Huntington's Disease Society of America

What is Juvenile Huntington's Disease?

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Disclaimer

- The information presented today is for informational use only.

- •All attendees are encouraged to consult with the primary care provider, neurologist or other healthcare provider about any advice, exercise, medication, treatment, nutritional supplement or regimen that may have been mentioned as part of this presentation.

Presenter Disclosures

Sandra K Kostyk, MD, PHD

- **The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:**

Full Financial Disclosures for the past year for S.K. Kostyk

Employment at The Ohio State University Department of Neurology. Consultant in Neurology and Spinal Cord Injury Medicine clinics at the Chalmers P Wiley Veterans Administration Outpatient Clinics. The effect of Video Game Biofeedback Modulated Exercise (ViBE) on Individuals with Huntington's disease. 2008-2009 Huntington Study Group/Huntington's Society of Canada Clinical Research Award, Co-Investigator. Robert A Vaughn Family Fund Award 2010-2012. National Institutes of Health/NINDS Facilities of Research in Spinal Cord Injury, Sub-Investigator. Site investigator on the following clinical trials through the University of Rochester and the HSG: HORIZON (Medivation and Pfizer), COHORT, PHAROS, and HART-HD (NeuroSearch). Site investigator through the Massachusetts General Hospital and the HSG: 2CARE HD,CREST-E and REACH2HD. Site investigator for the GAD2 phase 2 clinical trial through Neurologix. Site investigator for QE3 through the PSG and Cornell University. Site Investigator for study of tetrabenzazine on

balance and mobility in HD through Lundbeck. Consultant FDA Orphan Products Development Program.

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Red Rock Canyon 2012

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Summary:

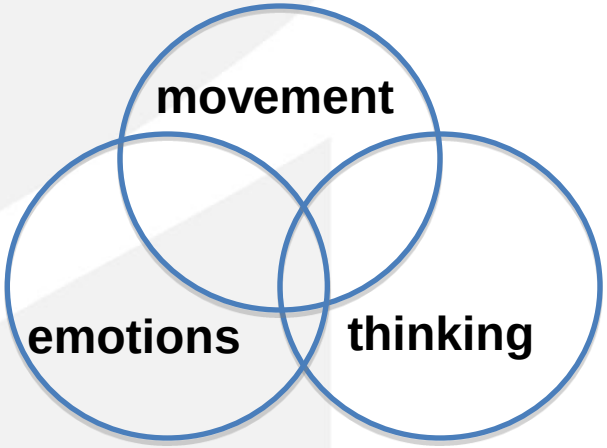
We will review what is meant by “Juvenile" onset HD and how it can be similar and also how it is different from the adult form.

We will discuss symptom presentation and the difficulties associated with making a clinical diagnosis of juvenile onset HD.

We will briefly review the pros and cons of genetic testing of children.

Finally we will consider treatment strategies with a focus on the special issues related the dynamics of growing up with a diagnosis of HD.

Huntington's disease is neurodegenerative disorder that affects multiple aspects of how a person functions.



Symptoms can present at any age though symptoms most commonly present at age 35-55.

In a small percentage of cases symptoms start before age 20.

Juvenile Onset HD

Usually a family history of relatively young onset HD.

Often inherited from the father. (~80 %)

CAG repeat size usually (but not always) >60

HD is a “trinucleotide repeat” disorder

DNA code:

A (adenine)
C (cytosine
G (guanine)
T (thymine)

Codon = groups of 3

HD is caused by an increased number of CAG repeats

Normally we have less than 10-26 CAG repeats

TAC--TTA--TAG--GAG--GTA--ATA—TAT--GCC--CCT--GGT--CAG—TAC-TTA-TAG-
GAG-GTA-ATA-TAT-GCC-CCT-GGT-CAG--TTA--TAT—CAG—CAG—CAG—CAG—
CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG-CAG-CAG-CAG-CAG-CAG-
TAT-GCC-CCT-GGT-CAG-TAG-CGT-TAC-TTA-TAG-GAG-GTA-ATA-TAT-GCC-CCT-
GGT-CAG-TAG-CGT-TAC-TTA-TAG-GAG-GTA-ATA-TAT-GCC-CCT-GGT-CAG-TAG-

