Decline in Skills & Regression in Adolescents & Adults with Down Syndrome

Down's Syndrome Association

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July 15, 2025

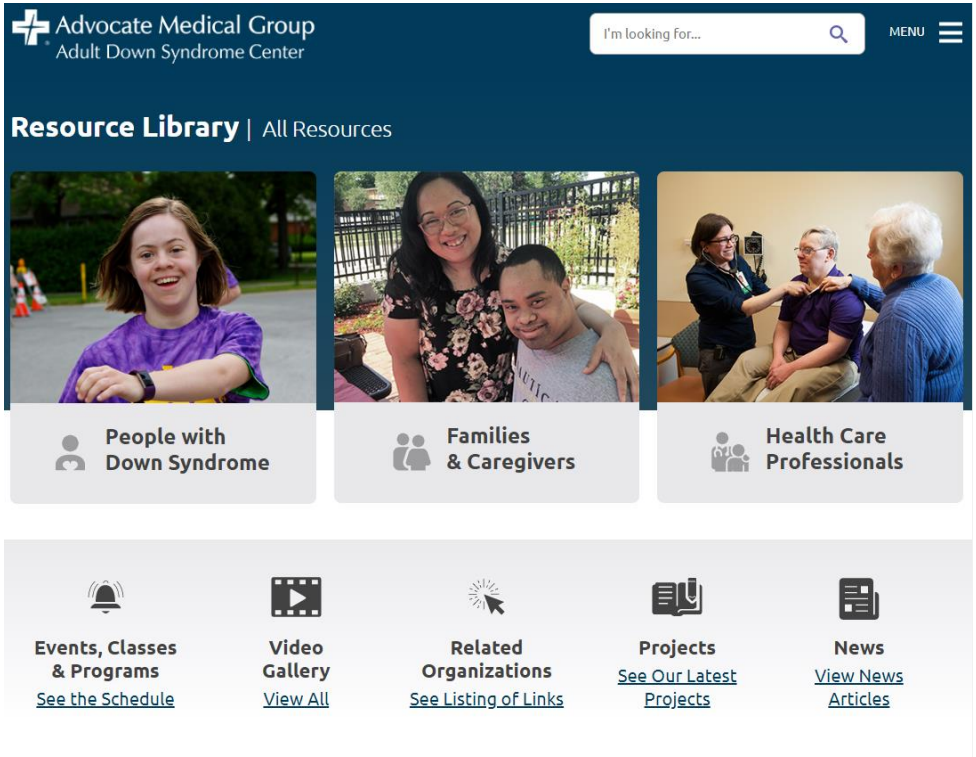



Advocate
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Adult Down
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Please note:

- This presentation is intended for families, caregivers, health care professionals, and service providers of individuals with Down syndrome.
- The information in this presentation is provided for educational purposes only and is not intended to serve as a substitute for a medical, psychiatric, mental health, or behavioral evaluation, diagnosis, or treatment plan by a qualified professional.
- We are unable to provide diagnosis or treatment recommendations specific to an individual. We recommend that you bring specific questions about an individual with Down syndrome to their medical and/or therapy professionals.

Resource Library



https://adscresources.advocatehealth.com/

Objectives

- Define decline in skills.
- Describe causes of decline in skills in adolescents and adults with Down syndrome, including Down syndrome regression disorder and Alzheimer's disease.
- Identify strategies to assist with diagnosis and treatment of decline in skills.

What is decline in skills?

Decline in skills

- Decreased ability to perform or use previously mastered skills or abilities.
  - Cognition
  - Behavior/psychological changes
  - Ability to perform activities of daily living
  - Motor function
  - Speech
  - Executive function (planning, focus attention, manage multiple tasks)

Why might a person with Down syndrome decline?

