Outline

• Case report
• Myths and Facts: ASD Interventions
• Early intervention for toddlers
• Interventions for young adults
Case Report

• CC: 25mo girl with no significant PMH here for developmental & behavioral issues
• HPI:
  ▫ Typical development till 18mo then slowed
  ▫ Parents concerned
Case Report: Language

- Mom speaks to daughter in Armenian
- Dad speaks in English
- Poor articulation “hapooni” for “happy birthday”

<table>
<thead>
<tr>
<th>Patient’s Development</th>
<th>Typical Development (Nelson 6th Ed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty with 2 word requests</td>
<td>50 word vocabulary, uses 2 word sentences by 24mo</td>
</tr>
<tr>
<td>Does not point</td>
<td>Points to picture by 24mo</td>
</tr>
</tbody>
</table>

- Concerned for language delay
Case Report: Personal-Social

• No interested in other children -> isolates & plays alone at playground & play dates
• Poor eye contact
• Overwhelmed in social situations

<table>
<thead>
<tr>
<th>Patient’s Development</th>
<th>Typical Development (Nelson 6th Ed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sloppy when uses spoon to feed self</td>
<td>Uses spoon and fork by 15mo</td>
</tr>
<tr>
<td>Does not drinks from an open cup</td>
<td>Drinks from a cup by 12mo</td>
</tr>
<tr>
<td>Removes slippers, socks, and shoes</td>
<td>Removes garments by 18mo</td>
</tr>
</tbody>
</table>

• Concerned for social and personal development
Case Report: Repetitive Behavior and Restricted Interests

- Demonstrates hand flapping when excited
- Toe walking at times
- Sometimes looks at things from the periphery
- Fixates on toy ducks and lines them up
- If says, “hi” to individual then goes through a list of saying “hi” to a series of toys or animals
Case Report

- PMH: ∅
- Birth history: Term, NSVD, w/o complications
- Medications: ∅
- Allergies: ∅
- FHx: no developmental or behavior problems
- SHx: lives with parents and 6 week old sister
- PE: wt: 12.25kg (25%)
  - General: well-developed and well-nourished
  - No dysmorphic features
Case Report - ADOS Module 1

- **Language/communication**: limited use of 2 word phrases, limited use of verbs, mainly used nouns, limited pointing, did not respond to name, did not start or continue conversation, no echolalia

- **Social**: deficit in reciprocal social interactions, i.e. joint attention, eye contact, and social interest

- **Restricted interest/repetitive behavior**: speech repetitive (frog) and excitable body stiffening

- **Dx**: Autism Spectrum Disorder
Case Report - Recommendations

- Applied behavioral analysis (ABA) therapy
- Microarray chromosomal analysis
- Labs: urine organic acids, serum amino acids, acylcarnitine profile, lactic acid, CBC, lead, TSH, and T4
- F/U 3mo or sooner if concerns
Autism Spectrum Disorder

• Impairments in social reciprocity and communication, and stereotyped and repetitive behaviors, with onset during childhood
Myths: Complementary and Alternative Medicine (CAM) Treatments

- No evidence to support casein and gluten free diet help with “leaky gut” to improve ASD sx
- No evidence to support that secretin (intestinal hormone) improve ASD behaviors
- Lack of evidence that metal chelation or hyperbaric oxygen therapy are effective and can cause risky side effects
Facts: Proven Interventions

- Early intervention – children < 3yo
- Individualized Education Program (IEP) >3yo
- Developmental and behavioral interventions
- Communication interventions
- Social skills interventions
- Sensory-motor interventions
- Family Support
Randomized, Controlled Trial of an Intervention for Toddlers with Autism: The Early Start Denver Model (ESDM)
## Background

- *Pediatrics, January 2010*
- Goal: evaluate efficacy of the ESDM
- n=48 dx with an ASD aged 18-30mo
- Severity not significantly different

<table>
<thead>
<tr>
<th>Early Start Denver</th>
<th>Assess &amp; Monitor (A/M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensive developmental &amp; behavioral interventions at home</td>
<td>Community referrals</td>
</tr>
<tr>
<td>20hr/wk of clinician interventions, parent delivery for ≥5hrs/wk, and community services</td>
<td>9.3hrs/wk of group interventions from commonly available community services</td>
</tr>
</tbody>
</table>
**Results**

- ESDM group showed significant improvement in IQ, adaptive behavior, and autism diagnosis over 2 years

