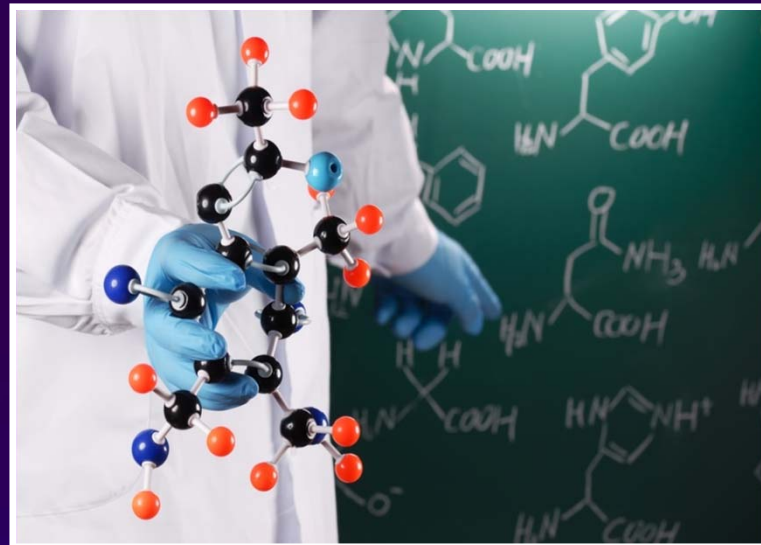
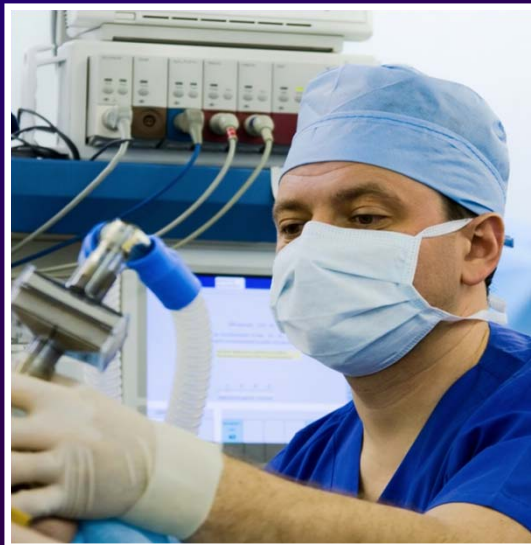
**It became apparent that as our system of care for those with [intellectual disabilities] evolved, our attention to their health needs lessened.**

Report of the Surgeon General's Conference on Health Disparities and [Intellectual Disabilities] 2002



## Clinicians / educators can solve this access problem

The healthcare access problem is, at its core, a healthcare education problem.





## Curriculum Assessment of Needs (CAN) Project

**AADMD surveyed 143 medical schools, 55 dental schools and 1424 residency programs.**

**81% of graduating physicians have never cared for a patient with IDD.**

Holder M; Waldman B; Hood H. International Journal of Oral Science 2009

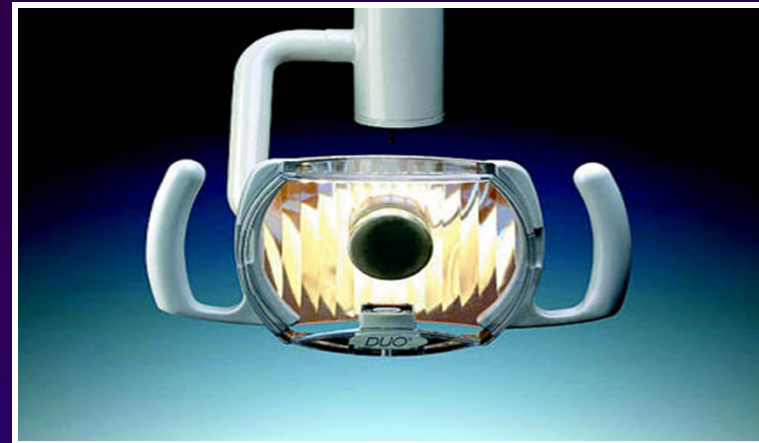
**51% of graduating dentists have never cared for a patient with IDD.**

Wolfe A; Waldman B; Milano M; Perlman S. Journal of the American Dental Association 2004

It is sad to say, but it is true . . .

