THE POWER OF TWO: CO-DIAGNOSIS AND WHAT DOES THIS GET YOU?

2025 *MED13L* and *CTNNB1* Family and Scientific Conference Boston 2025

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COLUMBIA | NewYork-Presbyterian

Disclaimer

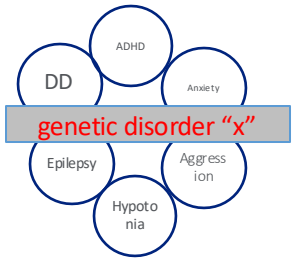
I am a clinician, but not necessarily your child's clinician.
Speak to your medical provider about any recommendations.

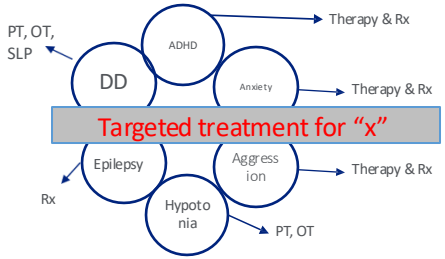
neurodevelopmental concerns

What is the diagnosis?

What do I do to treat this?

What can I expect for the future?





CNNB1 CONNECT AND CURE

THE MED13L FOUNDATION

Neurodevelopmental disorders

- 1 in 10 individuals have a neurodevelopmental disorder

- Group of conditions with onset in the developmental period (delays & atypia)
  - Global developmental delay, intellectual disability, cerebral palsy, autism spectrum disorder, attention deficit hyperactivity disorder (ADHD), specific learning disorders in reading (dyslexia), writing (dysgraphia) and mathematics (dyscalculia)

- Typically manifest in development, often before child enters grade school and characterized by developmental deficits that produce a range of impairments

  - Motor skills
  - Communication skills
  - Personal skills
  - Social
  - Academic
  - Occupational functioning

- Many have **overlapping features & common comorbidities**

- **Up to 30% of NDDs have genetic etiology/risk factor**

Prior NDD Diagnoses
(Simons Searchlight v13)

- ADHD
- Autism Spectrum Disorder (ASD)
  - PDD - NOS
- (Autistic Regression)
- Learning disorder
- Intellectual disability
- Developmental coordination disorder
- Stuttering

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(Simons Searchlight v13)

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  - PDD - NOS
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- Learning disorder
- Intellectual disability
- Developmental coordination disorder

Prior Non-NDD Diagnoses
(Simons Searchlight)

- Anxiety, Bipolar disorder, Conduct disorder, Mania, OCD, ODD, SIB
- Eating disorder
- Encopresis/fecal incontinence
- Enuresis/ incontinence
- Hyperphagia
- Language apraxia
- Language disorder
- Dysarthria
- Hypotonia
- Pica
- Sensory integration disorder
- Swallowing problem (dysphagia)

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Hot off the press!

CLINICAL REPORT Guidance for the Clinician in Rendering Pediatric Care

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Genetic Evaluation of the Child With Intellectual Disability or Global Developmental Delay: Clinical Report

Lance H. Rodan, MD,[1,2] Joan Stoler, MD, FAAP,[1] Emily Chen, MD, PhD,[3] Timothy Geleske, MD, FAAP,[4] and the Council on Genetics

Genetic neurodevelopmental disorders are common in the pediatric population, and establishing a specific diagnosis early provides multiple benefits including prognostication, surveillance for disorder-related complications, accurate recurrence risk, and specific management. This report provides an approach to the genetic evaluation of developmental delay/intellectual disability for the general pediatrician. When possible, genetic testing should be selected by phenotype, and typical distinguishing clinical features to facilitate this are presented. If a specific disorder or group of disorders cannot be ascer-

