
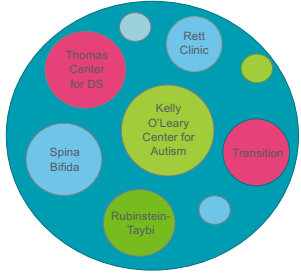



## Communication in Children with Down Syndrome

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## Division of Developmental & Behavioral Pediatrics

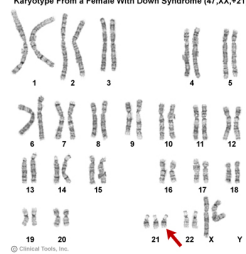
## Thomas Center for Down Syndrome

- Evaluations & treatment planning based on best practices and standard of care
- Education and advocacy
- Transition planning
- Care coordination, support, and assistance throughout childhood




## Trisomy 21 Karyotype

Karyotype From a Female With Down Syndrome (47,XX,+21)




© Clinical Tools, Inc.




## Down syndrome: Types

- Trisomy 21 – Most common at 95%, Risk for another child is 1% greater than by maternal age alone
- Mosaicism – 1% “Less severe”?
- Translocation – 4%  
In 1/3 of the cases one of the parents is a carrier. Risk for another child with DS increases by 3% if father is carrier, 10-15% if mother is carrier



## Understanding Risk

- 1/691 (adjusted for maternal age)
- 80% born to women *under* 35 years old



### Physical Characteristics




- Low muscle tone
- Single, palmar crease
- Epicanthic folds giving almond-shaped appearance
- Tongue large in relation to small oral structure
- Space between the first and second toes



### Medical Comorbidities


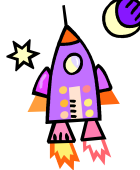
- Congenital cardiac problems (60%)
- Hearing loss (66-89%) of at least 15 – 20 dB in one ear; frequent otitis media with effusion
- Vision problems (60%) including congenital cataracts
- Seizure disorders 10x greater incidence
- Leukemia, 20x greater incidence
- Hypothyroidism (5%)
- Gastrointestinal problems including duodenal atresia, Hirschsprung disease, and Celiac disease
- Sleep apnea
- ASD ?%




### Typical Profile

<p>Potential Challenges</p> <ul style="list-style-type: none"> <li>• Hearing &amp; Vision</li> <li>• Speech &amp; Language</li> <li>• Verbal Short-Term Memory &amp; Working Memory</li> <li>• Learning from listening</li> <li>• Numbers</li> </ul>	<p>Common Strengths</p> <ul style="list-style-type: none"> <li>• Social understanding, empathy, &amp; social skills</li> <li>• Self help and daily living skills</li> <li>• Visual short-term memory</li> <li>• Visual learning a strength</li> <li>• Reading</li> </ul>
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Hodapp, Fidler, & Buckley, 2006


While there are similarities in how many children with Down syndrome communicate, each child has his or her own trajectory.



### Understanding Communication in DS




### Cognitive Development






### Motor Development Dependence





### Communication Profiles

- Emergence through experience and interaction
- Children are not little adults
- Focus first on “people” language” then on “school” language

### Receptive Language

- Also called auditory comprehension
- Examples include:
  - Responding to name
  - Understanding and following routines
  - Anticipating next steps in early games
  - Listening for details embedded in sentences



### Expressive Language

- Speech
- Body language
- Facial expression
- Gestures



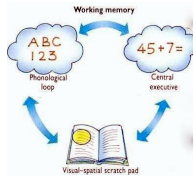

### Social Language




- Benefits
- Challenges
  - Avoidance strategies
  - Decreased initiation in learning contexts
  - Over-dependence



### Importance of Working Memory



Baddeley, A. (2003)



## Working memory

- Listen, process, manipulate
- Writing and anticipating upcoming text
- Decoding unfamiliar words
- Mental arithmetic

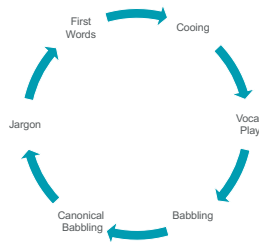


## Speech Issues in Children with DS

- Areas affecting speech
- Hearing loss
  - Auditory processing
  - Verbal short-term memory
  - Motor concerns
  - Planning



## Development of Talking



## Early Expression

- Mean age of first word is 18 months
  - Combining words at 30 months
- (Stoel-Gammon, 2003)