**The medical and dental professions bear some responsibility for the disparities in:**

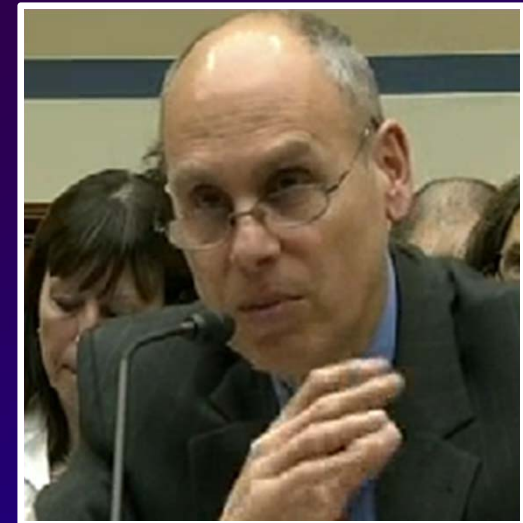
- Access to quality health care for Americans with IDD
- Professional education focused on patients with IDD
- Scientific publication focused on this patient population



As physicians and dentists evolved into non-players . . .

Non-medical and non-dental entities became the driving force behind the advocacy and the public policy.

As a result, these entities have become the driving force behind the language.



## Why are the Five Essential Concepts important?

**There is a widespread lack of a meaningful, scientifically sound language or vocabulary, rooted in basic principles of physiology and medicine.**

**Doctors need a biomedically-based conceptual framework, which can provide a theoretical basis for the clinical diagnosis and treatment of patients with neurodevelopmental disorders.**

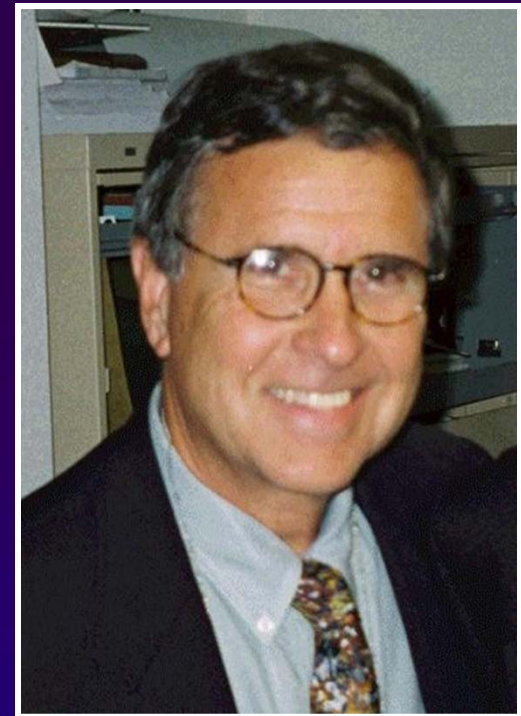


## The Five Essential Concepts

**The greatest mentors are those  
who teach us how to think.**

**Philip B. May, MD**

Senior Developmental Physician, Lee Specialty Clinic





## How do all these terms interrelate?

Intellectual Disability

Autism

Neuromotor Impairment

Down syndrome

Developmental Disabilities

Prader Willi

Seizure Disorder

Mental Retardation

Cerebral Palsy





## What is a Neurodevelopmental Disorder ?

**A medical disorder brought about by an injury to the neurological system during the period of a person's life in which they are experiencing rapid neurological development - from the point of conception to early adulthood – age 21 / 22.**

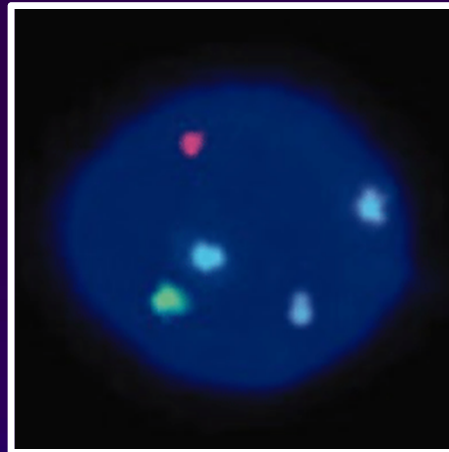


# The Cause of Neurodevelopmental Disorders

**Neurodevelopmental disorders can be genetic or acquired.**

## **Genetic causes:**

- Metabolic (PKU)
- Chromosomal (Trisomy 21)
- Structural (Tuberous Sclerosis)

