# Treatment Options and Executive Function Differences for ID/ASD and Behavioral Health Comorbid Diagnoses.

**TPN.Health**

**New Orleans, Louisiana**

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**Tucson, AZ**

**September 27, 2023**

# Announcements, Disclosures and Paperwork

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# Disclaimer

- None of the techniques described in this webinar will work for all persons with autism spectrum disorder (ASD) and/or Intellectual Disability (ID) and/or Substance Use Disorder (SUD). Every person with these disorders is different.
- There are no absolutes.
- All treatments have negative side effects. Some more than others. The presenter will do his best to cover the most common ones.
- The theories described in this webinar do not have the same amount of empirical evidence supporting each one of them. The presenter will do his best to describe the pros and cons of each.
- If you are concerned about a treatment technique described in this webinar ask the presenter about it.

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- **Speaker Disclosure:**
- **Financial: Kevin Blake maintains a private practice. He is a stockholder in Johnson & Johnson, Inc. and Amgen, Inc. Dr. Blake receives a speaking honorarium from TPN.Health and royalties from PESI, Inc.**
- **Non-financial: Kevin Blake is a member of the Children and Adults with Attention Deficit Disorders (CHADD), International Dyslexia Association (Orton Oak), Learning Disabilities Association of America, and American Psychological Association.**

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# Intellectual Disability (ID) Vs. Autism Spectrum Disorder (ASD)

## Intellectual Disability (ID)

- Difficulties with reasoning, problem solving, comprehending ideas; Based on IQ and social adaptability
- Improves with Applied Behavioral Analysis (ABA)
- Face more discrimination in housing, employment and more social isolation than ASD

Polyak, A. et al. (July 22, 2015).

- 2 to 3% of Children have ID

Author (November 9, 2021).

## Autism Spectrum Disorder (ASD)

- Social difficulties, communication problems, and repetitive behaviors
- Improves with Applied Behavioral Analysis (ABA)
- 30% of those with ASD and minimal verbal ability considered ID

Polyak, A. et al. (July 22, 2015).

- 1 in 36 (2.8%) will have ASD

Author (April 4, 2023).

# Autism

# Dismal Five

**Difficulty with:**

- **social–emotional reciprocity**
- **nonverbal communication, & behaviors used in social interactions**
- **developing, maintaining, and understanding relationships**

**Difficulty with at least two of the following 4:**

- **odd patterns of movement or speech**
- **sameness of routines or rituals**
- **special, highly focused interests**
- **strong responses to sensations in the environment**

**Author (2022)**

# ASD and Genetics

- "Autism (Spectrum Disorder, sic) is known to be a genetic disorder, at least in part." (p. 2 of 3).

Schendel, D. et al. (October, 2012).

"It is now abundantly clear that ASD has a genetic component, with the best evidence suggesting moderate genetic heritability" (p. 41).

--Durand, M.V. (2014)

- There are 239 likely candidate genes for autism.

Issifove, I. et al. (October 13, 2015).

- Of the 200 + genes related to autism about 70 are directly related to brain development
- The remainder are related to,"…psychiatric disorders and peripheral comorbidities that include cancer, cardiovascular disease, renal disorders, respiratory disorders and metabolic disorders, demonstrating a broader impact of brain-associated genes in other developing organ systems. Some of these may be related to random errors of metabolism and/or mutations in mitochondrial DNA as well as unusual gut microbiomes that can negatively effect the brain.

Stevenson, J.A. et al. (October 20, 2015).

# Neuroanatomy of ASD

- Increased grey matter anterior temporal & dorsolateral prefrontal lobe.
- Decreased grey matter occipital and medial parietal areas.
- Significant reduction in size of cerebellum (fewer Purkinje cells).
- Overall Bain Size Larger.

Ecker, C., (February 8, 2012); Durand, M.V. (2014); Volkmar (2017).

- Large grey matter differences in the following:
  - cingulate, motor area, basal ganglia, amygdala, inferior parietal lobe, prefrontal lobe
- Reductions in white matter volume.
- These differences are linked to autistic symptoms and persist throughout life.
- Estimates are 38% of those with ASD have intellectual disabilities.

Durand, M.V. (2014).

- 41% have an IQ>85

Baio et al. (April 17, 2018).

# Autism & Genetics

- **40% to 70% of ASD population has significant GI problems**

**Buie, T., et al. (November 7, 2014); Al-Beltag, M. (May 9, 2021)**

- **About 7% of those with ASD have mitochondrial disease**

**Frye, R.E. et al. (May 1, 2012); Al-Beltag, M. (May 9, 2021)**

- **Heritability between 60 and 70%**
- **<10% of cases caused by Fragile X, Tuberous Sclerosis, etc.**

**Volkmar et al. (2017).**

- **50 to 70% of those with ASD will have comorbid AD/HD**

**Hours, C et al. (Febuary28, 2022)**

- **21% of those with AD/HD have comorbid ASD**

**Young, S. et al (2020).**

# ASD and Comorbidity

- **Epilepsy: Up to 46%; 22% develop after age 10; General Population 1.2%**

Volkmar et al. (2019). CDC (January 25, 2019).

- **Anxiety Disorders: 50 to 80%; 42%; General Population: 6-10%.**

Durand, M. (2014); Autism Speaks (2017).

**Obsessive Compulsive Disorder: 17.4% ; General Population: 1.2%**

Postorino eta al. (October 30, 2018); National Institute of Mental Health (a) (November 2017).

- **Depressive Disorders: 25-34%; 7 to 26%; General Population: 2-6%**

Durand, M. (2014); Autism Speaks (2017)

- **Bipolar Disorder: 6 to 27%; General Population: 4.4%**

Autism Speaks (2017);

**Schizophrenia: 1.5%; General Population: General Population: 0.25 to 0.64%**

Baio (March 28, 2014); National Institute of Mental Health (May, 2018).