Decline in skills



CHILDHOOD: Autism spectrum disorder

ADOLESCENCE / EARLY ADULTHOOD: DS regression disorder

OLDER ADULTHOOD: Alzheimer's disease

Other causes

Image by Freepik

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Medical

- Medication side effects
- Sleep apnea
- Seizures
- Vitamin B12 deficiency
- Hypothyroidism or hyperthyroidism
- Adrenal insufficiency
- Diabetes mellitus
- Puberty
- Spinal stenosis, atlantoaxial instability, cervical myelopathy
- Pain (e.g., dental, menstrual)
- Severe constipation
- Gastroesophageal reflux disease (GERD, heartburn)
- Celiac disease
- Gallstones
- Gout

Medical

- Uncorrected or complications of congenital heart disease with pulmonary hypertension, congestive heart failure
- Eisenmenger's syndrome
- Thrombotic or hemorrhagic stroke
- Pneumonia
- Sepsis
- Lyme's disease
- Viral or bacterial meningitis or encephalitis
- Neuropsychiatric disorders
  - Catatonia
  - Mood disorder (e.g., depression)
  - Anxiety
  - Obsessive compulsive disorder
  - Psychotic disorder
  - Complex tic disorder
  - Post-traumatic stress disorder
  - Parkinsonism, dystonia

Medical

- Vision conditions
  - Glaucoma
  - Retinal detachment
  - Cataracts
  - Keratoconus
- Hearing changes
  - Hypoacusis or hyperacusis
  - Tinnitus
  - Vertigo
  - Cerumen impaction
- Urinary retention
- Urinary tract infections
- Toxic-metabolic conditions
- Autoimmune disorders

Social & environmental

- Changes in routine
- Graduating from school
- Death of family, friends, pets
- Changes in teachers or staff
- Sibling moving out of the house, getting married, etc.
- News overdose
- Family stress
- Physical relocation
- Response to hospitalization or medical condition

James
Age: 27

- Reduced interest in activities, apathy, altered sleep
- Diagnosis: medication side effect
- Treatment: stopped the medication, return to “safe” activities

José
Age: 27

- Depressed mood, loss of skills, hallucinatory behavior
- Psychoses? Alzheimer's disease? DSRD?
- Completed a sleep study
- Diagnosis: sleep apnea
- Treatment: CPAP

Down syndrome regression disorder (DSRD)

DSRD

- Has also been referred to as:
  - Down syndrome disintegrative disorder
  - Regression
  - Adult regression syndrome
  - Catatonia
- Limited data on prevalence
- Continues to be studied and discussed

Expert consensus

- Paper published in July 2022
- 27 panelists who previously published on regression in DS or were involved in national or international working groups
- Name, diagnostic work up, diagnostic criteria



frontiers | Frontiers in Neurology

ORIGINAL RESEARCH
published: 15 July 2022
doi: 10.3389/fneur.2022.940175

Assessment and Diagnosis of Down Syndrome Regression Disorder: International Expert Consensus

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Specialty section:
This article was submitted to Dementia and Neurodegenerative Diseases, a section of the journal Frontiers in Neurology

Received: 10 May 2022
Accepted: 24 June 2022
Published: 15 July 2022

Citation:
Santoro JD, Patel L, Kammeyer R, Filipink RA, Gombolay GY, Cardinale KM, Real de Asua D, Zaman S, Santoro SL, Marzouk SM, Khoshnood M, Vogel BN, Tanna R, Pagarkar D, Dhanani S, Ortega MdC, Partridge R, Stanley MA, Sanders JS, Christy A, Sannar EM, Brown R, McCormick AA, Van Mater H, Franklin C, Worley G, Quinn EA, Capone GT, Chicoine B, Skotko BG and Rafii MS (2022) Assessment and Diagnosis of Down Syndrome Regression Disorder: International Expert Consensus. Front. Neurol. 13:940175. doi: 10.3389/fneur.2022.940175

Objective: To develop standardization for nomenclature, diagnostic work up and diagnostic criteria for cases of neurocognitive regression in Down syndrome.

Background: There are no consensus criteria for the evaluation or diagnosis of neurocognitive regression in persons with Down syndrome. As such, previously published data on this condition is relegated to smaller case series with heterogenous data sets. Lack of standardized assessment tools has slowed research in this clinical area.

Methods: The authors performed a two-round traditional Delphi method survey of an international group of clinicians with experience in treating Down syndrome to develop a standardized approach to clinical care and research in this area. Thirty-eight

Santoro et al. 2022

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Diagnostic criteria

- **Symptom onset:** New neurologic, psychiatric, or mixed symptoms over a period of <12 weeks in previously healthy individual with DS
- **Exclusion of other causes**

Symptoms

- Altered mental status or behavioral dysregulation
- Cognitive decline
- Developmental regression with/without new autistic features
- New focal neurologic deficits on examination and/or seizure
- Insomnia or circadian rhythm disruption
- Language deficits
- Movement disorder (excluding tics)
- Psychiatric symptoms

Santoro et al. 2022

Catatonia

- Abnormality of movement and behavior
- Can (but may not) be associated with a mental illness
- Various presentations
  - Repetitive or purposeless overactivity
  - Resistance to movement

Health Condition	Prevalence (6,078)	Prevalence %	Prevalence (30,326)	Prevalence %	More or less common?	Odds Ratio
	Down Syndrome		Controls			
Catatonia	73	1.20%	70	0.23%	More	5.25*

Chicoine et al. 2021 | *p<0.0001

How is DSRD different than other types of decline in skills?