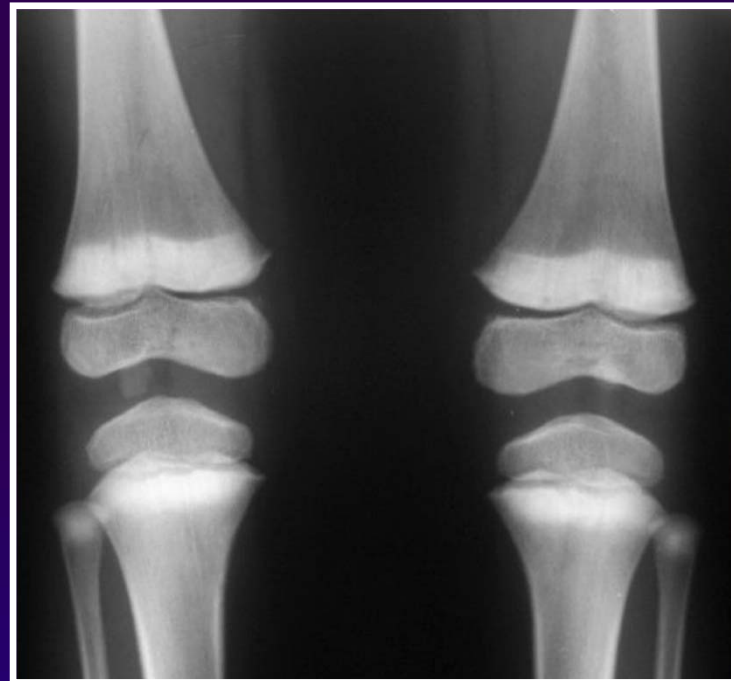
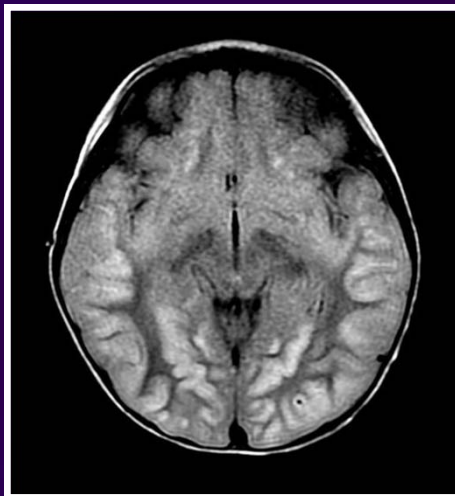
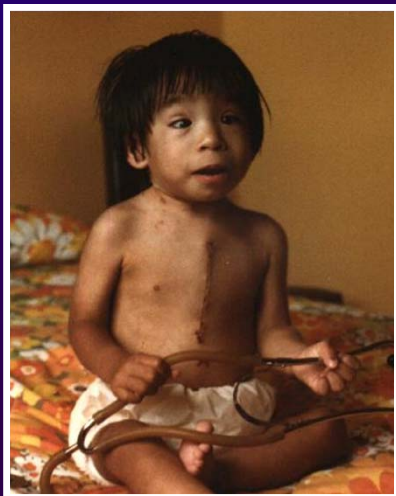


# The Cause of Neurodevelopmental Disorders

**Neurodevelopmental disorders can be genetic or acquired.**

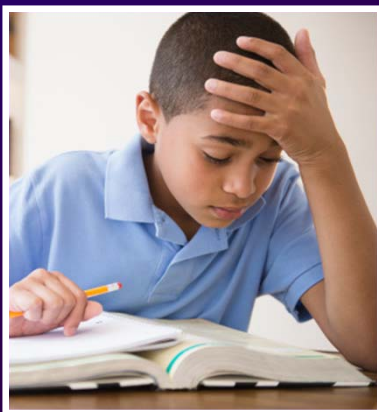
## **Acquired causes:**

- Prenatal (Fetal Alcohol Syndrome)
- Perinatal (Hypoxic Brain Injury)
- Postnatal (Lead Toxicity)



