BEST PRACTICE GUIDELINES

for Mental Health Disorders in the Perinatal Period:

ATTENTION-DEFICIT/ HYPERACTIVITY DISORDER

JUNE 2026

BC Women's Provincial Reproductive Mental Health Program & Perinatal Services BC

BC WOMEN'S HOSPITAL+ HEALTH CENTRE
Provincial Health Services Authority

Perinatal Services BC
Provincial Health Services Authority

Provincial Health Services Authority

Land Acknowledgement

We respectfully acknowledge that the document "Best Practice Guidelines for Mental Health Disorders in the Perinatal Period: Attention-Deficit/Hyperactivity Disorder" was developed at the BC Women's Hospital + Health Centre (BCWH), on the unceded, traditional and ancestral territories of the Coast Salish People, specifically the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish) and səlí l̓ wətaʔɬ (Tsleil-waututh) Nations who have cared for and nurtured the lands and waters around us for all time. We give thanks for the opportunity to live, work and support care here.

We recognize that we serve people throughout British Columbia (BC), including those from Indigenous communities and all First Nations, Inuit and Métis Peoples living in BC. We commit, with gratitude, to strengthening our relationships with Elders, knowledge keepers, and traditional custodians of these lands as we work together to provide culturally safe and inclusive health care for everyone.

This Attention-Deficit/Hyperactivity Disorder (ADHD) chapter of the BC Best Practice Guidelines for Mental Health Disorders in the Perinatal Period is a manual for healthcare professionals who care for birthing individuals in their reproductive years. This guidance describes best practices for the care of birthing individuals with ADHD in the perinatal period (preconception through to one year postpartum).

Perinatal Services BC
Provincial Health Services Authority

BC WOMEN'S HOSPITAL+ HEALTH CENTRE
Provincial Health Services Authority

Provincial Health Services Authority

Produced by:

The BC Women's Provincial Reproductive Mental Health Program, (part of BC Women's Hospital & Health Centre) and Perinatal Services BC. BC Women's Hospital & Health Centre and Perinatal Services BC are programs of the BC Provincial Health Services Authority.

BC Women's Provincial Reproductive Mental Health Program:

Author, Project Lead, and Editor:	Catriona Hippman	PhD, Postdoctoral Fellow
Author:	Olivia Scoten	MD, Pediatrics resident, BC Children's Hospital (contribution to guideline as UBC Medical Student)
Author and Medical Advisor:	Barbara Shulman	MD, FRCPC, Psychiatrist, Medical Lead
Author and Medical Advisor:	Deirdre Ryan	MB, FRCPC, Psychiatrist
Author, Project Manager, and Editor:	Sydney Schulz	MSc, CGC, Genetic Counsellor (contribution to guideline as RMH Research Manager)
Author and Project Manager:	Prescilla Carrion	MSc, CGC, CCGC, Genetic Counsellor (contribution to guideline as RMH Research Manager)
Author:	Katarina Tabi	PhD, Postdoctoral Fellow

Perinatal Services BC:

The Perinatal Services BC Clinical Reference Group, a multidisciplinary group, including family doctor, International Board Certified Lactation Consultants, midwifery, nursing, and obstetrician representation.

Medications Tables:

Author and Consultant:	Vanessa Paquette	PharmD, Clinical Pharmacy Specialist, BC Women's & Children's Hospitals

Multidisciplinary Reviewers:

Alixandra Bacon, RM (MA)	Founder, ADHD Pregnancy Specialty Clinical Service; Clinical Faculty, UBC
Anita Parhar, PhD	Co-Founder and Educational Director, Adult ADHD Centre; Director of Women's Health, ADHD Centre for Women
Gurdeep Parhar, MD, CCFP, CCBOM, CIME	Co-Founder, Adult ADHD Centre; Clinical Professor, UBC

We also thank Nevena V. Radonjic, MD, PhD, Elizabeth A. Witham, MD and all members of the BC Women's Provincial Reproductive Mental Health program for their support and review of earlier drafts.

Funded by: BC Women's Health Foundation

Design and Production by: Addon Creative Inc.

Suggested Citation:

Scoten O, Schulz S, Ryan D, Shulman B, Paquette V, Carrion P, Tabi K, PSBC Clinical Reference Group, Hippman C. (2026) *BC Women's Provincial Reproductive Mental Health Program & Perinatal Services BC Best Practice Guidelines for Mental Health Disorders in the Perinatal Period: Attention-Deficit/Hyperactivity Disorder.* Vancouver, BC: BC Women's Provincial Reproductive Mental Health Program.

Table of Contents

1. Key Points and Recommendations

Key points

- The rate of Attention-Deficit/Hyperactivity Disorder (ADHD) is approximately 3.2%[1] in adult women, and 4.4% in gender-diverse adults who were assigned female at birth[2].
- Although ADHD is a chronic condition, rather than an episodic one, during the perinatal period there may be an exacerbation of symptoms[3] that can be successfully managed through preconception counselling and appropriate perinatal planning, management, and support.
- Clinical features of ADHD in perinatal people are the same as those in non-perinatal people.
- ADHD often co-exists with other psychiatric illnesses (e.g., perinatal depression and/or anxiety) and neurodevelopmental disorders[4,5].
- Family history of ADHD is a major risk factor[6,7].
- The Adult ADHD Self-Report Scale (ASRS) is a common, simple to administer, effective tool used to screen for ADHD[8]. There are no self-report ADHD tools developed specifically for the perinatal population.
- Diagnosing ADHD involves a diagnostic assessment interview using DSM-5 criteria[9].
- Before diagnosing ADHD, it is important to exclude medical conditions that might cause symptoms that mimic the disorder. Diagnosing ADHD in pregnancy can be complicated by the finding that pregnancy itself may cause neurocognitive changes that mimic ADHD[10].
- ADHD is primarily managed through behavioural therapy and medications. Mild to moderate ADHD may be successfully treated with non-pharmacological treatments, including self-management strategies. Medications — most frequently stimulants — may also be required for moderate to severe ADHD.

1 Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163(4):716-723.
2 Cheung AS, Ooi O, Leemaqz S, et al. Sociodemographic and Clinical Characteristics of Transgender Adults in Australia. *Transgend Health*. 2018;3(1):229-238.
3 Freeman MP. ADHD and Pregnancy. *Am J Psychiatry*. 2014;171:723-728.
4 Biederman J. Adult psychiatric outcomes of girls with attention deficit hyperactivity disorder: 11-year follow-up in a longitudinal case-control study. *Am J Psychiatry*. 2010;167:409-417.
5 Jensen CM, Steinhausen HC. Comorbid mental disorders in children and adolescents with attention-deficit/hyperactivity disorder in a large nationwide study. *ADHD Atten Deficit Hyperact Disord*. 2015;7(1):27-38.
6 Faraone SV. Molecular Genetics of Attention-Deficit/Hyperactivity Disorder. *Biol Psychiatry*. 2005;57:1313-1323.
7 Faraone SV, Biederman J, Monuteaux MC. Toward guidelines for pedigree selection in genetic studies of attention deficit hyperactivity disorder. *Genet Epidemiol*. 2000;18:1-16.
8 Kessler RC, Adler L, Ames M, et al. The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. *Psychol Med*. 2005;35(2):245-256.
9 American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Publ Online May. 2013;22. doi:10.1176/APPI.BOOKS.9780890425596
10 Henry JD, Rendell PG. A review of the impact of pregnancy on memory function. *J Clin Exp Neuropsychol*. 2007;29(8):793-803.

- Non-pharmacological treatments include psychoeducation, self-management / coaching, cognitive behavioural therapy (CBT), mindfulness-based interventions, and dialectical behavioural therapy. Of the non-pharmacological options for ADHD treatment, CBT has been the most studied and shown to be most effective[11,12].
- When deciding whether to treat ADHD with medications in pregnancy, it is important to weigh risks associated with ADHD medications in pregnancy against risks associated with untreated or inadequately treated ADHD in pregnancy. Available safety data for ADHD medications in pregnancy is largely reassuring.
- Research on the safety of ADHD medications during lactation is scarce. As a general rule, it is not necessary to stop stimulant medication as prescribed for ADHD to breastfeed or feed expressed human milk. Likewise, it is not necessary to stop breastfeeding or feeding expressed human milk to take stimulant medication as prescribed for ADHD. We suggest caution regarding breastfeeding if a patient is taking non-stimulant medications for ADHD or multiple medications. The decision to breastfeed or feed expressed human milk while taking medications should be made collaboratively and the infant's development should be closely monitored[13,14].

11 Vidal-Estrada R, Bosch-Munso R, Nogueira-Morais M, Casas-Brugue M, Ramos-Quiroga JA. Psychological treatment of attention deficit hyperactivity disorder in adults: a systematic review. *Actas Esp Psiquiatr.* 2012;40(3):147-154.
12 Prevatt F. Coaching for College Students with ADHD. *Curr Psychiatry Rep.* 2016;18(12):1-7.
13 Kittel-Schneider S, Quednow BB, Leutritz AL, McNeill RV, Reif A. Parental ADHD in pregnancy and the postpartum period - A systematic review. *Neurosci Biobehav Rev.* 2021;124:63-77.
14 Bolea-Alamanac BM, Green A, Verma G, Maxwell P, Davies SJC. Methylphenidate use in pregnancy and lactation: a systematic review of evidence. *Br J Clin Pharmacol.* 2014;77(1):96-101.

Recommendations

1. For people with a family history of ADHD or multiple risk factors, have a high index of suspicion for ADHD and screen using the ASRS.
    - If a patient screens positive for ADHD, further investigation is warranted to assess whether they meet full diagnostic criteria (See page 14).
2. Encourage people with a diagnosis of ADHD to plan their pregnancy.
3. Work with people with ADHD, and ideally their support system, to develop an individualized treatment plan to optimize their mental health in the perinatal period. This includes education about signs and symptoms of deteriorating mental health and strategies for supporting mental wellness - particularly prioritizing sleep and nutrition.
4. Given frequency of co-occurrence for people with ADHD, pay particular attention to screening in the perinatal period for depression and anxiety (Edinburgh Postnatal Depression Scale), substance use disorders (single alcohol screening question, 5Ps, Substance Use Risk Profile — Pregnancy scale), and intimate partner violence.
5. Consider referring to a general psychiatrist or specialist reproductive/perinatal psychiatrist if you:
    - have concerns about the safety of ADHD medications in pregnancy or during lactation; and/or
    - would like support with ongoing management of your patient with ADHD in the perinatal period.
6. For patients with ADHD whose treatment plan might include medications in the perinatal period:
    - Educate patients about first-line, second-line, and third-line treatment options;
    - Engage in shared decision making with the patient, and the patient's partner or family member(s) as appropriate;
    - Discuss the importance of balancing the risks of using ADHD medications during pregnancy or breastfeeding against the risks of potential ADHD symptom exacerbation if the patient does not use ADHD medications;
    - Ensure medication regimen is titrated to lowest effective dose and the minimum number of medications;
    - Monitor pregnancy carefully, including fetal growth, blood pressure checks, and ensuring appropriate weight gain; and
    - If using ADHD medications while breastfeeding, monitor the baby for adverse effects, growth and development, and refer to lactation supports as indicated.

2. Education

2.1 WHAT IS ADHD?

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder which involves impaired attention and executive functioning, such as the ability to concentrate and plan, and/or impulse control and hyperactivity. It is common globally, affecting 3-7% of children[15], with 75% of females continuing to have symptoms into adulthood[16]. About 3.2% of adult women[17,18], and 4.4% of gender-diverse adults who were assigned female at birth[19], have ADHD.

It is not uncommon for ADHD to be untreated in adulthood, with only ~10% of adults with ADHD receiving treatment[17]. Perhaps relatedly, studies show that up to 89% of adults with ADHD have co-existing psychiatric disorders[20], with mood and anxiety disorders being the most common. ADHD frequently co-exists with many other psychiatric and neurodevelopmental disorders (Tables 1 and 2), and may be overlooked.

