

FASD and Mental Health Treatment: A Multimodal Approach to Transgenerational Issues

Presenter: Kieran D. O'Malley

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The FASD Learning Series is part of the Alberta government's commitment to programs and services for people affected by FASD and those who support them.

Concept of Dual Diagnosis in FASD

- Prenatal alcohol exposure causes a mixture of a developmental and psychiatric disorder
- The psychiatric disorder is 'neuro-psychiatric' as it is driven by organic brain dysfunction
- Recent research points to the epigenetic component to FASD, suggesting prenatal alcohol effects on genetic transcription
- Infants exposed to alcohol prenatally are often exposed to stress prenatally and postnatally

(Rutter, 1984; Harris, 1995; Rapoport, 2000; Streissguth & O'Malley 2000; O'Malley, 2008; O'Malley, 2009)

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Fetal Alcohol Spectrum Disorders (FASDs)

is an umbrella term describing the range of effects that can occur in an individual whose mother drank alcohol during pregnancy. These effects may include physical, mental, behavioral, and/or learning disabilities with possible lifelong implications.

The term FASD is not intended for use as a clinical diagnosis.

National Consensus Statement released by NOFAS
April 15th 2004, Washington DC

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General Principles Regarding Developmental Disability in FASD

- FASD i.e. FAS & ARND constitute the most common preventable type of mental retardation
- However, 75 - 80% of the patients with FASD are NOT mentally retarded
- The developmental disability involves a complex learning disorder with verbal and non-verbal components
- Language problems are commonly interwoven with the learning disability

(Streissguth et al,1996; Coggins et al, 2008; O'Malley, 2008)

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General Principles Regarding Psychiatric Disorder in FASD

- The psychiatric disorder can present from infancy and is not related to facial dysmorphology
- The psychiatric disorder reflects a combination of organic brain dysfunction with environmental influences
- The environment can have positive or negative influences
- The diagnosis of FAS or ARND does not determine the severity or complexity of the psychiatric disorder

(O'Malley, 2009)

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FASDs are the Great Masqueraders!

- Regulatory Disorder of Infancy
- ADHD
- PTSD or Developmental Trauma Disorder
- Asperger's Disorder or PDD
- Mood Disorder (Affective Instability)
- Conduct Disorder
- Major Depressive Disorder with mood-incongruent psychotic features
- Generalized Anxiety Disorder or Panic Disorder
- Schizoaffective Disorder
- Brief Psychotic Disorder
- Personality Change i.e. Labile, Aggressive/Seizure Disorder

(O'Malley, 2009)

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Psychiatric Diagnosis in FASD

(Famy et al 1998; SCID, Seattle, USA)

AXIS I

Major Depressive Disorder	11 of 25 (44%)
Psychotic Disorders	10 of 25 (40%)
Brief Psychotic Disorders	7 of 25 (28%)
Bipolar I Disorder	5 of 25 (20%)
Anxiety Disorders	5 of 25 (20%)

CO-MORBID DIAGNOSIS

Alcohol & Drug Dependence	15 of 25 (60%)
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AXIS II

Avoidant Personality	6 of 25 (29%)
Antisocial Personality	4 of 25 (19%)
Dependent Personality	3 of 25 (14%)

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Psychiatric Diagnosis in FASD

(Chun et al 2001; SCID Seattle, USA)

AXIS I (20 OF 25)

Anxiety Disorders	72%
Mood Disorders	52%
Psychotic Disorders	36%

CO-MORBID DISORDERS

Alcohol & Drug Dependence	52%
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AXIS II (13 of 25)

Antisocial Personality	52%
Borderline Personality and Others	20%

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Psychiatric Clinical Diagnosis

57 Patients, 3 to 32 Years

40 Male, 17 Female

Calgary Consultation Practice, Canada

CO-MORBID AXIS 1 DISORDERS

1 DISORDER	17%
2 DISORDERS	64%
3 DISORDERS	19%

(O'Malley, 2001 (CDC); O'Malley, 2008)

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Psychiatric Clinical Diagnosis

57 Patients, 3 to 32 Years
40 Males, 17 Female (Calgary Consultation Practice)

AXIS I

ADHD	58%
Mood Disorder	44%
Personality Change, Labile/Aggressive	36%

AXIS II

Avoidant Personality	14%
Dependent Personality	13%
Passive/Aggressive Personality	9%
Schizoid Personality	8%