- DSRD tends to be more severe and pervasive.
- The contributing cause can be the same or similar in some instances.
- Is autoimmunity/inflammation always present?

Vivian
Age: 22

- Personality change, difficulty performing at her job
- Agitated behavior initially, followed by decreased movement, eating, and interest in activities
- Progressive over 3-4 months
- Diagnosis: DSRD
- Treatment: medication, ECT, measured reintroduction into activities

Naya
Age: 23

- Depressed mood, catatonia
- Diagnosis: DSRD
- Treatment:
  - Treated with anti-depressant but not improving
  - Stopped anti-depressant and started Lorazepam
  - Catatonia started to improve with Lorazepam
  - Depression persisted
  - Started anti-depressant again
  - Depression significantly improved, catatonia continued to improve

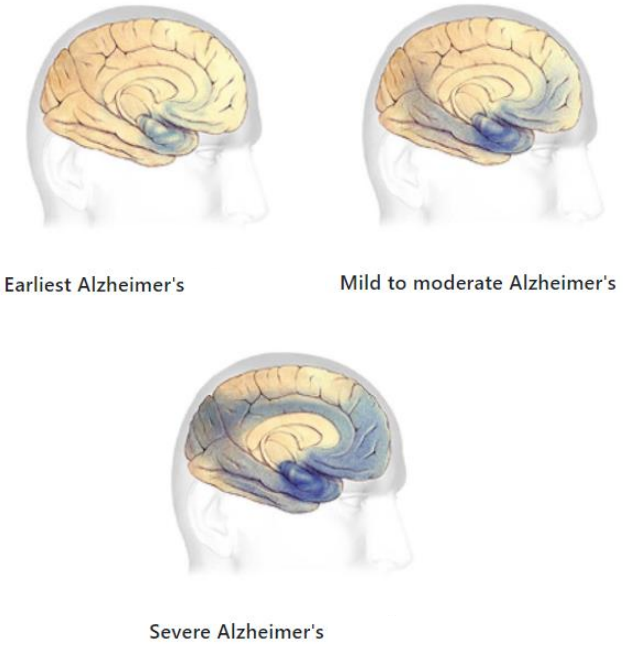
Alzheimer's disease

Alzheimer's disease (AD)

- Progressive neurological condition
- Affects the brain
- Type of dementia
- Plaques and tangles = the microscopic changes in the brain consistent with Alzheimer's disease (also referred to as neuropathologic changes)

Alzheimer’s and Down syndrome

By age 40, nearly all people with Down syndrome have the brain pathology of Alzheimer’s disease.



Images from Alzheimer’s Association

Mann 1988, Hartley et al. 2014

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Why?

- Amyloid precursor protein (APP)
- Chronic inflammation?
- Metabolic abnormalities?

Zis & Strydom 2018, Lai et al. 2021, Tournissac et al. 2021

Alzheimer's and Down syndrome

By age 40, nearly all people with Down syndrome have the brain pathology of Alzheimer's disease.

HOWEVER, **symptoms** of Alzheimer's disease are uncommon before age 40.

Tsou et al. 2020

Symptoms

- Changes in self-talk, adherence to routines
- Psychological changes
- Memory impairment
- Loss of previously mastered skills
- Incontinence
- Weight loss
- Seizures
  - Higher rate
- Unsteady gait
- Swallowing difficulties

Menendez 2005, Ballard et al. 2016, Altuna et al. 2021

AD prevalence and average ages

- Prevalence of clinical Alzheimer's disease
  - Estimates vary
  - 55% in those ages 50-59
  - Greater than 75% in those ages 60 and older
- Average age at diagnosis
  - 54 to 55 years old
- Average age at death
  - 59 to 60 years old

McCarron et al. 2017, Sinai et al. 2018, Fortea et al. 2020, Rubenstein et al. 2024