In HD there are more than 36 CAG repeats in a row

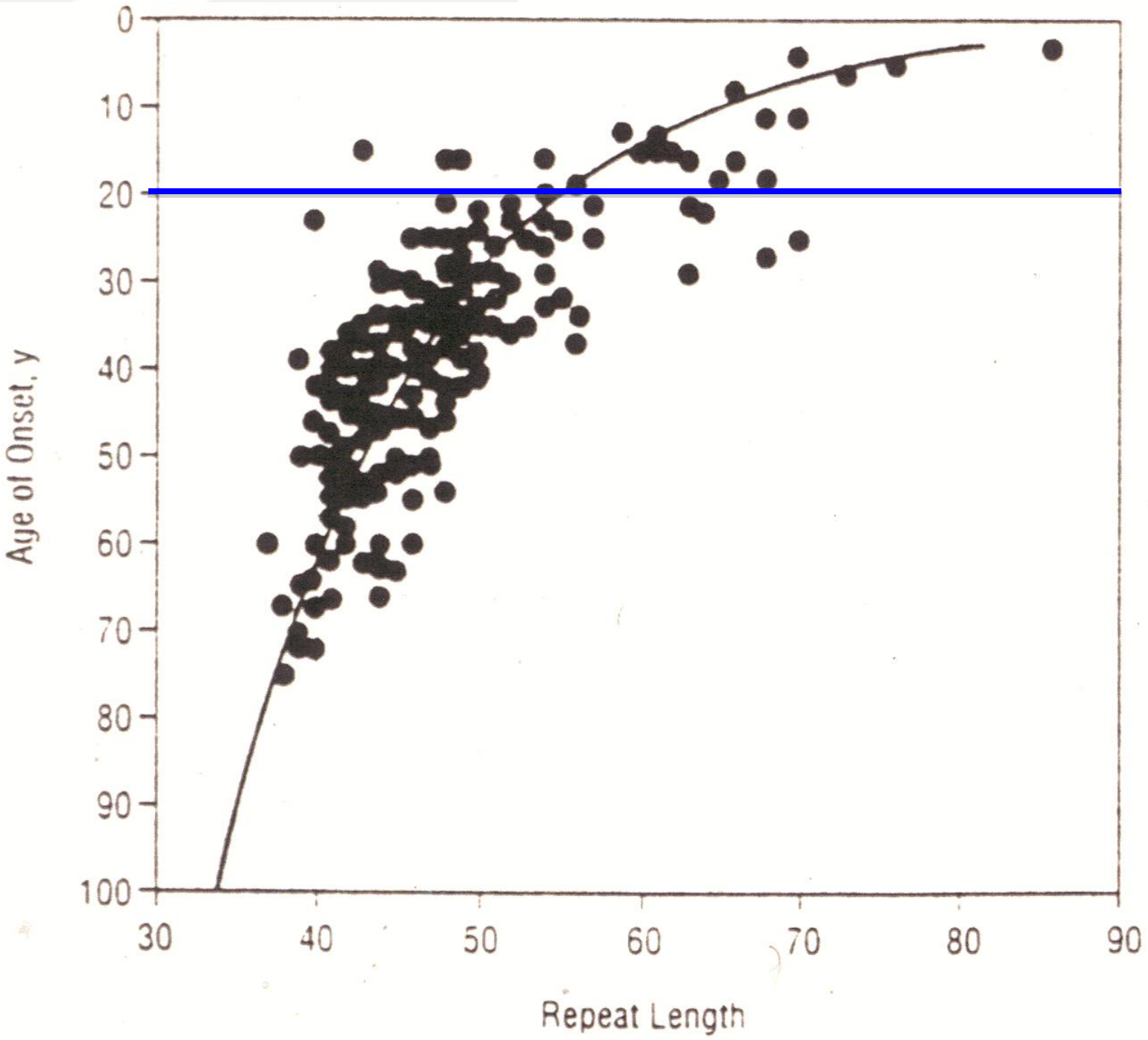
TAC--TTA--TAG--GAG--GTA--ATA—TAT--GCC--CCT--GGT--CAG—TAC-TTA-TAG-
GAG-GTA-ATA-TAT-GCC-CCT-GGT-CAG--TTA--TAT—CAG—CAG—CAG—CAG—
CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—
CAG—CAG-- CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—CAG—
CAG—CAG—CAG—CAG—CAG-- CAG—CAG—CAG-CAG—CAG—CAG—CAG—
TAC-TTA-TAG-GAG-GTA-ATA-TAT-GCC-CCT-GGT-CAG-TAG-CGT-GGT-CAG-TAG-
CGT-TAC-TTA-TAG-GAG-GTA-ATA-TAT-GCC-

