

# **AFFIDAVIT OF DR. LARRY BURD**

Dr. Larry Burd, being duly sworn, hereby deposes and says:

1. My name is Larry Burd. I am a professor, education specialist, and therapist. I received my Ph.D. in Community Health Science from the University of Manitoba in 1997. I earned my M.S. in Special Education from the Eastern Montana College in Billings, Montana in 1980.

2. Since 1980 until the present I have been at the University of North Dakota School of Medicine and Health Sciences. I am the Director of the North Dakota Fetal Alcohol Syndrome Center, which provides diagnostic services, treatment and training for people with developmental disabilities, birth defects, and mental illness. Much of this work focuses on fetal alcohol spectrum disorders (FASD). I also provide clinical and research electives for medical students and am a Professor in the Department of Pediatrics at the University.

3. I serve as an expert consultant for the National Zero to Three Model Court Teams on identification and management of young children in foster care with fetal alcohol spectrum disorder, the National Institute on Alcohol Abuse and Alcoholism work group on harmonization of diagnostic criteria for FASD, the National Organization on Fetal Alcohol Syndrome (NOFAS) Justice Taskforce, Potential Strategies and Opportunities for Monitoring the Proportion of Children Affected by a Fetal Alcohol Spectrum Disorder with the National Center on Birth Defects and Developmental Disabilities at the Centers for Disease Control and Prevention (CDC), in collaboration with the American Academy of Pediatrics (AAP), and an advocacy working group on FASD in Ireland named Ireland ENDpae. I am the Principal Investigator of the Republic of Congo Fetal Alcohol Spectrum Disorders program. I also serve as Member of the Advisory Committee for the Salford Parents and Careers Education Course for Improvements in FASD Outcomes in Children (SPECIFICS).

4. As a clinician I have evaluated and provided treatment for over 18,000 children and adolescents primarily from North Dakota, Minnesota, South Dakota, and Montana. I have provided developmental clinics on Tribal Nations for over thirty years. I have provided training on the

diagnosis and management of developmental disabilities, infant and child mortality, and costs of health care in all 50 states.

5. As a researcher in the field of fetal alcohol syndrome I have published over 230 peer reviewed publications in widely respected journals in pediatrics, psychology, genetics, teratology, neurology and psychiatry. Over 90 of these publications are on FASD (Appendix 1). I have had research projects on 41 Tribal Nations and in 40 countries. In support of my research I have obtained competitive funding from many entities, including the Substance Abuse and Mental Health Services Administration (SAMSHA), the Centers for Disease Control and Prevention (CDC), the National Institute on Alcohol Abuse and Alcoholism (NIAAA), and the National Institute of Child Health and Development (NICHD), the National Institute for Deafness and Other Communicative Disorders (NIDCD), Bureau of Indian Affairs (BIA), North Dakota Department of Health, North Dakota Department of Human Services, Robert Wood Johnson Foundation, Bush Foundation, the ARC, and March of Dimes.

6. My work has been cited by federal agencies, including the Centers for Disease Control and Prevention, the National Institute on Alcohol Abuse and Alcoholism, and the Substance Abuse and Mental Health Services Administration.

7. Additionally, I recommend six references as especially important authorities on FASD:

- *Fetal Alcohol Spectrum Disorders Listening Session Report*, Office of Juvenile Justice and Delinquency Prevention (2017).
- *Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs and Health*, U.S. Department of Health and Human Services (HHS), Office of the Surgeon General (2016).
- *Fetal Alcohol Spectrum Disorders: Implications for Juvenile and Family Court Judges*, National Council of Juvenile and Family Court Judges (2015).
- *Resolution 112B on Fetal Alcohol Spectrum Disorders*, A.B.A. House of Delegates (Aug. 7, 2012).
- *Consensus Statement on Recognizing Alcohol-Related Neurodevelopmental Disorder (ARND) in Primary Health Care of Children*, Interagency Coordinating Committee on Fetal Alcohol Spectrum Disorders (2011).

- Kathleen Stratton, Cynthia Howe, and Frederick Battaglia eds., *Fetal Alcohol Syndrome: Diagnosis, Epidemiology, Prevention, and Treatment* (1996). Available online at: <http://www.nap.edu/openbook.php?isbn=0309052920>.

8. Fetal Alcohol Spectrum Disorder (FASD) is a developmental disability resulting from the biological mother's consumption of alcohol while the child was in utero.<sup>1</sup> There is no known safe level of alcohol exposure during pregnancy.<sup>2</sup> Alcohol at even low levels constricts the blood supply to the fetus decreasing transport of oxygen and nutrition and transport of waste products back to the mother's system for elimination. Prenatal alcohol exposure can greatly impact the development of the fetus by altering brain structure and function.<sup>3</sup> The organ system most frequently damaged is the developing brain.<sup>4</sup> This brain damage is typically manifested by increased rates of neurocognitive impairments, gross and fine motor impairments, speech and language deficits, and impairments in adaptive behavior.<sup>5</sup> The expression of FASD is related to age and development.

