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Project TEACH is New York State's Child/Adolescent & Perinatal Psychiatry Access Program.

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NEW YORK STATE | Office of Mental Health

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ADHD Treatment in Perinatal Patients

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It's So Nice to Meet You!

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Disclosures

I have no relevant financial relationships to disclose.

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Learning Objectives

- Recognize the impact of untreated ADHD on perinatal outcomes and apply diagnostic criteria
- Discuss evidence-based non-pharmacological interventions for perinatal ADHD, including psychoeducation, Cognitive Behavioral Therapy, peer support, coaching, and environmental modifications.
- Evaluate the reproductive safety profiles of ADHD medications during pregnancy and lactation, including stimulants, bupropion, atomoxetine, and α2 agonists, considering risks and relative infant dose during breastfeeding.

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Objectives

- Review major known risks associated with untreated ADHD in perinatal patients
- Review Diagnosis/Differential Diagnosis of Peripartum ADHD
- Overview non-pharmacological options for perinatal patients with ADHD
- Discuss major known risks associated with pharmacological treatments for ADHD during the perinatal period

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A Case

- A 33 year old primigravida presents for an initial evaluation.
- Diagnosed with ADHD in college and used Vyvanse with good effect and tolerability since early 20s.
- Was advised to discontinue medication upon pregnancy.
- Since pregnancy, patient cannot complete tasks, has received warnings about performance at work, and last week experienced a minor motor vehicle collision. She is tearful, feeling ineffective and worthless.
- EPDS: 12

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Scope:

- ADHD affects ~4.4% of American adults
- Estimated ratio in adults is 1.6 male to 1 female
- No longer viewed as “just a childhood illness”
  - An estimated 60% of children with ADHD will continue to have clinically relevant symptoms as adults
  - Inattentive symptoms in particular frequently persist, although hyperactive symptoms may also persist in some cases

- Kessler, R. C., Adler, L., Barkley, R., Biederman, J., Conners, C. K., Demler, O., Faraone, S. V., Greenhill, L. L., Howes, M. J., Secnik, K., Spencer, T., Ustun, T. B., Walters, E. E., & Zaslavsky, A. M. (2006). The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *The American journal of psychiatry*, *163*(4), 716–723.
- Quinn PO, Madhoo M. A review of attention-deficit/hyperactivity disorder in women and girls: uncovering this hidden diagnosis. Prim Care Companion CNS Disord. 2014;16(3):PCC.13r01596
- Young, J. L., & Goodman, D. W. (2016). Adult attention-deficit/hyperactivity disorder diagnosis, management, and treatment in the *dsm-5* era. *The Primary Care Companion For CNS Disorders*.

