

# WHAT'S NEW: THERAPEUTIC OPTIONS IN HELPING CHILDREN WITH AUTISM

Dr Rajini Sarvananthan  
Consultant Developmental Paediatrician

# WHAT CAUSES AUTISM?


## ▶ GENETICS

- Recurrence risk is 10–19% in siblings
- Different mechanisms in transmission
- Mutations
- Polygenic
- Rett Syndrome, Fragile X, 15q11–q13 duplication


## EPIGENETICS

# WHAT CAUSES AUTISM?

## ▶ Risk Factors

- Maternal gestational diabetes
  - Bleeding in pregnancy
  - Prematurity
  - Infections in pregnancy
  - Paternal age
  - Maternal age
- 

# DIAGNOSIS

- ▶ CLINICAL DIAGNOSIS
  - ▶ DSM 5 criteria of Social Communication Impairment and Restrictive and Repetitive Patterns of Behaviour
  - ▶ Tools used in the diagnosis of Autism Spectrum Disorder
    - Autism Diagnostic Interview Revised
    - Autism Diagnostic Observation Schedule
    - Childhood Autism Rating Scale
    - Social Responsiveness Scale
- 

# EARLY DIAGNOSIS: HOW EARLY?

## LETTER

doi:10.1038/nature12715

### Attention to eyes is present but in decline in 2–6-month-old infants later diagnosed with autism

Warren Jones<sup>1,2,3</sup> & Ami Klin<sup>1,2,3</sup>

Deficits in eye contact have been a hallmark of autism<sup>1,2</sup> since the condition's initial description<sup>3</sup>. They are cited widely as a diagnostic feature<sup>4</sup> and figure prominently in clinical instruments<sup>5</sup>; however, the early onset of these deficits has not been known. Here we show in a prospective longitudinal study that infants later diagnosed with autism spectrum disorders (ASDs) exhibit mean decline in eye fixation from 2 to 6 months of age, a pattern not observed in infants who do not develop ASD. These observations mark the earliest known indicators of social disability in infancy, but also falsify a prior hypothesis: in the first months of life, this basic mechanism of social adaptive action—eye looking—is not immediately diminished in infants later diagnosed with ASD; instead, eye looking appears to begin at normative levels prior to decline. The timing of decline highlights a narrow developmental window and reveals the early derailment of processes that would otherwise have a key role in canalizing typical social development. Finally, the observation of this decline in eye fixation—rather than outright absence—offers a

Data were collected at 10 time points: at months 2, 3, 4, 5, 6, 9, 12, 15, 18 and 24. We studied 110 infants, enrolled as risk-based cohorts:  $n = 59$  at high-risk for ASD (full siblings of a child with ASD<sup>19</sup>) and  $n = 51$  at low-risk (without first-, second- or third-degree relatives with ASD). Diagnostic status was ascertained at 36 months. For details on study design, clinical characterization of participants, and experimental procedures, see Methods and Supplementary Information.

Of the high-risk infants, 12 met criteria for ASD<sup>19</sup> (10 males, 2 females), indicating a conversion rate of 20.3%<sup>19</sup>. One child from the low-risk cohort was also diagnosed with ASD. Given the small number of girls in the ASD group, we constrained current analyses to males only, 11 ASD (10 from the high-risk cohort and 1 from the low-risk), and 25 typically developing (all from the low-risk cohort).

At each testing session, infants viewed scenes of naturalistic caregiver interaction (Fig. 1a, b) while their visual scanning was measured with eye-tracking equipment. The 36 typically developing and ASD children viewed 2,384 trials of video scenes.

Control comparisons tested for between-group differences in atten-

# EARLY DIAGNOSIS

- ▶ Three patterns of manifestation
  - Early onset (on or before 1<sup>st</sup> birthday)
  - Late onset (after 1<sup>st</sup> birthday)
  - Normal development followed by regression after 18 months

Half the cases of ASD show typical social behaviours but by 24 months symptoms more apparent

# EARLY DIAGNOSIS

- ▶ Greenspan's early warning signs:
  - No back and forth sharing of sounds and gestures at 9–12 months
  - No babbling 12mths
  - No single words 16mths
  - No 2 word spontaneous phrases by 24 mths

