

Adolescent SUD: Etiology & Risk Factors

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Etiologic Factors

Adolescence common issues

- *(Biologic & developmental)*

Stage & gateway theory

Substance characteristics

Biology & genetic susceptibility

Family factors

Social factors

Medical factors

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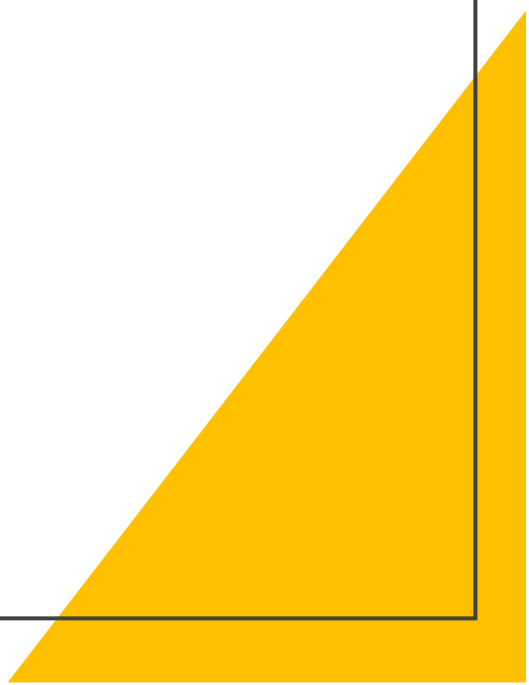
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Adolescence common issues (*Biologic & developmental*)

- In adolescence there is **an imbalance** between:
 - Subcortical “**bottom-up**” systems
 - “**Top-down**” cognitive control regions
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- A large yellow triangle is positioned in the bottom right corner of the slide, pointing towards the top right.



Subcortical “bottom-up” system



Primitive & earlier developing parts of the brain



Express **reactivity** to **motivational stimuli**




“Top-down” cognitive control regions



Develop **later**



Includes **executive functions**

- 
- Development of the **subcortical** regions is **curvilinear**
 - (**Peaks** in **13-17 y**)
 - Development of **top-down** cortical regions (*prefrontal regions*) have **linear pattern**
 - **Imbalance** between these developing systems:
 - **Vulnerability** to **incentive reward-based** modulation
 - Increased **susceptibility** to **motivational** properties of substances
 - Vulnerable to **drug sensitization**
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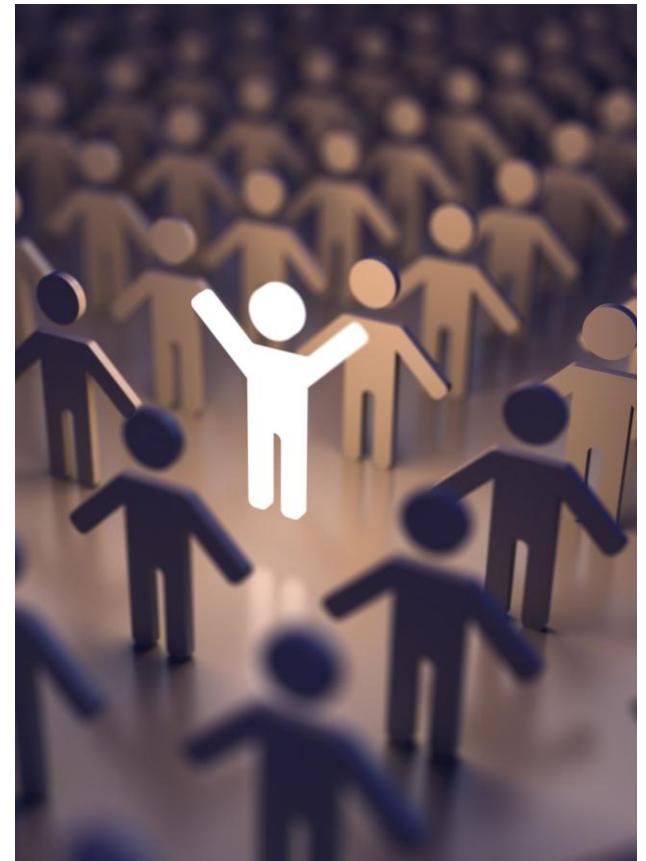
Developmental Factors:

- Adolescence is a period of **experimentation & risk taking**.
- **Stress** from the change in **roles/expectations** at school/home
- Using drugs to “**escape**” & relieve **anxiety & unhappiness**.
- Needs to **identify with peers** to avoid rejection



Peers

- Individuals **select** peer groups, **influence** them and are **influenced** by them
- ✓ High youth **orientation** to peers
- ✓ **Peer** substance use
- ✓ Affiliation with **socially deviant** peers
- ✓ Affiliation with **older** peers



Peer substance use

- One of the **hallmarks** of the development of adolescent SUDs
- Adolescent **drug users select drug-using** friends
- SUD is a **behavioral deviance**
- Affiliation with **socially deviant** peers
- Often associated with other forms of **deviance**



Affiliation with older peers

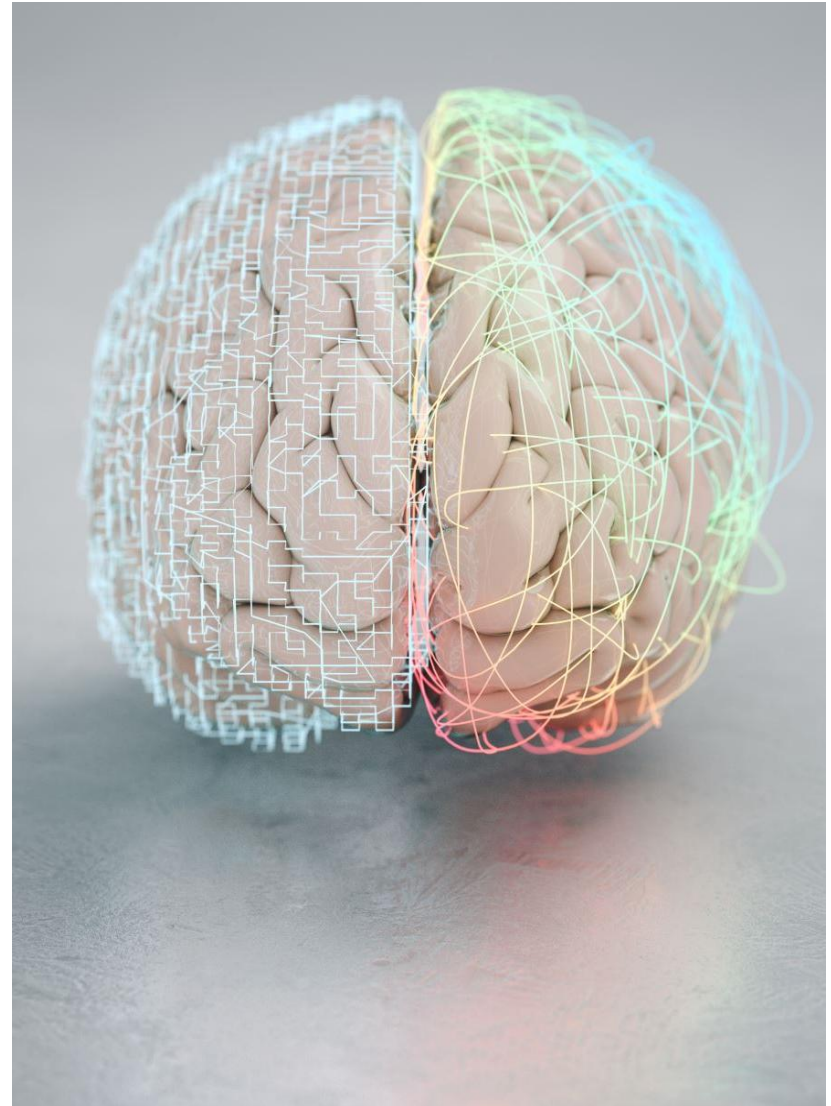
- May be hazardous
 - Premature exposure to risky situations
 - eg; drugs, sex, automobile travel, social settings without adult supervision.
-