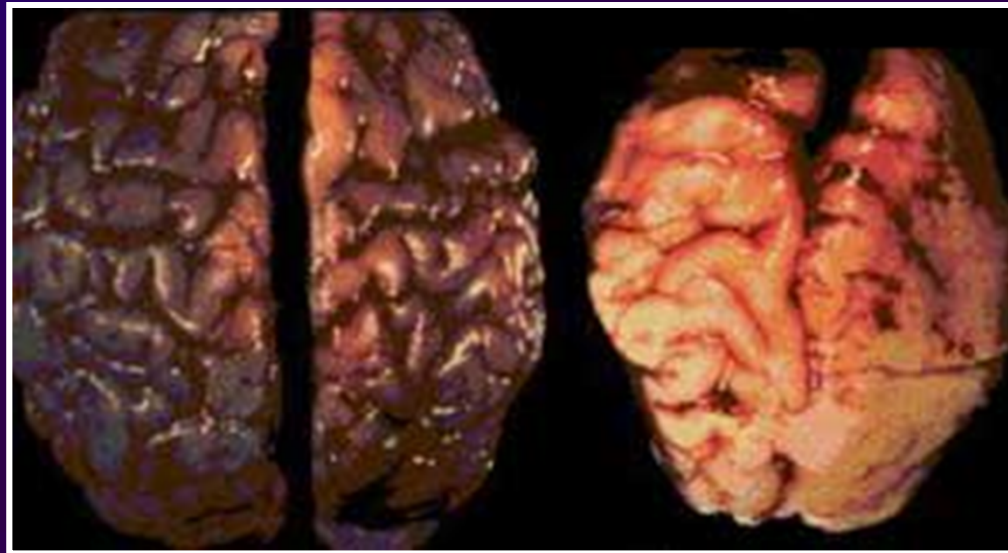
## The Major Functions of the Brain

- **Memory and learning**
- **Control of motor function**
- **Control and routing of sensory input**
- **Emotional regulation / control**



## The First Essential Concept

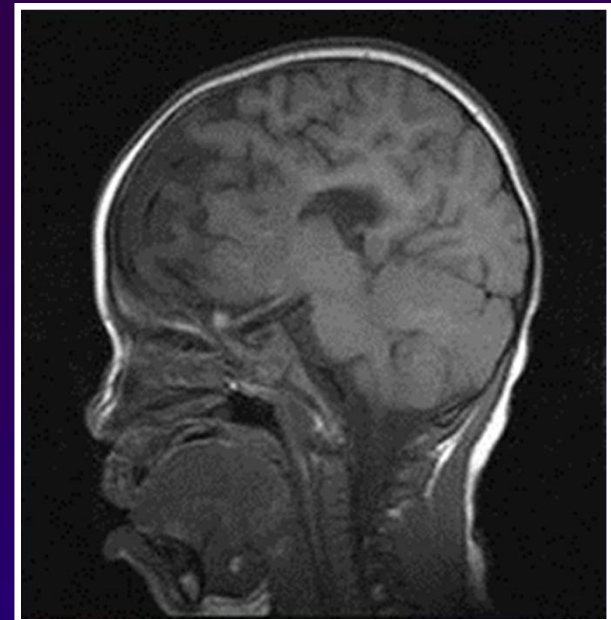
**The major functions of the brain require that specific interrelated brain structures work together in a coordinated fashion. And, when these relationships are improperly developed or disrupted, neurodevelopmental (brain) dysfunction will occur.**





## The Second Essential Concept

All issues, clinical or otherwise, related to the disabilities, which may be experienced by an individual with a neurodevelopmental disorder can be traced directly back to brain dysfunction.