There is a rough correlation between repeat size and age of onset.

The higher the repeat size the early the disease onset.

Only 5-10% of individuals have repeat sizes greater than 50 or 60.

Symptoms in these individuals often start before age 20


0
10
20
30
40
50
60
70
80
90
100
Age of Onset, y
30
40
50
60
70
80
90
Repeat Length

HD basics

- **The disease starts insidiously and progresses continuously.**

- **Symptoms include changes in:**
  - **Behavior**
  - **Motor function**
  - **Thinking ability**

HD basics

In adults motor symptoms include:

Chorea
Motor impersistence
Oculomotor changes
Impaired fine motor control
Balance and gait disorder
Dystonia
Speech/swallowing problems

Juvenile HD symptoms

- Stiffness of legs. Scissoring gait.
- Walking on toes.
- Clumsiness of arms and legs.
- Decline of mental ability and milestones.
- Changes in behavior.
- Seizures (~ 25 % of children with HD).
- Swallowing and speech difficulties.
- Bradykinesia.
- Cerebellar signs.
- Chorea is less common in children but may be seen in teens.

Behavioral changes

- “A common early symptoms of juvenile HD is difficulty starting or finishing a task or doing all the steps of a task in the right order. As these can also be common symptoms of ordinary adolescence, parents teachers and physicians must look beyond single symptoms for a pattern of change that suggest HD.”

- – From Family guide series on Juvenile HD.

Behavioral issues

- Aggression
- Impulsiveness
- Adolescence and sexuality
- Depression
- Obsessive compulsive behavior
- Hallucinations (rare)

Juvenile HD

- Seizures are more common in children with HD than in adults
- Seizures seem to be more common in children who present with symptoms before age 10
- A neurologist can help prescribe anti-seizure medications

Genetic testing

- Usually for children who clearly have clinical symptoms and progression of symptoms.
- Genetic counseling before and after testing.
- Ensure that testing is in the best interest of the child.

Juvenile Onset HD

Why is it difficult to make a clinical diagnosis of JHD?

- The disease presents differently in each child.
- JDH is a rare form of a rare disorder.
- All children develop at different rates.
- Many children without HD or with other disorders may have symptoms that look like HD.
  - ADHD, depression, juvenile forms of bipolar disorder, mild cerebral palsy, seizure disorders, thyroid disease, etc.

Dangers of premature testing

- Incorrectly blaming symptoms on HD.
- Discrimination (insurance, future employment, others).
- Negative psychological and social effects.
- Testing of other children in the family is not encouraged.

Genetic testing of children at risk for HD. Nance, M. Neurology 49:1048 1997

- 44 subjects
- Of the 15 presenting under age 10, 12 had CAG repeats greater than 80.
- Symptoms included declining school performance, seizures, oral motor dysfunction, rigidity and gait disorder.
- Presenting symptoms in those over age 10 were more varied but usually included behavioral and motor symptoms.

A functional scale for assessing juvenile-onset HD

- A. School attendance.
- B. Academic/developmental performance.
- C. Chores.
- D. Activities of daily living.
- E. Residence.

A. School attendance

3- attends school, no special needs.

2- attends school, some regular classes, some modified classes.

1- attends school, few or no regular classes.

0- unable to attend school.

B. Academic/developmental performance

3- Reading/writing/math skills appropriate to age.