# INTERVENTION

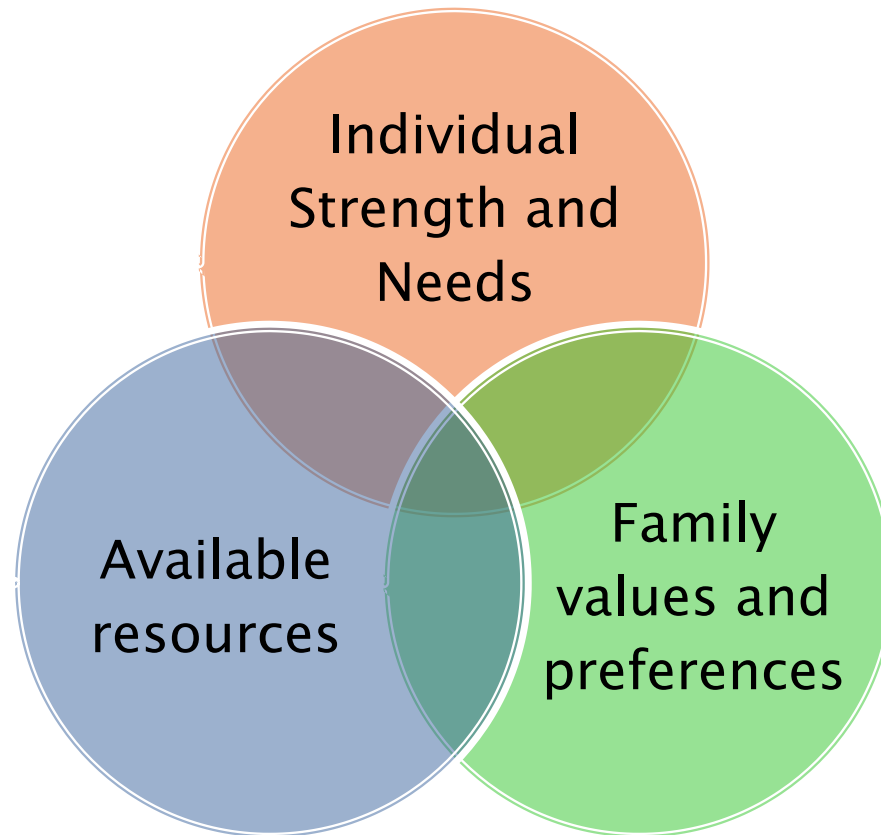
- ▶ Medical definition
  - Treatment or action taken to cure or reduce the burden of disease
- ▶ Psychological definition
  - Action taken that can change behaviour, emotion and well being



# CHOOSING INTERVENTIONS

- ▶ Evidence-based
  - WHO, WHEN, HOW, WHERE
  - Peer reviewed
  - Has it been replicated
  - Who does it help (use of standard diagnostic tools) and what were the outcomes
  - research provides a starting point for determining what interventions are most likely to be effective in achieving the desired outcomes for an individual

# CHOOSING INTERVENTIONS



# Parent-mediated social communication therapy for young children with autism (PACT): long-term follow-up of a randomised controlled trial



Andrew Pickles, Ann Le Couteur, Kathy Leadbitter, Erica Salomone, Rachel Cole-Fletcher, Hannah Tobin, Isobel Gammer, Jessica Lowry, George Vamvakas, Sarah Byford, Catherine Aldred, Vicky Slonims, Helen McConachie, Patricia Howlin, Jeremy R Parr, Tony Charman, Jonathan Green



## Summary

**Background** It is not known whether early intervention can improve long-term autism symptom outcomes. We aimed to follow-up the Preschool Autism Communication Trial (PACT), to investigate whether the PACT intervention had a long-term effect on autism symptoms and continued effects on parent and child social interaction.

**Methods** PACT was a randomised controlled trial of a parent-mediated social communication intervention for children aged 2–4 years with core autism. Follow-up ascertainment was done at three specialised clinical services centres in the UK (London, Manchester, and Newcastle) at a median of 5.75 years (IQR 5.42–5.92) from the original trial endpoint. The main blinded outcomes were the comparative severity score (CSS) from the Autism Diagnostic Observation Schedule (ADOS), the Dyadic Communication Assessment Measure (DCMA) of the proportion of child initiations when interacting with the parent, and an expressive-receptive language composite. All analyses followed the intention-to-treat principle. PACT is registered with the ISRCTN registry, number ISRCTN58133827.