abstract

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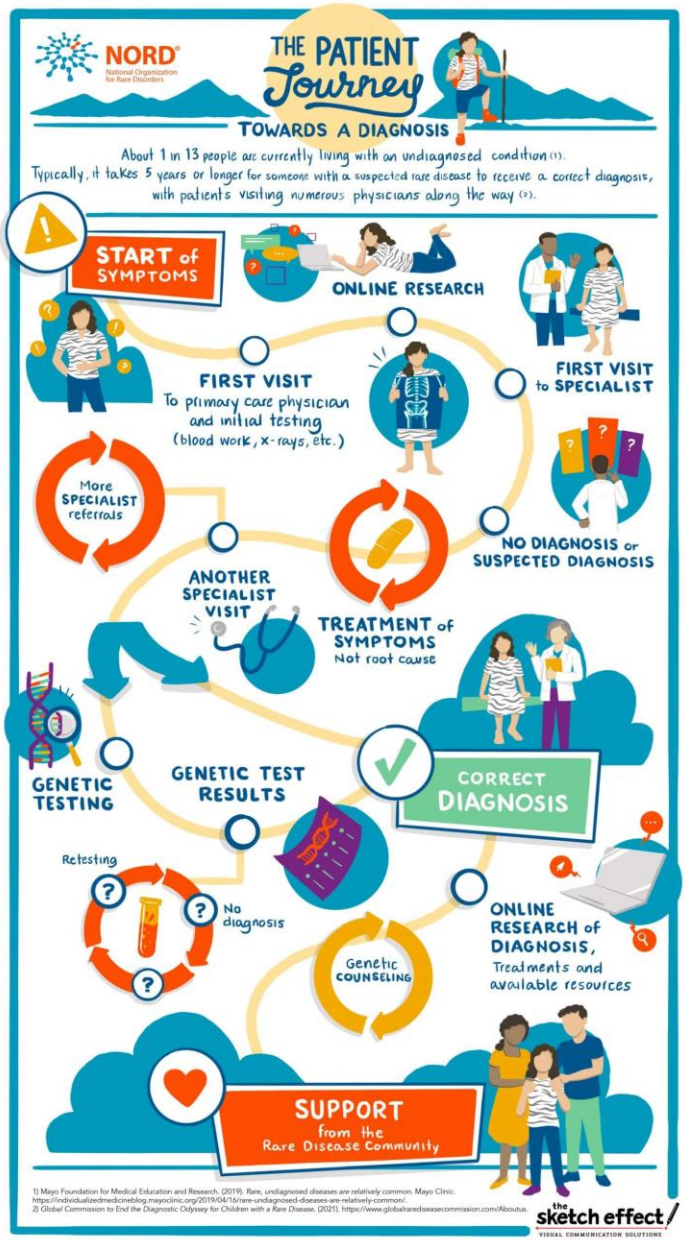
Drs Rodan and Stoler prepared and revised the manuscript. Drs Chen and Geleske revised the manuscript.


NORD
National Organization for Rare Disorders
THE PATIENT Journey
TOWARDS A DIAGNOSIS
About 1 in 13 people are currently living with an undiagnosed condition (1).
Typically, it takes 5 years or longer for someone with a suspected rare disease to receive a correct diagnosis, with patients visiting numerous physicians along the way (2).
START of SYMPTOMS
ONLINE RESEARCH
FIRST VISIT
To primary care physician and initial testing (blood work, x-rays, etc.)
FIRST VISIT to SPECIALIST
More SPECIALIST referrals
NO DIAGNOSIS or SUSPECTED DIAGNOSIS
ANOTHER SPECIALIST VISIT
TREATMENT of SYMPTOMS
Not root cause
GENETIC TESTING
GENETIC TEST RESULTS
CORRECT DIAGNOSIS
Retesting
No diagnosis
Genetic COUNSELING
ONLINE RESEARCH of DIAGNOSIS,
Treatments and available resources
SUPPORT
from the
Rare Disease Community
1) Mayo Foundation for Medical Education and Research. (2019). Rare, undiagnosed diseases are relatively common. Mayo Clinic. https://individualizedmedicineblog.mayoclinic.org/2019/04/16/rare-undiagnosed-diseases-are-relatively-common/.
2) Global Commission to End the Diagnostic Odyssey for Children with a Rare Disease. (2021). https://www.globalraredcasecommission.com/Aboutus.
the sketch effect
VISUAL COMMUNICATION SOLUTIONS

You have a diagnosis, a “name” to what’s going on….now what!