9. FASD is present at birth, lasts a lifetime, closely resembles the functional elements of other developmental disabilities (e.g., intellectual disability, autism spectrum disorder, or physical disability), requires similar services, and has a similar response to interventions.<sup>6</sup> Most children and adolescents with FASD can learn to adapt to their needs and grow into adults who meet their full potential, if they are provided with the proper resources. Providing appropriate care for adolescents with FASD is difficult in juvenile corrections systems where even basic knowledge of FASD is often lacking.

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<sup>1</sup> Institute of Medicine, KR Stratton KR, Howe CJ, Battaglia FC & Institute Of M 1996. *Fetal alcohol syndrome- diagnosis, epidemiology, prevention, and treatment*, Washington, D.C, National Academy Press.

<sup>2</sup> Substance A, Mental Health Services A & Office of the Surgeon G 2016. Reports of the surgeon general. Facing addiction in america: The surgeon general's report on alcohol, drugs, and health. Washington (DC): US Department of Health and Human Services.

<sup>3</sup> Institute of Medicine, *supra* note 1.

<sup>4</sup> S. Popova S, Lange S, Burd L, Urbanoski K & Rehm J (2013). Cost of specialized addiction treatment of clients with fetal alcohol spectrum disorder in canada. BMC public health 13:570.

<sup>5</sup> Larry Burd L, Cotsonas-Hassler TM, Martsolf J & Kerbeshian J (2003a). Recognition and management of fetal alcohol syndrome. Neurotoxicology and teratology 25:681-688, Burd L, Klug MG, Martsolf J & Kerbeshian J *ibid.* Fetal alcohol syndrome: Neuropsychiatric phenomics.697-705, Lees B, Mewton L, Jacobus J, Valadez EA, Stapinski LA, Teesson M, Tapert SF & Squeglia LM (2020). Association of prenatal alcohol exposure with psychological, behavioral, and neurodevelopmental outcomes in children from the adolescent brain cognitive development study. Am J Psychiatry 177:1060-1072.

<sup>6</sup> WJ Edwards WJ & Greenspan S (2010). Adaptive behavior alcohol spectrum and fetal disorders. The Journal of Psychiatry & Law 38:419-447.

10. Recent prevalence estimates from elementary schools in the U.S. found that 5% of first grade students had FASD.<sup>7</sup> Using the widely-accepted FASD prevalence rate of 5% of the general population (i.e., one of every 20 births in the U.S.), there are approximately 200,000 *new* cases each year. There are an estimated 3.6 million children and adolescents with FASD in the U.S, many of whom are undiagnosed.

11. FASD appears to occur more frequently in juvenile corrections compared to the general population. Children with FASD are 19 times more likely to be incarcerated compared to children without FASD.<sup>8</sup> In the U.S. the prevalence of FASD in juvenile corrections ranges from 10% to 22%.<sup>9</sup> Minority populations appear to be disproportionately represented among youth with FASD in juvenile corrections populations by 4-6-fold.<sup>10</sup>

12. People diagnosed with FASD are no more likely to commit crimes than the general population. Two studies found that individuals with FASD and well-matched control groups had no significant difference in rates of criminal involvement.<sup>11</sup> However, while studies have shown they are not more likely to commit crime, children and adolescents with FASD are more likely to be caught up in the justice system simply as a result of their disabilities.<sup>12</sup> This appears to involve the gullibility of adolescents with FASD and their susceptibility to exploitation and victimization.