2- mild decrease in academic performance but still able to to take a test or write.

1- unable to write legibly but able to communicate orally.

0- unable to read/write/communicate orally.

C. Chores.

- 2- Able to assist in age-appropriate manner with household chores.
- 1- Occasionally assists with chores.
- 0- Unable to participate in household chores.

D. Activities of daily living.

- 3- Performs self-cares in an age appropriate manner.
- 2- Requires some assistance for bathing dressing, grooming, or feeding.
- 1- assists others who bathe, dress, or feed him/her
- 0- unable to assist in self care.

- E. Residence.
  - 2- At home with only family assistance
  - 1- At home/group home/foster care with assistance from non-family members.
  - 0- Living in a skilled nursing care facility.

Add points to determine stage of HD

- Stage 1 ……..11-13 points
- Stage 2 …….. 7-10 points
- Stage 3 ……. 3-6 points
- Stage 4 …….. 1-2 points
- Stage 5 …….. 0 points

Treatment: This is a progressive disorder. Treatment plan needs to be regularly reviewed.

- Symptomatic treatment:
  - Spasticity/rigidity. PT/OT, benzodiazepines, baclofen, dantrolene, tizanidine.
  - Speech swallowing and dental care issues.
  - Depression, Aggression, OCD and behavioral issues. Behavioral Modification. Medical treatments. Psychiatry and psychology input.
  - Seizures: multiple medication options
  - Chorea. Benzodiazepines, amantadine, neuroleptics, tetrabenazine

The Juvenile HD treatment team

- Family and community
- pediatrician
- pediatric neurologist
- pediatric physiatrist
- physical therapist
- occupational therapist
- orthopedic surgeon
- orthotist
- speech/language pathologist
- home care nurse
- psychologist
- psychiatrist
- social worker
- educator/schools (individual education plans)

JHD educational resources

Huntington Disease Society of America www.HDSA.org

Juvenile Huntington's Disease

The Juvenile HD Handbook: A Guide for Families and Caregivers -- 2nd Edition

Martha Nance, MD, 2007. This book provides readers with information about Juvenile HD, including genetic testing, when it is appropriate to perform the test, how to understand your HD affected child, and what to do if you find yourself in compromising situations as well as where to turn for help.

Down load or order hard copy $7.00 each

Juvenile HD: A Guide for Families

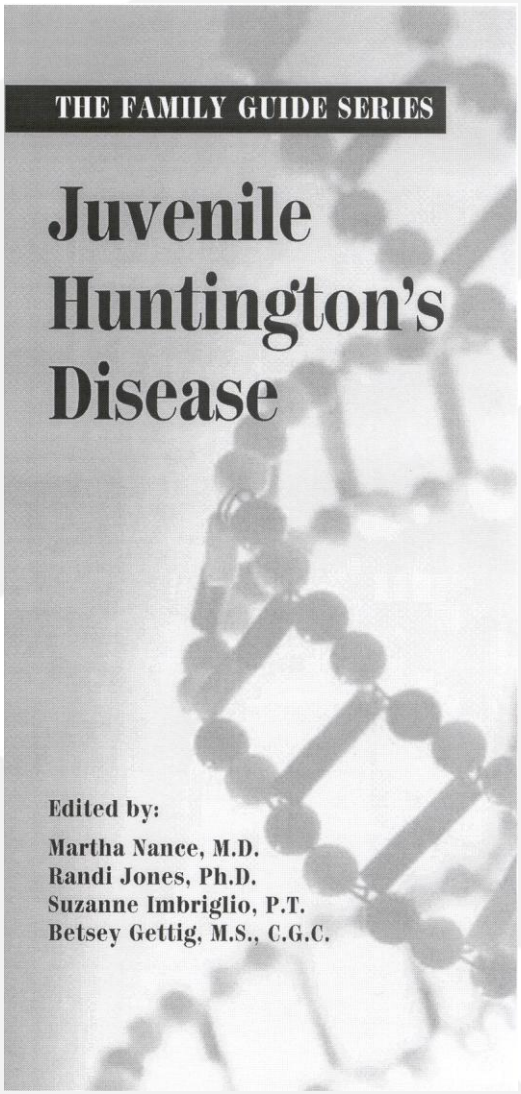
Edited by Martha Nance, MD, Randi Jones PhD, Suzanne Imbriglio PT & Betsy Gettig MS/CGC. This pamphlet defines Juvenile HD, diagnosis, specific medical issues, prognosis of the disease, financial, legal & social issues and more.