(O'Malley, 2001 (CDC); O'Malley, 2008)

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Psychiatric Clinical Diagnosis

Consultation patients in Ireland, including Belfast (preliminary)

Male: 28 Female: 25 Age: Birth to 21 years

Diagnosis:

- Regulatory Disorder
- ADHD
- Affective Instability, mimics Bipolar Disorder
- Co-morbid PTSD or Developmental Trauma Disorder
- Aspergers Disorder or PDD
- Conduct Disorder, always with ADHD
- Generalized Anxiety Disorder
- Intermittent Explosive Disorder
- Co-morbid Addictive Disorder, Binge drinking

(O'Malley, 2009)

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FASD Medical Clinical Evaluation

- History of prenatal alcohol exposure
- Evidence of characteristic facial anomalies
- Evidence of growth retardation
- Structural brain abnormalities, i.e. Corpus callosum, cerebellum, hippocampus
- Neurophysiological abnormalities, i.e. Complex partial/ Absence seizure disorder
- Gross motor function
- Fine motor function
- Sensory function

(IOM, 1996; Astley & Clarren, 1997; Kapp & O'Malley, 2001; O'Malley, 2008)

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THE HOLISTIC EVALUATION of a patient with FAS or ARND requires an evaluation of:

- COGNITIVE,
- LANGUAGE, AND
- BEHAVIOURAL CHARACTERISTICS

(O'Malley, 2008; O'Malley, 2009)

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Cognitive Evaluation of FASD

Cognitive

- Complex/mixed learning disorders with inability to link cause and effect
- Poor working memory
- Specific deficits in mathematics, and/or reading/writing skills
- Often marked split verbal/performance IQ 12-15 points
- Poor capacity for abstraction
- Metacognition deficits in school performance
- Executive function deficits in planning and organization
- Poor insight
- Impaired judgment

(Streissguth, 1997; Mattson & Riley, 1998; Connor et al, 2000; Massey, 2008; Page, 2008; 14 O'Malley, 2008)

Language Deficits in FASD

- Deficits in higher level receptive and expressive language, i.e. inability to comprehend the feelings/motivations of others
- Impairment in social interaction, social perception, social cognition and social communication
- Problems in articulating emotions, Alexithymia i.e. the patient does not have the words to express feelings and so acts them out in physical expression

(Coggins et al, 1998; Coggins et al, 2008; Kapp & O'Malley, 2001; O'Malley & Nanson, 2008; Sullivan, 2008)

Behavioural Characteristics in FASD

- Attentional problems, visual and auditory
- Poor impulse control
- Physical hyperactivity
- Poor adaptive functioning measured on Vineland Adaptive Behavioral Scales (VABS)

(Driscoll et al, 1990; Institute of Medicine, 1996; Streissguth et al, 1996; Carrmichael, Olson et al, 1997; O'Malley & Nanson, 2002; Massey, 2005; O'Malley, 2005)

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Standardized Psychiatric Diagnosis (DSM IV-TR, ? DSM V)

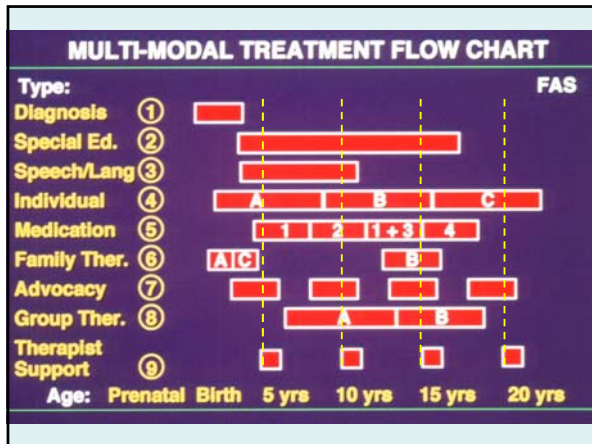
- 1. Alcohol Related Neurobehavioural Disorder**
Less useful as it contributes to negative diagnosis of Oppositional Defiant Disorder and/or Conduct Disorder
- 2. Alcohol Related Neurodevelopmental Disorder (ARND)**
More helpful as it's less negative, especially in school setting
- 3. Mood Disorder (293.83)**
Anxiety Disorder (293.84)
Psychotic Disorder (293.8X)
Due to general medical condition of prenatal alcohol exposure with clinical evidence of FAS or ARND
- 4. Personality Change Due to... (310.1)**