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<sup>7</sup> CD Chambers CD, Coles C, Kable J, Akshoomoff N, Xu R, Zellner JA, Honerkamp-Smith G, Manning MA, Adam MP & Jones KL (2019). Fetal alcohol spectrum disorders in a pacific southwest city: Maternal and child characteristics. *Alcohol Clin Exp Res* 43:2578-2590, May PA, Hasken JM, Baete A, Russo J, Elliott AJ, Kalberg WO, Buckley D, Brooks M, Ortega MA, Hedrick DM, Tabachnick BG, Abdul-Rahman O, Adam MP, Jewett T, Robinson LK, Manning MA & Hoyme HE (2020a). Fetal alcohol spectrum disorders in a midwestern city: Child characteristics, maternal risk traits, and prevalence. *Ibid.*44:919-938, May PA, Hasken JM, Bozeman R, Jones JV, Burns MK, Goodover J, Kalberg WO, Buckley D, Brooks M, Ortega MA, Elliott AJ, Hedrick DM, Tabachnick BG, Abdul-Rahman O, Adam MP, Jewett T, Robinson LK, Manning MA & Hoyme HE *ibid.*Fetal alcohol spectrum disorders in a rocky mountain region city: Child characteristics, maternal risk traits, and prevalence.900-918, May PA, Hasken JM, Stegall JM, Mastro HA, Kalberg WO, Buckley D, Brooks M, Hedrick DM, Ortega MA, Elliott AJ, Tabachnick BG, Abdul-Rahman O, Adam MP, Robinson LK, Manning MA, Jewett T & Hoyme HE *ibid.*Fetal alcohol spectrum disorders in a southeastern county of the united states: Child characteristics and maternal risk traits.939-959.

<sup>8</sup> S. Popova S, Lange S, Burd L & Rehm J (2015). Cost attributable to fetal alcohol spectrum disorder in the canadian correctional system. *International journal of law and psychiatry* 41:76-81.

<sup>9</sup> EB Bisgard EB, Fisher S, Aduato S & Louis M (2010). Screening, diagnosis, and intervention with juvenile offenders. *The Journal of Psychiatry & Law* 38:475-506.

<sup>10</sup> N. Hughes N, Clasby B, Chitsabesan P & Williams H (2016). A systematic review of the prevalence of foetal alcohol syndrome disorders among young people in the criminal justice system. *Cogent Psychology* 3:1214213.

<sup>11</sup> Fetal alcohol spectrum disorders: implications for juvenile and family court judges 2015. National Council of Juvenile and Family Court Judges

<sup>12</sup> Popova S, Lange S, Burd L & Rehm J (2015). Cost attributable to fetal alcohol spectrum disorder in the canadian correctional system. *International journal of law and psychiatry* 41:76-81.

13. In foster care, six studies have found mean FASD rates to be 25.1% (one in every four children and adolescents).<sup>13</sup> This demonstrates the need for improved early screening efforts and risk reduction programs for service systems that provide services to youth prior to entry into juvenile corrections programs.

14. FASD is considered a descriptor for several categorical medical diagnoses: fetal alcohol syndrome (FAS), partial fetal alcohol syndrome (pFAS), and alcohol related neurodevelopmental disorders (ARND), which is diagnosed as static encephalopathy/alcohol exposed (SE/AE) or neurobehavioral disorder/alcohol exposed (ND/AE).<sup>14</sup> In the fifth edition of the Diagnostic and Statistical Manual,<sup>15</sup> the central nervous system (CNS) dysfunction in FASD is diagnosed as neurodevelopmental disorder associated with prenatal alcohol exposure (ND-PAE). Both ARND and ND-PAE have considerable diagnostic overlap.<sup>16</sup> Most children with FASD do not have growth impairment or easily identified facial characteristics or dysmorphology. In addition, the dysmorphic features of FASD tend to decrease by adolescence into adult life.<sup>17</sup> An adolescent with abnormal facial features, growth impairment, and intellectual disability is not typical of FASD. The number of people who have the most well-known or classic type of FASD (i.e., fetal alcohol syndrome) is quite small, comprising only about 1-5 % of cases.<sup>18</sup> By far, the

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<sup>13</sup> Larry Burd L, Klug MG & Husark K in press. Prevalence of fetal alcohol spectrum disorder and screening in the forensic context. *In: Brown N. N. (ed.) Fasd: A guide for forensic mental health assessment.* (submitted 2020).

<sup>14</sup> HE Hoyme HE, May PA, Kalberg WO, Kodituwakku P, Gossage JP, Trujillo PM, Buckley DG, Miller JH, Aragon AS, Khaole N, Viljoen DL, Jones KL & Robinson LK (2005). A practical clinical approach to diagnosis of fetal alcohol spectrum disorders: Clarification of the 1996 institute of medicine criteria. *Pediatrics* 115:39-47.

<sup>15</sup> American Psychiatric Association 2013. *Diagnostic and statistical manual of mental disorders*, Washington, D.C.. American Psychiatric Association.

<sup>16</sup> S. Johnson S, Moyer CL, Klug MG & Burd L (2018). Comparison of alcohol-related neurodevelopmental disorder and neurodevelopmental disorder associated with prenatal alcohol exposure diagnostic criteria. *Journal of Developmental and Behavioral Pediatrics* 39:163-167.

<sup>17</sup> SW Jacobson SW, Hoyme HE, Carter RC, Dodge NC, Molteno CD, Meintjes EM & Jacobson JL (2020). Evolution of the physical phenotype of fetal alcohol spectrum disorders from childhood through adolescence. *Alcohol Clin Exp Res*.