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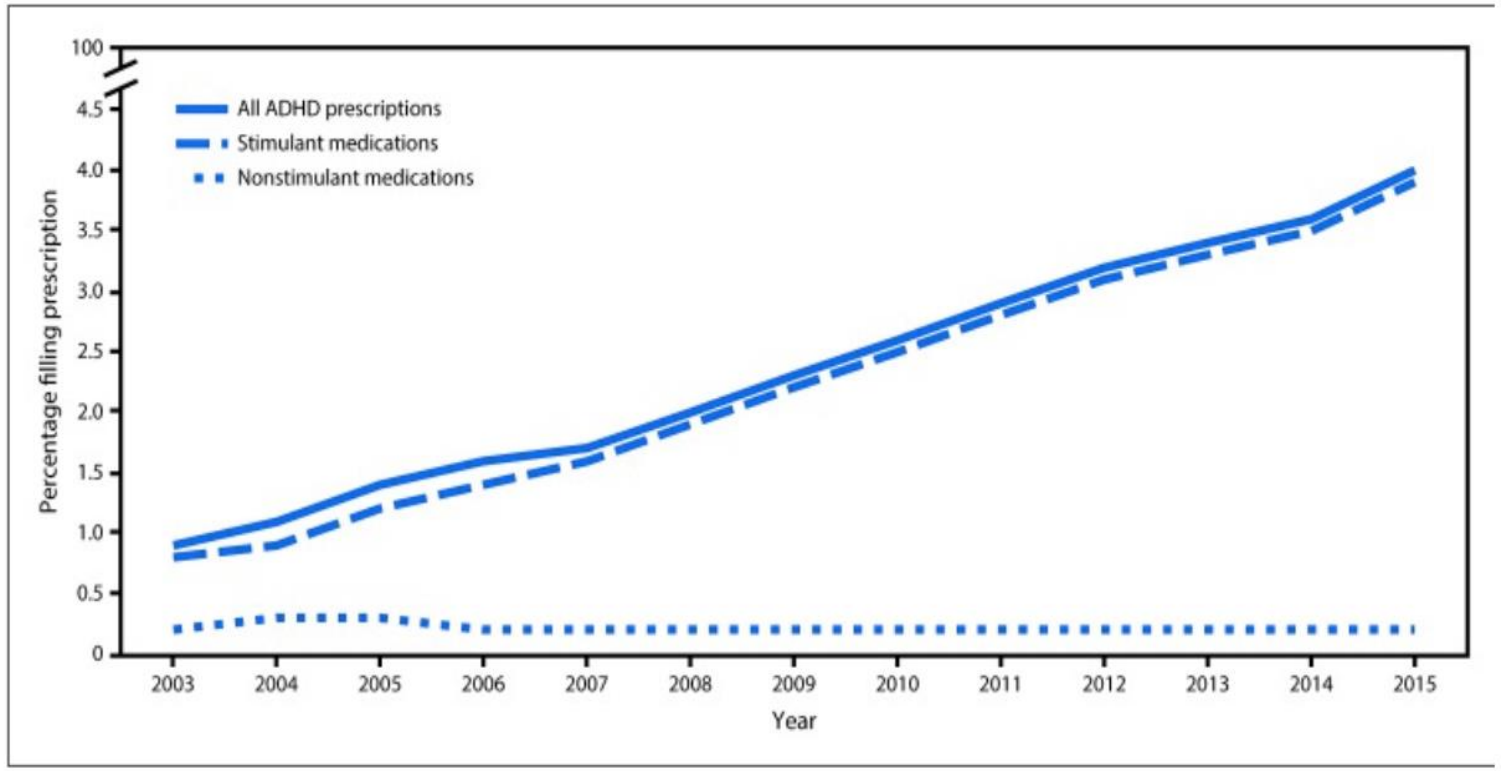
- Treatment for ADHD in adults is increasing
- The increase in prescriptions is largely being driven by stimulants



FIGURE

Percentage of women aged 15–44 years with private employer-sponsored insurance who filled one or more prescriptions for an attention-deficit/hyperactivity disorder (ADHD) medication, by medication class — United States, 2003–2015

Attention-Deficit/Hyperactivity Disorder Medication Prescription Claims Among Privately Insured Women Aged 15–44 Years — United States, 2003–2015

MMWR Morb Mortal Wkly Rep. 2018 Jan 19;67(2):66-70.

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Impact of ADHD on pregnancy outcomes

Limited studies have shown some specific perinatal risks

- **Murray,** et al. (2022). Associations Between ADHD Symptoms and Maternal and Birth Outcomes: An Exploratory Analysis in a Multi-Country Cohort of Expectant Mothers. *Journal of attention disorders*, *26*(14), 1882–1894.
  - higher risk for maternal stress, comorbid depressive symptoms, and significant negative impact on social supports
  - higher rates of tobacco use and preterm birth, but this lost significance when adjusted for confounding factors[5]
- **Poulton**, et al. (2018). Perinatal Outcomes of Women Diagnosed with Attention-Deficit/Hyperactivity Disorder: An Australian Population-Based Cohort Study. *CNS drugs*, *32*(4), 377–386.
  - increased risk of multiple negative outcomes including pre-eclampsia, pre-term labor/birth, higher incidence of surgical delivery, and higher need for neonatal resuscitation and higher likelihood of neonatal admission
  - although they were unable to confidently ascribe these outcomes to parental ADHD, use of psychostimulants, or other correlated factors

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Untreated ADHD in adults is associated with negative outcomes