Table 1. ***Psychiatric disorders frequently co-existing with ADHD***

Co-existing psychiatric disorders
Mood disorders (e.g., depression, bipolar disorders)[17,21,22]
Anxiety[17,21]
Substance use disorders[17,21]
Eating disorders[21]
Impulse control disorders[17]

15 Thomas R, Sanders S, Doust J, Beller E, Glasziou P. Prevalence of attention-deficit/hyperactivity disorder: a systematic review and meta-analysis. *Pediatrics*. 2015;135:994-1001.
16 Owens EB, Zalecki C, Gillette P, Hinshaw SP. Girls with childhood ADHD as adults: Cross-domain outcomes by diagnostic persistence. *J Consult Clin Psychol*. 2017;85(7):723-736.
17 Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163(4):716-723.
18 Biederman J. Adult psychiatric outcomes of girls with attention deficit hyperactivity disorder: 11-year follow-up in a longitudinal case-control study. *Am J Psychiatry*. 2010;167:409-417.
19 Cheung AS, Ooi O, Leemaqz S, et al. Sociodemographic and Clinical Characteristics of Transgender Adults in Australia. *Transgend Health*. 2018;3(1):229-238.
20 Sobanski E. Psychiatric comorbidity in adults with attention-deficit/hyperactivity disorder (ADHD). *Eur Arch Psychiatry Clin Neurosci*. 2006;256 Suppl 1:i26-31.
21 Jensen CM, Steinhausen HC. Comorbid mental disorders in children and adolescents with attention-deficit/hyperactivity disorder in a large nationwide study. *ADHD Atten Deficit Hyperact Disord*. 2015;7(1):27-38.
22 Young S, Toone B, Tyson C. Comorbidity and psychosocial profile of adults with Attention Deficit Hyperactivity Disorder. *Individ Dif*. 2003;35(4):743-755.

Table 2. *Neurodevelopmental disorders frequently co-existing with ADHD*

Co-existing neurodevelopmental disorders
Specific behavioural problems, such as oppositional defiant disorder[23,24,25]
Specific disorders of communication, learning, and motor development[24,25]
Autism spectrum disorders[24]
Intellectual disabilities[24]
Tic disorders[24]

Approximately 10% of adults with recurrent depression and/or anxiety disorders also have ADHD[25,26,27]. We know from clinical experience that treatment for perinatal depression and anxiety alone is often insufficient for those with co-occurring ADHD. Research supports this, showing that individuals who stopped ADHD medication during pregnancy experienced increased depression, even when continuing anti-depressants[27]. Therefore, it is particularly important for ADHD to be adequately managed for a greater chance of treating patients with co-existing depression and/or anxiety to remission.

Unlike depression, which is most often episodic in nature, ADHD is a chronic condition that exists before pregnancy. While there is no formal diagnosis of perinatal ADHD, we see in clinical practice that ADHD symptoms often become more challenging to manage as birthing individuals deal with the increased demands of pregnancy and parenting. These guidelines summarize the current literature on ADHD in pregnancy and the postpartum period (usually defined as the year after birth), and offer clinical guidance on the diagnosis and management of this condition in the perinatal period.

2.2 SIGNS AND SYMPTOMS

Individuals with ADHD may have symptoms of inattention, symptoms of hyperactivity/impulsivity, or a combination of both[28] (Table 3), although adults with ADHD often show more symptoms of inattention[29]. Adults with ADHD often struggle with household tasks like cooking and cleaning, and keeping track of their children's schedules and appointments[29,30].

23 Cheung AS, Ooi O, Leemaqz S, et al. Sociodemographic and Clinical Characteristics of Transgender Adults in Australia. *Transgend Health*. 2018;3(1):229-238.
24 Jensen CM, Steinhausen HC. Comorbid mental disorders in children and adolescents with attention-deficit/hyperactivity disorder in a large nationwide study. *ADHD Atten Deficit Hyperact Disord*. 2015;7(1):27-38.
25 Young S, Toone B, Tyson C. Comorbidity and psychosocial profile of adults with Attention Deficit Hyperactivity Disorder. *Individ Dif*. 2003;35(4):743-755.
26 Sobanski E. Psychiatric comorbidity in adults with attention-deficit/hyperactivity disorder (ADHD. *Eur Arch Psychiatry Clin Neurosci*. 2006;256 Suppl 1:i26-31.
27 Baker AS, Wales R, Noe O, Gaccione P, Freeman MP, Cohen LS. The Course of ADHD during Pregnancy. *J Atten Disord*. 2022;26(2):143-148.
28 American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Publ Online May. 2013;22. doi:10.1176/APPI.BOOKS.9780890425596
29 Young S, Adamo N, Ásgeirsdóttir BB et al. Females with ADHD: An expert consensus statement taking a lifespan approach providing guidance for the identification and treatment of attention-deficit/ hyperactivity disorder in girls and women. *BMC Psychiatry*. 2020;20(1):1-27.
30 Weiss M, Murray C. Assessment and management of attention-deficit hyperactivity disorder in adults. *CMAJ*. 2003;168(6):715-722.

Table 3. *Diagnostic criteria for ADHD per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*[28]

There must be:

- an ongoing pattern of inattentive and/or hyperactive-impulsive symptoms — at least 6 months;
- multiple inattentive and/or hyperactive-impulsive symptoms - 5 or more for adults [6 or more are required for age < 17];
- several inattentive and/or hyperactive-impulsive symptoms which had onset before age 12;
- several inattentive and/or hyperactive-impulsive symptoms that are present in two or more settings (e.g., home, school/university, work);
- evidence that inattentive and/or hyperactive-impulsive symptoms interfere with, or reduce the quality of, functioning (e.g., interpersonal, occupational)

Symptoms are not better explained by:

- oppositional behavior, defiance, hostility, or failure to understand tasks or instructions
- another mental disorder (e.g., psychotic disorder, mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal)

Inattentive symptoms	Hyperactive-impulsive symptoms
1. Poor attention to detail	1. Frequent fidgeting (e.g., tapping a desk)
2. Difficulty concentrating/sustaining attention on tasks	2. Finds it difficult to sit still for prolonged periods
3. Seems preoccupied, difficulty in shifting focus even when spoken to directly	3. Feeling of inner restlessness or agitation
4. Difficulty with completing tasks (gets distracted/ side-tracked)	4. Often loud and disruptive
5. Organizational challenges (for example, resulting in chronic lateness - for appointments/deadlines, messiness, disorganized work)	5. Always "on the go", difficult for others to keep up
6. Reluctance to engage in tasks that require sustained mental effort (e.g., preparing reports, reviewing lengthy papers)	6. Often talks excessively
7. Difficulty keeping track of personal belongings/ items required for task completion	7. Frequently interrupts others (difficulty restraining themselves from sharing their perspectives or waiting their turn in conversation)
8. Easily distracted	8. Highly impatient (e.g., difficulty waiting in line)
9. Frequently forgetful	9. Often intrudes into others' activities (e.g., may take over what others are doing)

Predominantly inattentive type: 5 or more symptoms of inattention for at least 6 months, but < 5 symptoms of hyperactivity-impulsivity.

Predominantly hyperactive-impulsive type: 5 or more symptoms of hyperactivity-impulsivity for at least 6 months, but < 5 symptoms of inattention.

Combined type: 5 or more symptoms of inattention AND 5 or more symptoms of hyperactivity-impulsivity for at least 6 months.

2.3. RISK AND PROTECTIVE FACTORS

Development of ADHD: Risk Factors

ADHD is caused by a complex interplay of genetic and environmental factors. While genetic factors are recognized as most influential in the development of ADHD[31,32], there are a variety of environmental factors that have also been associated with the development of ADHD, including social determinants of health[33,34,35,36,37,38,39,40]. Understanding these risk factors could help clinicians identify women and birthing individuals who are more likely to have ADHD, who could most benefit from ADHD screening (Table 4).

Table 4. *Risk factors for the development of ADHD*

Think about screening your perinatal patient for ADHD if:	Information about risk factors	Questions to consider asking patients
They have a family history of ADHD	The strongest known risk factor is a family history of ADHD. Twin studies show a heritability rate of ADHD ranging from approximately 70-80%[41], and family studies show that first degree relatives of an individual with ADHD have ADHD themselves at a rate of 4-26 times that of a control group[42].	Does anyone in your family have ADHD, for example, parent, sibling, child?

28 American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Publ Online May. 2013;22. doi:10.1176/APPI.BOOKS.9780890425596

31 Faraone SV. Molecular Genetics of Attention-Deficit/Hyperactivity Disorder. *Biol Psychiatry*. 2005;57:1313-1323.

32 Faraone SV, Biederman J, Monuteaux MC. Toward guidelines for pedigree selection in genetic studies of attention deficit hyperactivity disorder. *Genet Epidemiol*. 2000;18:1-16.

33 Das Banerjee T das, Middleton F, Faraone SV. Environmental risk factors for attention-deficit hyperactivity disorder. *Acta Paediatr*. 2007;96:1269-1274.

34 Bouchard MF, Bellinger DC, Wright RO, Weisskopf MG. Attention-Deficit/Hyperactivity Disorder and Urinary Metabolites of Organophosphate Pesticides. *Pediatrics*. 2010;125:1270-1277.

35 Braun JM, Kahn RS, Froehlich T, Auinger P, Lanphear BP. Exposures to environmental toxicants and attention deficit hyperactivity disorder in U.S. children. *Env Health Perspect*. 2006;114:1904-1909.

36 Rauh VA. Impact of Prenatal Chlorpyrifos Exposure on Neurodevelopment in the First 3 Years of Life Among Inner-City Children. *Pediatrics*. 2006;118:1845-1859.

37 Sagiv SK. Prenatal Organochlorine Exposure and Behaviors Associated With Attention Deficit Hyperactivity Disorder in School-Aged Children. *Am J Epidemiol*. 2010;171:593-601.

38 Stevens SE. Inattention/overactivity following early severe institutional deprivation: presentation and associations in early adolescence. *J Abnorm Child Psychol*. 2008;36:385-398.

39 Scahill L, Schwab-Stone M, Merikangas KR, Leckman JF, Zhang H, Kasl S. Psychosocial and clinical correlates of ADHD in a community sample of school-age children. *J Am Acad Child Adolesc Psychiatry*. 1999;38(8):976-984.

40 Pheula GF, Rohde LA, Schmitz M. Are family variables associated with ADHD, inattentive type? A case-control study in schools. *Eur Child Adolesc Psychiatry*. 2011;20(3):137-145.