- **Sleep Disorders: 50 to 80%; General Population: 19 to 30%**

Durand, M. (2014); Devnani et al. (October/November, 2015); Calhoun et al. (January, 2015); Al-Beltag, M. (May 9, 2021)

# Comorbidity & AD/HD

- **65 to 85 percent of adults with AD/HD suffer one or more Comorbidities.**
- **Depression, anxiety disorders, bipolar disorder, substance abuse disorders and personality disorders are the most common comorbidities diagnosed in adults with AD/HD.**

**Sobanski, E. (September, 2006).**

**Katzman, M.A., et al. (August 22, 2017).**

# ASD & AD/HD

- 26% of Children with PDD-NOS, or ASD have comorbid Combined Type AD/HD
- 33% of Children with PDD-NOS, or ASD have comorbid Inattentive AD/HD
- 59% of Children with PDD-NOS, or ASD have some type of AD/HD

Goldstein, S. et al. (2011).

- British population study of AD/HD+ASD adults
- The higher the inattention scores the more social and communication difficulties they had
- Conclusion: AD/HD and ASD may have "somewhat" common etiology

Panagiotidi, M., et al. (August 11, 2017)

# ASD & AD/HD

**“The majority of individuals with ASD have ADHD symptoms. A substantial minority of individuals with ADHD (15–25%) demonstrates ASD symptoms.”**

**Antshel, K.M. et al. (February 15, 2016)**

# Prevalence of Alcohol Use in Those with ASD Compared to "Neurotypicals"

- **"In each group, the prevalence of drinking was lower than in individuals without ASD, yet increasing continuously with age."**
- **It was found that those with ASD who had the highest risk of alcohol use were those with comorbid ADHD and/or Specific Learning Disorder.**

**Kaltenegger, H.C. et al. (February, 2021)**

# Neurobiologic Commonalities Between ASD and SUD

- Scientists from Taiwan stated, "…From the prospective of neurobiologic mechanisms, ASD and SUD share several common neural circuits and molecular signaling pathways."
- The results of a study they conducted indicated:
  - People with ASD are vulnerable to developing SUDs.
  - Particularly those whom do not receive psychotropic medications for their psychiatric disorders.
  - As well as those who had comorbid Behavioral Disorders, ADHD, and Tics.
  - ASD people with SUD have significantly higher risk of morbidity than ASD people without SUD, and non-ASD people.

Jing-Syuan, H. et al. (January 4, 2021)

# Prevalence of ASD = SUD and Treatment

**A Norwegian review of literature there is no consistent prevalence rate for Autism Spectrum Disorder (ASD) and Substance Use Disorder (SUD). Furthermore the authors saw no consistence on the efficacy of studied treatments. The best they could deduce from the literature was that about 14% of those with SUD had ASD, and 2% of those with ASD had SUD. They concluded both with ASD and comorbid SUD, "…require long-term treatment and involve multiple parts and levels of both specialized treatment facilities and support of primary health services." The authors continued that the combination of ASD and SUD represents a small population, and stated that the best treatment for SUD is group counseling, but those with ASD often have such severe social interaction difficulties they cannot participate in groups. Finally, they said screening for ASD and SUD needs to become common.**

**Arnevik, E.A. et al. (August 17, 2016).**

# Risk Factors for Those with ASD Having SUD

- **Risk Factors of SUD with ASD:**
  - **Limited social resources**
  - **Familial substance abuse**
  - **Comorbid mental/medical health issues**
  - **Average, or above IQ**
- **ASD + SUD probably is comorbid more than we know**
- **In Canada 21% of those with ASD have a lifetime risk of comorbid SUD**

**Ressel, M. et al. (2020)**

# Risk Factors for Those with ASD Having SUD

- **5 cognitive risk factors for SUD in those with ASD:**
  1. **Perceived social deficits**
  2. **High social motivation**
  3. **Psychological Distress**
  4. **Poor executive function**
  5. **Maladaptive coping strategies**

**Ressel, M. et al. (2020).**

- **There is some indication that those with higher impairment from ASD use and abuse substances more, but this is not diagnostic.**
- **Child abuse may also put them more at risk for SUD.**
- **There is no screening instrument for ASD + SUD.**

# Risk Factors for Those with ASD Having SUD

- **Risky symptoms of ASD for having comorbid SUD:**
  - **Rigidity**
  - **Perseveration**
  - **Communication Problems**
  - **Comfort seeking**

**McKowen et al. (April 1, 2023)**

# Age of Onset: ASD Vs. Neurotypicals

- Age of onset of those with ASD of comorbid SUD was significantly older that those with ADHD, and controls (21.7 years on average).

Yule, A.M. et al. (August 7, 2021)

- Those with ADHD tended to show SUD earlier than Neurotypicals (16.24 years to 17.29 years).
- Those with ADHD tend to use street drugs significantly earlier than their neuortypical peers (ADHD = 16.02 years; Neurotypicals = 17.12 years).
- Those males with ADHD started using tobacco much earlier than neurotypicals (ADHD males = 14.62 years; Neurotypical males = 17.32 years).

Wilens, T.E. et al. (April 22, 2011)

# Age of Onset: Neurotypicals with SUD

- In people 18 to 30 it has been found that those whom had been admitted for Substance Use Disorder 74% of them began to use before the age of 17.
- 10.2% began before the age of 11.
- The scientists concluded the earlier the initiation the more psychiatric comorbidities and severe the psychopathology.
- 50% of Adolescents said they initiated alcohol use by age 16.9 years.

