Aging in Individuals With Developmental Disabilities- Medical Concerns

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March 15, 2013

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Developmental Disability

Definition

- A severe chronic disability
- Mental or physical impairment manifested before the age of 22 years
- Is likely to continue indefinitely
- Results in substantial functional limitations in three or more of the following areas of major life activity
  - Self care
  - Receptive and expressive language
  - Learning
  - Mobility
  - Self direction
  - Capacity for independent living
  - And economic sufficiency
- It reflects the persons need for a combination and sequence of special interdisciplinary or generic care, treatment or other services which are lifelong or extended duration and are individually planned and coordinated

Aging and Developmental Disabilities

- In 2002, an estimated 641,000 adults with DD were older than 60.
- In 2002 about 75% of all older adults with DD were in the 40-60 year old age range.
- The number of adults with I/DD age 60 years and older is projected to nearly double from 641,860 in 2000 to 1.2 million by 2030 due to increasing life expectancy and the aging of the baby boom generation

Onset of Aging in the General Population vs. the DD Population

General Population

- 65-70 years

Persons with DD

- 45-55 years

Normal Age Related Changes in Body Systems

Heart and Lungs

- Maximum heart rate in response to exercise is lower
- Cardiac output decreases
- Blood vessels become thicker and stiffer
- Lung elastic recoil decreases
- Vital capacity decreases
- Diaphragm may weaken as much as 25% with normal aging.

Normal Age Related Changes in Body Systems

Endocrine system

- Thyroid problems more common
- Insulin resistance increases
- Less ability to recover from stress due to less responsiveness to the body's stress hormones
- Blood pressure may drop with sudden position changes such as standing up quickly

Normal Age Related Changes in Body Systems

Skin

- The skin gets thinner and more easily damaged
- Subcutaneous body fat decreases (although total body fat increases)
- Decrease number of sweat glands Skin takes longer to heal if injured
- Hair grays/hair loss
- Nails turn yellow, become more brittle

Normal Age Related Changes in Body Systems

Digestive System

- Less saliva production
- Swallow reflex slows
- Small intestine is less able to digest food and absorb nutrients
- The muscles that help digestion slow down, making constipation a problem
- Lower esophageal sphincter weakens leading to clinically significant gastroesophageal reflux

Normal Age Related Changes in Body Systems

Genitourinary System

- Gradual decline in glomerular filtration rate
- Enlarged prostate leading to bladder outlet obstruction
- Neurogenic bladder
- Incontinence
- The kidneys don’t process medications as efficiently
- More prone to UTI
- Menopausal Symptoms

Normal Age Related Changes in Body Systems

Musculoskeletal

- Muscles lose protein and become smaller
- Muscle contraction is weaker and slower
- Bones lose calcium and become weaker
- Joints, tendons and ligaments are less flexible and are less able to move

Normal Age Related Changes in Body Systems

Nervous System

- Certain parts of the brain lose cells brain gets smaller.
- More susceptible to bleeding in the brain with minor trauma (subdural hematoma).
- Information moves through the nervous system at a slower rate.
- More time is needed to process information.
- The brain is less able to recover from damage.

Sensory Changes

Vision

- Lens of the eye stiffens
- Farsightedness
- More difficult to tell blue and green shades apart
- Lens thickens and gets cloudy
- Need more light to see

Sensory Changes

Hearing

- More difficult to hear higher pitched sounds
- More difficult to filter out background noise
- Trouble sorting out similar pitches so similar sounds often blend into a single sound

Sensory Changes

Touch

- More sensitive to extremes of heat or cold
- May be more or less sensitive to pain or pressure sensation
- High risk of injury because less fat for protection from heat, cold or painful stimulus

Sensory Changes

Taste and Smell

- Sensitivity to smell is decreased
- Taste is decreased

Physiologic changes affecting absorption and effectiveness of medications

Absorption

- ↓ Swallowing
- ↓ Stomach emptying
- ↓ Intestinal motility
- ↑ Transit time
- ↑ Stomach acid
- ↓ Absorptive surface area
- ↓ Intestinal blood flow

Physiologic changes affecting absorption and effectiveness of medications

Distribution

- ↓ Muscle mass
- ↓ Total body water
- ↑ Total body fat
- ↓ Liver clearance
- ↓ Kidney clearance
- ↓ Protein stores

Physiologic changes affecting absorption and effectiveness of medications

Neurologic changes

- ↓ Number of neurons
- ↓ Number of receptors
- ↓ Neurotransmitters

Pre-Existing Developmental Disability and Related Medical Problems

- Communication Problems/Non-Verbal
- Mental Retardation
- Neuropsychiatric Disorders
- Orthopedic Problems
- Neurologic Problems
- Trouble dealing with Changes in Routine
- Pain
- Depression
- Hearing or Vision Problems

Secondary Medical Conditions

- **Secondary medical conditions can be a direct result of or under the influence of the primary disability.**

  – For example, in a person with cerebral palsy, common secondary conditions include contractures, fixed deformities and the resultant orthopedic complications which then arise from these.

Associated Medical Conditions

- **Associated medical conditions are those that occur with a higher frequency in people with certain impairments.**
  - For example, thyroid disease is more common in persons with Down Syndrome.
  - It is important to be aware of the associated conditions of a given disability and to monitor for signs and symptoms, and to routinely screen for these conditions where appropriate.

Comorbid Conditions

- **Comorbid conditions are unrelated to the primary disability.**
  - For example, colon cancer or heart disease is not a direct result of the primary disability of cerebral palsy. The person with cerebral palsy has the same risk profile based on family history, lifestyle as the person who does not have the primary disability.
  - It is important for the person with disabilities to have the same opportunity for routine health screenings as the general population.