41 Faraone SV. Molecular Genetics of Attention-Deficit/Hyperactivity Disorder. *Biol Psychiatry*. 2005;57:1313-1323.

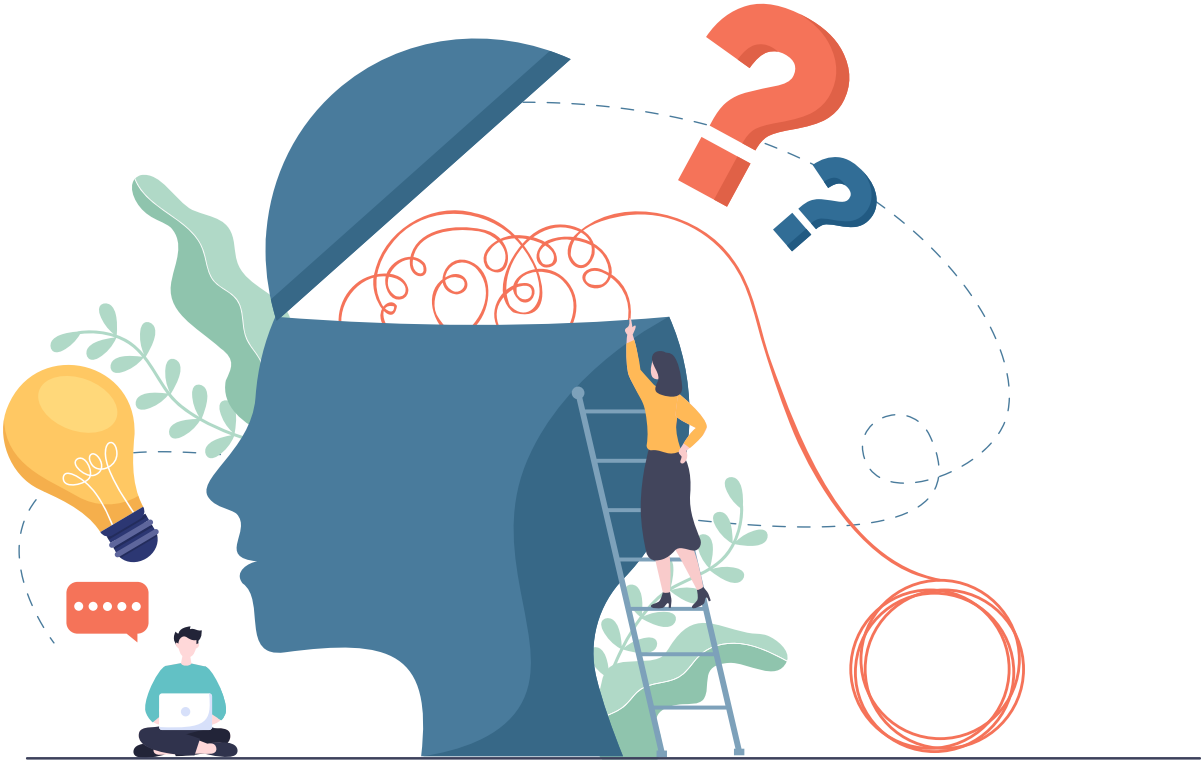
42 Faraone SV, Biederman J, Monuteaux MC. Toward guidelines for pedigree selection in genetic studies of attention deficit hyperactivity disorder. *Genet Epidemiol*. 2000;18:1-16.

Think about screening your perinatal patient for ADHD if:	Information about risk factors	Questions to consider asking patients
Their mother or birth parent had hypertension / pre-eclampsia during their pregnancy with the patient	A strong association has been observed for the development of ADHD amongst children of mothers and birthing parents who had hypertensive disorders during pregnancy [OR = 1.29 (1.22 to 1.36)], and specifically preeclampsia [OR = 1.28 (1.21 to 1.35)][43,44].	Do you know if your [mother/birth parent] had hypertension / pre-eclampsia while they were pregnant with you?
They were born preterm	A strong association has been observed for the development of ADHD amongst children who were born preterm [OR = 1.84 (1.36 to 2.49)[43,44]; preterm birth + very low birth weight OR = 3.04 (2.19 - 4.21)[45]].	Do you know if you were born preterm?
Their mother or birth parent smoked during their pregnancy with the patient	A strong association has been observed for the development of ADHD amongst children of mothers and birthing parents who smoked during pregnancy [OR = 1.60 (1.45 to 1.76)] [43,44].	Do you know if your [mother/ birth parent] smoked while they were pregnant with you?
Their parent(s) (mother/ birth parent, father/ partner) experienced mental illness that wasn't treated during their pregnancy and/or postpartum period with the patient	A tentative association has been observed for the development of ADHD amongst children exposed to untreated parental mental illness during pregnancy or postpartum [HRs for parental perinatal depression ranged from 1.42 (1.35 - 1.49) to 2.25 (2.09 - 2.41)][46].	Do you know if your [mother/birth parent] or [father/co-parent] experienced depression or a mental illness while they were pregnant with you or when you were a baby?
They had asthma as a child	A strong association has been observed for the development of ADHD amongst children with asthma [OR = 1.51 (1.40 to 1.63)[43,44]	Do you have asthma? Did you have asthma as a child?
They were exposed to environmental toxins (air pollution, heavy metals) as a child	A tentative association has been observed for the development of ADHD amongst children exposed to air pollution [PM2.5 exposure HR = 1.81 (1.62 - 2.00); PM10 exposure OR = 1.42 (1.01 - 1.82); NO2 exposure OR = 1.08 (1.01 - 1.16)][47] and heavy metals [RR = 2.41 (1.49 - 3.90)], particularly lead [RR = 2.37 (1.28 - 4.40)][48].	Did you live in a city growing up, or an area with a lot of pollution or wildfires?

43 Arango C, Dragioti E, Solmi M, et al. Risk and protective factors for mental disorders beyond genetics: an evidence-based atlas. *World Psychiatry*. 2021;20(3):417-436.
44 Kim JH, Kim JY, Lee J, et al. Environmental risk factors, protective factors, and peripheral biomarkers for ADHD: an umbrella review. *Lancet Psychiatry*. 2020;7(11):955-970.
45 Franz AP. Attention-Deficit/Hyperactivity Disorder and Very Preterm/Very Low Birth Weight: A Meta-analysis. *Pediatrics*. 2018;141.
46 Chen LC. Association of parental depression with offspring attention deficit hyperactivity disorder and autism spectrum disorder: A nationwide birth cohort study. *J Affect Disord*. 2020;277:109-114.
47 Bouchard MF, Bellinger DC, Wright RO, Weisskopf MG. Attention-Deficit/Hyperactivity Disorder and Urinary Metabolites of Organophosphate Pesticides. *Pediatrics*. 2010;125:1270-1277.
48 Braun JM, Kahn RS, Froehlich T, Auinger P, Lanphear BP. Exposures to environmental toxicants and attention deficit hyperactivity disorder in U.S. children. *Env Health Perspect*. 2006;114:1904-1909.

Think about screening your perinatal patient for ADHD if:	Information about risk factors	Questions to consider asking patients
They grew up in a low-resource environment (e.g., low income, family adversity, social deprivation)	There is tentative evidence of an association between ADHD and childhood adversity, such as low income[49], family adversity[49,50], and social deprivation[51].	Could you tell me a bit about your childhood? What was your family life like (calm, chaotic)? Did you feel secure / insecure in your family relationships? Were there times when there wasn't enough food in your house, or you were worried about having enough to eat?

Note. It is important to keep in mind that many of these risk factors may be confounded by undiagnosed ADHD in the mother / birth parent, and the observed association may be due to genetic risk.



49 Scahill L, Schwab-Stone M, Merikangas KR, Leckman JF, Zhang H, Kasl S. Psychosocial and clinical correlates of ADHD in a community sample of school-age children. *J Am Acad Child Adolesc Psychiatry.* 1999;38(8):976-984.

50 Pheula GF, Rohde LA, Schmitz M. Are family variables associated with ADHD, inattentive type? A case-control study in schools. *Eur Child Adolesc Psychiatry.* 2011;20(3):137-145.

51 Stevens SE. Inattention/overactivity following early severe institutional deprivation: presentation and associations in early adolescence. *J Abnorm Child Psychol.* 2008;36:385-398.

Development of ADHD: Protective Factors

- Breastfeeding was the only factor that was identified to have a statistically significant protective effect against the development of ADHD amongst children (Class IV – weak association) in an umbrella review of meta-analyses[52].

Management of ADHD: Risk Factors for Exacerbation of Symptoms

> Hormone changes

Hormone changes for females with ADHD have been observed to exacerbate ADHD symptoms, for example: during puberty, in the week before menstruation, and during pregnancy[53,54], postpartum and perimenopause.

> Increased mental load

Times of increased mental load also worsen ADHD symptoms, for example, during pregnancy[53,54] and postpartum[55].

> Sleep disruption

Poor sleep can exacerbate ADHD symptoms, and trying to maximize sleep is especially important in the perinatal period. In the postpartum period, there is a close relationship between sleep and infant feeding choices. Presenting evidence about infant feeding options and supporting families to make informed decisions that are aligned with their values is important. Remember that sleep can be maximized overnight for mothers/birth parents who breastfeed, when partners or support people feed the baby either expressed human milk or formula by bottle for one or more feeds. Families using formula should be supported with appropriate safe formula feeding guidance. Efforts to promote sleep can also protect milk supply and opportunities to breastfeed. Partners or support people can also support sleep for mothers/birth parents by caring for babies in other ways such as diapering, soothing, and bringing baby to the lactating parent to feed. A trained postpartum doula could be particularly helpful, if financially possible. In some cases, treatment of sleep impairment with medications is recommended, but it would be important to ensure that another responsible adult is available to attend to the baby's needs while the mother/birth parent is sleeping.

52 Kim JH, Kim JY, Lee J, et al. Environmental risk factors, protective factors, and peripheral biomarkers for ADHD: an umbrella review. *Lancet Psychiatry*. 2020;7(11):955-970.
53 Freeman MP. ADHD and Pregnancy. *Am J Psychiatry*. 2014;171:723-728.
54 Eddy LD, Jones HA, Snipes D, Karjane N, Svikis D. Associations Between ADHD Symptoms and Occupational, Interpersonal, and Daily Life Impairments Among Pregnant Women. *J Atten Disord*. 2019;23(9):976-984.
55 Joseph HM, Khetarpal SK, Wilson MA, Molina BSG. Parent ADHD Is Associated With Greater Parenting Distress in the First Year Postpartum. *J Atten Disord*. 2022;26(9):1257-1268.

Management of ADHD: Protective Factors for Control of Symptoms

Personal, familial, and social factors have been identified to have a protective and/or positive impact on outcomes for those with ADHD[56,57,58,59].

- Social support[57,58,59,60,61]
- A high sense of coherence[59] and self-efficacy in the context of ADHD[62,63]
- Positive self-perceptions of competence[56]

While this evidence mostly comes from studies of children with ADHD, recognizing protective factors that could help patients build resilience could be useful for developing individualized treatment plans for women and birthing individuals with ADHD[56].

56 Dvorsky MR, Langberg JM. A Review of Factors that Promote Resilience in Youth with ADHD and ADHD Symptoms. *Clin Child Fam Psychol Rev*. 2016;19:368-391.
57 Hölling H, Schlack R, Dippelhofer A, Kurth BM. Personal, familial and social resources and health-related quality of life in children and adolescents with chronic conditions. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*. 2008;51:606-620.
58 Schei J, Nøvik TS, Thomsen PH, Indredavik MS, Jozefiak T. Improved quality of life among adolescents with attention-deficit/hyperactivity disorder is mediated by protective factors: a cross sectional survey. *BMC Psychiatry*. 2015;15.
59 Wüstner A. Risk and protective factors for the development of ADHD symptoms in children and adolescents: Results of the longitudinal BELLA study. *PLoS One*. 2019;14.
60 Klasen F. Risk and protective factors for the development of depressive symptoms in children and adolescents: results of the longitudinal BELLA study. *Eur Child Adolesc Psychiatry*. 2015;24:695-703.
61 Mastoras SM, Saklofske DH, Schwean VL, Climie EA. Social Support in Children With ADHD: An Exploration of Resilience. *J Atten Disord*. 2018;22:712-723.
62 Singer MJ, Humphreys KL, Lee SS. Coping Self-Efficacy Mediates the Association Between Child Abuse and ADHD in Adulthood. *J Atten Disord*. 2016;20:695-703.
63 Newark PE, Elsässer M, Stieglitz, R. Self-Esteem, Self-Efficacy, and Resources in Adults With ADHD. *J Atten Disord*. 2016;20(3):279-290.