<sup>18</sup> Chambers CD, Coles C, Kable J, Akshoomoff N, Xu R, Zellner JA, Honerkamp-Smith G, Manning MA, Adam MP & Jones KL (2019). Fetal alcohol spectrum disorders in a pacific southwest city: Maternal and child characteristics. *Ibid.*43:2578-2590, May PA, Hasken JM, Baete A, Russo J, Elliott AJ, Kalberg WO, Buckley D, Brooks M, Ortega MA, Hedrick DM, Tabachnick BG, Abdul-Rahman O, Adam MP, Jewett T, Robinson LK, Manning MA & Hoyme HE (2020a). Fetal alcohol spectrum disorders in a midwestern city: Child characteristics, maternal risk traits, and prevalence. *Ibid.*44:919-938, May PA, Hasken JM, Bozeman R, Jones JV, Burns MK, Goodover J, Kalberg WO, Buckley D, Brooks M, Ortega MA, Elliott AJ, Hedrick DM, Tabachnick BG, Abdul-Rahman O, Adam MP, Jewett T, Robinson LK, Manning MA & Hoyme HE *ibid.*Fetal alcohol spectrum disorders in a rocky mountain region city: Child characteristics, maternal risk traits, and prevalence.900-918, May PA, Hasken JM, Stegall JM, Mastro HA, Kalberg WO, Buckley D, Brooks M, Hedrick DM, Ortega MA, Elliott AJ, Tabachnick BG, Abdul-Rahman O, Adam MP, Robinson LK, Manning MA, Jewett T & Hoyme HE *ibid.*Fetal alcohol spectrum disorders in a southeastern county of the united states: Child characteristics and maternal risk traits.939-959, Popova

most common category of FASD is diagnosed as alcohol related neurodevelopmental disorder (ARND).<sup>19</sup> Neurobehavioral and cognitive challenges faced by patients with ARND are the most prevalent source of impairments across the lifespan.<sup>20</sup>

15. In pre-adolescents with FASD, deficits in IQ, as well as academic deficits in math, spelling and written language are common.<sup>21</sup> Deficits in memory and recall, planning and comprehension are very common. Pre-adolescents' motor skills, coordination, balance, and handwriting are often affected. They may present as clumsy. Impairments in pre-adolescents' social skills result in difficulty acquiring and maintaining friendships, impaired social functioning and age appropriate independence, and the need for increased supervision. They are at risk for exploitation by others and have difficulty with appropriate boundaries. Behaviors that are often observed include impaired executive functioning, impulsive acts, repetitive problem behavior, poor response to demands, and increased risk taking.<sup>22</sup>

16. Adolescence is defined by developmental trajectories that include impaired judgement, impulsivity, undeveloped executive functioning, and episodes of poor judgement. FASD exacerbates these development differences and vulnerabilities in this maturing population. Prenatal alcohol exposure of any severity is associated with increased prevalence of common neurodevelopmental disorders.<sup>23</sup> The biological basis for these age dependent deficits are alterations of brain structure and function which originated during pregnancy. Children and adolescents with FASD have smaller cerebral surface area, aberrant cortical thickness, and overall

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S, Dozet D & Burd L (2020). Fetal alcohol spectrum disorder: Can we change the future? Alcoholism, clinical and experimental research:10.1111/acer.14317.

<sup>19</sup> Burd L, Klug MG & Husark K in press. Prevalence of fetal alcohol spectrum disorder and screening in the forensic context. *In*: Brown N. N. (ed.) Fasd: A guide for forensic mental health assessment, Popova S, Dozet D & Burd L (2020). Fetal alcohol spectrum disorder: Can we change the future? Alcoholism, clinical and experimental research:10.1111/acer.14317.

<sup>20</sup> Burd L, Klug MG, Martsolf J & Kerbeshian J (2003b). Fetal alcohol syndrome: Neuropsychiatric phenomics. *Neurotoxicology and teratology* 25:697-705, Chasnoff IJ, Wells AM & King L (2015). Misdiagnosis and missed diagnoses in foster and adopted children with prenatal alcohol exposure. *Pediatrics* 135:264-70.

<sup>21</sup> Burd L, Cotsonas-Hassler TM, Martsolf J & Kerbeshian J (2003a). Recognition and management of fetal alcohol syndrome. *Neurotoxicology and teratology* 25:681-688.