Down load or order hard copy $2.00 each

The Juvenile Onset HD Resource Directory

Comprehensive resource guide for families of children affected by Juvenile Onset HD. Information about federal, state and local programs.

Down load or order hard copy $10.00 each



Pamphlet for families can be downloaded from Huntington's Disease Society of America Web site (www.hdsa.org)

HDSA PUBLICATIONS (con't)

JHD SPECIFIC

The *Family Guide Series to Juvenile HD* by Martha Nance, MD (copyright 2009)

The Juvenile HD Handbook by Martha Nance, MD (copyright 2009)

School and the Juvenile HD Experience (copyright)

The JHD Directory (copyright 2009)

HDSA Webinars (archived on www.hdsa.org)

GENERAL

Palliative and End of Life Issues	November 17, 2010
HD and Nutrition	January 26, 2011
Team Management of HD	February 22, 2011
Communication through Use of Assistive Technology	September 26, 2011

JHD SPECIFIC

Juvenile HD	February 24, 2012

HDYO

- **Huntington's Disease Youth Organization**
- **hdyo**.org
- **HDYO**! A site created for young people to learn about HD in an age- appropriate, friendly and factually correct manner.

Resources Available through the Huntington Society of Canada www.huntingtonsociety.ca

PUBLICATIONS (available in print and on line)

JHD: A resource for Family, Health Providers and Caregivers (copyright 2008) www.huntingtonsociety.ca/english/uploads/Juvenile_HD_2008.pdf

FACT SHEETS (available on line)

GENERAL

Diet and HD	June 2010
Palliative Care	June 2010
End of Life	June 2010
Strategies to Enhance Care	August 2007

Other Websites with JHD Resources

Stanford HOPES (Huntington's Outreach Project for Education at Stanford) – JHD section created 2010 www.stanford.edu/group/hopes/cgi-bin/wordpress/category/hd-basics/juvenile-hd/

NIH/ORD – JHD section http://rarediseases.info.nih.gov/GARD/Condition/10510/Juvenile_Huntington_disease.aspx)

MDVU (Movement Disorders Virtual University) www.mdvu.org/ (primarily for health care providers)

Patient Power, JHD interview with Martha Nance and Sandra Kostyk, 2008 www.patientpower.info/program/juvenile-huntingtons-disease

HD Lighthouse (www.hdlf.org/jhd)

International JHD Resources

PUBLICATIONS

Juvenile Huntington's Disease (and other trinucleotide repeat disorders),

Quarrell, Brewer, Squitieri, Barker, Nance, Landwehrmeyer, 2009

(Amazon.com Price:$110.00) Mostly geared towards professionals.

WEBSITES

EHDN – www.euro-hd.net

JHD section www.euro-hd.net/html/network/groups/jhd

International JHD Resources

HDA (UK): http://hda.org.uk

Information for Schools – also cites HDSA and HSC resources

Challenging Behavior – Huntington's Disease in Children and Teenagers – A Guide for Professionals, Glendinning

Downloadable fact sheets: http://hda.org.uk/hda/factsheets

Challenging Behavior in Juvenile HD

A Young Person with JHD at School

A Brief Guide to Juvenile HD for Children's Hospices and Palliative Care Services

International JHD Resources

Scottish HD Association (www.hdscotland.org/youth)

- JHD Section divided by audience

This site is mostly geared to helping those in the following groups deal with having a family member with HD

- Children Ages 8-12
- Teens Ages 13-17
- Young Adults Ages 18-25
- Professionals (very limited info for health care providers.)

Australia (www.ourhdspace.org)

- Website dedicated to helping young people affected by HD

Other useful sites.