Early Onset of Use

- **A strong predictor for SUDs over the lifetime**
- **It is unknown:**
 - Whether it is **a marker** for other risk factors predict SUD
 - Whether it has **a causal effect**
- Adolescent brain is **vulnerable** to drug **sensitization**
- SUD interferes normal adolescent **developmental** tasks

Brain Mechanisms

- **Repeated exposure** to substances
- Leads to **neural adaptations**
- Altering the “**hedonic tone**”
- So that it become **lower** over time
- Resulting in **dysphoria & craving** when not using
- Driving the **substance dependence cycle**



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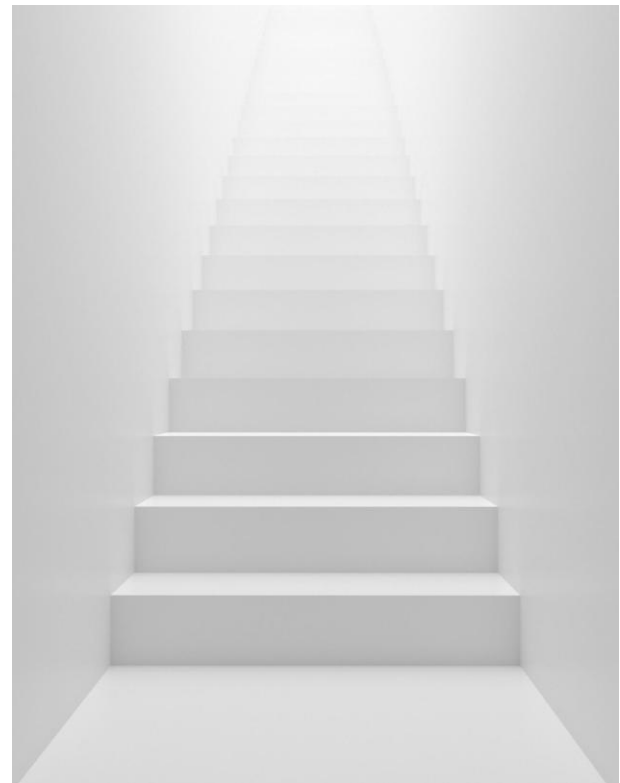
Family factors

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Stage & the “Gateway” Theory

- **Lower-order** substances (which are more commonly used) **precede** the use of **higher-order** substances.
- A **licit** substance, such as **cigarettes** is used **first** in a sequence followed by **illicit** substances.
- Progressively **fewer** adolescents **advance** to later & more serious levels of substance use
- Whether consumption begins with **a legal or illegal** drug, risk for & rate of progression to SUD is **the same**



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- Availability
- Not expensive
- Easy use
- Rapid effect
- Subjective pleasurable effect



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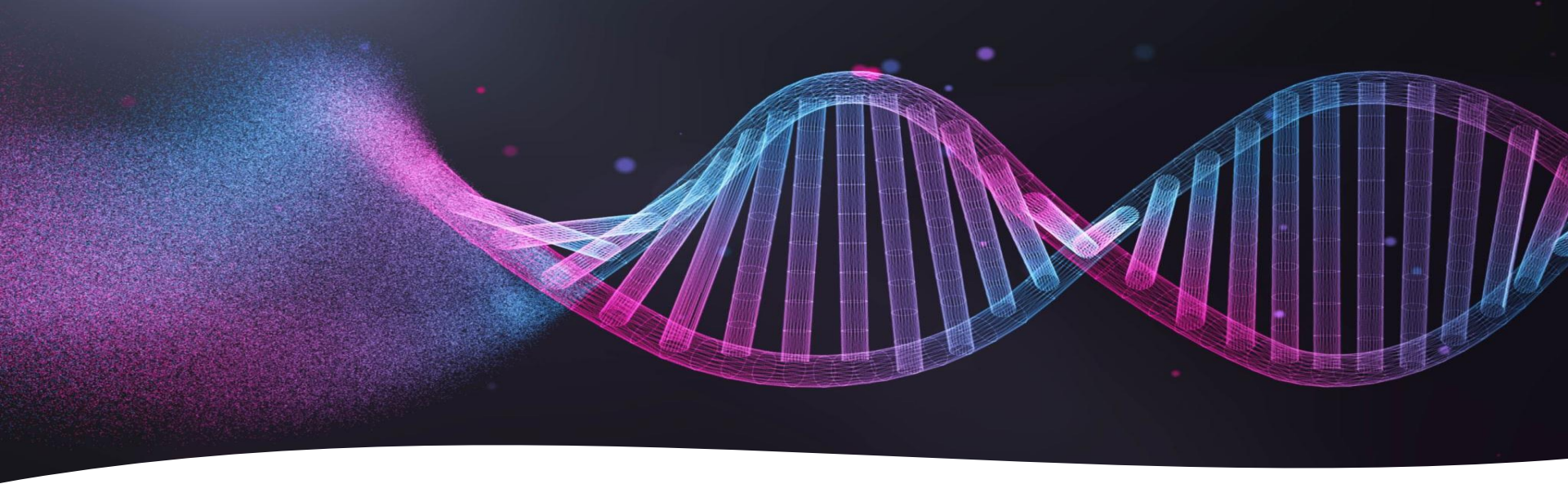
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- Twice in M Z vs D Z
- Genetic alone can't account for SUD
- No single gene was found