- Find your new genetic “family”
- Learn everything you can about the disorder
- Reach out to the researchers
- Find the expert clinicians
- Look into potential treatments

- Go back to your clinical and educational team and teach them!
  - GeneReviews
  - Orphanet
  - OMIM
  - PubMed

SIMONS SEARCHLIGHT

Driven by science. United by hope.

Simons Searchlight is a partnership of leading scientists, doctors and families on a mission. We are a non-profit, online community that studies over 100 genes that are associated with autism and other neurodevelopmental disorder

COMBINED

Combined Bain is a consortium led by patient advocacy foundations, working with the clinicians, researchers and pharmaceutical firms that are developing treatments for the disorders they represent.

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The power of a genetic diagnosis

- Global developmental delay
- Ataxia and tremor
- Seizures/Epilepsy
- Hypotonia
- Cerebral palsy

- **Angelman Syndrome**
- Multiple clinical trials in the pipeline → close to FDA-approved treatment!

Back to the clinician's office with a new genetic diagnosis….Coding!

- **What is an ICD-10 code?**
  - International Classification of Diseases, 10th Edition
- ICD-10 codes = universal language for doctors and other healthcare professionals to communicate about diseases, injuries, and other health conditions.
- Standardized system of alphanumeric designations (letters and numbers) used to classify and identify a vast range of health conditions developed by the World Health Organization (WHO).
- **Accurate documentation:** Healthcare providers use these codes to standardize documentation of diagnoses and conditions in patient records, promoting clarity and communication among providers.
- **Medical billing and reimbursement:** ICD-10 codes are used for processing insurance claims and ensuring healthcare providers are accurately reimbursed for services.
- **Healthcare research and analysis**: Researchers and public health officials use ICD-10 codes to analyze data on disease prevalence, identify health trends, track outbreaks, and evaluate interventions.
- **Healthcare policy and decision-making**: The codes are utilized for developing health policies and allocating resources