**Author (July 17, 2014)**

# ASD + ADHD = SUD?

- American Scholars assessed 230 adults controls, 219 adults with ADHD, and 230 adults with ASD for risk of SUD.
- They found 69% of those with ASD had a lifetime prevalence of comorbid ADHD
- Those with ASD and comorbid ADHD had significantly higher rates of psychopathology than those ASD individuals without comorbid ADHD, and the controls.
- Those with ASD only were at significantly lower risk of developing SUD than those with ASD and ADHD, and controls.

**Yule, A.M. et al. (August 7, 2021)**

# ASD + ADHD + Disruptive Behavior Disorder = SUD?

- **28% of those with Autism Spectrum Disorder (ASD) meet criteria for ADHD**
- **20% in addition to the above meet criteria of other disorders**
- **13% have disruptive behavior disorder**
- **1 to 36% have Substance Abuse Disorder**

**McKowen et al. (April 1, 2023)**

# Protective Factors of Those with ASD From Developing SUD

- ASD protective factors from SUD:
  - "Can't Break the rules and routines" limit experimentation
  - Social isolation and lack of independent living
  - Limited access to substances
  - Low sensation seeking
  - Comorbid diagnosis of ASD and Intellectual Disability (ID)
- Rates of substance use in the US:
  - Neurotypical:
    - Tobacco: 31%
    - Alcohol Abuse: 11%
  - ASD:
    - Tobacco: 5.2%
    - Alcohol Abuse: 0.9%

Ressel, M. et al. (2020)

# Need to Screen for Undiagnosed ASD in Adult Outpatient Populations

**"The results suggest that ASD should be ruled out as an 'underlying' disorder in adult psychiatric patients, possibly by collecting a developmental history. Furthermore, there is a need for careful clinical assessment of co-occurring psychiatric disorders in autistic adults within adult psychiatric care services. It is possible that treatment of comorbid psychiatric disorders is the most important way of increasing the functional level in autistic adult psychiatric out-patients. The similarities between autistic and non-autistic adult psychiatric out-patients seem to outweigh the differences, although clear differences exist in clinically assessed symptoms of ASD. This calls for a raised awareness of ASD and increased competency regarding ASD in adult psychiatric services."**

**Nyrenius, J. et al. (2023)**

# Intellectual Disability

# Neuroanatomy of Intellectual Disability

## Down Syndrome (Tricomy-21)

**"Numerous post-mortem and morphometric neuroimaging investigations of individuals with DS have reported complex changes in regional brain volumes, most notably in the hippocampal formation, temporal lobe, frontal lobe, parietal lobe, and cerebellum. Moreover, neuropsychological assessments have revealed deficits in language development, emotional regulation, and memory that reflect these structural changes and are more severe than expected from general cognitive dysfunction."**

**Hamadelseed, O. et al (August 3, 2023)**

## Williams Syndrome

**"WS is a multi-systemic disorder caused by hemi-deletion of roughly 27 genes on chromosome 7, resulting in cardiovascular morbidities, intellectual impairment, and hypersociability. Besides a decrease of about 11% in brain size, patients with WS have aberrant regionalization of cortical surfaces as assessed with brain MRI, particularly in superior parietal regions and the orbitofrontal cortex[1]. Animal models have suggested *GTF2IRD1*, a gene-encoded general transcription factor, as one of the most promising candidate genes for neuroanatomical differences in WS. Genetic perturbations on *GTF2IRD1* have recently been associated with dog friendliness toward humans.**

**Chieh Fan, C. et al. (June 8, 2018)**

# Comorbidity and Intellectual Disability

**Mazza and colleagues in 2019 found after conducting a literature review that 33.6% of those with Intellectual Disability meet criteria for a comorbid psychiatric disorder, but which specific disorder is highly individual patient specific.**

**Mazza, M. et al. (August 20, 2019)**

# Prevalence of Depression & Anxiety in Those with ID

- **Dutch research recently found that 13.7% of those with Intellectual Disability meet criteria for depression. The research literature indicates it could be from 0% to 39%.**

**Scheirs, J.G.M. et al. (February 3, 2022)**

- **Recent research indicated that the rate of people with Intellectual Disabilities who meet criteria for anxiety is 3 to 22%. The Swiss investigator who found this out suggested that anxiety should always be screened for in those with ID.**

**Hofmann, V. (June 23, 2023)**

# Intellectual Disability, Depression and Anxiety

**Scholars from the Netherlands found adults with Intellectual Disability and Epilepsy had a high level of depression (21.7%). However, they found their Depression was not related to their Epilepsy. What they found is that there was a connection in those who have Intellectual Disability and Epilepsy as well as Anxiety, of which 12.7% of the subjects were found to experience. The scientist concluded the Quality of Life those with Intellectual Disability was significantly worse in those with Epilepsy and multiple seizure disorders.**

**Snoeijen-Schouwemaars, F.M. (February 28, 2019)**

# Severe and Profound ID and Depression

- **Those with Severe-Profound Intellectual Disability (ID) are less likely to be diagnosed with depression because of their difficulty communicating what they experience emotionally internally.**
- **Common signs of Depression in those with Severe-Profound ID:**
  - **Anhedonia, Crying/Tearfulness, Psychomotor agitation, Reduced Appetite, Irritability, Sleep Problems**

**Eaton, C. et al. (January 11, 2021).**

# ID + ADHD?

**"Our results, together with other findings, suggest that excluding children with ADHD from services and interventions on the basis of the presence of mild ID is clinically unwarranted, given that children with ADHD and ID do not seem to differ from those without ID in terms of ADHD subtype and number of ADHD symptoms. They are more likely to have CD, however. It also appears that they differ from children with ID alone, suggesting that ID does not drive the link to conduct problems."**

**Ahuja, A et al. (September 2013)**

# ID and Substance Use Disorder

- **Alcohol use in those with Intellectual Disabilities can go undetected and assessment instruments need to be adapted for their population.**
- **Intellectual Disability Services and Substance Addiction Services should work hand in hand.**
- **People with Intellectual Disabilities are a heterogeneous group and need services geared to the individual.**