<sup>22</sup> D. Kingdon D, Cardoso C & Mcgrath JJ (2016). Research review: Executive function deficits in fetal alcohol spectrum disorders and attention-deficit/hyperactivity disorder - a meta-analysis. *J Child Psychol Psychiatry* 57:116-31, Kodituwakku PW, Kalberg W & May PA (2001). The effects of prenatal alcohol exposure on executive functioning. *Alcohol Res Health* 25:192-8.

<sup>23</sup> B. Lees B, Mewton L, Jacobus J, Valadez EA, Stapinski LA, Teesson M, Tapert SF & Squeglia LM (2020). Association of prenatal alcohol exposure with psychological, behavioral, and neurodevelopmental outcomes in children from the adolescent brain cognitive development study. *Am J Psychiatry* 177:1060-1072, Weyrauch D, Schwartz M, Hart B, Klug MG & Burd L (2017). Comorbid mental disorders in fetal alcohol spectrum disorders: A systematic review. *Journal of Developmental and Behavioral Pediatrics* 38:283-291.

widespread reductions in cortical volume.<sup>24</sup> Children and adolescents with FASD also have reductions in resting-state functional connectivity in brain regions which regulate attention and executive functioning.<sup>25</sup>

17. Research has shown and been reported in multiple peer reviewed journals that adolescents with FASD will exhibit deficits in self-care, money and time management, household routines, and in their ability to work independently and adhere to rules and expectations.<sup>26</sup> This broad domain of development is known as adaptive behaviors. In the evaluation of FASD, it is important to assess adaptive behaviors for impairment. In development of adolescents' social skills, they can exhibit deficits in age-appropriate independent functioning and are at risk for exploitation by peers. They exhibit problems with interpersonal boundaries and require increased supervision, especially in juvenile corrections facilities. Adolescents diagnosed with FASD are at increased risk for substance abuse, depression, anxiety, repetition of problem behavior, increased risk taking and exploitation by peers, decreased impulse control, and deficits in planning ahead and meeting deadlines. Highly variable day-to-day functioning is also often misinterpreted as avoidance and manipulation.

18. The brain damage characteristic of FASD often impairs the ability of young people to participate fully in legal proceedings. A 2014 study of young people with FASD found that 90 percent had an impaired ability in at least one of the following: understanding Miranda rights and criminal procedure, appreciating the nature and object of the proceedings, and participating in their defense and communicating with counsel.<sup>27</sup>

Table 1 provides a link between the neurocognitive impairments common in FASD and their impact in legal proceedings.

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<sup>24</sup> Lees B, Mewton L, Jacobus J, Valadez EA, Stapinski LA, Teesson M, Tapert SF & Squeglia LM (2020). Association of prenatal alcohol exposure with psychological, behavioral, and neurodevelopmental outcomes in children from the adolescent brain cognitive development study. *Am J Psychiatry* 177:1060-1072.

<sup>25</sup> Ibid.

<sup>26</sup> S. Baldwin S, Leblanc, R. (2005). Teaching students with fetal alcohol spectrum disorders: A resource guide for florida educators. Florida Department of Education - Bureau of Exceptional Education and Student Services, Paley B & O'connor MJ (2011). Behavioral interventions for children and adolescents with fetal alcohol spectrum disorders. *Alcohol Res Health* 34:64-75.

<sup>27</sup> Fetal alcohol spectrum disorders: implications for juvenile and family court judges 2015. National Council of Juvenile and Family Court Judges

**Table 1**

IMPAIRMENTS	IMPACT IN LEGAL SETTING
COGNITIVE/INTELLECTUAL	
Visual/Spatial Reasoning	Capacity to accurately and logically interpret what you see and describe/reproduce it accurately.
Attention/Distractibility	Time on task is limited. Important information may be missed. Often a failure to habituate to sounds, movements, changes, normalcy.
Impulsivity	Increases risk of poorly thought out action or decisions
Memory	Often leads to suggestibility, confabulation, and changing stories. Anxiety negatively impacts memory.
Visual Memory	Limitations in accurate recall of visual information details, locations of objects, events or images
Verbal Memory	May be unable to recall more than 1 or 2 items. May be limited to 1-2 step directions.
Executive Functioning	Impairs planning, organization, consideration of options, sequences of events. Impairs forethought or consideration of outcomes.
LEARNING	
Reading Disability	Impaired reading achievement experienced by 25-40% of people with FASD.
Word Reading	Limits ability to read text in forms, written directions, signs, labels. Many people with FASD read at grades 3 or 4 levels.