**Findings** 121 (80%) of the 152 trial participants (59 [77%] of 77 assigned to PACT intervention vs 62 [83%] of 75 assigned to treatment as usual) were traced and consented to be assessed between July, 2013, and September, 2014. Mean age at follow-up was 10.5 years (SD 0.8). Group difference in favour of the PACT intervention based on ADOS CSS of log-odds effect size (ES) was 0.64 (95% CI 0.07 to 1.20) at treatment endpoint and ES 0.70 (95% CI –0.05 to 1.47) at

Lancet 2016; 388: 2501–09

Published Online  
October 25, 2016  
[http://dx.doi.org/10.1016/S0140-6736\(16\)31229-6](http://dx.doi.org/10.1016/S0140-6736(16)31229-6)

See [Comment](#) page 2454

Institute of Psychiatry,  
Psychology and Neuroscience,  
Kings College London, UK  
(Prof A Pickles PhD,  
E Salomone PhD, I Gammer MSc,  
G Vamvakas MSc,  
Prof S Byford PhD,  
Prof P Howlin PhD,  
Prof T Charman PhD); Newcastle  
University, Newcastle, UK  
(Prof A Le Couteur FRCPsych,  
R Cole-Fletcher PhD, J Lowry MSc,  
Prof H McConachie PhD,

# Caregiver-Mediated Intervention for Low-Resourced Preschoolers With Autism: An RCT



**WHAT'S KNOWN ON THIS SUBJECT:** Mixed results exist regarding the efficacy of caregiver-mediated interventions for children who have ASD. To date, randomized controlled studies have rarely compared 2 active interventions; none have focused on targeting families who are low-resourced in the community.



**WHAT THIS STUDY ADDS:** Significant improvements were found in social communication of children who have autism when caregivers received a hands-on caregiver training intervention in the home. These are the first data from a low-intensity, short-term intervention with low-resourced families.

## abstract



**OBJECTIVES:** To compare 2 short-term, community caregiver training interventions for preschool-aged children with Autism Spectrum Disorder who had low resources. Low resource was defined by the US Department of Housing and Urban Development low-income index or 1 "indicator," (eg, Medicaid eligibility). Child outcomes focused on joint engagement, joint attention, and play.

**METHODS:** Participants included 112 families of a child who had Autism Spectrum Disorder who met criteria for being low-resourced and who were randomly assigned to 1 of 2 3-month interventions, group caregiver education or individualized caregiver-mediated intervention (CMM). Children were assessed for social communication skills pre- and post-

**AUTHORS:** Connie Kasari, PhD,<sup>a,b</sup> Kathy Lawton, PhD,<sup>a,d</sup> Wendy Shih, MPH,<sup>e</sup> Tyson V. Barker,<sup>f</sup> Rebecca Landa, PhD,<sup>g</sup> Catherine Lord, PhD,<sup>h</sup> Felice Orlich, PhD,<sup>i</sup> Bryan King, MD,<sup>j</sup> Amy Wetherby, PhD,<sup>j</sup> and Damla Senturk, PhD<sup>e</sup>

<sup>a</sup>Human Development & Psychology, <sup>b</sup>Center for Autism Research & Treatment, and <sup>c</sup>Biostatistics, University of California, Los Angeles, Los Angeles, California; <sup>d</sup>The Ohio State University Nisonger Center, and <sup>e</sup>The Ohio State University Special Education Department, Columbus, Ohio; <sup>f</sup>Department of Human Development and Quantitative Methodology, University of Maryland, College Park, Maryland; <sup>g</sup>Kennedy Krieger Institute, Baltimore, Maryland; <sup>h</sup>Weill Cornell Medical Center, New York, New York; <sup>i</sup>Children's Hospital of Seattle, Seattle, Washington; and <sup>j</sup>Department of Clinical Sciences, Florida State University, Tallahassee, Florida

### KEY WORDS

autism, early intervention, parent-child interactions, joint attention

### ABBREVIATIONS

ADOS—Autism Diagnostic Observation Schedule  
ASD—autism spectrum disorder  
CEM—caregiver education module  
CMM—caregiver-mediated module  
CQI—Caregiver Quality of Involvement Scale  
GLMM—generalized linear mixed models  
ICC—Intraclass correlation  
IJA—initiating joint attention  
SPA—structured play assessment

Dr Kasari led the conceptualization and design of the study and took major responsibility for writing the manuscript; Dr Lawton coordinated all aspects of data collection and fidelity across sites and contributed to the drafting of the manuscript;

# EVIDENCE BASED INTERVENTION

- ▶ Parent-mediated early intervention for young children with autism spectrum disorder – improvement in understanding of language, improvement in autism severity and maternal knowledge of autism.