- Mortality
  - Decreased life expectancy (12.7 years of life and 11.1 years of healthy life); increased all-cause mortality relative to general population. Increased risk of death primarily from unnatural causes, suicide, homicide
  - Early diagnosis (ideally in childhood), decreases risk of all-cause mortality
- Accidents and Unintentional Injuries
  - Higher rates of accidents/injuries, motor vehicle collisions, traffic violations, license suspensions, emergency room visits
- Sleep
  - Higher rates of sleep disturbance and sleep disorders
- Occupational Impairment:
  - Lower rates of job stability, more disciplinary action at work, impulsive quitting, reduced work performance, lower income
- High Risk Behaviors
  - Higher rates of high risk sexual behaviors (inconsistent condom use, high number of partners, higher rates of STDs, higher rates of unplanned pregnancy and early pregnancy
  - Higher rates of substance use and SUD; higher rates of criminal activity
- Parenting
  - Lower parenting efficacy and involvement, laxness, over-reactivity, inconsistency, worse problem solving
- Social Relationships:
  - Lower rates of marriage, higher rates of divorce, lower marital satisfaction, fewer and shorter romantic relationships, higher rates of IPV (perpetration and victimization, no gender moderator
  -)Elevated risk of multiple medical comorbidities, especially neurological, metabolic, musculoskeletal and respiratory illnesses

Kosheleff AR, Mason O, Jain R, Koch J, Rubin J. Functional Impairments Associated With ADHD in Adulthood and the Impact of Pharmacological Treatment. J Atten Disord. 2023 May;27(7):669-697. doi: 10.1177/10870547231158572. Epub 2023 Mar 6. PMID: 36876491; PMCID: PMC10173356.

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Why treat during pregnancy?

Treatment of ADHD has been shown to reduce:

- rates of morbidity/mortality
- reduce substance abuse
- emotional dysregulation and impulsivity

Treatment of ADHD also has positive impact on:

- Successful employment and improved financial resources
- Social connection and support
- Engagement in health-promoting behaviors
- Parenting

Kosheleff AR, Mason O, Jain R, Koch J, Rubin J. Functional Impairments Associated With ADHD in Adulthood and the Impact of Pharmacological Treatment. J Atten Disord. 2023 May;27(7):669-697. doi: 10.1177/10870547231158572. Epub 2023 Mar 6. PMID: 36876491; PMCID: PMC10173356.

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Screening and Diagnosis

- ADHD confounders:
  - Cognitive changes related to pregnancy and postpartum
  - Depressive disorders
  - Anxiety disorders
  - PTSD
  - Substance use
  - Sleep apnea
  - Any medical condition that causes fatigue

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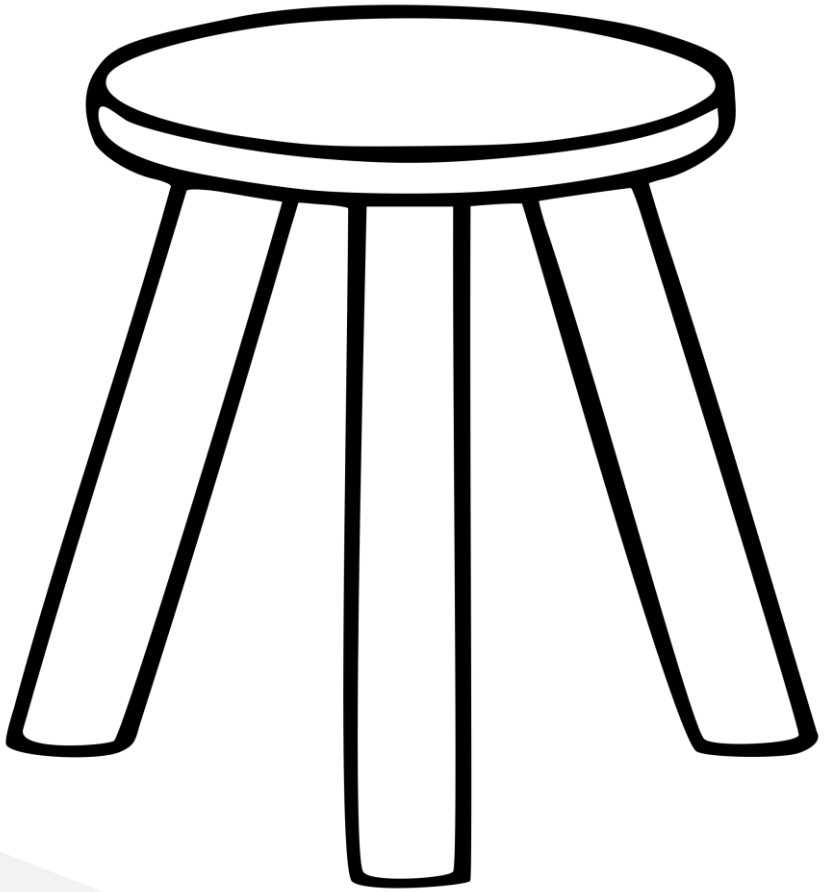
Assessment