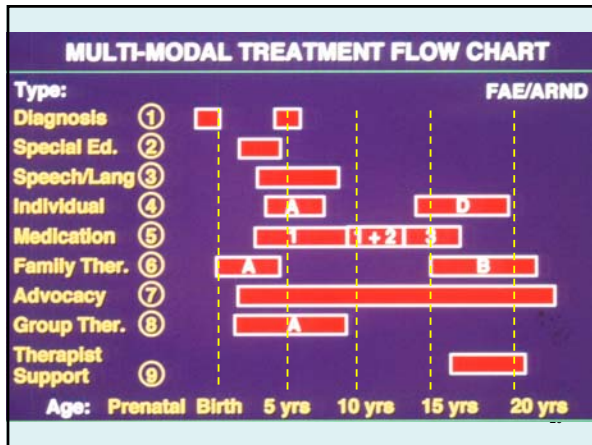
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Multimodal Treatment Approach

1. DIAGNOSIS of Developmental and Neuropsychiatric Disorder(s) (DUAL DIAGNOSIS)
2. INDIVIDUAL THERAPY
 - Psychotherapy, inc. sex education
 - Sensory Integration
 - Speech & Language
 - Medication: Psychostimulants, SSRI's, Atypicals, Anticonvulsants, Anxiolytics, TCI's, Alpha adrenergic agents, Atomoxetine, Adderall, Lithium, Sleep meds.
3. DYADIC THERAPY
4. FAMILY THERAPY
5. GROUP THERAPY
6. RESIDENTIAL/HOUSING
7. VOCATIONAL –REHABILITATION
8. DENTAL CARE
9. ADVOCACY

(O'Malley, 2009) 18





Multimodal Treatment Locations

COMMUNITY:
Birth home, Foster home, Adoptive home, Respite home

SCHOOL:
Regular, Special Needs

RESIDENTIAL:
Short term, Long stay, LD, Addiction, Juvenile Justice

HOSPITAL:
Acute medical/psychiatric, Chronic medical/psychiatric/
LD/addictive services

(O'Malley, 2009) 21

Individual Therapy

- Infant massage/motor training
- Indirect non-verbal play therapy
- Cognitive behavioural therapy
- Reality-based therapy
- Trauma-based therapy

(O'Malley, 2008; O'Malley, 2009)

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Dyadic Therapy

- Parent/infant
- Parent/young child
- Parent/teenager
- Marital/Partner therapy

(O'Malley, 2008; O'Malley, 2009)

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Family Therapy

- Family Education
- Instrumental Family Therapy
- Relief of Family Stress
- Family Grief Work
- Family Restoration Work

(O'Malley, 2008; O'Malley, 2009)

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Group Therapy

- Play therapy for traumatized children
- Reality-based groups for females or males
- Support group for birth parents, adoptive parents, foster parents
- Support group for professionals (individual)

(O'Malley, 2009)

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Vocational Rehabilitation

- School-based work experience
- Community-based work experience, i.e. School linked or Technical College linked
 - Personal Advisor

(O'Malley, 2008; O'Malley, 2009)

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Housing

- Income support, DLA
- Mental Health and/or Developmental Disability Funding
- Guardianship or Protective Payee
- Vulnerable Adult
- Carer's Allowance

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MEDICATION: Drugs that are generally useful and safe

- Psychostimulants* Growth hormone effect
- Anticonvulsants * valproate, teratogenic
- Anti-Anxiety agents* diazepam, long half life
- Atypical Antipsychotics* wt gain
- Alpha adrenergic antagonists* lower BP
- GABAergic agents
- Sleep medication

(O'Malley, 2003; O'Malley, 2008; Byrne, 2007)

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CONTROLLED TRIALS in Developmental Disability

- Methylphenidate
- Fluoxetine
- Valproic acid
- Risperidone

(O'Malley, 2009)

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Drugs to avoid/be cautious of in FASD