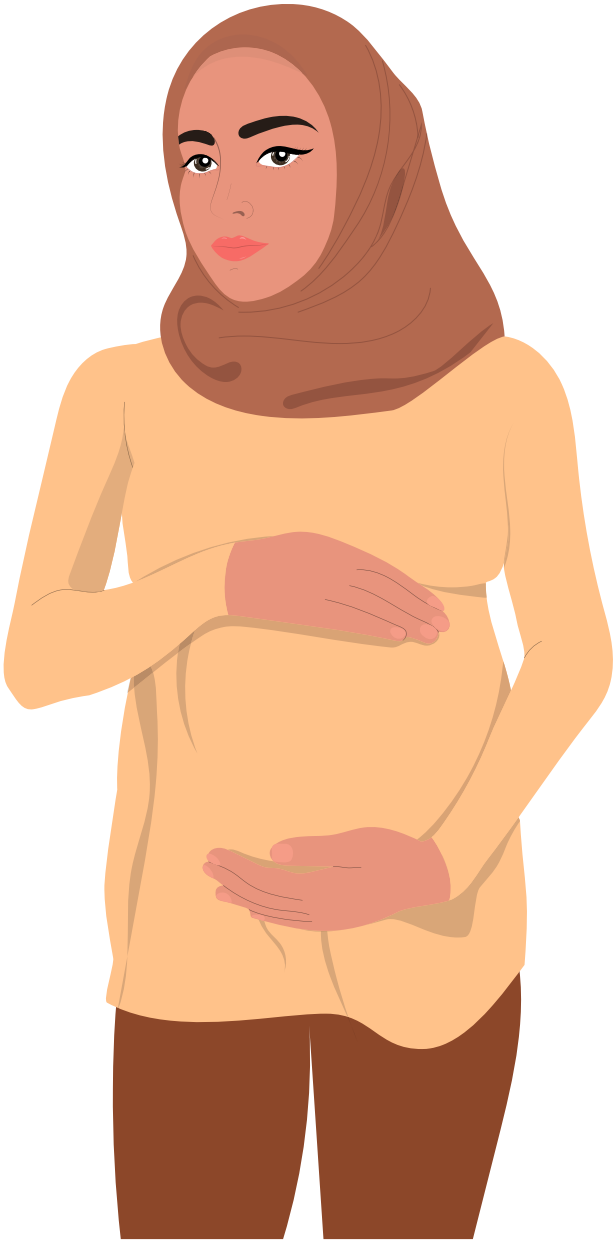
2.4. ADHD AND THE PERINATAL PERIOD

There is a lack of research following the course of ADHD symptoms across the perinatal period. However, pregnancy is known to affect neurocognitive functions, with pregnant individuals reporting issues with memory, disorientation, confusion, and reading difficulties[64,65]. Studies have shown the memory and executive functioning can be impaired in pregnancy[64,66,67] and the postpartum period[68], but findings are inconsistent[69,70]. Women and gender-diverse birthing individuals with a pre-existing diagnosis of ADHD may be particularly vulnerable to worsening cognitive challenges during pregnancy[71].

Pregnancy requires individuals to manage many medical appointments and prepare the home for the baby. If the pregnancy is complicated by conditions such as gestational diabetes, which has been found to be more common in individuals with ADHD[72], individuals must also adhere to specific diets and regimes. As these tasks involve planning, organization, financial oversight, and time management, the symptoms of ADHD may make them particularly challenging[73]. Additionally, unplanned pregnancies and early parenthood (i.e., younger age) are more common in individuals with ADHD[74,75,76,77], which may add additional stress for these patients in the perinatal period. The birth and early neonatal period may also be more likely to be stressful or traumatic for people with ADHD, given evidence of increased risks for caesarean delivery, need for neonatal resuscitation, and admission for the neonate to an intensive care unit for more than 4 hours.

64 Sharp K, Brindle PM, Brown MW, Turner GM. Memory loss during pregnancy. *BJOG*. 1993;100(3):209-215.
65 Poser CM, Kassirer MR, Peyser JM. Benign encephalopathy of pregnancy. Preliminary clinical observations. *Acta Neurol Scand*. 1986;73(1):39-43.
66 Keenan PA, Yaldoo DT, Stress ME, Fuerst DR, Ginsburg KA. Explicit memory in pregnant women. *Am J Obstet Gynecol*. 1998;179(3):731-737.
67 Galen Buckwalter J. Pregnancy, the postpartum, and steroid hormones: effects on cognition and mood. *Psychoneuroendocrinology*. 1999;24:69-84.
68 Henry JF, Sherwin BB. Hormones and cognitive functioning during late pregnancy and postpartum: A longitudinal study. *Behav Neurosci*. 2012;126(1):73-85.
69 Onyper SV, Searleman A, Thacher PV, Maine EE, Johnson AG. Executive functioning and general cognitive ability in pregnant women and matched controls. *J Clin Exp Neuropsychol* 2010;32:986-995.
70 Henry JD, Rendell PG. A review of the impact of pregnancy on memory function. *J Clin Exp Neuropsychol*. 2007;29(8):793-803.
71 Freeman MP. ADHD and Pregnancy. *Am J Psychiatry* 2014;171:723-728.
72 Walsh CJ, Rosenberg SL, Hale EW. Obstetric complications in mothers with ADHD. *Front Reprod Health*. 2022;4(1040824).
73 Eddy LD, Jones HA, Snipes D, Karjane N, Svikis D. Associations Between ADHD Symptoms and Occupational, Interpersonal, and Daily Life Impairments Among Pregnant Women. *J Atten Disord*. 2019;23(9):976-984.
74 Owens EB, Zalecki C, Gillette P, Hinshaw SP. Girls with childhood ADHD as adults: Cross-domain outcomes by diagnostic persistence. *J Consult Clin Psychol*. 2017;85(7):723-736.
75 Skoglund C, Kopp Kallner H, Skalkidou A, et al. Association of Attention-Deficit/Hyperactivity Disorder With Teenage Birth Among Women and Girls in Sweden. *JAMA Netw Open*. 2019;2(10).
76 Barkley RA, Fischer M, Smallish L, Fletcher K. Young adult outcome of hyperactive children: adaptive functioning in major life activities. *J Am Acad Child Adolesc Psychiatry*. 2006;45(2):192-202.
77 Hua MH, Huang KL, Hsu JW, et al. Early Pregnancy Risk Among Adolescents With ADHD: A Nationwide Longitudinal Study. *J Atten Disord*. 2021;25(9):1199-1206.

ADHD in pregnancy can impact multiple parts of life, especially at work and in personal relationships. Studies indicate inattentive symptoms were the most important predictors of impairment in daily functioning[78]. This is supported by our clinical observations that ADHD symptoms frequently become difficult to manage during the perinatal period, requiring extra support and attention. Parenting with ADHD may feel overwhelming, particularly for individuals who haven't yet established organizational skills to manage their symptoms. Balancing their own needs with their baby's needs can be challenging, and hyper-focusing on the needs of the baby might lead a parent to neglect their own selfcare like sleep and nutrition. Additionally, parents with ADHD have been found to experience higher levels of parental distress in the first year postpartum compared to new parents without ADHD[79]. Evidence is also emerging that parents with ADHD may be at greater risk for postpartum depression and anxiety, as well as intimate partner violence. More research is needed to explore ADHD symptom severity and co-existing conditions across the perinatal period, but current evidence emphasizes that special attention needs to be given to pregnant patients with ADHD.



78 Eddy LD, Jones HA, Snipes D, Karjane N, Svikis D. Associations Between ADHD Symptoms and Occupational, Interpersonal, and Daily Life Impairments Among Pregnant Women. *J Atten Disord*. 2019;23(9):976-984.

79 Joseph HM, Khetarpal SK, Wilson MA, Molina BSG. Parent ADHD Is Associated With Greater Parenting Distress in the First Year Postpartum. *J Atten Disord*. 2022;26(9):1257-1268.

3. Screening and Diagnosis

3.1. SCREENING

When a general mental health screening has been completed and ADHD is suspected, the first step is to have patients complete the Adult ADHD Self-Report Scale (ASRS-V1.1)[80], before diagnostic assessment for those screening positive. The ASRS is the most commonly used self-report screening tool for ADHD and was initially developed with 18 items assessing DSM-IV-TR criteria (ASRS v1.1).

The ASRS (18 item version) asks patients to rate how often they experience various symptoms and has two sections, A and B. Part A (the first 6 questions) is all that is required to screen for ADHD. This screener is available online, with unrestricted use granted, and in many different languages (https://www.hcp.med.harvard.edu/ncs/asrs.php "ASRS v1.1 Screener-English (PDF)"). An updated version of the ASRS that reflects DSM-5 criteria has also been released (https://adhdscreeneronline.com/).

Part A of the ASRS-V1.1[80] asks patients to indicate the frequency of specific symptoms. A screen is positive when a patient checks "often" or "very often" for **four or more** of the six questions. Part B of the ASRS (the remaining questions) provides additional prompts to further clarify the patient's symptoms.

If a patient screens positive for ADHD, further investigation is warranted to assess whether they meet full diagnostic criteria (see Table 3 for a summary, and the DSM-5 for comprehensive details)[81]. We recommend that you consider:

- Asking the patient to complete Part B of the ASRS.
- Asking someone who knows the patient well (e.g., parent, spouse) to complete the ASRS with the patient in mind to gain insights into how their symptoms are perceived by and impact those around them.
- Using a functional impairment scale such as the Weiss Functional Impairment Rating Scale- Self (WFIRS-S) to evaluate ADHD-related challenges[82]. The WFIRS-S has been validated in the ADHD population, and is available from the CADDRA website.
- Referral to an ADHD specialist for diagnostic assessment interview, where possible.

80 Kessler RC, Adler L, Ames M, et al. The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. *Psychol Med*. 2005;35(2):245-256.

81 American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Publ Online May. 2013;22. doi:10.1176/APPI.BOOKS.9780890425596

82 Weiss MD, McBride NM, Craig S, Jensen P. Conceptual review of measuring functional impairment: findings from the Weiss Functional Impairment Rating Scale. *Evid Based Ment Health*. 2018;21(4).

3.2. DIAGNOSIS

Recognizing and diagnosing ADHD in the perinatal period can be challenging, as some individuals experience neurocognitive symptoms in pregnancy that may be mistaken for ADHD (see section *2.4. ADHD and the Perinatal Period*). It's ideal for ADHD to be diagnosed before pregnancy, but this isn't always possible. Pregnant people with suspected ADHD might benefit from a mental health assessment to differentiate pregnancy-related cognitive changes from true ADHD symptoms.

To distinguish ADHD from neurocognitive changes in the perinatal period, consider:

> Temporality of symptoms

- Did they begin prior to pregnancy?
- Did they begin in childhood (difficulty in school)?
- When do parents/close relatives think symptoms started?

> Pervasiveness of symptoms

- Are they present across multiple settings?

> Severity of symptoms

- Do they clearly interfere with daily functioning?

4. Treatment and Self-Management

4.1. OVERVIEW OF MANAGEMENT FOR ADHD IN THE PERINATAL PERIOD

While ADHD is not preventable, the risks and impacts of the disorder in the perinatal period can be managed with preconception counselling and perinatal planning, management, and support.

Preconception counselling includes:

- Discussing risks associated with untreated/under-treated ADHD (e.g., driving risks), and ways to reduce symptoms and optimize functioning across all domains of life (school, occupation, family).
- Reviewing and potentially changing medications prior to becoming pregnant (see section *4.6. Medications for the Treatment of ADHD*).
- Reinforcing the importance of seeking help if ADHD symptoms become worse during pregnancy or postpartum.

Planning, management, and support includes:

- Asking all pregnant people about a personal history of ADHD or other neurodevelopmental disorders/psychiatric illnesses.
- Developing a management plan for pregnancy and lactation/infant feeding that involves the pregnant person and their family supports, psychiatry, obstetrics, primary care, and lactation consultant support, as appropriate. Planning needs to incorporate ongoing monitoring, and, if necessary, adjustment of medications throughout the perinatal period.
- Addressing factors that may reduce functioning in the perinatal period, such as stress, nutrition (particularly prioritizing eating throughout the day), and sleep deprivation. Promoting executive functioning in the postpartum period is crucial for the safety and wellbeing of the parent and baby (e.g., remembering to fasten baby's seat belt).
- Support postpartum women and birthing people to achieve their infant feeding goals. This includes providing evidence-informed counselling on breastfeeding when taking prescribed medication. See Box 1 regarding language.

Box 1. The importance of inclusive language

Not every person who is lactating will be comfortable with the term 'breastfeeding.' It is important for healthcare professionals to ask people which term they prefer to use when discussing the act of feeding their baby. Other options may include 'chestfeeding' or 'nursing.' We encourage clinicians to be sensitive to patient language preferences, and aware of inclusive language options[83,84]. In the interests of plain language writing, we use the terms breastfeeding and human milk in this guideline, but the messages are intended to apply to individuals of all genders.