<table>
<thead>
<tr>
<th></th>
<th>ESDM</th>
<th>A/M</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ (standard score points)</td>
<td>Average increase of 17.6</td>
<td>Average increase of 7.0</td>
</tr>
<tr>
<td>Adaptive behavior (socialization, daily living skills, &amp; motor skills)</td>
<td>Showed steady rate of development</td>
<td>Average decline</td>
</tr>
<tr>
<td>Diagnosis changed from autism to PDD-NOS</td>
<td>30%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Conclusion

- First randomized, controlled trial to demonstrate the efficacy of a comprehensive developmental behavioral intervention for toddlers with an ASD for improving cognitive and adaptive behavior and reducing severity of ASD diagnosis

- **Importance** of early detection of and intervention in autism
Interventions for Adolescents and Young Adults with Autism Spectrum Disorders
Background:

• Transition from childhood to adulthood tx focused on adaptive behaviors leading to independent functioning
• Independent living, vocational engagement, postsecondary education
• No cure, intervention strategies most effective, but less available as individuals age
Interventions for Adolescents and Young Adults with ASD

- *Effective Health Care Program*: August 2012
- Goal: examine effects of available interventions on young adults (age 13-30yo) with an ASD
  - Transition from childhood to adulthood
  - Behavioral, educational, vocational, medical
- Kept 32 best papers of 1,035 articles reviewed
- Paper quality: good, fair, poor
## Description of Study Quality Levels

<table>
<thead>
<tr>
<th>Quality</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Good</strong></td>
<td>Good studies are considered to have the least bias and results are considered valid. A good study has a clear description of the population, setting, interventions, and comparison groups; uses a valid approach to allocate patients to treatments; has a low dropout rate; and uses appropriate means to prevent bias; measure outcomes; analyze and report results.</td>
</tr>
<tr>
<td><strong>Fair</strong></td>
<td>Fair studies are susceptible to some bias, but probably not sufficient to invalidate the results. A study may be missing information, making it difficult to assess limitations and potential problems. As the “fair quality” category is broad, studies with this rating vary in their strengths and weaknesses. The results of some fair-quality studies are possibly valid, while others are probably valid.</td>
</tr>
<tr>
<td><strong>Poor</strong></td>
<td>Poor studies are subject to significant bias that may invalidate the results. These studies have serious errors in design, analysis, or reporting; have large amounts of missing information; or have discrepancies in reporting. The results of a poor-quality study are at least as likely to reflect flaws in the study design as to indicate true differences between the compared interventions.</td>
</tr>
</tbody>
</table>
Results

• Description of the 32 best papers out of 1,035 reviewed
  ▫ 27 poor
  ▫ 5 fair
  ▫ 0 good

• Therefore, strength of evidence for the interventions reviewed was insufficient
Interventions for Adolescents and Young Adults with ASD - Behavioral

• Individual/group-based social skills training: some gain in social skills (poor)
• Computer-based social skills training: some improvement in emotion recognition (poor)
• Intensive behavioral treatment: some gains in adaptive behavior (poor)
Interventions for Adolescents and Young Adults with ASD - Vocational

- **Vocational**: on-the job supports reported increased rates of employment in community (poor)
Interventions for Adolescents and Young Adults with ASD - Allied Health

- **Facilitated communication:** did not increase participants’ communication or literacy (poor)
- **Music therapy:** some gains in social skills (poor)
- **Leisure/recreation program:** positive effects on stress and quality of life in leisure group (fair)
Interventions for Adolescents and Young Adults with ASD: Educational

- **Vocabulary train**: ineffective in increasing nouns *(poor)*
- **Reading comprehension**: improved *(poor)*
- **Specific life/transition skills**: some gains *(poor)*
Interventions for Adolescents and Young Adults with ASD - Medical

- **Antipsychotics**: improvements in aggression, irritability/agitation, repetitive behavior, & sensory motor behaviors in patients receiving risperidone (2 fair, 1 poor)
- **Opioid receptor antagonists**: significant increase in stereotypy (poor)
- **SRI**: inconsistent results -> RCT of fluvoxamine improved behavior vs. crossover study with clomipramine vs. placebo showed no significant difference (2 fair, 3 poor)
Poor quality studies led to insufficient evidence

- Lack of randomized controlled trials
- Lacked comparison groups
- Poorly defined diagnostic approach, inclusion/exclusion criteria, participant characteristics, and interventions
- Inconsistent results
- Major Flaws!
Future Research