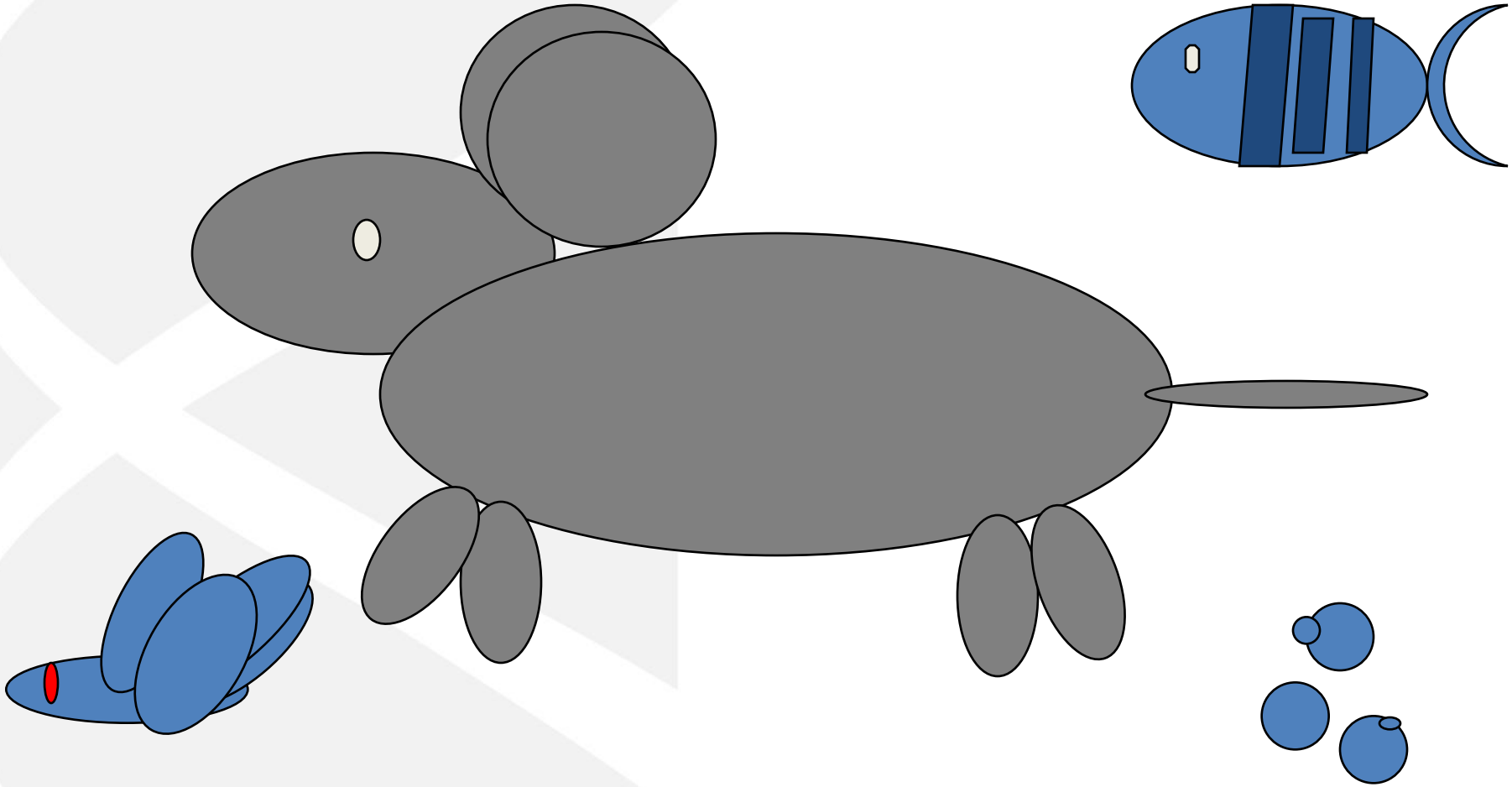
- National Information Center for Children and Youth with Disabilities

  http://nichcy.org/

Example of downloadable documents

* Adaptions and accommodations for students with disabilities
* Simple and inexpensive communication devices
* Sexuality Education for children and youth with disabilities.