- Validated measures (e.g. ASRS)
- Clinical history
  - Assess for childhood symptoms
  - Family, gestational, developmental, educational, history
  - Current level of functioning: work, relationships, driving
  - Co-occurring: medical, sleep, SUD
- Collateral

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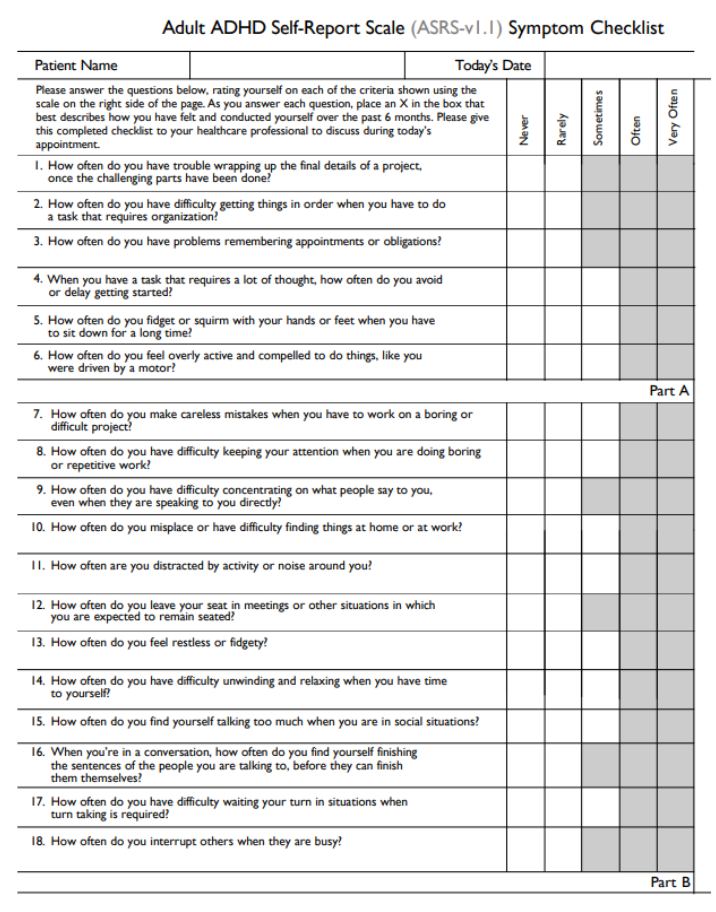
Screening and Diagnosis



Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

Patient Name		Today's Date					
Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right side of the page. As you answer each question, place an X in the box that best describes how you have felt and conducted yourself over the past 6 months. Please give this completed checklist to your healthcare professional to discuss during today's appointment.			Never	Rarely	Sometimes	Often	Very Often
1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?							
2. How often do you have difficulty getting things in order when you have to do a task that requires organization?							
3. How often do you have problems remembering appointments or obligations?							
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?							
5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?							
6. How often do you feel overly active and compelled to do things, like you were driven by a motor?							
							Part A
7. How often do you make careless mistakes when you have to work on a boring or difficult project?							
8. How often do you have difficulty keeping your attention when you are doing boring or repetitive work?							
9. How often do you have difficulty concentrating on what people say to you, even when they are speaking to you directly?							
10. How often do you misplace or have difficulty finding things at home or at work?							
11. How often are you distracted by activity or noise around you?							
12. How often do you leave your seat in meetings or other situations in which you are expected to remain seated?							
13. How often do you feel restless or fidgety?							
14. How often do you have difficulty unwinding and relaxing when you have time to yourself?							
15. How often do you find yourself talking too much when you are in social situations?							
16. When you're in a conversation, how often do you find yourself finishing the sentences of the people you are talking to, before they can finish them themselves?							
17. How often do you have difficulty waiting your turn in situations when turn taking is required?							
18. How often do you interrupt others when they are busy?							
							Part B

- Adult ADHD Self-Report Scale (ASRS) is a tool that screens for ADHD symptoms
- To meet DSM-5 criteria, patients need
  - At least 6 inattentive and/or hyperactive symptoms
  - For at least 6 months
  - Affecting 2 or more settings
  - Causing functional impairment
  - Evidence of at least some symptoms in starting in childhood

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Non-pharmacological interventions

- Psychoeducation
- Individual and Couples Counseling
- Neurofeedback
- Peer support
- Executive Functioning Coaching
- Environmental modifications (e.g. prioritizing public transport over driving, accommodations in school/work, etc.)