• More randomized controlled trials
• Develop treatment manuals for replication
• Research conducted in community-based settings
• Expand research to broader spectrum of individuals with ASD and show real-world impact & outcome
• Improve understanding of effects of aging on health, cognition, & other domains of functioning
Future Research Needs: Interventions for Adolescents and Young Adults With Autism Spectrum Disorders
Background

- *Effective Health Care Program* from the Agency of Healthcare Research and Quality: Sept 2012
- Follow up article to generate important questions for future research on interventions for young adults with ASD
- Questions generated from clinicians, family members, and advocates
- Regarding the need for effective interventions across lifespan
- To guide researchers for future investigations
4 Top Tier Questions to Investigate

• What is the effectiveness of available interventions for treating behavioral issues (i.e. aggression, self-injury, etc) during transition years in adolescents and young adults?

<table>
<thead>
<tr>
<th>Intervention</th>
<th>manualized ABA based intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparators</td>
<td>drug + ABA, drug + manualized psychotherapy, and manualized psychotherapy</td>
</tr>
<tr>
<td>Outcomes</td>
<td>measures of healthcare utilization, hospitalization, psychotropic drug use, family functioning</td>
</tr>
<tr>
<td>Considerations</td>
<td>control groups &amp; replication potential</td>
</tr>
</tbody>
</table>
4 Top Tier Questions to Investigate

- What is the **effectiveness of early intervention programs to improve functional behavior in adolescents and young adults with ASD**?

<table>
<thead>
<tr>
<th><strong>Intervention</strong></th>
<th>ABA based tx in early childhood</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comparators</strong></td>
<td>community based services</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>improvement of functional behavior over long periods of time into young adulthood</td>
</tr>
<tr>
<td><strong>Considerations</strong></td>
<td>prospective studies, control confounding</td>
</tr>
</tbody>
</table>
4 Top Tier Questions to Investigate

- What is the **effectiveness of available manualized transition programs** (i.e. work readiness programs, vocational programs, person-centered planning, training programs) in ASD?

<table>
<thead>
<tr>
<th>Intervention</th>
<th>manualized transition programs (i.e. work readiness programs, person-centered planning, training programs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparators</td>
<td>no participation or other types of transition programs</td>
</tr>
<tr>
<td>Outcomes</td>
<td>hours out of the home (i.e. volunteering, working) to measure behavioral flexibility; function engagement; increase in income</td>
</tr>
<tr>
<td>Considerations</td>
<td>randomization, report long term outcomes, outcomes beyond employment</td>
</tr>
</tbody>
</table>
4 Top Tier Questions to Investigate

- What is the **effectiveness of community-based programs** (i.e. private ABA schools, CBT programs, social skills programs) to provide care for adolescents and young adults with ASD?

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Community based programs (i.e. private ABA schools, CBT programs, social skills programs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparators</td>
<td>No participation or other types</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Measures of social engagement, participation in external activities</td>
</tr>
<tr>
<td>Considerations</td>
<td>Randomization, participant-centered outcomes, good characterization of participants</td>
</tr>
</tbody>
</table>
Conclusions

- Increasing numbers of adolescents facing transition to adulthood
- **Intervention** research across lifespan lags behind
- No sufficient strength of evidence for documenting the effects of any intervention in this age group
- Unlikely, large scale implementation of interventions considered until strong evidence developed like seen in previous EI study
- Future: identify **useful interventions** -> create manuals to encourage standardized **replication**
References


Case Report: Gross Motor

- Falls down at times because “clumsy”
- Difficulty with climbing

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<thead>
<tr>
<th>Patient’s Development</th>
<th>Typical Development (Nelson 6th Ed)</th>
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<tbody>
<tr>
<td>Jumps up minimally with both feet</td>
<td>Broad jump 3yo</td>
</tr>
<tr>
<td>Alternates feet ascending and descending stairs holding onto rails</td>
<td>3yo</td>
</tr>
</tbody>
</table>
Case Report: Fine Motor

<table>
<thead>
<tr>
<th>Patient’s Development</th>
<th>Typical Development (Nelson 6th Ed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scribbles but does not imitate vertical lines</td>
<td>Scribbles 15mo and copies lines at 24mo</td>
</tr>
<tr>
<td>Stacks 6 blocks</td>
<td>3yo</td>
</tr>
</tbody>
</table>