For further support providing gender-affirming care in the perinatal period, please refer to the Pregnancy and Infant Feeding section of Trans Care BC's Clinical Handbook: https://www.transcarebc.ca/clinical-handbook/pregnancy-infant-feeding

83 Dinour LM. Speaking out on "Breastfeeding" terminology: recommendations for gender inclusive language in research and reporting. *Breastfeed Med* 2019;14:523–32.

84 Rasmussen KM, Felice JP, O'Sullivan EJ, Garner CD, Geraghty SR. The meaning of "Breastfeeding" is changing and so must our language about it. *Breastfeed Med* 2017;12:510–4.

4.2. SUMMARY OF TREATMENTS

Treatment of ADHD often involves a combination of behavioural therapy and medications, typically psychostimulants — see Table 5 for a list of treatments commonly used in ADHD. For mild to moderate ADHD in pregnant or postpartum women and gender diverse birthing people, psychoeducation, self-management strategies, coaching, and psychotherapies are recommended as first line interventions. In addition to these interventions, pharmacotherapy may be required for pregnant or postpartum individuals with moderate to severe ADHD[85,86]. When treating a pregnant or postpartum person, it's important to consider if ADHD is present along with any other psychiatric illness, as their treatment will not be as successful if the ADHD is not addressed at the same time[87]. Decisions about medication use are complex, and should take into consideration aspects of patients' lives and available resources. Consider using our companion patient resource to support treatment decision making for ADHD in the perinatal period.

It can be useful to keep in mind that people with ADHD may struggle to process or remember information as easily as others, and may be experiencing more intense emotional or mental health symptoms. It may help if healthcare professionals individualize their care for patients with ADHD using different teaching or learning approaches (asking about patient preferences), and giving patients information in a written format to take away with them. Potential alternatives could be inviting patients to take notes during appointments, recording appointments, and/or bringing a support person with them to appointments.

Table 5. ***Treatments commonly used to treat ADHD in the perinatal period***

Severity of Symptoms	Treatment and Self-Management
Mild to moderate of ADHD	A. Psychoeducation B. Self-management/coaching C. Psychotherapies i. Cognitive Behavioural Therapy (CBT) ii. Mindfulness-Based Interventions iii. Dialectical Behaviour Therapy
Moderate to severe	Treatment for mild to moderate symptoms plus: D. Pharmacotherapy (medications) i. Stimulants a. Amphetamine-based stimulants b. Methylphenidate-based stimulants ii. Non-stimulants

85 Baker AS, Freeman MP. Management of Attention Deficit Hyperactivity Disorder During Pregnancy. *Obstet Gynecol Clin North Am*. 2018;45(3):495-509.

86 Murugappan MN, Westberg SM, Contag S, et al. Maternal ADHD and Perinatal Prescription Stimulant Use. *J Atten Disord*. 2022;26(10):1347-1356.

87 Baker AS, Wales R, Noe O, Gaccione P, Freeman MP, Cohen LS. The Course of ADHD during Pregnancy. *J Atten Disord*. 2022;26(2):143-148.

4.3. PSYCHOEDUCATION

Psychoeducation has been shown to reduce disorganization and inattention while improving self-confidence in adults with ADHD[88]. We are unaware of research on psychoeducation for ADHD in the perinatal period, however, psychoeducation in the perinatal period has been shown to be effective for other mental health conditions, like perinatal depression[89,90]. The aim of psychoeducation for ADHD in the perinatal period is to help pregnant people and their families understand the symptoms they are experiencing and the disorder, learn about available treatment options, and strengthen existing coping strategies. The goal is to promote understanding and personal management of ADHD[87,88].

Specific topics important to cover in psychoeducation for ADHD include:

- Information about the disorder[91]
- Prevalence[92,93,94]
- Signs and symptoms[95]
- Risk and protective factors for the management of ADHD symptoms[96,97,98,99,100,101,102,103,104]

88 Wiggins D, Singh K, Hutchins, DE, Getz HG. Effects of a brief group intervention for adults with ADHD. *J Ment Heal Couns.* 1999;21(1):82-92.
89 Goodman JH, Santangelo G. Group treatment for postpartum depression: a systematic review. *Arch Womens Ment Health.* 2011;14(4):277-293.
90 Sockol LE, Epperson CN, Barber JP. A meta-analysis of treatments for perinatal depression. *Clin Psychol Rev.* 2011;31(5).
91 Posner J, Polanczyk GV, Sonuga-Barke E. Attention-deficit hyperactivity disorder. *Lancet.* 2020;395(10222):450-462.
92 Thomas R, Sanders S, Doust J, Beller E, Glasziou P. Prevalence of attention-deficit/hyperactivity disorder: a systematic review and meta-analysis. *Pediatrics.* 2015;135:994-1001.
93 Kessler RC, Adler L, Barkley R, et al. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry.* 2006;163(4):716-723.
94 Biederman J. Adult psychiatric outcomes of girls with attention deficit hyperactivity disorder: 11-year follow-up in a longitudinal case-control study. *Am J Psychiatry.* 2010;167:409-417.
95 Young S, Adamo N, Ásgeirsdóttir BB et al. Females with ADHD: An expert consensus statement taking a lifespan approach providing guidance for the identification and treatment of attention-deficit/ hyperactivity disorder in girls and women. *BMC Psychiatry.* 2020;20(1):1-27.
96 Dvorsky MR, Langberg JM. A Review of Factors that Promote Resilience in Youth with ADHD and ADHD Symptoms. *Clin Child Fam Psychol Rev.* 2016;19:368-391.
97 Hölling H, Schlack R, Dippelhofer A, Kurth BM. Personal, familial and social resources and health-related quality of life in children and adolescents with chronic conditions. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz.* 2008;51:606-620.
98 Schei J, Nøvik TS, Thomsen PH, Indredavik MS, Jozefiak T. Improved quality of life among adolescents with attention-deficit/ hyperactivity disorder is mediated by protective factors: a cross sectional survey. *BMC Psychiatry.* 2015;15.
99 Wüstner A. Risk and protective factors for the development of ADHD symptoms in children and adolescents: Results of the longitudinal BELLA study. *PLoS One.* 2019;14.
100 Klasen F. Risk and protective factors for the development of depressive symptoms in children and adolescents: results of the longitudinal BELLA study. *Eur Child Adolesc Psychiatry.* 2015;24:695-703.
101 Mastoras SM, Saklofske DH, Schwean VL, Climie EA. Social Support in Children With ADHD: An Exploration of Resilience. *J Atten Disord.* 2018;22:712-723.
102 Singer MJ, Humphreys KL, Lee SS. Coping Self-Efficacy Mediates the Association Between Child Abuse and ADHD in Adulthood. *J Atten Disord.* 2016;20:695-703.
103 Newark PE, Elsässer M, Stieglitz, R. Self-Esteem, Self-Efficacy, and Resources in Adults With ADHD. *J Atten Disord.* 2016;20(3):279-290.
104 Weissenberger S, Ptacek R, Klicperova-Baker M, et al. ADHD, Lifestyles and Comorbidities: A Call for an Holistic Perspective — from Medical to Societal Intervening Factors. *Front Psychol.* 2017;8(454).

- Highly co-occurring conditions[92,105,106,107]
- Treatment options[108,109,110,111]
- Benefits and potential risks of treatment (particularly related to pharmacotherapy in the perinatal period)[112,113,114]
- Anticipated improvements with treatment[115,116,117]

4.4. SELF-MANAGEMENT AND COACHING

In self-management, patients are supported to make changes in how they structure their lives to reduce the impact of ADHD symptoms and improve their quality of life. There are coaches who specialize in supporting people with ADHD (https://caddac.ca/find-a-resource/). Coaching helps individuals with ADHD manage their behaviour and improve functioning with support and accountability. Coaches help with setting realistic goals, developing plans to accomplish these goals, and tailoring their daily routines to better cope with ADHD. Coaching for ADHD has been shown to improve attention, time management, concentration, impulsivity, self-esteem, quality of life, and overall task completion[113,118,119,120].

105 Jensen CM, Steinhausen HC. Comorbid mental disorders in children and adolescents with attention-deficit/hyperactivity disorder in a large nationwide study. *ADHD Atten Deficit Hyperact Disord*. 2015;7(1):27-38.
106 Young S, Toone B, Tyson C. Comorbidity and psychosocial profile of adults with Attention Deficit Hyperactivity Disorder. *Individ Dif*. 2003;35(4):743-755.
107 Sobanski E. Psychiatric comorbidity in adults with attention-deficit/hyperactivity disorder (ADHD). *Eur Arch Psychiatry Clin Neurosci*. 2006;256 Suppl 1:i26-31.
108 Baker AS, Freeman MP. Management of Attention Deficit Hyperactivity Disorder During Pregnancy. *Obstet Gynecol Clin North Am*. 2018;45(3):495-509.
109 Vidal-Estrada R, Bosch-Munso R, Nogueira-Morais M, Casas-Brugue M, Ramos-Quiroga JA. Psychological treatment of attention deficit hyperactivity disorder in adults: a systematic review. *Actas Esp Psiquiatr*. 2012;40(3):147-154.
110 Radonjić NV, Bellato A, Khoury NM, Cortese S, Faraone SV. Nonstimulant Medications for Attention-Deficit/Hyperactivity Disorder (ADHD) in Adults: Systematic Review and Meta-analysis. *CNS Drugs*. 2023;37.
111 Faraone SV. The World Federation of ADHD International Consensus Statement: 208 Evidence-based conclusions about the disorder. *Neurosci Biobehav Rev*. 2021;128:789-818.
112 Kittel-Schneider S, Quednow BB, Leutritz AL, McNeill RV, Reif A. Parental ADHD in pregnancy and the postpartum period – A systematic review. *Neurosci Biobehav Rev*. 2021;124:63-77.
113 Ornoy A. Pharmacological Treatment of Attention Deficit Hyperactivity Disorder During Pregnancy and Lactation. *Pharm Res*. 2018;35(3):1-11.
114 Nörby U, Winbladh B, Källén K. Perinatal outcomes after treatment with ADHD medication during pregnancy. *Pediatrics*. c2017;140:20170747.
115 Kubik JA. Efficacy of ADHD coaching for adults with ADHD. *J Atten Disord*. 2010;13(5):442-453.
116 Solanto MV, Marks DJ, Wasserstein J, et al. Efficacy of meta-cognitive therapy for adult ADHD. *Am J Psychiatry*. 2010;167:958-968.
117 Cortese S, Adamo N, Del Giovane C, et al. Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: a systematic review and network meta-analysis. *Lancet Psychiatry*. 2018;5(9):727-738.
118 Wentz E, Nydén A, Krevers B. Development of an internet-based support and coaching model for adolescents and young adults with ADHD and autism spectrum disorders: A pilot study. *Eur Child Adolesc Psychiatry*. 2012;21(11):611-622.
119 Sehlin H, Ahlström BH, Bertilsson I, Andersson G, Wentz E. Internet-Based Support and Coaching With Complementary Clinic Visits for Young People With Attention-Deficit/Hyperactivity Disorder and Autism: Controlled Feasibility Study. *J Med Internet Res*. 2020;22(12).
120 Prevatt F. Coaching for College Students with ADHD. *Curr Psychiatry Rep*. 2016;18(12):1-7.

Self-management strategies include:

- Establishing routines, structures, habits
- Using lists, calendars, timers
- Self-care, including taking breaks, sleep hygiene, regular nutritious meals, exercise
- Reducing workload during pregnancy or implementing additional structure or external supports in the workplace
- Taking public transport or making alternative transportation arrangements to avoid driving

Implementing the above strategies may be particularly helpful for patients who want to avoid the use of medications during pregnancy[121]. Driving ability, in particular, is an important safety consideration in the context of severe or untreated ADHD. Treatment with stimulants has been shown to improve driving capability[122], but alternative transportation arrangements are strongly recommended for pregnant people with a history or high risk of driving impairment.