**Williams, F. et al. (May 30, 2018).**

# ID + SUD Prevalence and Drugs of Choice

- **A Spanish study (Salavert, J. et al. [July 1, 2018]) investigated those with mild, moderate and severe Intellectual Disability whom were psychiatrically hospitalized found that 1/3 of them met criteria for SUD.**
- **The drugs of abuse were in order of preference:**
  1. **Cannabis 25%**
  2. **Alcohol 22.7%**
  3. **Cocaine 13.6%**
- **The most common combination of drugs used was Cannabis and Alcohol by mostly the mildly ID impaired.**
- **The scientists concluded SUD is prevalent in those with ID and comorbid mental health disorder.**

**Salavert, J. et al. (July 1, 2018)**

# ID + SUD Prevalence and Drugs of Choice

- **Scientists from the Netherlands [Didden, R. et al. (March, 2020)] found that those with mild and borderline Intellectual Disability frequently use tobacco, alcohol and street drugs, particularly in forensic settings.**
- **They also concluded "addiction professionals" often know little about Intellectual Disability.**

**Didden, R. et al. (March, 2020)**

# Borderline Intellectual Disability and Comorbid SUD

- **Prevalence of Those with Borderline Intellectual Disability (IQ: 70 to 85) and comorbid Substance Use Disorder (SUD) is 30%.**

**Braatveit, K.J. et al. (May 4, 2018).**

# Past History & History of Diagnosis

- **It is not uncommon to be first diagnosed with Intellectual Disability and later to be found to be Autistic (ASD) with/without Intellectual Disability (ID)**
- **They may appear to be ID, but later be found to be blind, deaf, etc. After that is addressed they improve exponentially.**
- **In the 1980's 69% of those with ASD were also considered ID.**
- **In 2014 30% of those with ASD were also considered ID.**
- **Most genes identified as autism genes also cause intellectual disability.**

**Sohn, E. et al. (April 15, 2020).**

# ASD + ID and SUD

- Those with ASD and Intellectual Disabilities (ID) are less likely to be in SUD treatment if they are not externalizers.
- Those with later diagnosis of ASD are more at risk of SUD because they have fewer resources to draw on.
- Those with a lack of structure and organization will use drugs to fill the time.

- Executive Function difficulties in ASD:
  - Weak set-shifting, focused attention, cognitive flexibility, and working memory
  - This may put them at risk for Tobacco and caffeine use to improve cognitive function.

Ressel, M. et al. (2020)

# Substance Use in Those with ASD and/or ID

- **Substance Use Disorder increases 1 to 2.2% every year in those with ASD.**
- **The increase in Substance Use Disorder is significantly faster in those with ASD Only and ID Only.**
- **Most commonly those with ID Only abuse alcohol (57%)**
- **Cannabis is the most commonly abuse substance in those with Only ASD (41%).**
- **The highest risk of Substance Use Disorder from the two groups (ASD and ID) is when comorbid psychiatric disorders are present, especially depression. This is particularly true in those with ASD + ID.**
- **It should be noted that SUD can negatively affect medical conditions, like cardiac disease which is frequently seen in ID and/or ASD. Hence, it must be screened for.**

**Roux, A.M. et al (June 13, 2022)**

# Themes & Needs of Those with ID + SUD Vs. Neurotypicals +SUD

- General themes of alcohol and tobacco use in those with Intellectual Disability (ID) tend to follow those of neurotypicals.
  - Being like others
  - Social and emotional influences
  - Misunderstandings and learning from experiences
  - Choices and challenges
- Those with ID have health promotion needs that are far more complex than their neurotypical peers.
  - They have lower abilities of thinking about the consequences of their actions
  - They have lower levels of self-efficacy.

Kerr, S. et al. (March 21, 2016).

# Executive Dysfunction

# Depression and Executive Function

**"In conclusion, although awaiting replication, the present study suggests that reduced executive functioning and depression symptoms is primarily linked through fatigue... Patients who report fatigue are likely experiencing more problems with executive functioning."**

- **The scientists who reported these results stated treatments that focus on treating fatigue and/or those that improve executive functioning may strengthen executive functioning in those with depression.**

**Kraft, B. et al. (June, 2023)**

# Depression and Anxiety's Affect ion Executive Function

- **"Depression and anxious arousal demonstrated broad deficits in EF, whereas anxious apprehension was associated with deficits in shifting."**

**Warren, S.L. et al. (Jan 15, 2021)**

# How Can SUD Negatively Affect Executive Functions?

- **A study conducted by Mexican scientists examining the how executive function can be negatively affected by Substance Use Disorder (SUD) found those with SUD have significant deficits in Working Memory, Cognitive Flexibility, Daily Executive Functioning, and difficulty with emotional and behavioral regulation.**
- **In addition they found if someone had deficits inhibition neuropsychologically they are more at risk of use and abuse (ADHD).**
- **This is probably due to differences in the dopaminergic system, prefrontal cortex, anterior cingulate, and basal ganglia…**

**Inozemtseva, O. et al. (August 3, 2019)**

# How Can Cannabis, Alcohol, or Inhalants Effect Executive Function

- **Egyptian scientists recently concluded:**

**"Cannabis had the greatest impact on early conceptualization and problem-solving skills, where as alcohol and inhalants mostly impair flexibility and sustained attention." They continued that poly substance use impairs the majority of executive functions.**

**Abdulaal, A. et al. (February 13, 2023)**

# Executive Function Difficulties with SUD

- Research out of the Netherlands (Duijkers, J.C.L.M. et al. [June 28, 2016]) found that, "…Executive (dys-) function is currently even seen as a shared underlying key component of most mental disorders."
- The scientists stated the most common finding with dual diagnosis (SUD with another mental health disorder) and executive function is weakness in set shifting and inhibitory control.
- They concluded that substance use caused significant emotional turbulence and sensory sensitivity that contributed to the executive function difficulties.