## The Third Essential Concept

Each neurodevelopmental disorder is associated with one or more primary complications or symptom complexes. These primary complications include:

- Cognitive impairment (intellectual disability)
- Neuromotor dysfunction
- Seizure
- Psychiatric / behavioral disturbances
- Sensory impairment



## Secondary Health Consequences

**The patient with a neurodevelopmental disorder may also demonstrate secondary health consequences, which occur as a result of the primary complication.**



## Secondary Health Consequences

### Resulting from Primary Complications

- **Avulsion of maxillary teeth: Impact trauma from seizure-related fall**
- **Boxer's fracture: Impulse dyscontrol**
- **Multiple Consequences: Injury 2<sup>o</sup> Cognitive / Behavioral Issues in FAS**



## Secondary Health Consequences

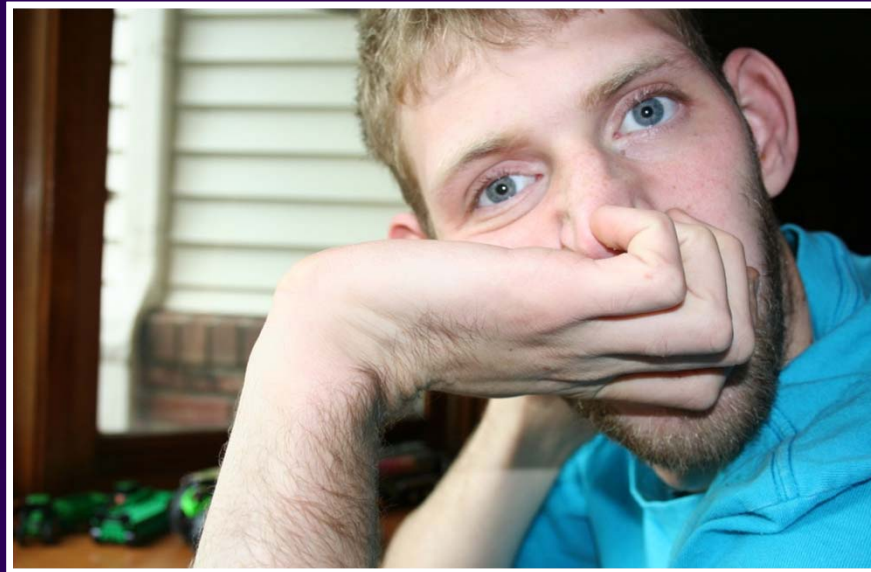
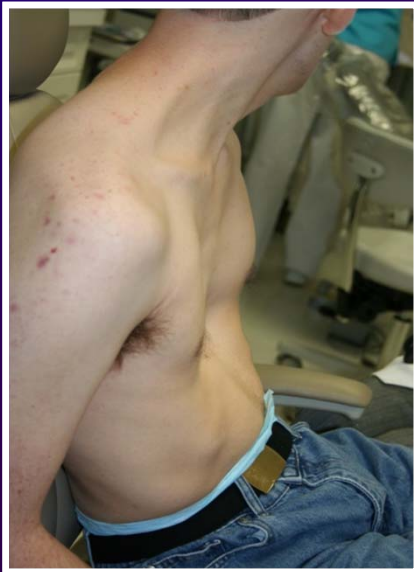
The dysfunction in learning, and the social isolation experienced by a child with autism (a behavioral complication associated with multiple neurodevelopmental disorders) are really secondary secondary health consequences.





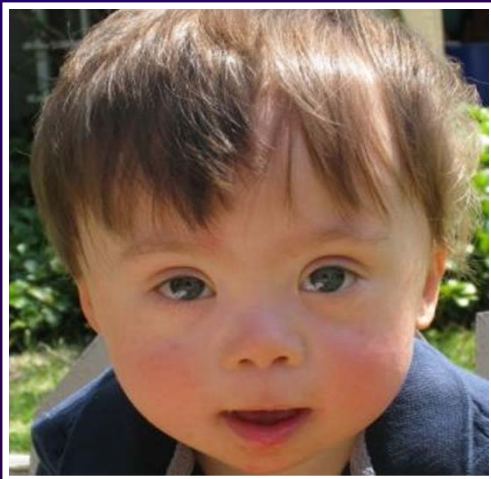
## The Fifth Essential Concept

**Neurodevelopmental disorders are often associated with syndrome-specific conditions, which are not a direct result of brain injury.**