- **TCAs** (elavil, tofranil, desipramine, clomipramine): cardiac toxicity, lower seizure threshold, lethal in overdose
- **Lithium**: cardiac, renal and thyroid problems
- **Paroxetine**: interferes with metabolism of other psychotropic drugs
- **SSRIs**: activation of possible suicidality, EPPS
- **Chlorpromazine**: lowers seizure threshold, liver toxicity, excess sedation
- **Atypical antipsychotics**: Elongate QTc, Hyperprolactinaemia, wt. gain

(O'Malley, 2009)

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Neuroprotective Agents

- Thiamine
- Folate
- Vitamin A
- Vitamin D
- Pyridoxine
- Magnesium
- Zinc
- Choline

(Dreosti, 1993; Riley, 2005; O'Malley, 2008)

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General Medication Guidelines

DISINHIBITION

- Immediate onset
- Disappears quickly
- Mild/Moderate
- Dystonic Symptoms
 - Silliness, goofiness
 - Panic/Anxiety
 - Regression, overactive

UNMASKING DISORDER

- Delayed onset
- May be prolonged
- Moderate/Severe
- Syntonic Symptoms
 - Consistent with psychopathology
 - Mood, irritability, tics

(Wilens, 1998)

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Psychostimulant Use in FAS/ARND

Streissguth et al, Seattle, [1996]

415 patients all ages

142 patients [32%] on methylphenidate [long & short acting]

67 patients [47%] had a positive response

Psychostimulant Use in FAS/ARND

Synder et al, Saskatoon, [1997]

11 patients [children & adolescents]

**methylphenidate, dextroamphetamine, pemoline
[long & short acting]**

Known positive responders

No significant effect on sustained attention

Positive effect Conner's Parent rating scale

Psychostimulant Use in FAS/ARND

Oesterheld et al, South Dakota, [1998]

4 patients [children]

**methylphenidate, short acting, fixed dose,
randomized double-blind placebo crossover trial**

**Significant improvement Hyperactivity-Attention
score**

**No significant change Daydreaming-Attention
score [Conners]**

Psychostimulant Use in FAS/ARND

**O'Malley et al, Calgary, Montana, South Dakota,
[1999]**

30 patients [children & adolescents]

23 pts. methylphenidate; 22% positive response

**19 pts. dextroamphetamine; 79% positive
response**

**8 pts. positive response to dextroamphetamine
after negative response to methylphenidate
[MD/Parent report]**

Transgenerational Management Principles

1. Always assess child/adolescent in the context of the family system
2. Always assess for family history of psychiatric disorder, alcoholism or learning/ developmental disability
3. Always assess for history of trauma not just in patient but in parenting system
4. Often the therapy has to cross age barriers, i.e. child therapy coupled with family therapy or adult therapy
5. Regular multidisciplinary meetings are essential

(O'Malley, 2009)

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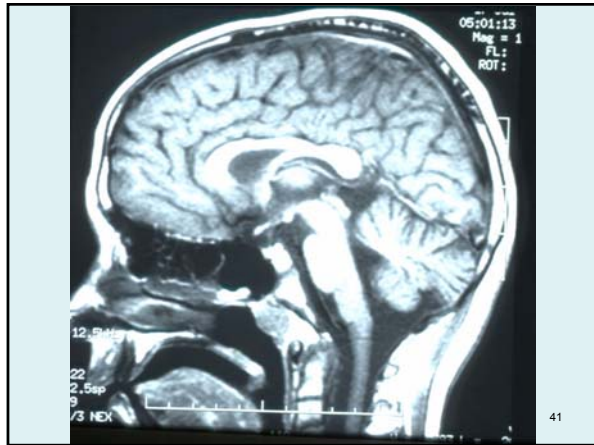
Patient Slides with Brain Dysfunction

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Familiar Belfast Presentation of FAS or ARND

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1. Qualitative impairment in social interaction, as manifested by at least two of the following:

- Marked impairment in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body postures and gestures to regulate social interaction
- Failure to develop peer relationships appropriate to developmental level
- A lack of spontaneous seeking to share enjoyment, interests, or achievements with other people (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)
- lack of social or emotional reciprocity