RESEARCH: Our hope for the future



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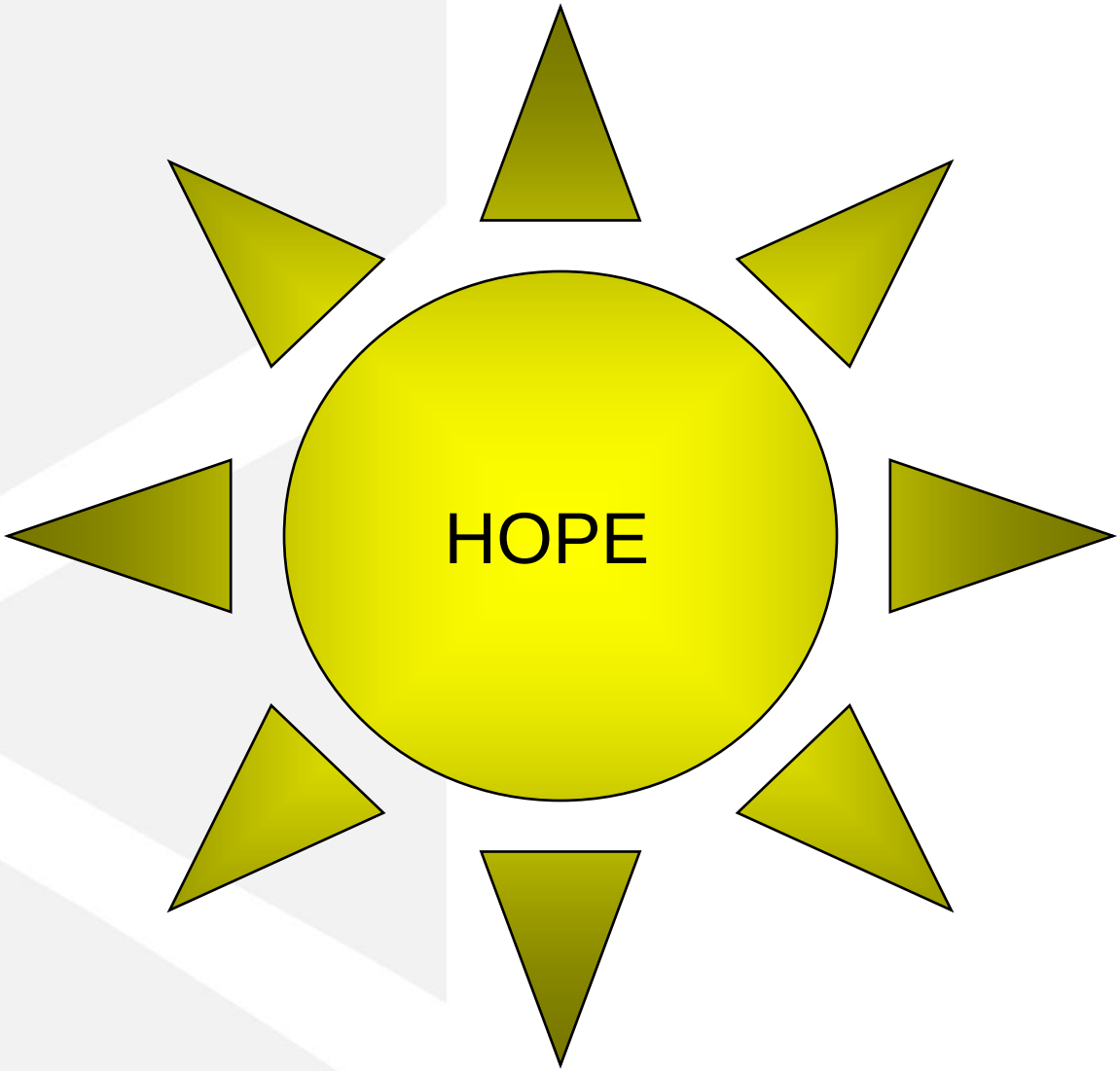
HOPE