Duikers, J.C.L.M. et al. (June 28, 2016)

# ASD and Executive Function

**Neuropsychological testing and fMRI imagery demonstrated middle-aged adults with Autism Spectrum Disorder have lifelong decreased function in the cortico-striatal-thalamic network and smaller hippocampal volumes. This can effect flexible thinking as well as cognition, attentional control, motivation, motor control and environmental stimulus salience.**

**Blair Braden, B. et al. (September 21, 2017)**

# ASD and Executive Function

- **There appears to be a broad range of Executive Function difficulties in those with Autism Spectrum Disorder.**
- **Individual executive dysfunction difficulties appear to remain the same throughout the life span for individuals on the spectrum.**
- **There does not appear to be one type of Executive Dysfunction unique to ASD.**

**Demetriou, E.A. et al. (April 25, 2017)**

# ASD and Executive Function

- **Executive Function difficulties in ASD:**
  - **Weak set-shifting, focused attention, cognitive flexibility, and working memory**

**Ressel, M. et al. (2020)**

# Intellectual Disability and Executive Function

- Executive Dysfunction in those with Intellectual Disability is heterogeneous and not one size fits all.
- For example:
- Those with Down Syndrome/Trisomy 21 often have the following Executive Function difficulties:
  - Problems shifting, with verbal memory, and verbal inhibition
- Those with Williams Syndrome (WBSCR on chromosome 7q11.23.)* have Poor Planning Abilities.
- Those with both have Executive Deficits in:
  - Attention, visual categorization, working memory
- However, Executive Function is not well studied in Intellectual Disability.

Costanzo, F. et al. (may 2013)

Morris, C.A. (April 13, 2023)*

# Intellectual Disabilities and Executive Functions

- **People with Intellectual Disability perform significantly worse on Executive Functions than age matched neurotypical controls.**
- **The population of people with Intellectual Disabilities have a lot of heterogeneous executive function difficulties that present different symptoms depending on the specific syndrome they have.**

**Spaniol, M. et al. (September 9, 2021)**

# What is Executive Function (EF)?

# Phineas Gage

- Vermont, 1848 was 25 year old railroad working tamping gun powder in a drilled hole in rock excavation.
- Explosion forced 3 foot iron rod through his left cheek and out the top of his skull.
- Lost his left eye, but not consciousness; no focal neurological deficits; left facial weakness.
- Massive personality change:
  - Prior to accident was, "the most efficient and capable foreman"
  - After accident was childish, obstinate, could not control his desires, his friends did not consider him to be Phineas Gage.
  - He had problems with short-term memory, motor attention and inhibitory control.

O'Driscoll, K., and Leach, J.P. (December 19, 1998)

**Damage to right & left prefrontal lobes = Problems with rational decisions and processing emotion.**

Damasio, H., et al. (August 26, 1994)

# Executive Function Defined

**Denckla defined executive functions as, "…the proactive elements of interference control, effortful and flexible organization, and strategic planning—that is, anticipatory, goal-oriented 'preparedness to act.' Executive function also may be construed to include working memory…, highlighting as it does the elements of delay between stimulus and response or maintenance of internal representations to guide actions" (p. 117-118).**

**Denckla, M.B. (1994).**

# When You Have to Use EF

- **Activities that involve planning or decision making.**
- **Those that involve error correction or troubleshooting.**
- **Situations when responses are not well rehearsed or contain novel sequences of actions.**
- **Dangerous or technically difficult situations.**
- **Situations that require the overcoming of a strong habitual response or resisting temptation.**

**Goldstein, S. (November 9, 2017).**

# Executive Function Defined

**“Executive functioning is a higher level psychological process responsible for cuing, directing and coordinating multiple aspects of perception, cognition, emotion, and behavior during purposeful, goal directed, problem solving behavior” (p. 29).**

**Dehn, M.J. (2014)**

# Naglieri & Goldstein's Definition of Executive Function

**"Executive Function is how efficiently you decide what to do."**

**Goldstein, S. (November 9, 2017)**

# Steps of “Executive Function”

- 1. Set goal
- 2. Gather info
- 3. Rate routes
- 4. Select route
- 5. Monitor
- 6. Change route
- 7. Solution

**Naglieri, J.A. et al. (2014)**

# Theories of Executive Function

# Baddeley's Executive Function Theory

**"The term working memory refers to a brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language comprehension, learning, and reasoning. This definition has evolved from the concept of a unitary short-term memory system. Working memory has been found to require the simultaneous storage and processing of information. It can be divided into the following three subcomponents…" (p. 556).**

# Baddeley's Executive Function Theory

- **Central Executive**: **"The central executive, which is assumed to be an attentional-controlling system, is important in skills such as chess playing and is particularly susceptible to the effects of Alzheimer's disease; and two slave systems, namely…" (p. 556).**

# Baddeley's Executive Function Theory (Continued)

- **Phonological Loop: "The phonological loop, which stores and rehearses speech-based information and is necessary for the acquisition of both native and second-language vocabulary" (p. 556).**