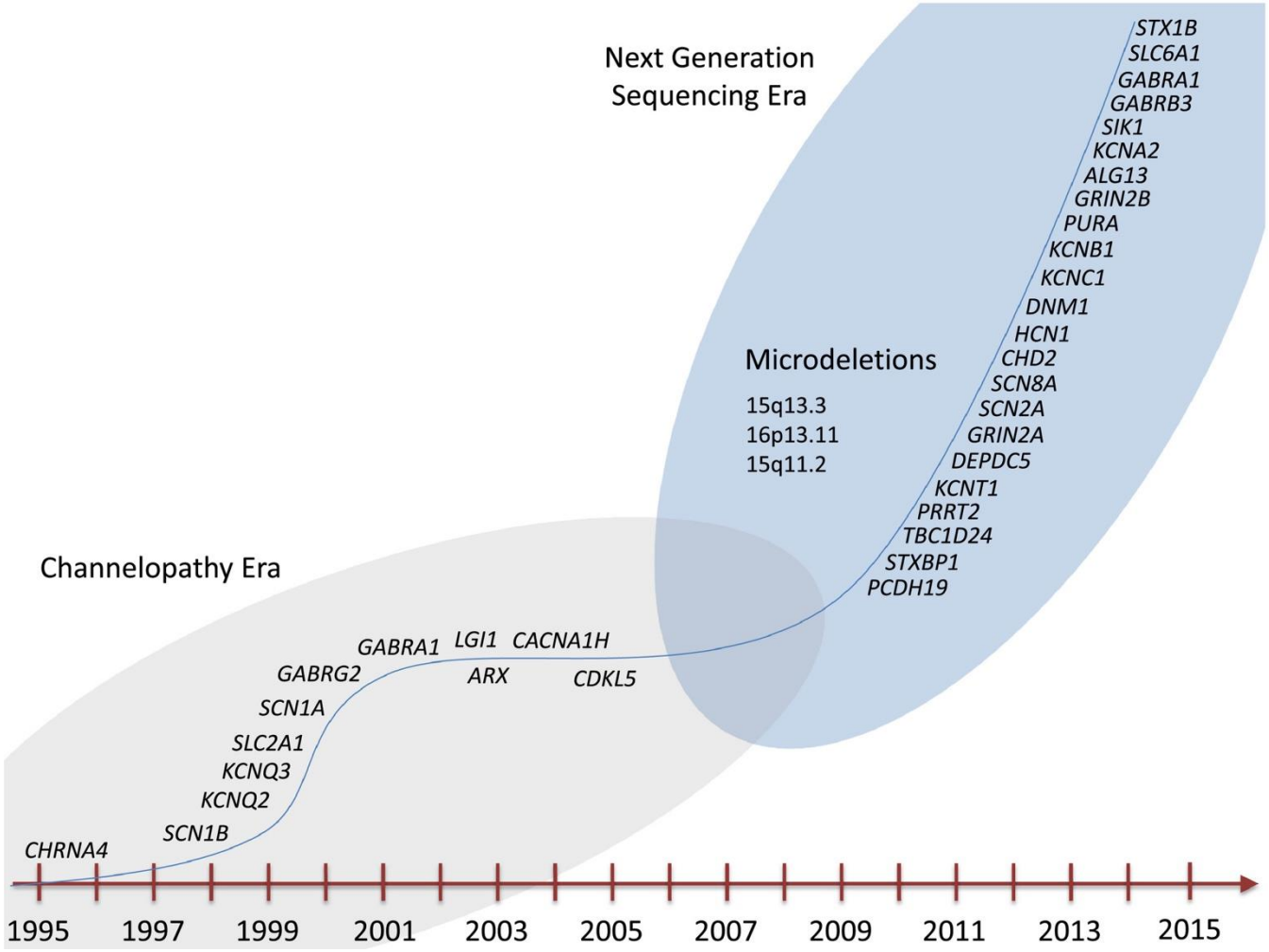
Common Codes

- Q99.8 – Genetic Disorder

- G40.919 - Epilepsy → medications

- F84 – Autism Spectrum Disorder --> needed to get ABA (applied behavioral analysis therapy)
- G80.9 - Cerebral Palsy → needed to get wheelchair, adaptive equipment approval
- R32 – incontinence → needed for insurance to cover costs of pull ups
- R13.10 - Dysphagia → feeding therapy
- F50.82. – ARFID (avoidant restricted food intake disorder) → feeding therapy
- R26.9 – Abnormal Gait → physical therapy

Epilepsy … secondary to…



Helbig I, Heinzen EL, Mefford HC; ILAE Genetics Commission. Primer Part 1-The building blocks of epilepsy genetics. Epilepsia. 2016 Jun;57(6):861-8. doi: 10.1111/epi.13381. Epub 2016 May 25. PMID: 27226047.

What is cerebral palsy (CP)?

Clinical diagnosis

Most common motor disability in childhood (1-4/100,000)

Group of disorders affecting movement, posture and muscle control

- Delays in motor skills (sitting, crawling, walking)
- Stiffy or floppy muscles (spasticity or hypotonia)
- Poor coordination or balance (ataxia, dyskinetic)
- Difficulty with fine motor skills (using hands)

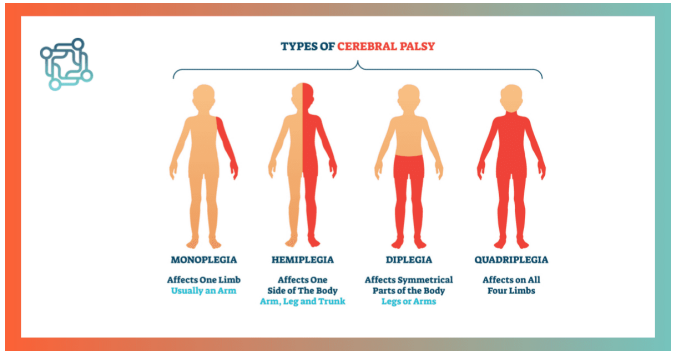
Umbrella term for a group of disorders, affects people differently