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ADHD Management: Pharmacologic Interventions

Kosheleff AR, Mason O, Jain R, Koch J, Rubin J. Functional Impairments Associated With ADHD in Adulthood and the Impact of Pharmacological Treatment. J Atten Disord. 2023 May;27(7):669-697. doi: 10.1177/10870547231158572. Epub 2023 Mar 6. PMID: 36876491; PMCID: PMC10173356.

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Key:
- ⊕ no significant evidence of outcome
- ◐ conflicting evidence
- ☒ significant evidence of outcome
- □ data unavailable

Tai, Sarah, et al. "Maternal and offspring outcomes associated with prescribed ADHD medication in pregnancy: a systematic review." *Archives of Women's Mental Health* (2025): 1-22.

Outcome	Stimulants: Methylphenidate	Stimulants: Dexamfetamine	Stimulants: Lisdexamfetamine	Non-stimulants: Atomoxetine	Non-stimulants: Guanfacine	Non-stimulants: Clonidine	Non-stimulants: Modafinil
MATERNAL OUTCOMES							
Antenatal							
- Pre-eclampsia	◐	◐	◐	⊕	⊕	⊕	□
- Pre-existing hypertension	⊕	⊕	⊕	⊕	⊕	⊕	□
- Gestational hypertension	⊕	⊕	⊕	⊕	⊕	⊕	□
- Gestational diabetes	⊕	⊕	⊕	⊕	⊕	⊕	□
- Anaemia	⊕	⊕	⊕	⊕	⊕	⊕	□
- Hyperemesis Gravidarum	⊕	⊕	⊕	⊕	⊕	⊕	□
- Renal Disease	⊕	⊕	⊕	⊕	⊕	⊕	□
- Depressive Episode	⊕	⊕	⊕	⊕	⊕	⊕	□
- Human Papillomavirus	□	□	□	□	□	□	□
- Cardiac disease complicating pregnancy	⊕	⊕	⊕	⊕	⊕	⊕	□
- Malnutrition	⊕	⊕	⊕	⊕	⊕	⊕	□
- Early Pregnancy Haemorrhage	⊕	⊕	⊕	⊕	⊕	⊕	□
Birth							
- Placental Abruption	⊕	⊕	⊕	□	□	□	□
- Post-Partum Haemorrhage	□	⊕	⊕	⊕	⊕	⊕	□
- Eclampsia	⊕	⊕	⊕	⊕	⊕	⊕	□
Post-natal							
- Depression	⊕	⊕	⊕	⊕	⊕	⊕	□

Outcome	Stimulants: Methylphenidate	Stimulants: Dexamfetamine	Stimulants: Lisdexamfetamine	Non-stimulants: Atomoxetine	Non-stimulants: Guanfacine	Non-stimulants: Clonidine	Non-stimulants: Modafinil
OFFSPRING OUTCOMES							
Antenatal							
- Threatened Abortion	□	⊕	□	□	□	□	□
- Spontaneous Abortion	⊕	⊕	⊕	⊕	⊕	⊕	□
- Pre-Term Delivery	⊕	⊕	⊕	⊕	⊕	⊕	□
- Small for Gestational Age	⊕	⊕	⊕	□	□	□	□
Birth							
- Foetal Distress (APGAR score at 1 min)	⊕	⊕	□	□	□	□	□
- Low Birthweight	⊕	⊕	⊕	□	□	□	□
Post-natal							
- TORCH infections	⊕	⊕	⊕	⊕	⊕	⊕	□
- Specialist Care Unit admission	⊕	⊕	⊕	□	□	□	□
- Congenital Malformations	◐	◐	◐	◐	□	□	☒
- Cardiac Malformations	◐	⊕	⊕	◐	⊕	⊕	☒
- Neurodevelopmental Disorders	⊕	⊕	⊕	⊕	□	⊕	⊕
- Growth Impairment	⊕	⊕	⊕	⊕	□	⊕	⊕
- Impairments in vision/hearing	⊕	⊕	⊕	⊕	□	⊕	⊕
- Epilepsy	⊕	⊕	⊕	⊕	□	⊕	⊕
- Seizures	⊕	⊕	⊕	⊕	□	⊕	⊕