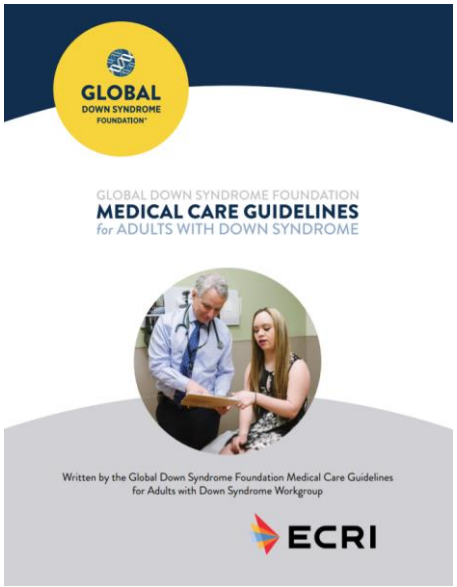
Preventing or delaying AD?

- Treat sleep apnea and practice good sleep hygiene
- Diet – Mediterranean, DASH, MIND
- Vitamin D supplement
- Good hydration
- Physical activity
- Promote mental health and stress management
- Challenge your brain
  - More complex employment
- Stay socially engaged
- Monitor for and treat hearing impairment

Piro-Gambetti et al. 2024, Agarwal et al. 2023, Xia et al. 2023, Lao et al. 2022, Nianogo et al. 2022, De la Rosa et al. 2020

Global Medical Care Guidelines

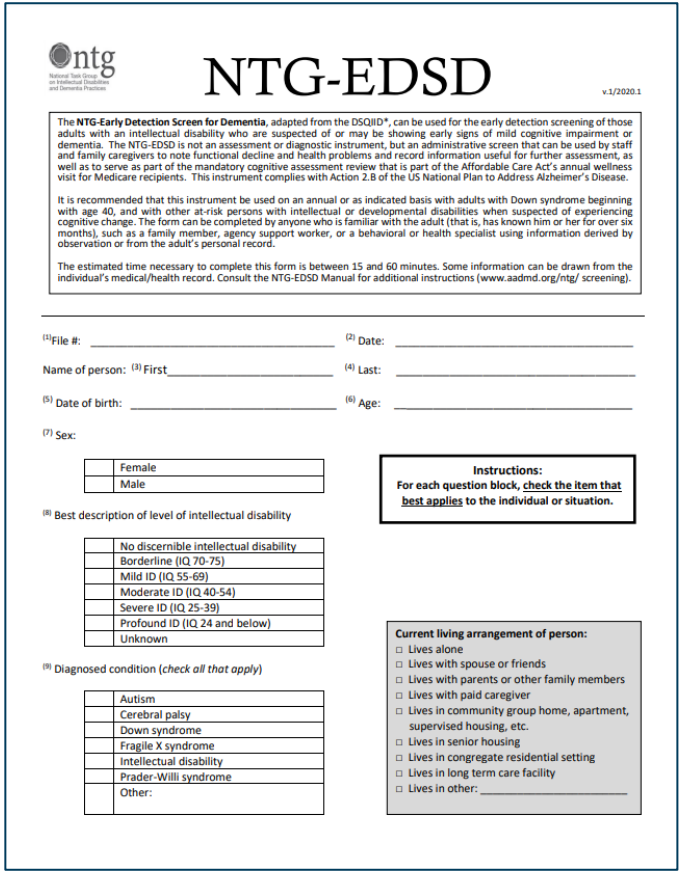
- For adults with Down syndrome younger than age 40, be cautious when diagnosing age-related, Alzheimer's type dementia.
- Assess baseline function each year beginning at age 40.
  - National Task Group Early Detection Screen for Dementia (NTG-EDSD)



Screening

- National Task Group on Intellectual Disabilities and Dementia Practices – Early Detection Screen for Dementia

NTG-EDSD



ntg
National Task Group on Intellectual Disabilities and Dementia Practices

NTG-EDSD

v.1/2020.1

The **NTG-Early Detection Screen for Dementia**, adapted from the DSQIID*, can be used for the early detection screening of those adults with an intellectual disability who are suspected of or may be showing early signs of mild cognitive impairment or dementia. The NTG-EDSD is not an assessment or diagnostic instrument, but an administrative screen that can be used by staff and family caregivers to note functional decline and health problems and record information useful for further assessment, as well as to serve as part of the mandatory cognitive assessment review that is part of the Affordable Care Act's annual wellness visit for Medicare recipients. This instrument complies with Action 2.B of the US National Plan to Address Alzheimer's Disease.