## Successful Outcomes

- Child's developmental level
- Child's learning style
- Skills of intervention personnel
- Level of participation of the family



## Encouraging Communication

- Play-based
- Prompts paired with environmental arrangement
- Incorporate gestures, vocalizations, joint attention, and spoken words
- Therapy sessions should include parent education





### Joint Attention

- Focusing the attention of a partner
- Voluntary eye gaze coordination between a partner and object of interest
- Optimal impact on learning occurs during joint attention





### Imitation

- Facial expression
- Body movements
- Vocalizations
- Done by both children and parents caregivers

### Early Months


- Encourage eye contact
- Develop sound awareness
- Encourage visual awareness
- Position for stability
- Use toys that can be watched or heard




### First Year

Focus on activities that:

- Engage in face-to-face interactions
- Encourage oral awareness and exploration
- Develop sound awareness and discrimination




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### Sign Language

- Look for readiness: waving, blowing kisses, etc.
- Start with a small number of concrete signs
- Accept approximations and “made up” signs
- Signs drop out with verbal competence



### Toddler

- Encourage turn-taking play
- Continue signing
- Sing songs and “follow-the-leader” games
- Read and point to pictures
- Introduce sight word recognition
- Encourage pretend play



## Toddler – Preschool

- Explore printed word recognition programs
- Always leave time for a response
- Gather groups of objects to practice matching, naming, and categories



## Preschool

- Encourage peer interactions
- Use sight words as a cue for vocabulary development
- Continue to model speech
- Expand what the child says



## Preschool (cont.)

- Use daily activities to guide language experience
- Use the child's interests to build articulation skills



## School Age

- Use "show and tell" activities
- Practice giving and taking directions
- Discuss cause and effect relationships
- Build his/her ability to see absurdities
- Practice telling stories



## School Age

- Look for ways to support learning
  - Visual Modifications
  - FM Systems
- Body Awareness
  - Public vs. private areas
  - Boundaries
- Direct social skills teaching
  - Use role playing to develop "scripts"



## School Age

- Find opportunities to use verbal speech:
  - Centers (in lower grades)
  - Group projects
  - On teacher errands with less familiar adults
- Focus on understanding the "hidden" curriculum



## Targeting Working Memory

- Sound & word discrimination games
  - Memory games
  - Encourage spoken language development
- [More research on working memory in DS](#)



## School Success

- We all function better when we know what to expect!
- The classroom:
  - Exciting
  - Unpredictable environment



## Strategies for Increasing Successful Communication

- Increase predictability =
- Increase attention to task
  - Reduce anxiety
  - Decrease behavioral challenge
  - Increase confidence to engage in activity



## Establishing Predictability

- **What** is happening, what is going to happen, and what are you supposed to be doing?
- **When** are you expected to start, stop or finish the activity?
- **Where** is the activity supposed to occur?
- **Why** are things happening as they are?



## Playing to Strengths: Visual Supports

A structured timetable of daily and weekly activities will help your child understand what's going on and what to expect



## Using Picture Schedules

- Compensate for weaknesses in receptive language
- Checked and rechecked independently
- Ease of understanding
- Customized to meet the needs of each child
- Varied according to number of pictures



**First**      **Then**




2 + 4 = 6  
magnetic numbers

ball bounce





**Modifying Directions**

- Avoid negatives
- Tell the child what you want him/her to do
- Don't assume the child can "read between the lines"
- Avoid use of abstract terms such as:
  - Wait
  - Maybe
  - Later





**Social Stories**

- Preparing for new situations
- Building scripts for interaction
- Providing visual support and repetition for learning and retention
- Helping with behavior




**Annie Rides a Bike**

Annie likes to ride her bike. She gets yogurt, Cheerios, and waffles at the store.




Sometimes Annie rides her bike to get cinnamon rolls. Mmm...






Oh no! Annie is too big for her bike seat. How will she ride?


She has a new bike to ride with Mama. Look how much fun they have together!

The new seat sits right behind Mama.



See the seat? Click! We put on the seat belt so we are safe on our ride.

Here is Annie riding safely. She holds the handle bars just like Mama.



Look at Annie's feet! They stay on the pedals.

Annie likes to ride her bike. She is safe with her seat belt and it is fun!

Annie likes to learn new things. She has fun riding her bike.

**Contact**

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