Genetic:

- Genetic influences become more apparent when environment allow for their expression (*Joint effects*)
- Gene-environment correlations

Genetic Influences

Direct effect:

- On **psychophysiological** reactions to substance
- On **subjective** effect of substances/their metabolism

Indirect effect:

- On temperament and **personality traits** such as behavioral disinhibition
→ *Which can lead to substance experimentation*

**Behavioral
dysregulation
in children
3–5 y:**

Hyperactivity, inattention, impulsivity

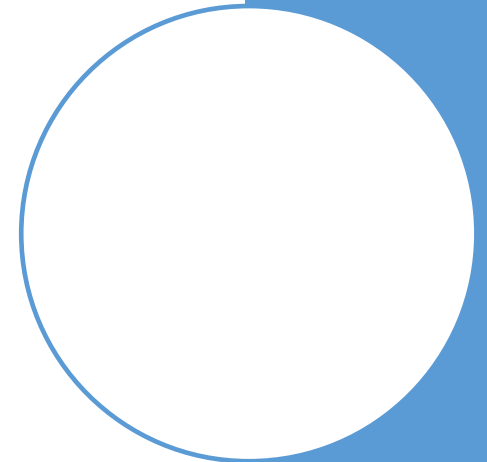
Poor persistence

Emotional lability

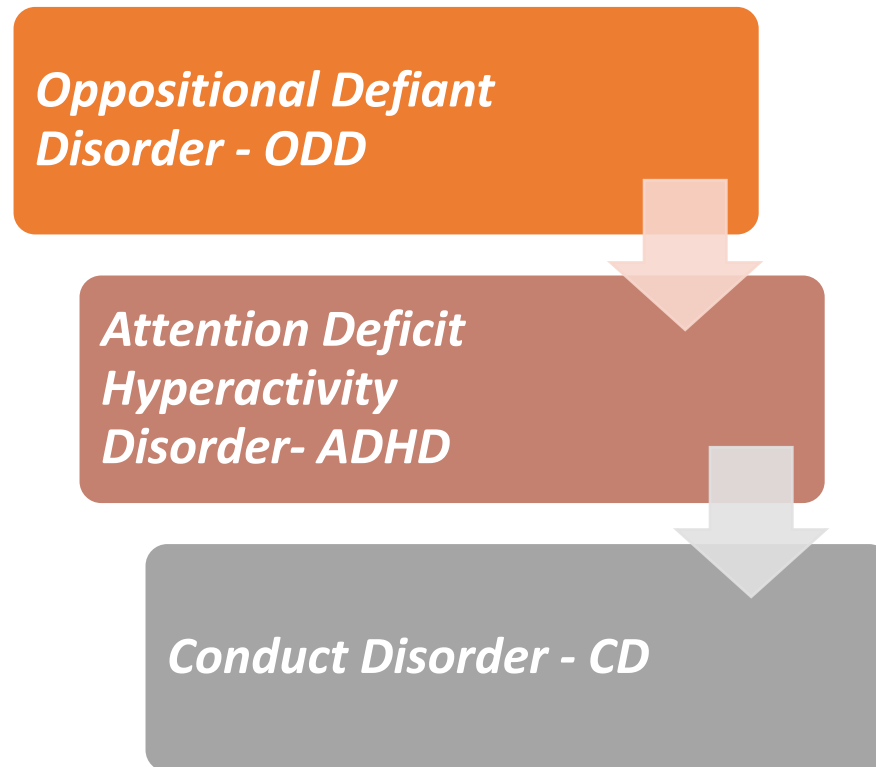
Poor self control


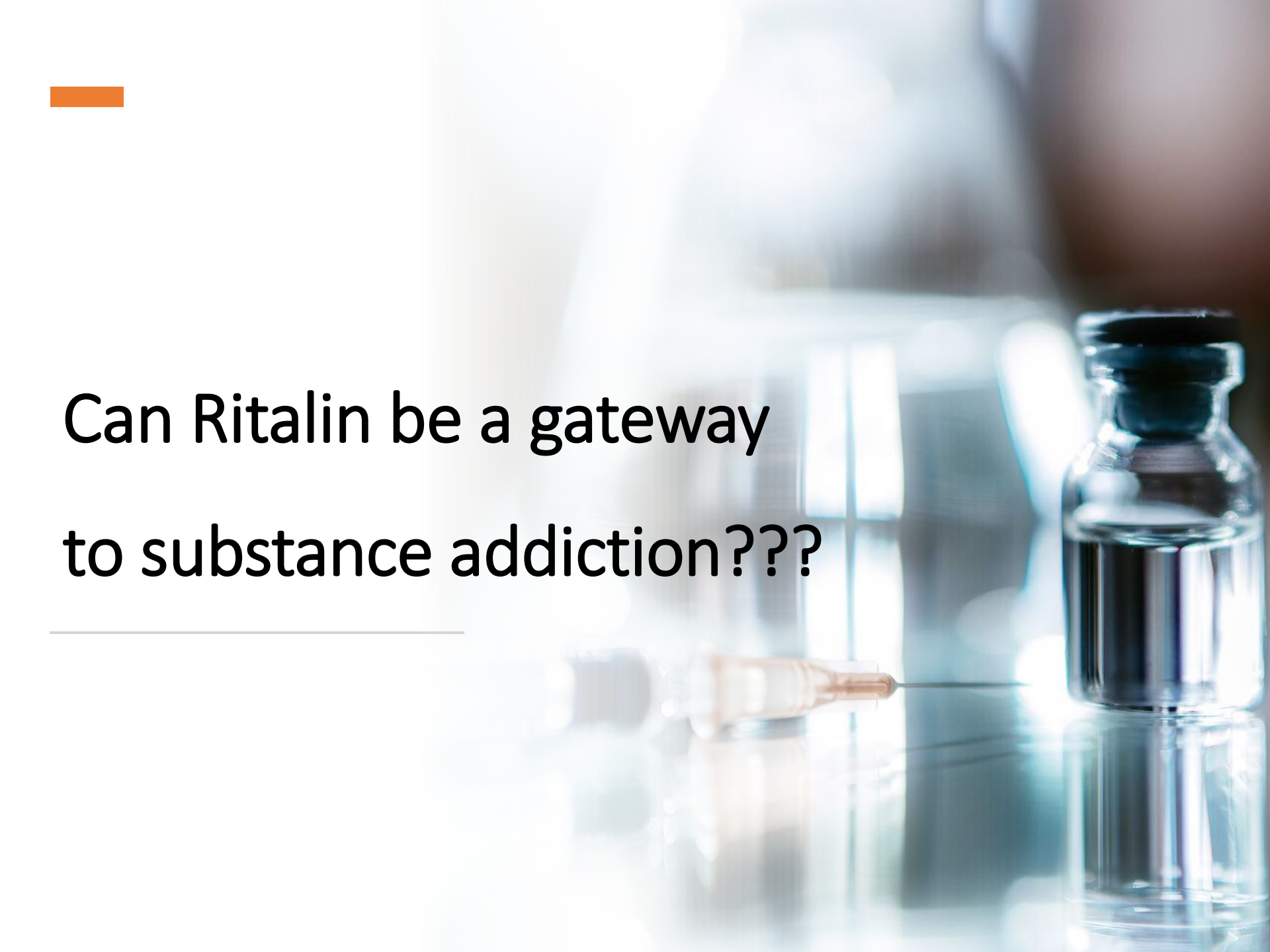
Aggression

Are highly **heritable & a strong family
history of SUD** is often present.