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2. Restricted repetitive and stereotyped patterns of behavior, interests, and activities, as manifested by at least one of the following:

- Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
- Apparently inflexible adherence to specific, nonfunctional routines or rituals
- Stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole-body movements)
- Persistent preoccupation with parts of objects

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3. The disturbance causes clinically significant impairment in social, occupational, or other important areas of functioning

4. There is no clinically significant general delay in language (e.g. single words used by age 2 years, communicative phrases used by age 3 years)

5. There is no clinically significant delay in cognitive development, except working memory, or in the development of age-appropriate self-help skills, adaptive behavior (other than in social interaction), and curiosity about the environment in childhood

6. Pervasive impulsivity

(O'Malley, 2009)

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Disrupted School Experience in FASD: A marker for diagnosis

- MALES 18% FAS or 18% FAE (ARND), 6-11 years old
- FEMALES 21% FAS,7% FAE (ARND), 6-11 years old
- MALES 70% FAS,75% FAE (ARND),12-20 years old
- FEMALES 30% FAS,50% FAE (ARND),12-20 years old

ISSUES:

Suspension

- 12% 6-11 years old
- 53% 12-20 years old

Expulsion

- 7% 6-11 years old
- 29% 12-20 years old

Drop-out

- 1% 6-11 years old
- 27% 12-20 years old

(Streissguth et al, 1996; O'Malley, 2009)

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Disrupted School Experience in FASD: A marker for diagnosis

ISSUES CONT:

Repeated Attentional Problems

- 70% 6-11 years old
- 69% 12-20 years old

Repeatedly Incomplete Schoolwork

- 55% 6-11 years old
- 62% 12-20 years old

Ever Failed a Grade

- 11% 6-11 years old
- 49% 12-20 years old

Repeatedly Failed a Class

- 3% 6-11 years old
- 31% 12-20 years old

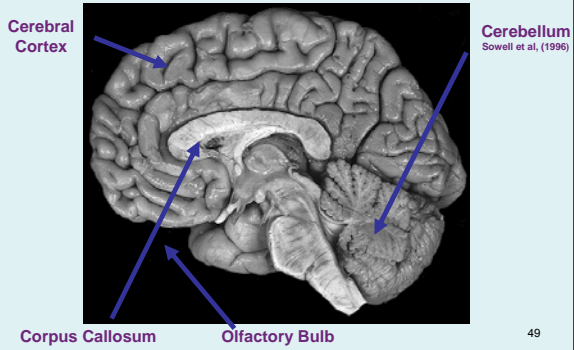
(Streissguth et al, 1996; O'Malley, 2009)

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Neuropsychological Testing and Brain Dymorphology in FAS and ARND

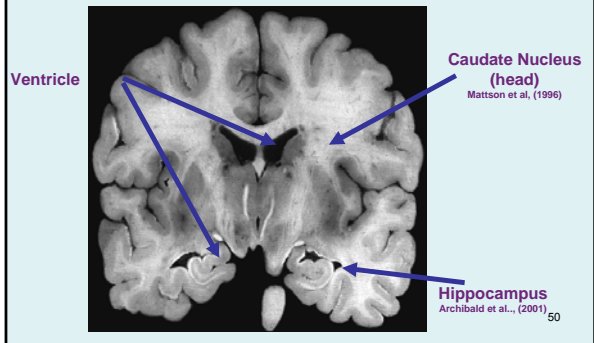
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Regions of the Brain Affected by Prenatal Alcohol

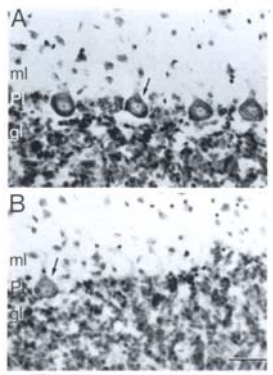


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Regions of the Brain Affected by Prenatal Alcohol



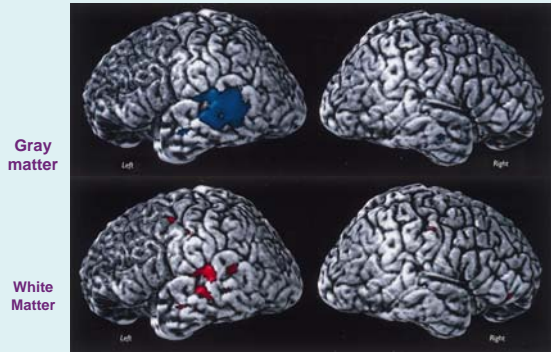
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Woodbury et al., 1996. Purkinje cells in cerebellar cortex of 6-month old macaque. A, No alcohol in gestation. B, Worsley doses 3.3 g/kg of alcohol during gestation.