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Risks associated with pharmacological treatment of ADHD in pregnancy: Methylphenidate and Amphetamine

- The earlier data about adverse effects from stimulant exposure exists from studies of pregnant individuals abusing psychostimulants (in particular methamphetamine)
  - See higher rates of fetal demise, hypertensive disorders, in utero growth restriction, preterm birth, postpartum hemorrhage in this group
- Cannot automatically extrapolate these risks to therapeutic use
- However, more recent larger studies have helped us shed light
  - Suarez 2024, JAMA Psychiatry
  - Di Giacomo 2024, JAMA Network Open
  - Huybrechts 2018, JAMA Psychiatry
- Most studies still have inherent methodological limitations

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Risks associated with stimulant treatment in pregnancy: miscarriage and birth defects

Miscarriage and birth defects

- Amphetamine: not associated with increased risk of birth defects
- Methylphenidate:
  - Studies mixed on increased risk of miscarriage (increased: 1.60 RR in Srinivas 2023; decreased: 0.69 RR in Hasan 2026)
  - Risk of birth defects: either a small increased risk (1.11 RR in Huybrechts 2018) or no association (di Giacomo 2024)

In utero growth effects

- Some evidence of growth acceleration and being large for gestational age (Norby 2017)
- However, other studies have shown growth restriction (Newport 2016)

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Risks associated with stimulant use in pregnancy: pregnancy complications and neurodevelopmental teratogenicity

- Pregnancy Complications
  - **Hypertensive disorders:** Multiple studies suggest that even after adjusting for confounders such as untreated illness, stimulant exposure appears to **increase the risk of pre-eclampsia by ~RR 1.2-2.0** (Tai et al 2025)
  - Increased rates of neonatal morbidity
    - Multiple studies have found increased risk of preterm labor (<37weeks gestation), NICU treatment, and other offspring outcomes. However, Tai et al found that in many studies, these outcomes attenuated or disappeared when controlling for confounders.
- Neurodevelopmental teratogenicity: No increased risk of neurodevelopmental disorders (Suarez 2024)

Risks associated with pharmacological treatment of ADHD in pregnancy: Bupropion

- **Overall Malformations:**
  - FDA label and large studies (e.g., International Bupropion Pregnancy Registry; United Healthcare database) show **no increased risk of *overall* congenital malformations** with 1st trimester bupropion exposure.
  - **Tran et al. (2025)** found an adjusted relative risk of **0.93 (95% CI, 0.67-1.29)** for major congenital malformations (35.5 vs 38.8 per 1,000 live births for exposed vs unexposed).
  - **Turner et al. (2019) meta-analysis** estimated a pooled proportion of **1.0% (95% CI = 0.0%-3.0%)** for congenital malformations.
  - Background rate for major malformations in all pregnancies is **2-4%**.
- **Cardiac Malformations:**
  - FDA label observes **no increased *overall* cardiovascular risk**. [1]
  - Bupropion Pregnancy Registry reported a **1.3%** rate of cardiac malformations (9/675 1st-trimester exposures), similar to the **~1% background rate**. [2]
- **Other Specific Defects:**
  - **Anderson et al. (2020)** identified an association with **diaphragmatic hernia**.

- Few other reported negative pregnancy outcomes
- Low risk for **postnatal adaptation syndrome**
- **Indications:**
  - Less effective than stimulants for ADHD
  - Consider when comorbid depression is present
  - Surprisingly, **not effective for smoking cessation during pregnancy**

Kranzler, Henry R., et al. "Placebo-controlled trial of bupropion for smoking cessation in pregnant women." *American journal of obstetrics & gynecology MFM* 3.6 (2021): 100315.

Bupropion Hydrochloride SR. FDA Drug Label. Food and Drug Administration. Updated date: 2025-09-30.WELLBUTRIN XL. FDA Drug Label. Food and Drug Administration. Updated date: 2026-02-10.

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Turner E, Jones M, Vaz LR, Coleman T. Systematic Review and Meta-Analysis to Assess the Safety of Bupropion and Varenicline in Pregnancy. Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco. 2019.