Reading Comprehension	Reduced ability to understand what is read.
Oral or Listening Comprehension	Very often undetected. Often occurs with attention impairments and other learning disabilities. May appear disinterested.
Non-Verbal	Seems disinterested, avoidant or uncaring. Actions may be incongruent with situations or events. Can't "read" peoples' intentions or actions.
Math- Usually Assessed as Calculation Skills	Impairs decision making for concepts of time, cost, duration (may think 9 weeks is more than 7 months). Difficulty with measurements (time, weight, distances, temperature, money).
Written Language	Difficulty with spelling, punctuation, and written expression. Developmental delays in ability to write letters or complete forms at age level. Often occurs with reading impairments.
Spelling	Spells below grade or age level.
ADAPTIVE BEHAVIOR	Assesses daily living skills, essential abilities for age appropriate independent functioning.
Socialization	Assesses ability to relate to others or function in groups. Socially odd (no or few friends).
Communication	Ability to communicate in age appropriate independent situations. Difficulty asking for help or clarifying misunderstandings.
Self-Care	Ability to function at age level. Impaired abilities in cooking, laundry, showering, and other areas of personal care or hygiene.
Gullibility, Naivety, Credulity	Inadequate caution in all steps of the legal process, often occurs with poor social skills (desire to fit in) and decreased IQ. Simplistic view or appreciation of consequences of

	decision making or uncritical acceptance of statements by others especially authority figures.
Suggestibility	Often co-occurs with decreased IQ, memory deficits, and anxiety. Easily led or influenced. Increases risk of victimization.
Confabulation	Repeated questioning can lead to confusion and confabulation where individuals confuse events that really happened with events that they may have heard about or that have been discussed repeatedly. Memory deficits and suggestibility commonly co-occur. Very serious problem in legal settings. Anxiety increases susceptibility to confabulation.
<b>ENVIRONMENTAL FACTORS</b>	
Adverse Childhood Experiences (ACEs) & Exposure to Trauma	Children and adolescents in foster care or juvenile services have much higher rates of exposure to multiple ACEs. Trauma and PTSD lead to loss of train of thought, impaired sustained attention, and explosive episodes,
Multiple Foster Home Placements	Often occurs when services are limited or when overall neuropsychological severity is increasing.
Victimization/Exploitation	May share money, housing, sexual favors for others, and can lead to theft or aggression to get or keep friends.
<b>MENTAL HEALTH</b>	
Anxiety	Increases desire to escape stressful situations and impairs thoughtful decision making.

	When comorbid with impulsivity adverse outcomes increased.
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19. FASD also co-occurs with hundreds of other conditions, including birth defects, mental disorders, neurological deficits, vision and hearing loss, growth failure, and organ defects, all of which may impact their ability to participate in legal proceedings.<sup>28</sup> Comorbidity is the co-occurrence of two conditions with greater than chance frequency. In a meta review, Popova and colleagues demonstrated that FASD is a condition with very high rates of co-occurring conditions across multiple organ systems.<sup>29</sup> The prevalence of vision and hearing impairments is very high in FASD. Few things are more essential in legal settings than to be able to see what is happening and to hear the proceedings. In FASD the prevalence of hearing loss is increased over 120 times.<sup>30</sup> Almost all patients diagnosed with FASD also have at least one additional diagnosis, with most patients having several comorbid conditions.<sup>31</sup> Many neurodevelopmental and mental health disorders (e.g., ID, ADHD, language disorder, learning disorder, anxiety disorder, and depression) have a much higher prevalence when compared to neurotypical children and adolescents in the general population.<sup>32</sup> Exposure to adverse childhood experiences (ACEs) in children and adolescents with FASD is greatly increased and contributes to the severity from comorbidity.<sup>33</sup>

20. FASD can have severe consequences for people in forensic systems, especially when their impairments are unrecognized. Impairments in FASD increase risk of exploitation while in

<sup>28</sup> Popova S, Lange S, Burd L & Rehm J (2016a). The economic burden of fetal alcohol spectrum disorder in Canada in 2013. *Alcohol and Alcoholism* (Oxford, Oxfordshire) 51:367-375, Weyrauch D, Schwartz M, Hart B, Klug MG & Burd L (2017). Comorbid mental disorders in fetal alcohol spectrum disorders: A systematic review. *Journal of Developmental and Behavioral Pediatrics* 38:283-291.

<sup>29</sup> S. Popova S, Lange S, Shield K, Mihic A, Chudley AE, Mukherjee RaS, Bekmuradov D & Rehm J (2016c). Comorbidity of fetal alcohol spectrum disorder: A systematic review and meta-analysis. *Lancet* 387:978-987.

<sup>30</sup> S. Popova S, Lange S, Probst C, Shield K, Kraicer-Melamed H, Ferreira-Borges C & Rehm J (2016b). Actual and predicted prevalence of alcohol consumption during pregnancy in the who african region. *Trop Med Int Health* 21:1209-1239.