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Parietal and Temporal Effects on White Matter and Gray Matter



Over abundance of gray matter in Perisylvian regions
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(Sowell et al. (2001). *NeuroReport*, 12:515-23)

Measurement of Frontal Lobe in Prenatal Alcohol Exposure

- 70 women who consumed moderate to large amounts of alcohol vs. 97 consuming little or no alcohol
- In utero ultrasound of fetuses
 - Measured distances of several regions including frontal lobe
- Frontal lobe was correlated with alcohol consumption
 - 46% of heavily exposed fetuses with length below 25th percentile
 - 20% non-exposed below this point

(Wass et al. (2001). *American Journal of Obstetrical Gynecology*) 53

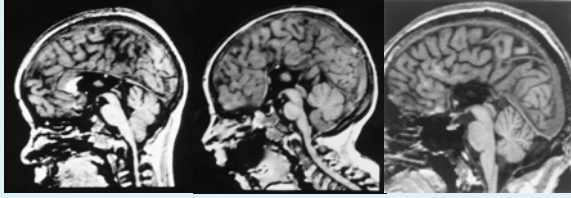
Basal Ganglia in Fetal Alcohol Spectrum Disorders

Basal Ganglia (especially the Caudate) volume reduced in FAS vs. controls (Mattson et al., ACER, 1996)

Mattson and colleagues (unpublished) related caudate volume with Executive Function measures

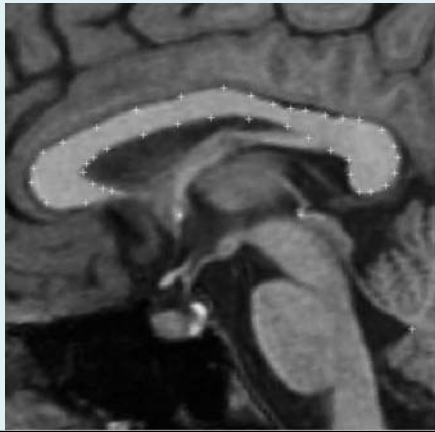
- Perseverative Responses from WCST
- False positives from CVLT-C