No cure for CP

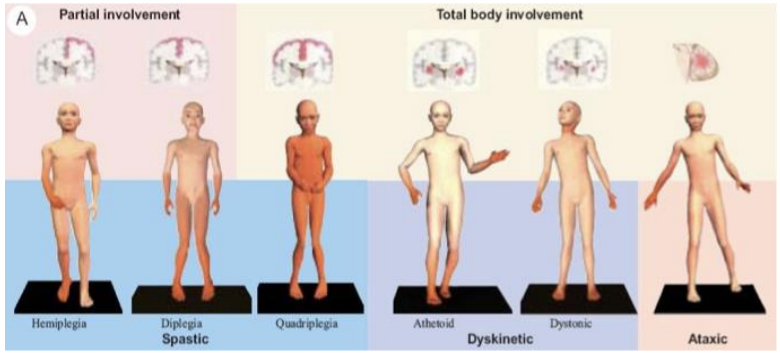
- Treatments help manage symptoms & improve quality of life
- Physical, occupational, speech therapy, medication, surgery

Classifications for CP

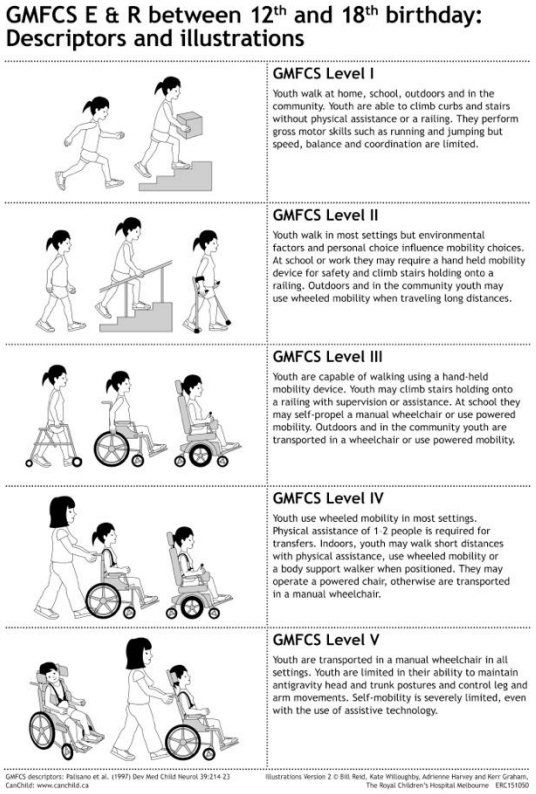
Body Parts Affected



Injury Pattern or Movement Disorder



Gross motor functional classification (GMFCS)



What about your educational plan?

- The Department of Education unlikely knows about your rare disease ☺
- Help them understand your child:
  - Motor challenges like cerebral palsy
  - Social challenges like autism
- Disability Classification Categories:
  - Autism
  - Intellectual disability
  - Language Disorder
  - Learning Disability
  - Other Heath Impairment