It is recommended that this instrument be used on an annual or as indicated basis with adults with Down syndrome beginning with age 40, and with other at-risk persons with intellectual or developmental disabilities when suspected of experiencing cognitive change. The form can be completed by anyone who is familiar with the adult (that is, has known him or her for over six months), such as a family member, agency support worker, or a behavioral or health specialist using information derived by observation or from the adult's personal record.

The estimated time necessary to complete this form is between 15 and 60 minutes. Some information can be drawn from the individual's medical/health record. Consult the NTG-EDSD Manual for additional instructions (www.aadmd.org/ntg/ screening).

[1] File #: _____ [2] Date: _____

Name of person: [3] First_____ [4] Last: _____

[5] Date of birth: _____ [6] Age: _____

[7] Sex:

	Female
	Male

Instructions:
For each question block, check the item that best applies to the individual or situation.

[8] Best description of level of intellectual disability

	No discernible intellectual disability
	Borderline (IQ 70-75)
	Mild ID (IQ 55-69)
	Moderate ID (IQ 40-54)
	Severe ID (IQ 25-39)
	Profound ID (IQ 24 and below)
	Unknown

Current living arrangement of person:
- □ Lives alone
- □ Lives with spouse or friends
- □ Lives with parents or other family members
- □ Lives with paid caregiver
- □ Lives in community group home, apartment, supervised housing, etc.
- □ Lives in senior housing
- □ Lives in congregate residential setting
- □ Lives in long term care facility
- □ Lives in other: _____

[9] Diagnosed condition (*check all that apply*)

	Autism
	Cerebral palsy
	Down syndrome
	Fragile X syndrome
	Intellectual disability
	Prader-Willi syndrome
	Other:

How is Alzheimer's disease similar to DSRD?

- Both involve decline in skills.
- Both are (probably) neurological conditions that often have psychological symptoms.
- Both are challenging for the individual and family.
- Both need more research, including ways to support the individual and family.

How is Alzheimer's disease different than DSRD?

- Age of onset
- Reversibility
- Treatment options

Seamus
Age: 51

- Sister noted he was no longer sending birthday cards to the family members
- Upon further evaluation at home, discovered their parents had been doing more for Seamus –he was much less independent with his ADLs
- Physical exam and labs did not find an alternative cause
- Diagnosed with Alzheimer's disease
- Had his first ever seizure

Summary

Alzheimer's disease	Down syndrome regression disorder (DSRD)	Autism (in DS)	Other
• Uncommon before 40 years of age • Average age of diagnosis mid-50s	• 10-30 years of age • Decline in cognitive, functional, and language skills • Movement disorder • Psychiatric symptoms	• Older age for loss of language (61.8 months vs 19.7 months) • Other skill loss (46.2 months vs 19.5 months) • Castillo et al (2008)	• Sleep apnea • Hypothyroidism • Response to pain • Depression • Vision impairment • Hearing impairment • And others

Determining the cause of a decline

Evaluation

- History and physical exam
- Blood work
  - CBC, metabolic panel, TSH, T4, vitamin B12 and folic acid, celiac
- Imaging (e.g., MRI)
- Sleep study
- Urine studies
- Lumbar puncture
- EEG
- Neuropsychological testing
- Other