Acute changes

Rapid changes from the baseline in behavior, mobility, ability to function is cause for concern.

Acute changes

Things to think about:

- Are they constipated or having trouble urinating?
- Any recent medication changes?
- Are they in pain?
- Is there infection/illness?
- Did they fall or hurt themselves?
- Is something upsetting them?
- Are they depressed or reacting to stresses in their environment?
- Are they having seizures?
- How are they sleeping?
- Are they eating, drinking ok?
- Are they dehydrated?

Acute changes
Treatable Medical Causes

- Dehydration
- Diabetes
- Infection
- Sleep Apnea
- Subdural Hematoma
- Seizures
- GERD
- Digestive diseases
- Heart problems
- Lung problems
- Thyroid problems
- Depression
- Mental Illness
- Change in set routine
- Loss of loved one
- Vision changes
- Hearing Changes
- Pain
- Constipation
- Urinary problems

Acute changes
Medication Effects

- **Anticholinergic**
  - **TCAs, anti-psychotics, cold meds**
- **Benzodiazepines**
  - **Valium, sedatives**
- **Steroids**
- **Anticonvulsants**
- **Mood stabilizers**
  - **AEDs, lithium**
- **Beta-blockers & cardiac meds**
- **Coumadin**

Aging and Developmental Disabilities

Persons with DD often have more trouble dealing with normal age related changes because of their pre-existing disabilities, secondary conditions and associated medical problems.

Down Syndrome

- Improvements in medical care have led to longer lifespan and enhanced quality of life.

Consequently,

- Up to 35 years of age, mortality rates are comparable in adults with DS to individuals with ID from other causes.
- After age 35, mortality rates double every 6.4 years in DS, as compared to 9.6 years for people without DS
- Currently estimated life expectancy of a 1-year-old child with DS is between 43 and 55 years

Curr Gerontol Geriatr Res. 2012; 2012: 412536.

Down Syndrome

- In 1983 the median age of death in persons with Down syndrome was 25 years.
- The average age of death for adults with Down syndrome is the mid to late 50's
- 25% of persons with Down syndrome are still alive at 65 years.

Rubin & Crocker,2006; Yang Rasmussen & Friedman, 2002

Down Syndrome

Associated Conditions

- Cataracts
- Glaucoma
- Keratoconus
- Hearing Loss
- Seizures
- Alzheimer's Disease
- Leukemia
- Constipation
- Celiac disease
- Gastroesophageal reflux
- Obstructive Sleep Apnea
- Diabetes
- Thyroid disease
- Neuropsychiatric Disorders
- Oral motor Dysfunction
- Swallowing Dysfunction
- Dental/Gingival disease
- Atlantoaxial Instability
- Congenital Heart Disease-Late complications
- Mitral Valve Prolapse

Down Syndrome
Secondary Conditions

- Aspiration
- Aortic Regurgitation
- Chronic Lung Disease
- Osteoarthritis
- Obesity
- Coronary Artery Disease
- Megaloblastic Anemia (secondary to chronic PPI therapy)

Down Syndrome and Alzheimer's

- People with Down Syndrome have a higher chance of developing Alzheimer's.
- Some studies estimate that as many as 50% of persons with Down Syndrome will have Alzheimer's by age 60.
- Since the risk is not 100%, so you cannot assume changes are due to Alzheimer's.
- When there is functional decline, behavioral changes or change from baseline, reversible medical causes must be ruled out.

Down Syndrome and Alzheimer's Dementia

- Alzheimer's disease is definitely linked to the 1st, 14th, and 21st chromosomes.
- Mutations in the APP gene on chromosome 21 can also cause early onset disease.
  - The presenilins have been identified as essential components of the proteolytic processing machinery that produces beta amyloid peptides through cleavage of APP.

Cerebral Palsy

Secondary Conditions

Contractures

Excessive joint wear and tear/overuse syndromes

Osteoarthritis

Osteoporosis

Scoliosis

Hip dislocation/subluxation

Neurogenic bowel/bladder

Bladder outlet obstruction

Constipation

Gastroesophageal Reflux

Barrett's metaplasia

Dental/gingival disease

Oromotor Dysfunction

Aspiration

Chronic Lung Disease

Sleep Apnea

Cerebellar Atrophy

Cerebral Palsy

Associated Conditions

Mental Retardation

Seizures

Learning Disabilities

Hearing Impairment

Vision Impairment

Growth problems

Communication Disorders

Case 1

LW is a 68 year old woman who has lived in an apartment with staff support for many years.

- She has always taken pride in her appearance and her possessions. She has worked for Goodwill for many years, sorting clothing.
- She has been independent in her ADL's, doing laundry with assistance and going to the grocery store with support from
- She has been able to use public transportation without supervision.

Case 1

- Over the last 12 months, she has begun to lose weight, her appetite seems diminished and staff have noticed that her apartment isn't as clean as usual.
- She seems more confused, and is less interested in her appearance. She will ask staff the same question several times a day.
- She recently got lost when trying to take a bus to the community center.

Case 2

RP is a 58 year old man with mixed spastic and choreoathetotic cerebral palsy, developmental delays and profound hearing loss related to neonatal bilirubin encephalopathy and RH incompatibility.

Case 2

- He attended special education classes in school, wears hearing aids and is minimally verbal. He can make his needs known with gestures and simple signs.
- He has been independent in his ADLs.
- He has always led an active life, riding horses, working on his parent's farm. Often his work involved heavy lifting.

Case 2

- Over the past few months he has started to become isolated, staying in his room.
- He has had several falls, regression of his motor skills. He has gone from ambulating independently to using a wheelchair fulltime.
- He has in the last 2 months stopped feeding himself and he has lost about 15 pounds.
- He has not had any change in his bowel or bladder function.