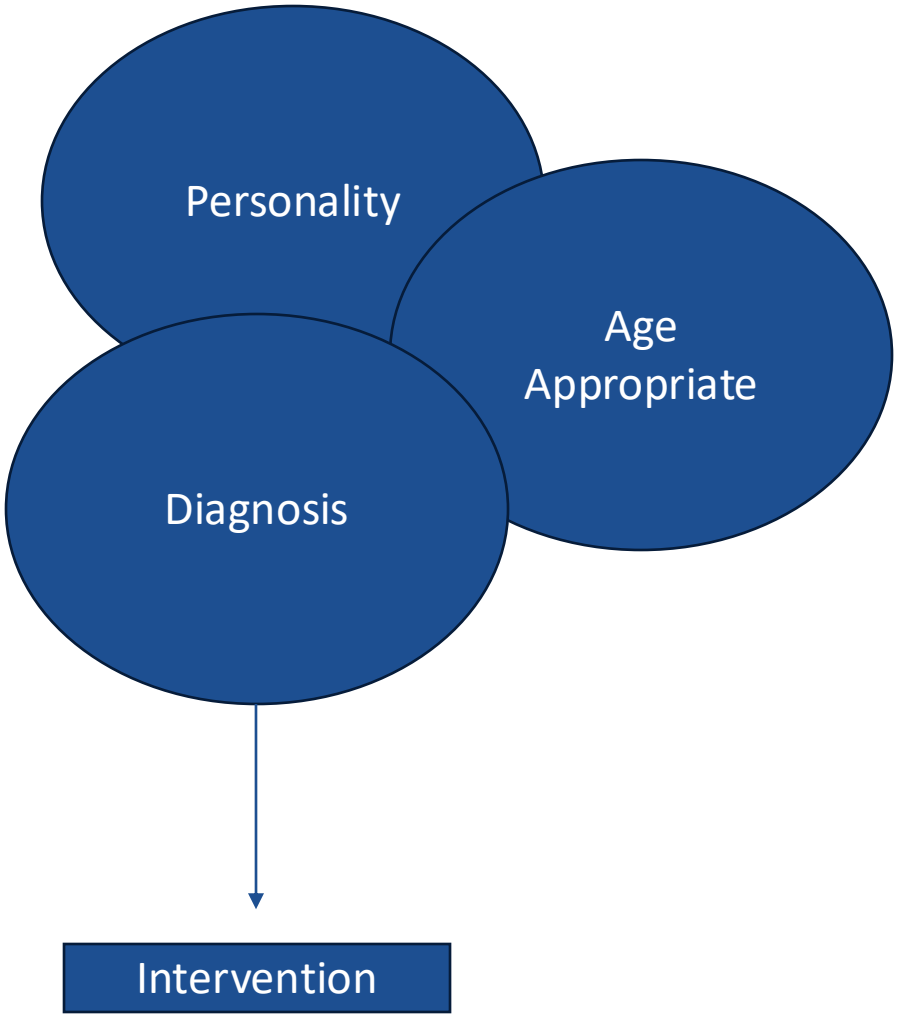
Dual Diagnosis: The Intersection of Two Worlds (actually many worlds)

- Dual diagnosis refers to the co-occurrence of a genetic disorder and a neurodevelopmental disorder.
- The prevalence of dual genetic conditions, including those involving NDDs, is increasing with advancements in genetic testing.
- This co-occurrence adds complexity to diagnosis, treatment, and ongoing care.

Benefits of a dual diagnosis approach

- Tailored treatment plans: A dual diagnosis approach considers the unique interplay between the two conditions, allowing for individualized treatment strategies.

- Improved symptom management: Addressing both conditions simultaneously can lead to more effective symptom management and improved overall well-being.


Personality
Age
Appropriate
Diagnosis
Intervention

Integrated care: a collaborative effort

- Integrated care involves a multidisciplinary team of professionals collaborating to provide comprehensive support.

- This can include geneticists, neurologists, psychiatrists, therapists, and other specialists working together to address the diverse needs of the individual.

- Integrated approaches enhance continuity of care, improve communication among providers, and empower individuals in their treatment journey.

Challenging the stigma: promoting understanding

- You can give them GeneReviews and publications (yes, we know you are teaching the providers)

- Educators, therapists, physicians

Community Support & Resources

- Autism
  - Autism Speaks
- Epilepsy
  - Epilepsy Foundation
- Cerebral Palsy
  - CP Research Network
- Rare Disease
  - NORD, Global Genes

Advocacy and policy change

- In the US, a **rare disease** is defined as a condition affecting fewer than 200,000 people.

- According to the NIH, there are **approximately 7,000 rare diseases** affecting between 25 and 30 million Americans.

- This equates to **1 in 10 Americans.**

- Policy changes for genetic testing for broader categories – global developmental delay, intellectual disability, cerebral palsy, epilepsy, autism spectrum disorder

Take Home Points

- Dual diagnosis presents a complex interplay of genetic and neurodevelopmental factors.
- Provides for a more personalized approach to each individual with a rare disease.
- An integrated and holistic approach to treatment offers hope for improved outcomes and enhanced quality of life.