Treatment

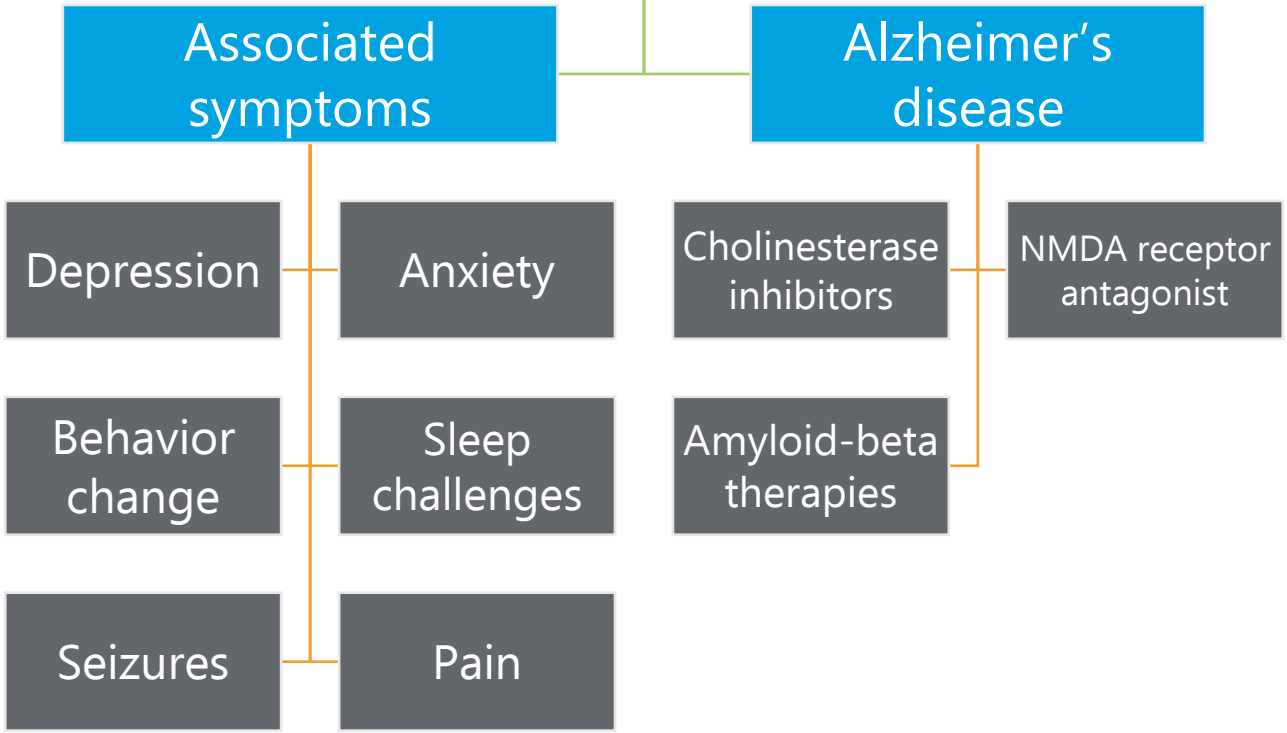
Treatment

- Treat diagnosable conditions
- Treat associated signs and symptoms
- Use therapies to help improve function
- Start with “safe activities”

Treatments for DSRD

Medications	Therapy	ECT	Immunotherapies
• Lorazepam for catatonia (amantadine, memantine) • Psychiatric medications • Seizure medications	• Counseling • Art, play, music and other therapies • Physical and occupational therapy	• Electroconvulsive therapy	• IVIG (intravenous immunoglobulin) • JAK inhibitors

Treatments for Alzheimer's disease



Amyloid-beta therapies

- MRI, PET scan, lumbar puncture
- Blood biomarkers
- “Do no harm”
  - Minimize risk and optimize benefit
  - Amyloid angiopathy
  - Strokes
  - Safety studies

Hillerstrom et al. 2024



Supporting individuals with Down syndrome & decline in skills

Diagnosis and treatment

- Families and staff
  - Be observant
  - Share your observations
    - Mood, behavior, function, motor activities, sleep, appetite, any other symptoms or changes you notice
    - What is still “missing” from the person?
    - Share observations on an ongoing basis

Strategies

- Focus on what the person can do and what they enjoy
- Encourage safe social interactions
- Sensory strategies
- Create visual schedules and routines (sleep, healthy eating, physical activity, etc.)

- Communication
  - Get down on their level (eye-to-eye)
  - Speak calmly with a slow pace
  - Provide simple instructions
  - Limit choices
  - Minimize background noise
  - Avoid arguing

AD: end-of-life discussions

- Challenges
  - Distorted perception of time
  - Tendency to perseveration
  - Burden of treatment may feel different for everyone
  - Large heterogeneity of level of intellectual disability at baseline in people with DS
  - Emotional capacity
  - Dementia

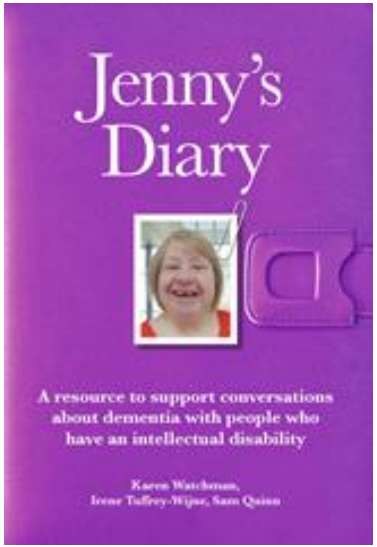


End-of-Life Guidebook

AD: end-of-life discussions



[Talking End of Life Toolkit]