Anderson KN, Lind JN, Simeone RM, et al. Maternal Use of Specific Antidepressant Medications During Early Pregnancy and the Risk of Selected Birth Defects. JAMA Psychiatry. 2020.

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Risks of Medications in Pregnancy: Atomoxetine

Limited data available

Broms 2023 and di Giacomo 2024 found **no increased risk of birth defects**

Cohen 2017 found **no evidence of increased risk of pre-eclampsia or preterm birth**

Madsen 2023 found **no evidence** of increased risk of long-term **developmental problems** including growth problems or **autism**

Bröms, G., Hernandez-Diaz, S., Huybrechts, K. F., Bateman, B. T., Kristiansen, E. B., Einarsdóttir, K., Engeland, A., Furu, K., Gissler, M., Karlsson, P., Klungsøyr, K., Lahesmaa-Korpinen, A. M., Mogun, H., Nørgaard, M., Reutfors, J., Sørensen, H. T., Zoega, H., & Kieler, H. (2023). Atomoxetine in Early Pregnancy and the Prevalence of Major Congenital Malformations: A Multinational Study. *The Journal of clinical psychiatry*, *84*(1), 22m14430.

Bang Madsen, K., Robakis, T. K., Liu, X., Momen, N., Larsson, H., Dreier, J. W., Kildegaard, H., Groth, J. B., Newcorn, J. H., Hove Thomsen, P., Munk-Olsen, T., & Bergink, V. (2023). In utero exposure to ADHD medication and long-term offspring outcomes. *Molecular psychiatry*, *28*(4), 1739–1746.

Cohen, J. M., Hernández-Díaz, S., Bateman, B. T., Park, Y., Desai, R. J., Gray, K. J., Patorno, E., Mogun, H., & Huybrechts, K. F. (2017). Placental Complications Associated With Psychostimulant Use in Pregnancy.*Obstetrics and gynecology*, *130*(6), 1192–1201.

di Giacomo, E., Confalonieri, V., Tofani, F., & Clerici, M. (2024). Methylphenidate and atomoxetine in pregnancy and possible adverse fetal outcomes: a systematic review and meta-analysis. JAMA network open, 7(11), e2443648-e2443648.

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Risks associated with pharmacological treatment of ADHD in pregnancy: α2 agonists

- Very little published data and what is known is confounded – most studies are from patients being treated for severe hypertension, which can have significant effects on pregnancy outcomes
- Clonidine was not associated with impairments in development or growth
- Guanfacine was similarly not associated with development or growth impairments after exposure during pregnancy

Bang Madsen, K., Robakis, T. K., Liu, X., Momen, N., Larsson, H., Dreier, J. W., Kildegaard, H., Groth, J. B., Newcorn, J. H., Hove Thomsen, P., Munk-Olsen, T., & Bergink, V. (2023). In utero exposure to ADHD medication and long-term offspring outcomes. *Molecular psychiatry*, *28*(4), 1739–1746.
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Lactation

Medication	RID*	Infant Concerns
Amphetamine	5-15%	Weight loss, irritability, wakefulness
Methylphenidate	Trace	Weight loss, irritability, wakefulness
Bupropion	Trace	2 case reports of seizure
Atomoxetine	No published data	No published data
Guanfacine	No published data	No published data
Clonidine	50%	Limited data; May affect milk supply

RID: relative infant dose. RID<10% is generally considered acceptable
Source: LactMed

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Lactation: Clinical Management

- Food for thought:
  - Most psychotropic medications transfer freely through the placenta
  - Thus, babies who were exposed to a psychotropic medication during pregnancy received a much higher dose of the medication during pregnancy than they would during lactation
- Some clinicians use short acting stimulants during lactation
  - Pros: reduces medication exposure to the infant, a good option if there is concern about the baby's behavior or weight
  - Cons: requires more frequent dosing, more challenging for the patient to manage, especially at a stressful time

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Summary of ADHD Management during pregnancy

1. Don't panic
2. Do your best to ensure diagnostic accuracy
3. Assess the severity of ADHD and the risks of untreated illness for the individual patient
4. Consider medical comorbidities
5. Consider possible non-pharmacological interventions
6. Consider the known perinatal risk/safety profile of medications
7. Prescribe as appropriate and adjust doses as needed

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