



Can the Social Communication Questionnaire be utilized for public health screening of autism spectrum disorders?

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The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the CDC



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Objectives

- **Provide general overview about autism spectrum disorders (ASD)**
- **Present sensitivity results from an ASD screener**
 - **How well does the Social Communication Questionnaire (SCQ) detect ASD in a broader population than was used in the original validity study**



Background



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Developmental Disabilities

- **Group of severe chronic conditions manifested during the developmental period (0 to 18 years)**
- **Attributable to an impairment in physical, cognitive, speech/language, psychological, or self-care areas**
- **~17% of US children <18 years of age**
- **Most causes unknown**



Pervasive Developmental Disorders

DSM-IV-TR (2000). APA, Washington, DC

- **Autism:**
 - Communication, Social, Behaviors/Interests
- **Pervasive Developmental Delay – Not Otherwise Specified:**
 - Atypical autism
- **Asperger's:**
 - Social, behaviors and interests impaired with no significant language or cognitive delay
- **Rett's Disorder:**
 - Only affects females, deceleration/regression, stereotyped hand movements
- **Child Disintegrative Disorder:**
 - Normal development for at least 2 years followed by a marked regression in skills



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Autism Spectrum Disorders

- **3 core developmental areas affected:**
 - Reciprocal social interactions
 - Communication
 - Behaviors and interests
- **Development in these areas follows a **different** path than most children**
- **What predisposes a child?**
- **What exposures are necessary?**



Warning Signs

SIGNS OF AUTISM

(Usually apparent in toddlers; watch for a cluster of symptoms)

- No pointing by 1 year
- No babbling by 1 year; no single words by 16 months; no two-word phrases by 24 months
- Any loss of language skills at any time
- No pretend playing
- Little interest in making friends
- Extremely short attention span
- No response when called by name; indifference to others
- Little or no eye contact
- Repetitive body movements, such as hand flapping, rocking
- Intense tantrums
- Fixations on a single object, such as a spinning fan
- Unusually strong resistance to changes in routines
- Oversensitivity to certain sounds, textures or smells



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Myths about children with ASD

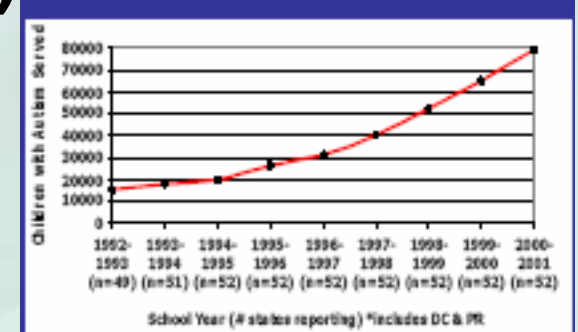
- Not affectionate
- Do not form attachments
- Never make eye contact
- Do not communicate
- Engage only in self-stimulatory and repetitive behaviors
- Lack emotional responses



Prevalence of ASD

- **Low incidence disorder?**
 - Past estimates report 4 to 5/10,000 children with ASD
- **More recent studies suggest**
 - Increasing prevalence based on service provision (medical and school)

Number of Children with Autism Served under IDEA, Part B, 1992-93 to 2000-01, 6-21 years



Prevalence of ASD



1 in 150

– Number of children quoted to have ASD

- **Prevalence estimate based on the largest summary of multiple communities in the United States (US)**

- Source: Autism and Developmental Disabilities Monitoring (ADDM) Network. Prevalence of the Autism Spectrum Disorders in Multiple Areas of the United States, Surveillance Years 2000 and 2002. Morbidity and Mortality Weekly Report, February 9, 2007 / 56(SS01).



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Is it Autism?

To Do:

- Identify
- Screen
- Treat



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Need for screening

- Who are we missing?
- No population based screening
- Direct screening
 - Clinical interview: health care providers listen critically to parents concerns
 - Observation: health care providers & educators look for signs
- Standardized measures



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Common instruments



- **SCQ**
- **Autism Diagnostic Observation Schedule (ADOS)**
- **Autism Diagnostic Interview-revised (ADI-R)**



SCQ



- **Quick, easy, inexpensive way to routinely screen for autism spectrum disorders**
 - **Ages/Grade:** over 4.0 years, with a mental age over 2.0 years
 - **Administration:** <10 minutes
 - **Format:** parent questionnaire with 40 yes-or-no items
 - **Current and Lifetime Forms**
 - **Scores:** total score with cutoff points; ≥ 15 indicates need for further evaluation for possible ASD
- **Original validity study based on a clinical sample of 200 individuals who participated in previous research studies**
- Source: Berument, Rutter, Lord, Pickles, & Bailey(1999). *The British Journal of Psychiatry* 175: 444-451.