Agnesis of the Corpus Callosum

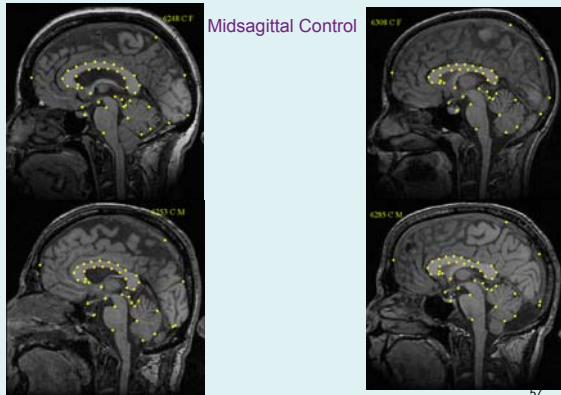


Stacy H et al., (1997) Pediatrics, 99:222-230

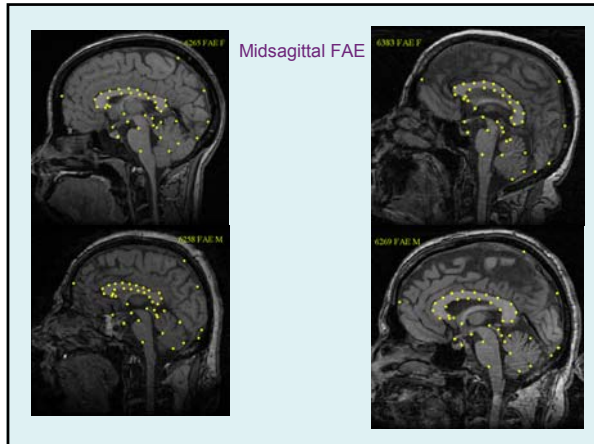
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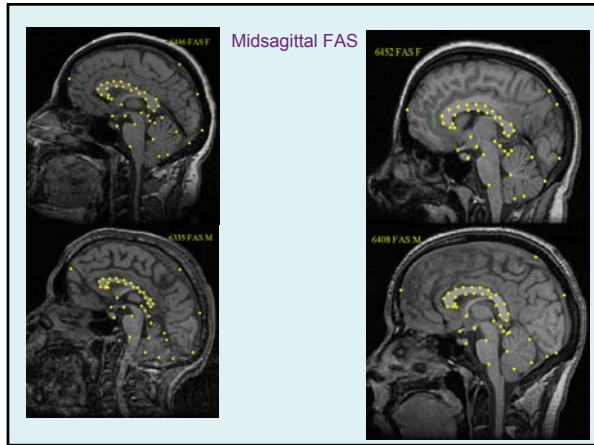


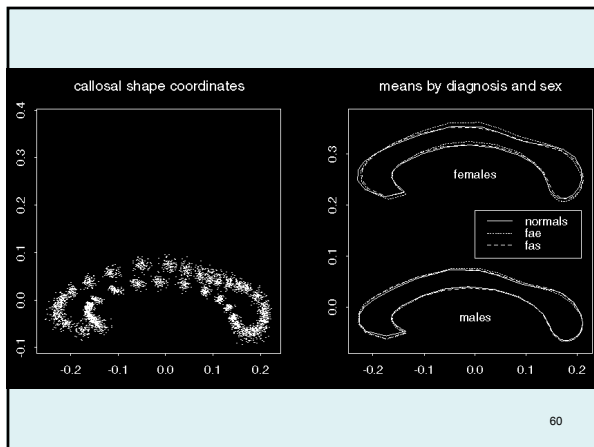
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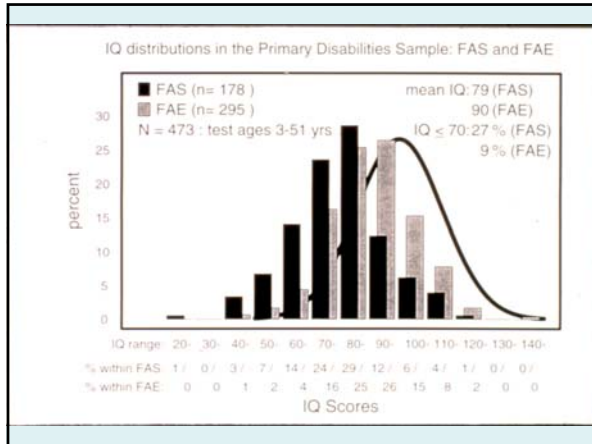


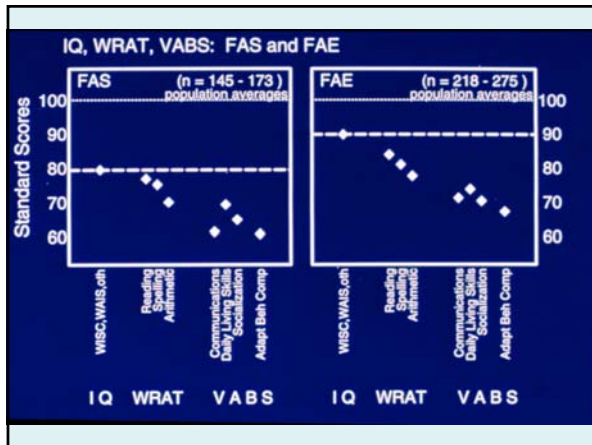
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Executive Functions are:

- A Group of Cognitive Abilities**
 - Self-Regulation of Behaviors
 - Sequencing of Behaviors
 - Cognitive Flexibility
 - Response Inhibition
 - Planning
 - Organization of Behavior
- A “Future-Oriented” Process**
 - Goal Directed
 - Delayed Gratification
- An Integrative Process**
 - Perception
 - Attention
 - Memory
 - Motor
 - General Intelligence

(Connor, 2000) 63

Studies in Children and Adolescents with FASD

Kodituakku and colleagues (ACER, 1995)