4.5. PSYCHOTHERAPIES

Research evaluating the efficacy of psychotherapies for the treatment of ADHD in the perinatal period is limited. Here we summarize research that has largely been conducted in adults with ADHD and has been extrapolated to the perinatal population.

4.5.1. Cognitive Behavioural Therapy

Cognitive Behavioural Therapy (CBT) focuses on how thoughts influence emotions, which in turn can affect behaviour and physical responses. CBT helps manage symptoms by changing negative thought patterns and unhelpful behaviours. ADHD-specific CBT treatments are tailored to improve executive functioning skills like time management, increasing structure and organization, and goal setting, while teaching more adaptive behavioural skills, for example, using planners and creating "to do" lists. There are also CBT programs that focus on emotional self-regulation, stress management, and impulse control.

CBT is currently the most extensively studied psychotherapy for ADHD, and has been found to be the most effective treatment for ADHD and co-existing anxiety and depression in adults[123].

121 Freeman MP. ADHD and Pregnancy. *Am J Psychiatry* 2014;171:723-728.
122 Biederman J, Fried R, Hammerness P, et al. The Effects of Lisdexamfetamine Dimesylate on Driving Behaviors in Young Adults With ADHD Assessed With the Manchester Driving Behavior Questionnaire. *J Adolesc Health.* 2012;51(6):601-607.
123 Vidal-Estrada R, Bosch-Munso R, Nogueira-Morais M, Casas-Brugue M, Ramos-Quiroga JA. Psychological treatment of attention deficit hyperactivity disorder in adults: a systematic review. *Actas Esp Psiquiatr.* 2012;40(3):147-154.

CBT for adults with ADHD has been shown to be effective in both group[121,124,125,126] and individual settings[127,128,129,130], and literature suggests that CBT for ADHD improves further with medication[131].

4.5.2. Mindfulness-Based Therapy

Mindfulness involves cultivating awareness by paying attention to the present moment with non-judgmental and kind acceptance. Mindfulness-based interventions (MBIs) are standardized evidence-based programs, with the most studied programs being the 8-week group-based Mindfulness-Based Cognitive Therapy (MBCT) and Mindfulness-Based Stress Reduction (MBSR) programs[132,133].

124 Virta M, Vedenpää A, Grönroos N, et al. Adults with ADHD benefit from cognitive-behaviorally oriented group rehabilitation: a study of 29 participants. *J Atten Disord*. 2008;12(3):218-226.
125 Stevenson CS, Whitmont S, Bornholt L, Livesey D, Stevenson RJ. A cognitive remediation programme for adults with Attention Deficit Hyperactivity Disorder. *Aust N Z J Psychiatry*. 2002;36(5):610-616.
126 Solanto MV, Marks DJ, Mitchell KJ, Wasserstein J, Kofman MD. Development of a new psychosocial treatment for adult ADHD. *J Atten Disord*. 2008;11:728-736.
127 Safren SA, Otto MW, Sprich S, Winett CL, Wilens TE, Biederman J. Cognitive-behavioral therapy for ADHD in medication-treated adults with continued symptoms. *Behav Res Ther*. 2005;43(7):831-842.
128 Safren SA, Sprich S, Mimiaga MJ, et al. Cognitive Behavioral Therapy vs Relaxation With Educational Support for Medication-Treated Adults With ADHD and Persistent Symptoms: A Randomized Controlled Trial. *JAMA*. 2010;304(8):875-880.
129 Virta M, Salakari A, Antila M, et al. Short cognitive behavioral therapy and cognitive training for adults with ADHD — a randomized controlled pilot study. *Neuropsychiatr Treat*. 2010;6(443).
130 Wilens TE, McDermott SP, Biederman J, Abrantes A, Hahesy A, Spencer TJ. Cognitive Therapy in the Treatment of Adults With ADHD: A Systematic Chart Review of 26 Cases. *J Cogn Psychother*. 1999;13(3):215-226.
131 Mongia M, Hechtman L. Cognitive behavior therapy for adults with attention-deficit/hyperactivity disorder: A review of recent randomized controlled trials. *Curr Psychiatry Rep*. 2012;14(5):561-567.
132 Kabat-Zinn J. *Full Catastrophe Living*. revised. Bantam Books; 2013.
133 Segal Z, Williams MG, Teasdale JD. *Mindfulness-Based Cognitive Therapy for Depression*. 2nd ed. The Guilford Press; 2018.

Research on mindfulness for managing ADHD in adults is increasing, as is our understanding of the underlying behavioural and neurological mechanisms. There are three main neural networks involved both in ADHD and in mindfulness: the default mode network, salience network, and central executive network[134,135,136,137,138,139,140]. Behaviourally, mindfulness-based interventions are most helpful for people with ADHD regarding symptoms of inattention, emotion regulation, executive function, and overall quality of life[132,141,142,143,144]. Clinical guidelines such as CADDRA Canadian ADHD Practice Guidelines[145] and the NICE guidelines in the UK[146] recommend MBIs as a non-pharmacological intervention for adults with ADHD.

The process of becoming a parent creates a unique set of challenges. In literature on other mental health diagnoses in the perinatal period, mindfulness helps improve self-compassion, parental self-efficacy, and various dimensions of mindfulness including observing, acting with awareness, non-judging and non-reactivity[147,148,149]. Although MBIs were introduced relatively recently and evidence for their use in managing ADHD in the perinatal population is still emerging, they seem increasingly promising.

134 Poissant H, Mendrek A, Talbot N, Khoury B, Nolan J. Behavioral and Cognitive Impacts of Mindfulness-Based Interventions on Adults with Attention-Deficit Hyperactivity Disorder: A Systematic Review. *Behav Neurol*. 2019;2019.
135 Cortese S, Kelly C, Chabernaud C, et al. Toward systems neuroscience of ADHD: a meta-analysis of 55 fMRI studies. *Am J Psychiatry*. 2012;169(10):1038-1055.
136 Francx W, Oldehinkel M, Oosterlaan J, et al. The executive control network and symptomatic improvement in attention-deficit/hyperactivity disorder. *Cortex*. 2015;73:62-72.
137 Liddle EB, Hollis C, Batty MJ, et al. Task-related default mode network modulation and inhibitory control in ADHD: effects of motivation and methylphenidate. *J Child Psychol Psychiatry*. 2011;52(7):761-771.
138 McCarthy H, Skokauskas N, Mulligan A, et al. Attention network hypoconnectivity with default and affective network hyperconnectivity in adults diagnosed with attention-deficit/hyperactivity disorder in childhood. *JAMA Psychiatry*. 2013;70(12):1329-1337.
139 Norman LJ, Carlisi CO, Christakou A, et al. Shared and disorder-specific task-positive and default mode network dysfunctions during sustained attention in paediatric Attention-Deficit/Hyperactivity Disorder and obsessive/compulsive disorder. *Neuroimage Clin*. 2017;15:181-193.
140 Sidlauskaite J, Sonuga-Barke E, Roeyers H, Wiersema J. Default mode network abnormalities during state switching in attention deficit hyperactivity disorder. *Psychol Med*. 2016;46(3):519-528.
141 Poissant H, Moreno A, Potvin S, Mendrek A. A Meta-analysis of Mindfulness-Based Interventions in Adults with Attention-Deficit Hyperactivity Disorder: Impact on ADHD Symptoms, Depression, and Executive Functioning. *Mindfulness*. 2020;11(12):2669-2681.
142 Cairncross M, Miller CJ. The Effectiveness of Mindfulness-Based Therapies for ADHD: A Meta-Analytic Review. *J Atten Disord*. 2020;24(5):627-643.
143 Xue J, Zhang Y, Huang Y, Tusconi M. A meta-analytic investigation of the impact of mindfulness-based interventions on ADHD symptoms. *Medicine (Baltimore)*. 2019;98(23).
144 López-Pinar C, Martínez-Sanchís S, Carbonell-Vayá E, Sánchez-Meca J, Fenollar-Cortés J. Efficacy of Nonpharmacological Treatments on Comorbid Internalizing Symptoms of Adults With Attention-Deficit/Hyperactivity Disorder: A Meta-Analytic Review. *J Atten Disord*. 2020;24(3):456-478.
145 Canadian ADHD Practice Guidelines 4.1. Edition. CADDRA. https://www.caddra.ca/canadian-adhd-practice-guidelines/.
146 National Guideline Centre (UK). Evidence review(s) for efficacy of non-pharmacological treatment and the impact of adverse events associated with non-pharmacological treatments of ADHD. In: Attention Deficit Hyperactivity Disorder (Update). National Institute for Health and Care Excellence (NICE); 2018.
147 Tabi K, Bhullar M, Fantu L, et al. Feasibility of online mindfulness-based interventions for families affected with postpartum depression and anxiety: study protocol. *BMJ Open*. 2022;12(9).
148 Perez-Blasco J, Viguer P, Rodrigo MF. Effects of a mindfulness-based intervention on psychological distress, well-being, and maternal self-efficacy in breast-feeding mothers: results of a pilot study. *Arch Womens Ment Health*. 2013;16(3):227-236.
149 Babbar S, Oyarzabal AJ, Oyarzabal EA. Meditation and Mindfulness in Pregnancy and Postpartum: A Review of the Evidence. *Clin Obstet Gynecol*. 2021;64(3):661-682.

4.5.3. Dialectical Behaviour Therapy

There are four modules in Dialectical Behaviour Therapy (DBT): 1) mindfulness skills, 2) distress tolerance, 3) interpersonal effectiveness skills, and 4) emotion regulation skills. Like CBT, DBT can be used in both individual and group settings.

DBT has been modified for adult patients with ADHD, with each module targeting ADHD-specific challenges. The mindfulness module addresses poor concentration, the distress tolerance module addresses disorganization, the interpersonal skills module addresses challenges to relationships, and the emotion regulation module addresses emotional stability[150]. After treatment with DBT, patients showed decreased ADHD symptoms, improved neuropsychological functioning, and reduction of co-existing anxiety and depression[151,152,153].

4.6. MEDICATIONS FOR THE TREATMENT OF ADHD

For moderate to severe ADHD, the gold standard of treatment involves a combination of psychotherapy and medication. First line medications for the treatment of ADHD are psychostimulants, particularly amphetamine-based stimulants (amphetamine, lisdexamfetamine), and methylphenidate[154], in long-acting formulations with once-daily dosing. A non-stimulant option that has been approved for the treatment of ADHD in adults in Canada is atomoxetine. Other non-stimulant options that are sometimes being used off-label for ADHD management in adults include bupropion, guanfacine, clonidine, and viloxazine[152,155].

Stimulant medications are typically the first choice to treat ADHD because they work for 70-80% of people with ADHD[156,157], and have been shown to be more effective than non-stimulant medications[158]. A recent meta-analysis found methylphenidate to be the preferred medication option for children and adolescents, and amphetamines for adults[159].

150 Philipsen A. Differential diagnosis and comorbidity of attention-deficit/hyperactivity disorder (ADHD) and borderline personality disorder (BPD) in adults. *Eur Arch Psychiatry Clin Neurosci.* 2006;256(1):42-46.
151 Zylowska L, Ackerman DL, Yang MH, et al. Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. *J Atten Disord.* 2008;11(6):737-746.
152 Philipsen A. Structured group psychotherapy in adults with attention deficit hyperactivity disorder: Results of an open multicentre study. *J Nerv Ment Dis.* 2007;195:1013-1019.
153 Hesslinger B. Psychotherapy of attention deficit hyperactivity disorder in adults. *Eur Arch Psychiatry Clin Neurosci.* 2002;252(4):177-184.
154 Baker AS, Freeman MP. Management of Attention Deficit Hyperactivity Disorder During Pregnancy. *Obstet Gynecol Clin North Am.* 2018;45(3):495-509.
155 Radonjić NV, Bellato A, Khoury NM, Cortese S, Faraone SV. Nonstimulant Medications for Attention-Deficit/Hyperactivity Disorder (ADHD) in Adults: Systematic Review and Meta-analysis. *CNS Drugs.* 2023;37.
156 Kooij JJS. Treatment. In: *Adult ADHD* pp. 87-149. Springer; 2022.
157 Spencer T, Biederman J, Wilens T, et al. A large, double-blind, randomized clinical trial of methylphenidate in the treatment of adults with attention-deficit/hyperactivity disorder. *Biol Psychiatry.* 2005;57(5):456-463.
158 Faraone SV. The World Federation of ADHD International Consensus Statement: 208 Evidence-based conclusions about the disorder. *Neurosci Biobehav Rev.* 2021;128:789-818.
159 Cortese S, Adamo N, Del Giovane C, et al. Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: a systematic review and network meta-analysis. *Lancet Psychiatry.* 2018;5(9):727-738.