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ADOS



- **Allows trained clinicians to accurately assess and diagnose autism and pervasive developmental disorder across ages, developmental levels, and language skills**
 - **Ages/Grade: toddlers to adults**
 - **Administration: 30 to 45 minutes**
 - **Format: standardized behavioral observation and coding**
 - **Score: cutoff scores for both a narrow diagnosis of autism and a broader diagnosis of pervasive developmental disorder**
- **“Gold standard” research studies**



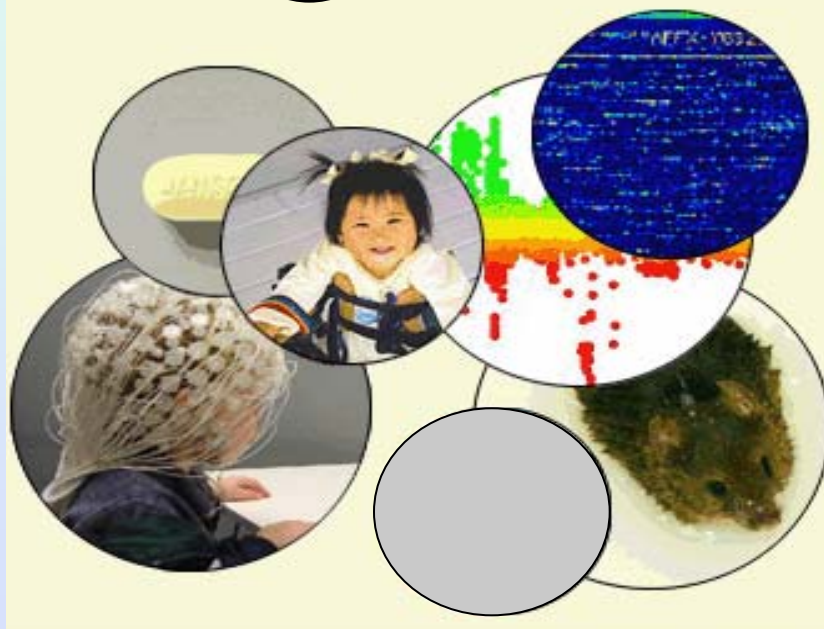
ADI-R



- **Useful interview for trained clinicians diagnosing autism, planning treatment, and distinguishing autism from other developmental disorders**
 - **Ages/Grade:** children and adults with a mental age above 2.0 years
 - **Administration:** 1 1/2 to 2 1/2 hours, including scoring
 - **Format:** standardized interview and response coding
- **“Gold standard” research studies**



Methods



Procedures

- Parents of children receiving special education services and/or clinical services for a broad range of ICD9 codes were identified from the ADDM, GA site
- Instruments administered
 - SCQ, ADI-R, ADOS
- **Cases:** children who **met** criteria on both the ADOS and ADI-R
- **Not-cases:** children who **do not** meet criteria on both the ADOS and ADI-R



Sample

- 177 parents/children participated
- Subsample for this analysis
 - Selected participants with **concordant** results (met or did not meet criteria) on both the ADOS and ADI-R
 - **147** participants
- Demographics
 - 72% male
 - Average age of participants
 - 9 years old at time of study visit



ICD-9 codes

- **60% of the 147 had at least 1 ICD code**
- **62 different codes**
 - Range 1-12 codes per child
 - Average 2 codes per child
- **Sample of codes**
 - 781.3 Lack of coordination
 - 237.70 Neurofibromatosis, unspecified
 - 315.9 Unspecified delay in development
 - 349.9 Unspecified disorders of nervous system



Results

		ADOS/ADI-R	
		Case	not Case
SCQ	≥ 15 (criteria met)	26	8
	< 15 (criterion not met)	1	112
		Percent	95% CI
Sensitivity		96.3	89.2, 103.4
Specificity		93.3	88.9, 97.8
PV+		76.5	
PV-		99.1	



Discussion

- **Original study:**
 - **Sensitivity: 85%**
 - **Specificity: 75%**
- **Current analysis:**
 - **Sensitivity: 96%**
 - **Specificity: 93%**
- Source: Berument, Rutter, Lord, Pickles, & Bailey(1999). *The British Journal of Psychiatry* 175: 444-451



Conclusions

- **The ≥ 15 criterion appears robust in this broader population-based sample of children with developmental concerns**
- **SCQ may have broader screening applicability**
 - **Not just valid in populations suspected to have signs of ASD**
 - **Useful screener in children with developmental disabilities generally**



Conclusions

- **Utilization of this screening tool in a population of school-age children may have important public health utility**



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