*Cochrane Database of Systematic Reviews 2013*



# EVIDENCE BASED INTERVENTIONS

- ▶ Early intervention in toddlers using (developmental + ABA model) parents and trained therapists improves cognitive scores, adaptive behaviour and autism scores.

# EVIDENCE BASED INTERVENTIONS

- ▶ Early intensive behavioural intervention (Applied Behavioural Analysis) improves cognitive, communication, adaptive and social skills in autism

# EVIDENCE BASED INTERVENTION

- ▶ ABA therapy effectiveness
  - Higher IQ
  - Age
  - Number of months
  - Number of hours

## Screams, Slaps & Love

A surprising, shocking treatment helps far-gone mental cripples

Photographed by Alan Grant

Life Magazine, 1965

[.pdf version](#)



Enraged bellows at the boy, then a sharp slap in the face. This deliberate, calculated harshness is part of an extraordinary new treatment for mentally crippled children. It is based on the old-fashioned idea that the way to bring up children is to reward them when they're good, punish them when they're bad. At the University of California in Los Angeles, a team of researchers is applying this precept to extreme cases. They have taken on three boys and a girl with a special form of schizophrenia called autism — utterly withdrawn children whose minds are sealed against all human contact and whose uncontrolled madness had turned their homes into hells ip.



# EVIDENCE BASED INTERVENTIONS


- ▶ Sensory Integration improves autistic mannerisms, sensory processing and regulation, social-emotional function, fine motor skills, self care and socialisation skills

- ▶ Pfeiffer B Am J Occ Ther 2011
- ▶ Schaaff R J Aut Dev Dis 2013

# EVIDENCE BASED INTERVENTIONS

- ▶ TEACCH
- ▶ Visual Strategies
- ▶ Improves adaptive skills and reduces behavioural issues.

# EVIDENCE BASED INTERVENTIONS

- ▶ Speech therapy for children between 2–3 years of age together with parents present improves expressive language at 4 years
  - ▶ Therapies which work are those targeting joint attention, symbolic play and teaching imitation skills
- 

# EVIDENCE BASED INTERVENTIONS

- ▶ Augmentative and alternative communication eg using PECS.
  - Less evidence with speech generating devices.

# EVIDENCE BASED INTERVENTIONS

- ▶ Floor time
- ▶ Social Story


# EVIDENCE BASED INTERVENTION

- ▶ Cognitive Behavioural Intervention
  - change negative or unrealistic thought patterns and behaviors with the aim of positively influencing emotions and life functioning
  - Verbal children (8 years and above) and higher intelligence
  - Identifying own emotional expressions, and organising their thoughts to replace the negative thoughts and feelings

# EVIDENCE BASED INTERVENTION

- ▶ Supplements
  - Melatonin for sleep difficulties
- ▶ Medication
  - Methylphenidate
    - Treat comorbid Attention Deficit Hyperactive Disorder
  - Risperidone
    - Improves irritability and self injurious behaviour
  - Aripiprazole

# ALTERNATIVE THERAPY WITH INCONCLUSIVE EVIDENCE

- ▶ Amino acid supplementation
  - ▶ Animal-assisted therapy
  - ▶ Gluten and / or casein free diet
  - ▶ Oxytocin
  - ▶ Massage and other sensory-based interventions
  - ▶ Music therapy
  - ▶ Omega-3 fatty acid (O3FA) supplementation
  - ▶ Auditory Integration Therapy
- 



# CLINICAL PRACTICE GUIDELINES

## Clinical Practice Guidelines

MOH/P/PAK/279.14 (GU)

### Management of Autism Spectrum Disorder in Children and Adolescents



Ministry of Health Malaysia



Malaysian Psychiatric Association



Malaysian Child and Adolescent Psychiatry Association



Academy of Medicine Malaysia