- **Visual-Spatial Sketchpad: "…which manipulates visual images" (p. 556).**

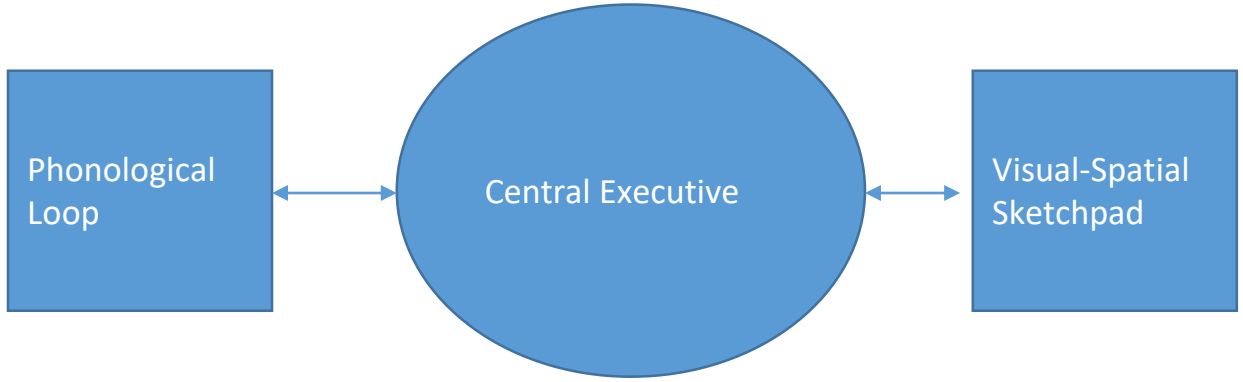
**Baddeley, A. (January 31, 1992)**

# Baddeley's Executive Function Theory (Contued)

**These systems, "…allow humans to comprehend and mentally represent their immediate environment, to retain information about their immediate past, to support the acquisition of new knowledge, to solve problems, and to formulate, relate, and act on current goals"(p. 28).**

**Baddeley, A. (January 31, 1992)**

# Baddeley's Executive Function Theory (Cont'd)




**Baddeley, A. (January 31, 1992).**

# Summary of Barkley's Theory of "Executive Function"

**Step 1: *Response Delay***

**Step 2: *Prolongation***

**Step 3: *Rule Governed Behavior***

**Step 4: *Dismemberment of the Environment***

**Barkley, R.A. (1997)**

**Barkley, R.A. (2008)**

# Brain Areas Involved in EF

- Prefrontal Cortex
- Basal Ganglia
- Amygdala
- Limbic System
- Cerebellum

Barkley, R.A. (2012)

- Prefrontal, subcortical and brain stem
  - Dorsolateral Prefrontal Cortex – Integrates behavior and cognition
  - Anterior cingulate cortex -- emotional drives decision making and inhibition
  - Orbital prefrontal cortex-maintenance of set, monitor of behavior for appropriateness

Goldstein, S. (November 9, 2017)

# Negative Influences On Executive Function

# Negative Influences of Executive Function

- **"People with ADHD, depression, learning disabilities, and autism often have difficulties with executive function. Alzheimer's disease or brain damage (for example from concussion or stroke) can also affect executive function. Some research has found an association between OCD and problems with executive function.**
- **People with no executive function impairment can experience temporary problems. For example, being overly stressed, sad, or sleep-deprived can hinder a person's executive function ability".***

**American Psychiatric Association (January 19, 2017)*; Diamond (September, 27, 2012)**

# Diamond's Literature Review of EF

- Good EF in childhood-Typically will have it through life
- EF can be taught throughout life and practice can improve it
- Predicts: achievement, quality of life, physical and financial health
- Fluid Intelligence (decision making/problem solving) can be taught and practice can improve it.
- Interference Control (selective attention/inhibition) may be the part of EF that protects what is in working memory
- Sleepiness, loneliness, and lack of fitness can hurt executive function

Diamond, A. (September 27, 2012)

# Interventions for Executive Dysfunction

# Teaching Executive Function

**Goldstein (2017) states, “Children can be taught to be more strategic.” Or, more efficient with executive function. He went on to say this is also true throughout the lifespan.**

**Goldstein, S. (November 9, 2017)**

# Interventions for Executive Functions

- **Teach Self-Monitoring and Self-Talk**
- **COGMED**
- **Teach Metacognitive Strategies, Planning and Decision Making**
- **Teach Multisensory Memory**
- **Associate things to remember with familiar place-Loci**

**Dehn, M.J. (2014)**

# Coaching and Executive Functioning

- **Coaching can work to relieve executive function difficulties in adolescents.**
- **Coaching is more directive than counseling/talk therapy.**

**Goldstein, S. (November 9, 2017)**

# Helping with Executive Function Difficulties

- **Cognitive Behavioral Therapy (CBT): “Stop, Look, Listen”**
- **Must teach at the point of performance.**
- **“A strategy is a procedure that a learner uses to perform a task.”**
- **It is thinking, “how do I accomplish what I want to do.”**
- **Practice, practice, practice…until it is automatic**
- **Teach “Metacognition”, Thinking about thinking”, this works with everyone.**

**Goldstein, S. (November 9, 2017)**

# Interventions for Executive Dysfunction

- **Guiding Principals:**
  - Automatize new behaviors-habits
  - Self-Awareness-strengths & weaknesses
  - Teach goal setting, planning and review
- **Organization & Planning:**
  - One master schedule (or, 1 @ home, 1 @ work/school) (paper/digital)
  - Keep all notes in one place
- **Clutter Control:**
  - Everything has a “home”
  - Rules for how long you keep things
  - “Touch it once”
  - Schedule organization times
- **Financial Organization:**
  - ID problem areas
  - Set short, mid, and long-term $ goals
  - Learn where $ is going and keep track of it

# Interventions for Executive Dysfunction

- Automatic payments, etc.
- Make “habit”

- **Time Management:**
  - Learn how long you can work without distraction
  - Set goal of time you will work without distraction
  - Identify distractors in work environment & get rid of them

- **Getting Projects Done:**
  - **Set goal;**
    - Use S.M.A.R.T. (Specific, Measurable, Attainable, Relevant & Timely) create “to do list”, to understand task and required outcome.
  - **Process:**
    - Write down all steps
    - Determine realistic amount of time needed for each step
    - Set priorities and schedule time for each step
    - Start working plan and monitor progress