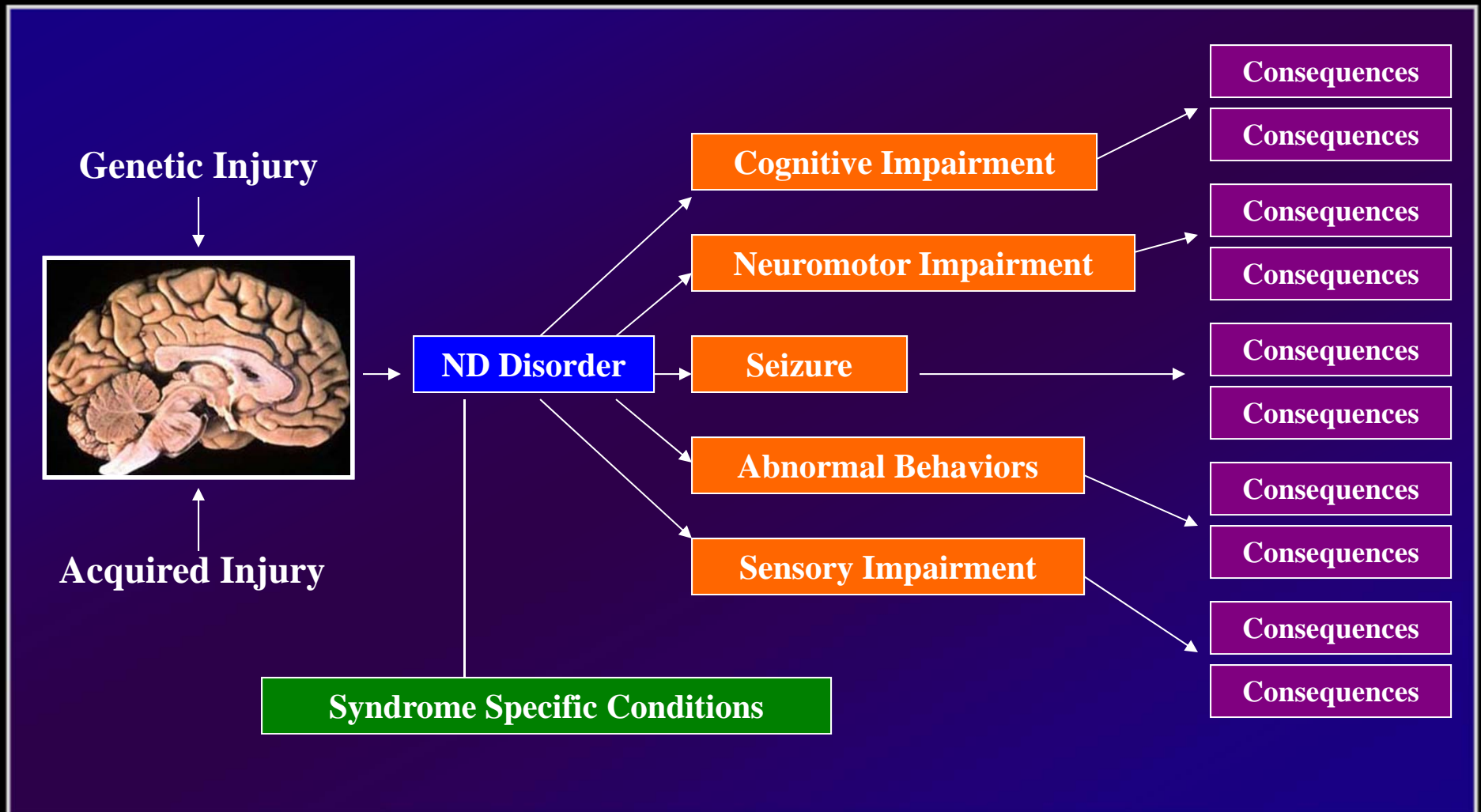
## Syndrome Specific Conditions

- **Microstomia:** Frequently encountered in Trisomy 21
- **Macroglossia:** Also associated with Trisomy 21
- **Tapered Fingers:** Coffin Lowery syndrome





# The Essential Concepts Schematic



**Thank You**

# **The Five Essential Concepts of Developmental Medicine**

**Henry Hood, DMD**

henryhood@admed.us