- **75%** of adolescents with **S U D** have **comorbid** psychiatric disorders
- Controversy about the effect of **A D H D** due to its **comorbidity** with **C D**





Can Ritalin be a gateway
to substance addiction???

Genes & environment:

- Low-risk environments **can not mute** a high genetic risk.
- When adolescents were raised in a **religious** household, **genetic** influences to initiate **alcohol** use.
- And when adolescents were raised in a **nonreligious** household, **40%** of initiation could be explained by **genetic** factors.



Prenatal exposure to substances

- Elevation of risk for SUD during adolescence
 - Through the influence on intrauterine neural development
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- **Trying** a substance in adolescence:
- Influenced strongly by **environmental** factors
- **Substance problems** in adolescence:
- Influenced strongly by **genetic** effects

- At **older** ages,...
- **Environmental** effects **decrease**
- **Genetic** effects **increase** in importance

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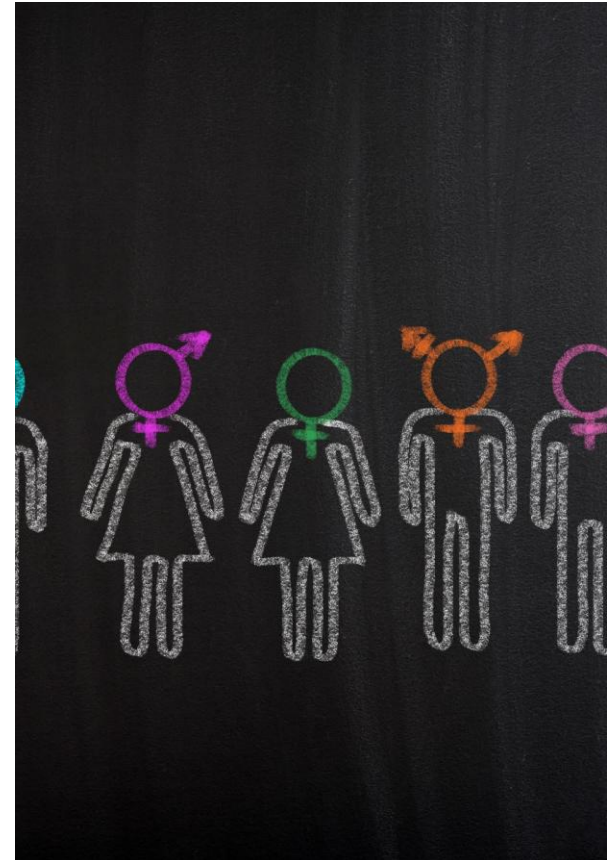
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Family factor

- Substance problems **cluster** within families.
- Risk **decreases** in more **distant** relatives.
- Remains somewhat elevated even among 5th degree relations.
- Due to **common genetic** influences within families; but there is substantial evidence of **environmental** mediation.





Family factor:

- Parental substance use
- Parental tolerance of use
- Older siblings substance use
- Availability of substance in the family

But individual personality dimensions can mediate the effect of sibling & parent influences



Family factor:

- Parent - child/adolescent relational problem
 - Affectional bonding
 - Inept discipline (ineffective. Coercive, hostile, inconsistent)
 - Poor supervision
 - Familial stress
 - Child abuse, neglect
 - Parental psychopathology
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- Access to substances (eg; from peers or neighborhood)
- Exclusion from school & truancy
- Delinquency
- Low SES
- High population density
- High crime
- Media promotion
- Socio-cultural context

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- Even in the **absence** of genetic or environmental **risk factors**.
 - **Chronic painful** medical conditions (eg, acute or prolonged injuries, multiple surgical procedures, sickle cell disease,...)
 - Risk of developing **addiction** to **prescribed** opioid **pain medications**
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Thanks for Your Attention