# Interventions for Executive Dysfunction

- **Healthy Living:**
  - **Good sleep every night**
  - **Good diet; no excesses**
  - **Weekly exercise plan-possibly develop with physician's help**
  - **Allow for rest and relaxation-learn relaxation technique (automatize)**
  - **Monitor mood; if bad 2 weeks get help**

- **Adaptive Thinking:**
  - **Monitor & chart negative and positive self-talk**
  - **Learn to counter negative self-talk with positive**
  - **Practice relaxation technique**
  - **Automatize**

**Jennings, A., and Nguyen, C. (September 5, 2014)**

# Treatment of ASD and/or ID with SUD

# Personal Insight

- **It often takes a large city with a well respected University Medical Center that has a clinic that specializes in neurodevelopmental disabilities to fully assess and treat a person with ASD and/or ID.**

# Remember

- **Applied Behavioral Analysis (ABA) has been shown to be an efficacious treatment modality for those with ASD and/or ID.**

**Author (November 9, 2021)**

**Polyak, A. et al. (July 22, 2015)**

# Substance Abuse Mental Health Services Administration (SAMSHA) Advisory For Those with Cognitive Disabilities

**In group settings:**

**"Minimize noise and visual distractions.**

- **When permissible and appropriate, supplement the client's report with input from family members or caregivers (with the client's consent) on the client's strengths and preferred learning style.**
- **Go over group rules, including confidentiality, at each session.**
- **Sum up the previous session.**

**Author (SAMHSA) (2019)**

- **Repeat important questions and points.**
- **If needed, give the individual(s) with a cognitive disability a short break.**
- **Convey key ideas visually.**
- **Incorporate role-playing and skills practice (e.g., refusal skills, deep diaphragmatic breathing).**
- **After sessions, see whether clients with cognitive disabilities understood key points by asking them, one on one, questions that cannot be answered simply 'yes' or 'no.'"**

# SAMHSA Recommendations for People with Cognitive Disabilities in Individual Counseling for Substance Abuse:

- **"Emphasize concrete action steps and healthy routines instead of abstract concepts.**
- **Consider having more frequent but shorter sessions.**
- **Minimize distractions, repeat important information, take a short break when needed, convey key ideas visually, use role-playing, get family and caregiver input when permissible and appropriate (with client consent), incorporate skills practice, and check for understanding."**

**Author (SAMHSA) (2019)**

# Other SAMHSA Suggestions

- "Ask simple questions and repeat them if necessary.
- Teach refusal skills.
- Avoid generalizing, i.e. explain that the same refusal skills that are used at a party can also be used at a bar.
- Have the individual repeat back a concept to make sure they understand.
- Utilize role-playing.
- Having the individual focus on specific goals, i.e. not cashing their SSI check at a liquor store.
- Address trauma in psychotherapy if it is an issue.
- Medication Assisted Treatment.
- Modify Alcoholics Anonymous (AA) groups."

Bhatt, N.V. et al. (June 17, 2021)

# Community Reinforcement and Family Training (CRAFT) for Treating SUD

**In 1998 Meyers and colleagues reported on the results of a treatment program for SUD called Community Reinforcement and Family Training or CRAFT. The technique targeted the significant others (parents, siblings, friends, etc.) of the person with Substance Use Disorder in addition to the patient. It included contingency management training as well as…**

**…training in communication skills and how to plan activities that would compete with substance use behavior in such a way that family and friends could improve their relationships with the patient. The goal was to was to reduce the patient's substance use and to increase their self-care.**

**Meyers, R.J et al. (1998)**

# Community Reinforcement and Family Training (CRAFT) for Treating SUD

**Subsequently in 2020 Yamamoto and colleagues published a study where they adapted CRAFT methodology to be used with those with ASD. Although, their research did not specifically involve comorbid SUD, they found CRAFT was useful in addressing the needs of those with ASD.**

**McKowen and colleagues (April 1, 2023) reviewed the Yamamoto (2020) group and Meyers (1998) group's results and concluded CRAFT may be an effective way to treat ASD with comorbid SUD.**

**Yamamoto, A. et al. (2020)**

**Meyers, R.J et al. (1998)**

**McKowen et al. (April 1, 2023)**

# Cognitive Behavior Therapy (CBT) as ASD + SUD Treatment

**A recent study from the Netherlands indicated that an adaptation of Cognitive Behavior Therapy (CBT) can have a positive outcome. A group treated with CBT had significantly less alcohol craving and use than controls at 3 month follow-up. Those in the treatment group said they felt they had more control over their lives as well as less depression and anxiety. The researchers found if those in the treatment group were provided with a "buddy" that could help them with behavior generalization and act as a coach it could help with treatment. The scientists also taught the treatment group mindfulness techniques to reduce rumination. Finally, the researchers found that cannabis use in the treatment group remained the same. The treatment group subjects found it helped reduce rumination. Additionally, the researchers found those in the treatment group used alcohol to be better able to participate in social situations.**

**Walhout, S.J.N. et al. (April 17, 2022)**

# Important Issues in Treating ASD + SUD

**A multidisciplinary task force from Harvard reviewed the literature and proposed a treatment approach for those with ASD and Comorbid SUD and they concluded it came down to the following:**

**"Thus, when treating patients with this comorbidity (ASD + SUD; Sic.), practitioners should consider the following: communication difficulties, diminished capacity for motivation and insight, limited social interactions, and obstacles to treatment engagement."***

**Isenberg, B.M. et al. (December, 2019) ***

**McKowen et al. (April 1, 2023)**

# Therapy Techniques That Work with ASD and/or SUD

- **Cognitive Behavioral Therapy (CBT):**
  - **Works well in neurotypical SUD populations in group and individual settings.**
  - **Works with ASD individuals with anxiety and emotional dysregulation**