<sup>31</sup> HC Olson HC (2015). Advancing recognition of fetal alcohol spectrum disorders: The proposed dsm-5 diagnosis of “neurobehavioral disorder associated with prenatal alcohol exposure (nd-pae)”. *Current Developmental Disorders Reports* 2:187-198, Weyrauch D, Schwartz M, Hart B, Klug MG & Burd L (2017). Comorbid mental disorders in fetal alcohol spectrum disorders: A systematic review. *Journal of Developmental and Behavioral Pediatrics* 38:283-291.

<sup>32</sup>  
<sup>33</sup> K. Flannigan K, Kapasi A, Pei J, Murdoch I, Andrew G & Rasmussen C (2020). Characterizing adverse childhood experiences among children and adolescents with prenatal alcohol exposure and fetal alcohol spectrum disorder. *Child Abuse Negl* 112:104888, Kambeitz C, Klug MG, Greenmyer J, Popova S & Burd L (2019). Association of adverse childhood experiences and neurodevelopmental disorders in people with fetal alcohol spectrum disorders (fasd) and non-fasd controls. *BMC Pediatr* 19:498.

police custody (false confessions) and risk of making uninformed and impulsive decisions prior to trial, during trial, and at sentencing or in plea agreements. This is especially important with respect to closely related issues of gullibility, credulity, confabulation, impaired comprehension, and attentional deficits. These nationally recognized deficits in pre-adolescents and adolescents with FASD, combined with the fact that they are more suggestible than comparison populations, impairs their ability to voluntarily waive their rights. Repeated questioning can lead to confusion and confabulation where individuals confuse events that really happened with events that they may have heard about or that have been discussed repeatedly during interrogation. This makes them vulnerable to coerced and false confessions. Forty-three percent of youth in corrections with FASD had given at least one false confession, two-thirds of which resulted in charges.<sup>34</sup>

21. Youth with FASD are also less able to adequately communicate with their counsel, calling into question whether they possess the requisite legal competencies to participate in court proceedings.<sup>35</sup>

22. Youth with FASD cannot always form the requisite intent required for certain crimes and do not fully understand the consequences of their actions.

23. The deficits associated with FASD result in youth with FASD overestimating their understanding of court proceedings, more often receiving their first formal charge earlier, and manifesting more extensive neuropsychiatric impairments.<sup>36</sup>

24. Early recognition and diagnosis improve outcomes. Appropriate diagnosis at any age improves outcomes. After identification 74% of adolescents with FASD had no new offenses and no probation violations in the first six months. Eighty three percent had no or reduced school suspensions, 100% had no expulsions, and 67 % had improved attendance at school.<sup>37</sup>

25. Forensic systems should improve screening for FASD, and defense attorneys and prosecutors need increased awareness of FASD. The high rates of cognitive impairments, along

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<sup>34</sup> K. McLachlan K, Roesch R & Douglas KS (2011). Examining the role of interrogative suggestibility in miranda rights comprehension in adolescents. *Law Hum Behav* 35:165-77.

<sup>35</sup> Larry Burd L & Edwards W (2019, Fall). Fetal alcohol spectrum disorders: Implications for attorneys and the courts. *Criminal Justice*:21-28.

<sup>36</sup> ME Clarke ME & Gibbard WB (2003). Overview of fetal alcohol spectrum disorders for mental health professionals. *Can Child Adolesc Psychiatr Rev* 12:57-63, Conry J & Fast DK 2000. *Fetal alcohol syndrome and the criminal justice system*, Vancouver Canada, British Columbia Fetal Alcohol Syndrome Resource Society, Fast DK & Conry J December 2011. Understanding the similarities and differences between fetal alcohol spectrum disorder and mental health disorders. Research and statistics division, department of justice canada.

<sup>37</sup> Bisgard EB, Fisher S, Aduvato S & Louis M (2010). Screening, diagnosis, and intervention with juvenile offenders. *The Journal of Psychiatry & Law* 38:475-506.

with comorbid mental health and developmental disabilities, impact the capacity of adolescents with FASD to assist at trial, understand plea options, and exercise appropriate judgement at all phases of the legal system. The result is that the basic legal rights of people with FASD are routinely jeopardized. Judicial appreciation of these issues is a key to improving the recognition of FASD and providing fairness in the legal system.

26. Service needs in children and adolescents with FASD is much broader and more frequent than in the general population.<sup>38</sup> These services may include educational supports, special education, developmental therapies, medication management, and community-based or residential treatment for mental health and substance abuse problems.