- 10 subjects with FAS/FAE, 10 controls, mean age 13
- Fewer categories and more perseverative errors (WCST)
- Generated fewer words (COWAT)
- Difficulty with complex planning problems (PPT)

Mattson and colleagues (ACER, 1999)

- 10 subjects with FAS, 8 PEA, 10 controls, mean age 11
- D-KEFS (Trails, Stroop, Tower, Word Context)
- Deficits in:
 - Planning
 - Response Inhibition
 - Abstract Thinking
 - Flexibility
- Deficits not related to Diagnosis

(Connor 2004; Connor, 2005)

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Studies in Children and Adolescents with FASD

Coles and colleagues (ACER, 1997)

- Children with FAS, ADHD, controls
- WCST
 - FAS had fewer categories completed than either controls or ADHD

Carmichael, Olson and colleagues (ACER, 1998)

- 9 children with FAS, 52 IQ similar controls, age 14-16
- Higher percentage of errors
- Fewer categories completed
- Non rule based errors
- Perseverative

Kopera-Frye and colleagues (Neuropsychologia, 1996)

- Adolescent and adults with FAS/FAE
- Cognitive Estimation Test
 - More bizarre responses

(Connor, 2005)

Executive Function Measures

- Wisconsin Card Sorting Test (WCST)
- Cognitive Estimation (CE)
- Controlled Oral Word Association Test (COWAT)
- Ruff's Figural Fluency (RFF)
- Trail Making Test (Trails)
- Stroop Color-Word Test (Stroop)
- Consonant Trigrams Test (CTT)
- Digit Span (DS)
- California Verbal Learning Test (CVLT)
(Clustering, Intrusions, Perseverations)

(Connor, 2004; Connor, 2005)

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Full Neurobehavioral Battery

Attention/Memory Tests

- Continuous Performance Test (CPT)
- Talland Letter Cancellation Test (LCT)
- Attention Process Training (APT)
- Stepping Stone Maze (SSM)
- California Verbal Learning Test (CVLT)

Executive Functioning

- Wisconsin Card Sorting Test (WCST)
- Stroop Color-Word Test (STROOP)
- Consonant Triagrams Test (CTT)
- Controlled Oral Word Association Test (COWAT)
- Ruff's Figural Fluency Test (RFF)
- Cognitive Estimation (CE)

Information Processing

- Wechsler Adult Intelligence Scale – Revised (WAIS-R)
- Wide Range Achievement Test – Revised (WRAT-R) Arithmetic
- Word Attack (WA)
- Spatial-Visual Reasoning Task (SVRT)

General Brain Damage

- Trail Making Test (TRAILS)
- Rey-Osterreith Complex Figure Test (RCFT)

(Connor, 2004; Connor, 2005)

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Findings of Neuroimaging and Neuropsychological Performance

Thick Corpus Callosum Associated with:

- Poor Executive Function
- Relatively Intact Motor Functioning

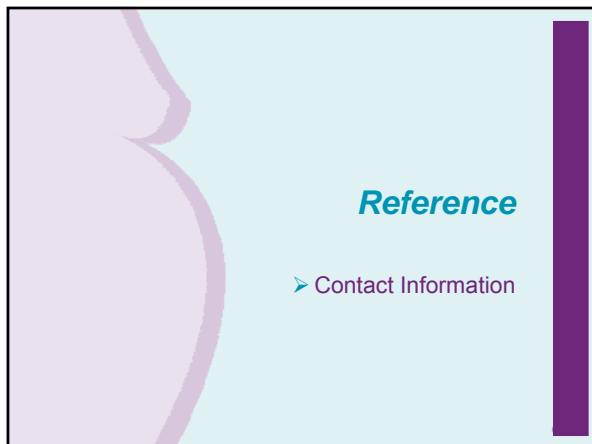
Thin Corpus Callosum Associated with:

- Poor Motor Coordination
- Relative Sparing of Executive Functions

New evidence cranial ultrasound on neonates

(Connor, 2004; Bookstein et al, 2005; Bookstein et al, 2008)

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Contact Information

*Kieran D. O'Malley, MB, DABPN.
Child & Adolescent Psychiatrist,
Belfast Trust, Belfast*



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