[Jenny's Diary Booklet]

How other people with Down syndrome may be affected

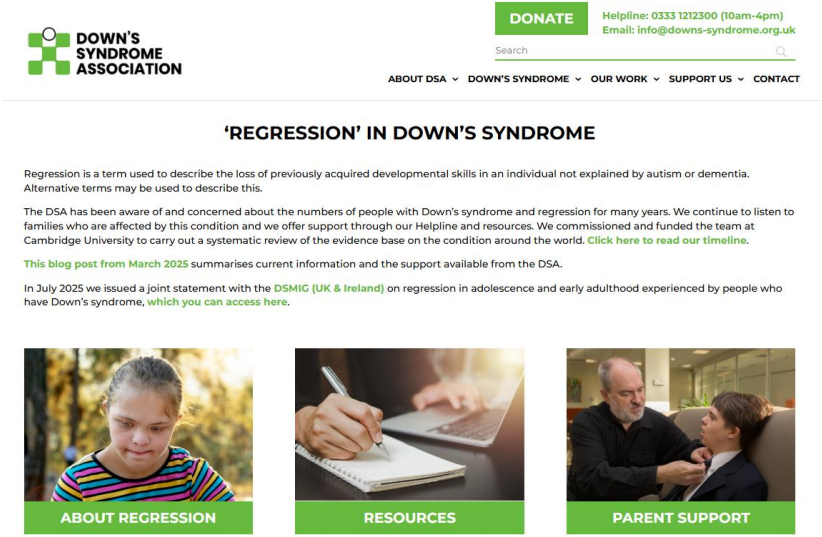
- First thing to consider – it does impact some individuals
- Can cause fear and anxiety
- Can cause resentment
- Can bring out the best “caregiver”

Takeaways

- There are many possible causes for a decline in skills.
- A thorough evaluation is indicated to assess for the various causes.
- Treatment consists of:
  - Treating the cause
  - Treating the symptoms

Resources

Down’s Syndrome Association



[Regression]



[Dementia]

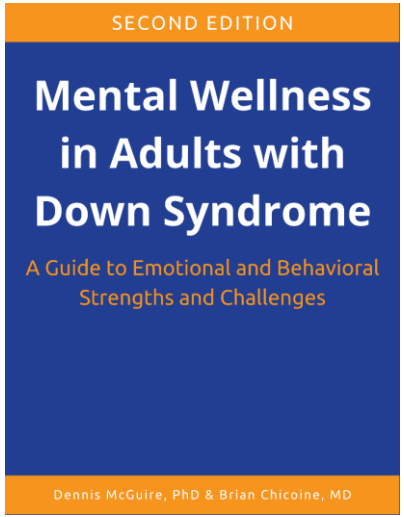
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Now part of ADVOCATEHEALTH

Adult Down Syndrome Center

- Resource Library
- Email List
- Facebook
- Instagram



Mental Wellness book





Available as a free PDF in English and Spanish

https://adscresources.advocatehealth.com/mental-wellness-in-adults-with-down-syndrome-2nd-edition/

Articles

- Alzheimer's Disease & Down Syndrome (guidebook, National Down Syndrome Society)
- Change in Behavior in a Person with DS and AD (article)
- Loss of Skills and Alzheimer's Disease (article)
- Reducing Risk of Getting Alzheimer's Disease (article)
- Regression & Down Syndrome (webpage, National Down Syndrome Society)
- Seizures in People with Down Syndrome and Alzheimer's Disease (article)

Visuals

- Alzheimer's Disease (story)
- Coping with Grief (story)
- Let's Talk About Dementia (booklet, Down's Syndrome Scotland)
- Orientation Book for People with Alzheimer's Disease (visual)
- What Is Death? (story)
- When Things in My Life Change (story)

Support Groups

Regression

- Down's Syndrome Association Group
- U.S. Facebook Group

Alzheimer's Disease

- Down's Syndrome Association Group
- U.S. Facebook Group

Questions?

Adult Down Syndrome Center

Resource Library

@adultdownsyndromecenter

Email List

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