27. Children with FASD obtain limited benefit from treatment programs that do not accommodate their deficits in adaptive behavior, such as the ability to work independently, meet self-care needs, manage money and time, and adhere to correctional rules and expectations.<sup>39</sup> The deficits in adaptive behavior are useful indicators of the capacity for independent living. This is an area where accurate diagnosis and diagnosis-informed interventions can be life changing. Measures of adaptive behaviors are used with IQ to determine intellectual disability. Adaptive behavior is a measure of the degree of impairment separate from IQ. IQ is not a superior measure of ability compared to adaptive behavior.<sup>40</sup>

28. Best practices for treatment include development of a future oriented prevention plan, prevention of substance use disorders, and risk reduction for further involvement in legal proceedings. Published research has demonstrated the potential of these diagnosis dependent interventions. A two-site screening and intervention program demonstrated the benefits of this approach:

- 74% of youth with FASD had no new offenses and no probation violations in the first 6 months;
- 89% had no new probation violations 12 months after implementation of intervention services;

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<sup>38</sup> LR Doyle LR & Mattson SN (2015). Neurobehavioral disorder associated with prenatal alcohol exposure (nd-pae): Review of evidence and guidelines for assessment. *Curr Dev Disord Rep* 2:175-186.

<sup>39</sup> Baldwin S, Leblanc, R. (2005). Teaching students with fetal alcohol spectrum disorders: A resource guide for florida educators. Florida Department of Education - Bureau of Exceptional Education and Student Services, Paley B & O'connor MJ (2011). Behavioral interventions for children and adolescents with fetal alcohol spectrum disorders. *Alcohol Res Health* 34:64-75.

<sup>40</sup> Edwards WJ & Greenspan S (2010). Adaptive behavior alcohol spectrum and fetal disorders. *The Journal of Psychiatry & Law* 38:419-447.

- 95% had either no change in placement or were moved to a placement that was equally or more appropriate for their needs, as specified in the diagnostic evaluation report;
- 83% showed no or reduced numbers of school suspensions at follow-up, as compared to baseline;
- 100% showed no school expulsions at follow-up;
- 67% showed increased school attendance levels; and
- 25% showed no or reduced numbers of school incident reports at follow-up, as compared to baseline.

Outcomes from the second site were similar:

- 85% of FASD-diagnosed individuals successfully completed probation and had no further arrests; and
- Baseline recidivism was 50% in the first year.<sup>41</sup>

29. Effective treatment programming must include access to developmentally appropriate services and diagnosis-informed care. Outcomes for children with FASD are substantially dependent on the quality of services provided to these youth. A program with poor outcomes is an inappropriate referral source and risks additional problems for youth referred to that setting. A young person's positive commitment to interventions will often not overcome the effects of low quality interventions. Research identifies eight characteristics key to improving interventions:

- Understand FASD;
- Treatment often needs to proceed at a slower pace due to impairments, comorbidity and increased levels of need;
- The use of picture schedules can be helpful where needed;
- Decrease memory burden by changing the pace, increasing repetition, using multimodal teaching strategies and changing to positive behavior management strategies;
- Manage the effects of anxiety around school and other learning demands; and
- Understand effects of comorbidity.

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<sup>41</sup> Bisgard EB, Fisher S, Adubato S & Louis M *ibid.* Screening, diagnosis, and intervention with juvenile offenders.475-506.

30. Behavior modification programs emphasizing negative consequences, often employed by juvenile correctional facilities, do not accommodate the deficits manifested by individuals with FASD. These interventions require the ability to think ahead and plan, and appreciate outcomes and consequences of actions. Deficits in executive functioning, memory, impulsivity and response to stress keep interventions emphasizing punishment or application of negative consequences from being effective in youth with FASD. Interventions that emphasize punishment often increase risk of behavioral escalation. Alternatively, positive behavior management calls attention to positive behaviors and as positive behaviors increase negative behaviors tend to decrease. This can greatly reduce opportunities for escalation which are so detrimental for youth in these settings. In my experience, this also reduces the rate of burn out for staff.

31. The lifelong challenges created by FASD can be ameliorated with proper treatment and a stable environment to include stable housing, individualized educational services, treatment for co-occurring conditions, and a long term future oriented plan which appropriately encompasses the brain based impairments which comprise the key areas impacting daily living skills. Most children and adolescents with FASD with the proper resources can learn to adapt to their needs and grow into adults who meet their full potential as demonstrated in above.

Further affiant sayeth not.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February \_\_\_\_, 2021

\_\_\_\_\_  
Dr. Larry Burd

Sworn to me and subscribed in my presence on February \_\_\_\_, 2021.

\_\_\_\_\_  
NOTARY PUBLIC

My commission expires:

Seal:

## Appendix 1

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## Appendix 2

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