Furthermore, long-acting formulations are typically preferred over short-acting formulations; short-acting formulations that need to be taken multiple times in a day are impractical and can be especially challenging to manage for people with ADHD.

Stimulant medications

- **Amphetamine** targets dopamine and norepinephrine, two neurotransmitters strongly implicated in the pathophysiology of ADHD. Amphetamine increases the release of norepinephrine and dopamine and partially inhibits reuptake, which can improve attention and reduce hyperactivity and impulsivity[160,161].
- **Dexamphetamine** is structurally and functionally similar to amphetamine, increasing release of norepinephrine and dopamine and partially inhibiting reuptake[162].
- **Lisdexamfetamine** is a prodrug of dexamphetamine, and is converted to the active form once in the blood stream, allowing for a slower release and longer duration of effect. It has been shown to be effective for reducing ADHD symptoms in adults, outperforming placebo in clinical trials[163,164].
- **Methylphenidate** also blocks dopamine and norepinephrine reuptake, increasing the availability of these molecules specifically in the prefrontal cortex. It is one of the most commonly prescribed medications for ADHD, and has shown significant efficacy in managing symptoms in adults when compared to placebo[165,166].

When stimulants are ineffective or cause severe side effects, non-stimulant medications are used as second-line treatments.

160 Del Campo N, Chamberlain SR, Sahakian BJ, Robbins TW. The roles of dopamine and noradrenaline in the pathophysiology and treatment of attention-deficit/hyperactivity disorder. *Biol Psychiatry*. 2011;69(12):e145-157.
161 Faraone SV. The Pharmacology of Amphetamine and Methylphenidate: Relevance to the Neurobiology of Attention-Deficit/Hyperactivity Disorder and Other Psychiatric Comorbidities. *Neurosci Biobehav Rev*. 2018;87:255-270.
162 Castells X, Blanco-Silvente L, Cunill R. Amphetamines for attention deficit hyperactivity disorder (ADHD) in adults. Cochrane Library; 2018. Accessed January 15, 2025. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD007813.pub3/full
163 Quintero J, Gutiérrez-Casares JR, Álamo C. Molecular Characterisation of the Mechanism of Action of Stimulant Drugs Lisdexamfetamine and Methylphenidate on ADHD Neurobiology: A Review. *Neurol Ther*. 2022;11(4):1489-1517.
164 Lisdexamfetamine. Lexicomp online database. Lexicomp Inc. 2022. Available at: http://online.lexi.com. Accessed January 3, 2023.
165 Spencer T, Biederman J, Wilens T, et al. A large, double-blind, randomized clinical trial of methylphenidate in the treatment of adults with attention-deficit/hyperactivity disorder. *Biol Psychiatry*. 2005;57(5):456-463.
166 Kolar D, Keller A, Golfinopoulos M, Cumyn L, Syer C, Hechtman L. Treatment of adults with attention-deficit/hyperactivity disorder. *Neuropsychiatr Dis Treat*. 2008;4(2):389-403.

Non-stimulant medications

- **Atomoxetine** is the only non-stimulant medication that is approved for use in Canada for the treatment of ADHD in adults, and is the most common non-stimulant medication for ADHD treatment in Canada[167]. It is a norepinephrine modulator and significantly more effective than placebo in adults with ADHD[168].
- **Bupropion** is a norepinephrine and dopamine reuptake inhibitor, which is also significantly more effective than placebo in adults with ADHD[169]. Note: Health Canada has not approved bupropion for the treatment of ADHD.
- **Viloxazine** extended release is a serotonin-norepinephrine modulating agent. It was originally approved in the 1970s in the United Kingdom for treating depression, and is now FDA approved in the USA for treatment of ADHD in children and adults[170]. It is also more effective than placebo[166]. Note: Health Canada has not approved viloxazine.
- **Guanfacine** is an alpha-2-adrenoreceptor agonist, which has been shown to be more effective than placebo in adults with ADHD[171]. Note: Health Canada has approved guanfacine for the treatment of ADHD only for those aged 6-17.
- **Clonidine** is another alpha-2-adrenoreceptor agonist, which has sometimes been used off-label for the treatment of ADHD[169]. However, there are no randomized controlled trials evaluating it's efficacy for the treatment of ADHD in adults. Note: Health Canada has not approved clonidine for the treatment of ADHD.

167 Garfield CF, Dorsey ER, Zhu S, et al. Trends in attention deficit hyperactivity disorder ambulatory diagnosis and medical treatment in the United States, 2000-2010. *Acad Pediatr.* 2012;12(2):110-116.
168 Radonjić NV, Bellato A, Khoury NM, Cortese S, Faraone SV. Nonstimulant Medications for Attention-Deficit/Hyperactivity Disorder (ADHD) in Adults: Systematic Review and Meta-analysis. *CNS Drugs*. 2023;37.
169 Cortese S, Adamo N, Del Giovane C, et al. Comparative efficacy and tolerability of medications for attention-deficit hyperactivity disorder in children, adolescents, and adults: a systematic review and network meta-analysis. *Lancet Psychiatry.* 2018;5(9):727-738.
170 Faraone SV, Radonjic NV. *Neurobiology of Attention Deficit Hyperactivity Disorder.* In: Tasman, A., et al. Tasman's Psychiatry. Springer, Cham. 2023:1-28.
171 Canadian ADHD Practice Guidelines 4.1. Edition. CADDRA. https://www.caddra.ca/canadian-adhd-practice-guidelines/.

4.6.1. Pharmacotherapy during Pregnancy

Unfortunately, it is common for care professionals to advise patients to stop their ADHD medications if they are contemplating pregnancy or pregnant, especially for patients taking more than one psychiatric medication for other co-existing conditions[172].

As when treating other psychiatric illnesses in the perinatal period, it is crucial to weigh the risks of ADHD medication exposure to the fetus against the risks of the untreated ADHD. Methylphenidate, dextro-amphetamine, and atomoxetine have been shown to cross the placenta in rat and mice models[173,174,175], and it is assumed they do so in humans as well, leading to exposure to the developing fetus[176]. However, stopping stimulant treatment during pregnancy can worsen mental health and impair functioning in the pregnant individual[170,177]. This may negatively impact the developing fetus, as untreated ADHD is associated with increased risks of spontaneous abortion and preterm birth[178].

Research on potential teratogenicity of ADHD medications, particularly stimulants, is largely reassuring[171,172,173,174] (see Table 6).

172 Baker AS, Wales R, Noe O, Gaccione P, Freeman MP, Cohen LS. The Course of ADHD during Pregnancy. *J Atten Disord.* 2022;26(2):143-148.
173 Peters HT, Strange LG, Brown SD, Pond BB. The pharmacokinetic profile of methylphenidate use in pregnancy: A study in mice. *Neurotoxicol Teratol.* 2016;54:1-4.
174 Shah NS, Yates JD. Placental Transfer and Tissue Distribution of Dextro-Amphetamine in the Mouse. *Arch Int Pharmacodyn Ther.* 1978;233(2):200-8.
175 Sauer JM, Ring BJ, Witcher JW. Clinical pharmacokinetics of atomoxetine. *Clin Pharmacokinet.* 2005;44(6):571-590.
176 Ornoy A, Koren G. The Effects of Drugs used for the Treatment of Attention Deficit Hyperactivity Disorder (ADHD) on Pregnancy Outcome and Breast-feeding: A Critical Review. *Curr Neuropharmacol.* 2021;19(11).
177 Bolea-Alamanac BM, Green A, Verma G, Maxwell P, Davies SJC. Methylphenidate use in pregnancy and lactation: a systematic review of evidence. *Br J Clin Pharmacol.* 2014;77(1):96-101.
178 Bro SP, Kjaersgaard MIS, Parner ET, et al. Adverse pregnancy outcomes after exposure to methylphenidate or atomoxetine during pregnancy. *Clin Epidemiol.* 2015;7(139).

The majority of studies do not find an increased risk of congenital malformations above the background risk of 3-5%[175,179,180,181,182,183,184,185,186,187,188,189,190,191]. Some studies have suggested a slightly increased risk of cardiac defects with methylphenidate use[192,193,194,195] and bupropion[196,197,198], however this risk appears to be small (methylphenidate: absolute risk of 1.7% relative to baseline of 1.07%; bupropion: incidence 0.279% vs. 0.07% with exposure to other antidepressants), and other studies have not found these associations. One study found an increased risk for gastroschisis with the use of ADHD medications in early pregnancy[199], but the absolute risk was small. Atomoxetine does not appear to be associated with major birth defects, though data are limited[184,192]. The only published study evaluating guanfacine in pregnancy was for the treatment of hypertension, and no congenital

179 Ornoy A. Pharmacological Treatment of Attention Deficit Hyperactivity Disorder During Pregnancy and Lactation. *Pharm Res*. 2018;35(3):1-11.
180 Briggs G, Towers C, Forinash A, et al. *Drugs in Pregnancy and Lactation: A Reference Guide to Fetal and Neonatal Risk*. Lippincott Williams & Wilkins; 2022.
181 Garey JD, Lusskin SI, Scialli AR. Teratogen update: Amphetamines. *Birth Defects Res*. 2020;112(15):1171-1182.
182 Dideriksen D, Pottegård A, Hallas J, Aagaard L, Damkier P. First trimester in utero exposure to methylphenidate. *Basic Clin Pharmacol Toxicol*. 2013;112(2):73-76.
183 Pottegard A, Hallas J, Andersen JT, et al. First-trimester exposure to methylphenidate: a population-based cohort study. *J Clin Psychiatry*. 2014;75(1).
184 Damer EA, Edens MA, Loos MLM, et al. Fifteen years' experience with methylphenidate for attention-deficit disorder during pregnancy: Effects on birth weight, Apgar score and congenital malformation rates. *Gen Hosp Psychiatry*. 2021;73:9-15.
185 Jiang H, Zhang X, Jiang C, Fu H. Maternal and neonatal outcomes after exposure to ADHD medication during pregnancy: A systematic review and meta-analysis. *Pharmacoepidemiol Drug Saf*. 2019;28(3):288-295.
186 Cohen JM, Hernández-Díaz S, Bateman BT, et al. Placental Complications Associated With Psychostimulant Use in Pregnancy. *Obstet Gynecol*. 2017;130(6):1192-1201.
187 Philipp E. Guanfacine in the treatment of hypertension due to pre-eclamptic toxaemia in thirty women. *Br J Clin Pharmacol*. 1980;10 Suppl 1:137-140.
188 Diav-Citrin O, Shechtman S, Arnon J, et al. Methylphenidate in Pregnancy: A Multicenter, Prospective, Comparative, Observational Study. *J Clin Psychiatry*. 2016;77(9).
189 Hærvig KB, Mortensen LH, Hansen AV, Strandberg-Larsen K. Use of ADHD medication during pregnancy from 1999 to 2010: a Danish register-based study. *Pharmacoepidemiol Drug Saf*. 2014;23(5):526-533.
190 Wajnberg R, Diav-Citrin O, Shechtman S, Ornoy A. Pregnancy outcome after in-utero exposure to methylphenidate: A prospective comparative cohort study. *Reprod Toxicol*. 2011;31:267.
191 Rose SJ, Hathcock MA, White WM, Borowski K, Rivera-Chiauzzi EY. Amphetamine-Dextroamphetamine and Pregnancy: Neonatal Outcomes After Prenatal Prescription Mixed Amphetamine Exposure. *J Atten Disord*. 2021;25(9):1295-1301.
192 Huybrechts KF. Association Between Methylphenidate and Amphetamine Use in Pregnancy and Risk of Congenital Malformations: A Cohort Study From the International Pregnancy Safety Study Consortium. *JAMA Psychiatry*. 2018;75:167.
193 Kolding L, Ehrenstein V, Pedersen L, et al. Associations Between ADHD Medication Use in Pregnancy and Severe Malformations Based on Prenatal and Postnatal Diagnoses: A Danish Registry-Based Study. *J Clin Psychiatry*. 2021;82(1).
194 Källén B, Borg N, Reis M. The Use of Central Nervous System Active Drugs During Pregnancy. *Pharmaceuticals*. 2013;6:1221.
195 Koren G, Barer Y, Ornoy A. Fetal safety of methylphenidate-A scoping review and meta analysis. *Reprod Toxicol*. 2020;93:230-234.
196 Alwan S. Maternal use of bupropion and risk for congenital heart defects. *Am J Obstet Gynecol*. 2010;203(1):52.e1-6.
197 Thyagarajan V, Robin Clifford C, Wurst KE, Ephross SA, Seeger JD. Bupropion therapy in pregnancy and the occurrence of cardiovascular malformations in infants. *Pharmacoepidemiol Drug Saf*. 2012;21(11):1240-1242.
198 De Vries C, Gadzhanova S, Sykes MJ, Ward M, Roughead E. A Systematic Review and Meta-Analysis Considering the Risk for Congenital Heart Defects of Antidepressant Classes and Individual Antidepressants. *Drug Saf*. 2021;44(3):291-312.
199 Anderson KN, Dutton AC, Broussard CS, et al. ADHD Medication Use During Pregnancy and Risk for Selected Birth Defects: National Birth Defects Prevention Study, 1998–2011. *J Atten Disord*. 2020;24(3).