**McKowen et al. (April 1, 2023)**

- **Dialectical Behavioral Modification (DBT):**
  - **Teaches how to cope with and change intense emotions, and unhealthy emotions.**
  - **Has been shown both to work with SUD and adapted to work with ASD for distress intolerance, interpersonal effectiveness, mindfulness, and emotional regulation.**
  - **Has not been found to work with combination of ASD and SUD.**

# Treatment Approach for ASD + SUD

**“A team of clinicians developed an integrated behavioral protocol addressing substance use in youth with autism spectrum disorder. The multidisciplinary team developed 12 youth, 7 parent, and 3 joint modules based on established evidence-based therapies shown to have effectiveness separately addressing autism spectrum and substance use. Two cases are discussed to illuminate this integrated intervention. Adaptations to the protocol were made during feedback from patients and their parents. Further research is needed to determine the effectiveness of this preliminary protocol.”**

**McKowen, J. et al. (April 1, 2023)**

# Treatment Approach for ASD + SUD

- "This report describes the development of an integrated, non- proprietary, flexible manualized behavioral therapy derived from empirically based therapies previously shown separately to evidence improvement in ASD and SUD but integrated here to address both."
- Cognitive Behavioral Therapy (CBT) has been found empirically as efficacious for both ASD and SUD separately.
- Clinicians worked together to combine the following treatment modalities to treat those with ASD and comorbid SUD:
  - Cognitive Behavioral Therapy (CBT) to address anxiety and emotional dysregulation.
  - Adolescent Community Reinforcement Approach (A-CRA) for lowering self-harm
  - Social Skills Training (SST) to improve social skills, social problem solving, self-monitoring, and possibly lower SUD.
  - Dialectical Behavioral Therapy (DBT), to help dealing with intense motions and reduce SUD
  - Community Reinforcement and Family Training (CRAFT; for the parent protocol specifically)

McKowen, J. et al. (April 1, 2023)

# Treatment Approach for ASD + SUD

- **50 minutes a week**
- **Need to be highly flexible and not follow Manual word for word. The Manual is a guideline.**

**McKowen, J. et al. (April 1, 2023)**

# Treatment Program for ID + SUD

- **A program called "Take it Personal!+" was use with success by scientist in the Netherlands and Arizona to treat SUD in those with Mild ID and Borderline ID.**
- **They used Motivational Interviewing Therapy (MIT) and Cognitive Behavioral Therapy (CBT). These were adapted to the abilities of those with ID.**
- **Individually provided therapy provided by therapist trained in MIT, CBT and working with people with ID.**
- **The results were promising.**

**Gosens, L.C.F. et al. (June 19, 2020)**

# Summary

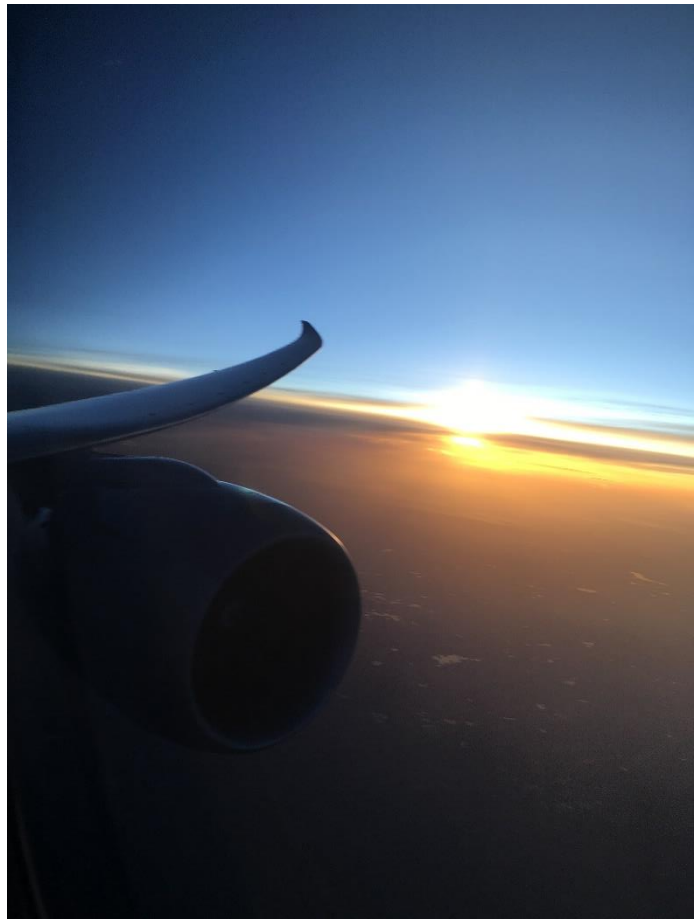
# Summary

- ASD and ID can be comorbid, but not always.
- Both ASD and ID can be comorbid with Depression and/or Anxiety.
- Both ASD and/or ID can be comorbid with SUD
- "If you have seen one person with Autism, you have seen one person with Autism."
- Depending on the "syndrome", etc. ID difficulties can be very different.
- Both ASD and/or ID can be Comorbid with ADHD and Behavior Disorders which can raise the risk of SUD.
- Depression, Anxiety, and SUD can cause unique executive dysfunction difficulties.
- Those with ASD and/or ID have a heterogeneous list of executive dysfunctions.
- There are ways to treat executive dysfunction.

# Summary (Continued)

- **We don't not know a lot about those with ASD and/or ID with comorbid SUD.**
- **There are some programs that show promise in treating those with ASD and/or ID with comorbid SUD, but much more research is needed.**
- **It often take a city with a university medical center to diagnose and treat a person with ASD and/or ID.**
- **There has been not much research done on this entire topic. There is a great need for more.**

# Thank You!



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