malformations were reported[185]. There are studies documenting the use of clonidine during pregnancy for the treatment of hypertension or hyperemesis gravidarum, which have found no increased risk for major or minor malformations[200,201,202]. There is no data available on the safety of viloxazine during the perinatal period.

There is some evidence that ADHD medications in pregnancy might increase the risk of pregnancy and neonatal complications, such as preeclampsia[184,203,204], preterm birth[184,205], low birth weight[185], jaundice[186], NICU admissions[203], and central nervous system disorders[203]. However, many of these studies were small and often focused on non-prescribed stimulant use or the simultaneous use of multiple medications, while several other studies found no such effects[186,188,189,202,203]. The magnitude of documented risks is arguably not clinically meaningful, and these risks may be elevated in ADHD in general, rather than directly caused by the medications[202,203].

The available evidence for the safety of ADHD pharmacotherapy in pregnancy is reassuring, particularly for the stimulants. Due to limited studies, further research is needed to evaluate the second line non-stimulant agents during pregnancy. Evidence is building that ADHD pharmacotherapy does not increase risk for long-term neurodevelopmental outcomes, although data for non-stimulant options are much more limited. Table 7 provides our summary and recommendations based on the evidence that is currently available. For every medication, we provide our overall impression and interpretation of the literature, and then summarize available data in four categories of outcomes: congenital malformations/fetal outcomes, pregnancy/obstetrical outcomes, neonatal outcomes, and long-term outcomes (unless no evidence is available in an outcome category).

200 Horvath JS, Phippard A, Korda A, Henderson-Smart DJ, Child A, Tiller DJ. Clonidine hydrochloride–a safe and effective antihypertensive agent in pregnancy. *Obstet Gynecol*. 1985;66(5):634-638.
201 Tuimala R, Punnonen R, Kauppila E. Clonidine in the treatment of hypertension during pregnancy. *Ann Chir Gynaecol Suppl*. 1985;197:47-50.
202 Maina A, Arrotta M, Cicogna L, et al. Transdermal clonidine in the treatment of severe hyperemesis. A pilot randomised control trial: CLONEMESI. *BJOG*. 2014;121(12):1556-1562.
203 Newport DJ, Hostetter AL, Juul SH, Porterfield SM, Knight BT, Stowe ZN. Prenatal Psychostimulant and Antidepressant Exposure and Risk of Hypertensive Disorders of Pregnancy. *J Clin Psychiatry*. 2016;77(11):1538-1545.
204 Poulton AS, Armstrong B, Nanan RK. Perinatal Outcomes of Women Diagnosed with Attention-Deficit/Hyperactivity Disorder: An Australian Population-Based Cohort Study. *CNS Drugs*. 2018;32(4):377-386.
205 Nörby U, Winbladh B, Källén K. Perinatal outcomes after treatment with ADHD medication during pregnancy. *Pediatrics*. 2017;140:20170747.

Table 6. *Summary of the evidence regarding fetal, obstetrical, neonatal, and infant risks and long-term outcomes associated with the use of medications for the treatment of ADHD while pregnant or lactating.*

Note. Approval for, and accessibility of, these medications will vary by jurisdiction.
Citations in Table 6 appear in a reference list after the table.

Stimulant medications for the treatment of Attention-Deficit / Hyperactivity Disorder (ADHD)

Medication First-line Second-line Third-line	Dosage Range[1]	Short-acting vs. Long-acting	Exposure – Pregnancy	Exposure – Lactation	Additional Considerations/ Monitoring
Amphetamine mixed salts (Adderall XR®)					
First-line	**Usual starting dose:** 10 mg po qam **Titration:** Titrate dose by 5 mg weekly up to 50 mg per day	**Long-acting** Duration of action ~12 hours	**Overall** Amphetamines do not appear to be associated with a clinically significantly increased risk for major congenital malformations, including cardiac malformations. Some evidence suggests possible small absolute increased risks for pre-eclampsia and preterm birth. Evidence is building that amphetamines do not increase risk for long-term neurodevelopmental outcomes. **Congenital malformations/ fetal outcomes** Multiple international studies with large sample sizes and rigorous analyses have documented no increased risk for major congenital malformations[2-7]. One study identified a possible increased risk for gastroschisis [aOR 3.0 (95% CI 1.2-7.4)][8], but the possibility of confounding by indication cannot be ruled out, and the absolute risk was small given rarity of gastroschisis (population prevalence of 0.05%[9]). Other studies have not found this association. **Pregnancy/obstetrical outcomes** Evidence shows no increased risk for placental abruption[9-11], gestational diabetes[5,12], postpartum hemorrhage[5,12], or perinatal death[5,12]. Possible increased risk for preeclampsia [aRR 1.29 (95% CI 1.11–1.49)][10], [OR 2.02 (95% CI 1.42–2.88)][11], perhaps particularly with stimulant use in the second half of pregnancy [OR 6.11 (95% CI 1.79-20.9)][14], but this risk appears to be small in most studies, and is not found in all studies[5,13]. It's also important to note the possibility of confounding by indication; one study found a higher risk for preeclampsia amongst those who used stimulants before but not during pregnancy [OR 1.2 (1.0–1.4)], but no increased risk for preeclampsia amongst those who used stimulants before and during pregnancy [OR 1.5 (0.8–2.6)[12]. Possible increased risk for preterm birth when stimulant use continues in the second half of pregnancy, but this risk appears to be small [aRR 1.30 (95% CI 1.10–1.55)][10], other studies have not found this association[11-13], and the possibility of confounding by indication cannot be ruled out[12]. **Neonatal outcomes** Evidence shows no increased risk for low birth weight[11-13,15], babies born small for gestational age[5,10,11], high birthweight[12], 5-min Apgar <7 [5,12,13], or neonatal intensive care unit admission[11]. **Long-term outcomes** Limited data is reassuring and has not shown any consistent associations with long-term neurodevelopmental outcomes when analysis is adjusted for confounding[16-18]. A meta-analysis of two population-based cohort studies showed no increased risk for any neurodevelopmental disorder [HRadjusted 0.95 (95% CI 0.82–1.11)]; ADHD [HRadjusted 0.92 (95% CI 0.78–1.08)]; or autism spectrum disorders [HRadjusted 0.86 (95% CI 0.63–1.18)].[17]	**Overall** Based on very limited data, at doses prescribed for therapeutic indications, amphetamine use during lactation does not appear to adversely affect infants[3,19-21]. Amphetamine is present in human milk and has been detected in the serum and urine of infants exposed to amphetamines via lactation[19]. **Recommendation** Monitor infant carefully for irritability, insomnia, and feeding difficulty.	Information provided here is related to therapeutic use of amphetamines during pregnancy and lactation and does not apply to non-prescribed amphetamine use in persons with stimulant use disorder. Non- prescribed use of amphetamines during pregnancy and lactation is not recommended due to associated maternal, fetal and neonatal harm.
Dextroamphetamine (Dexedrine®)					
Second line	**Usual starting dose and titration:** Immediate release: 5 mg po BID, increase by 5 mg weekly increments to a maximum of 50 mg per day Spansule: 10 mg po qam, increase by 5 mg increments weekly to a maximum of 50 mg per day	**Short-acting** Duration of action Immediate release tablets: ~4 hours Spansules: ~6-8 hours	Please see **amphetamine** for information on fetal/ neonatal risk in pregnancy. Almost all studies of amphetamine use included both amphetamine and dextroamphetamine and did not analyze them separately. One retrospective cohort study specifically evaluated the use of dextroamphetamine in pregnancy for ADHD in those that continued dextroamphetamine, those that stopped it prior to the end of the second trimester, and those unexposed[22]. Results demonstrated some associations with obstetrical outcomes, which were of small clinical (and in many cases, statistical) significance. Compared to continuers, those that stopped had greater odds of threatened abortion [OR: 2.28 (95%CI: 1.00, 5.15; p=0.049)]. The unexposed group compared to the continuers, had a lower risk of preeclampsia [OR: 0.58 (95%CI: 0.35, 0.97; p=0.037)], hypertension [OR: 0.32 (95%CI: 0.11, 0.93; p=0.036)], postpartum haemorrhage [OR: 0.57 (95%CI: 0.41, 0.80; p=0.001)], neonatal special care unit admittance [OR: 0.16 (95%CI: 0.12, 0.20; p<0.001)] and fetal distress [OR: 0.73 (95%CI: 0.54, 0.99; p=0.042)].	Please see amphetamine for information about lactation while taking dextroamphetamine. Two case series of dextroamphetamine use while lactating (*N*=4 and *N*=5) were consistent with the data for amphetamine use[23,24].	
Lisdexamfetamine (Vyvanse®)					
First-line	**Usual starting dose:** 20 – 30 mg po qam **Titration:** Increase by 10 mg weekly to a maximum of 70 mg daily	**Long-acting** Duration of action ~13-14 hours	Lisdexamfetine is a prodrug that is converted to dextroamphetamine[25]. Please see amphetamine and dextroamphetamine for information on fetal/neonatal risk in pregnancy. Many studies of amphetamine use included lisdexamfetamine, but did not analyze them separately.	Please see **amphetamine** for information that is likely applicable to lactation while taking lisdexamfetamine. One prospective telephone interview study found normal neurodevelopment with no significant adverse effects in 13 infants exposed to lisdexamphetamine or mix racemic amphetamine salts via human milk.[21]	
Methylphenidate (Ritalin®, Ritalin SR®, Biphentin®, Concerta®, Foquest®)					
First-line: Biphentin®, Concerta®, Foquest® **Second-line: Ritalin®, Ritalin SR®**	Please refer to the CADDRA Guidelines for dosing recom-mendations for each specific brand: https://www.caddra.ca/canadian-adhd-practice-guidelines/	**Long-acting:** Duration of action Biphentin® = ~10-12 hours Concerta® = ~12 hours Foquest® = ~13-16 hours **Short-acting:** Duration of action Ritalin® = ~3-4 hours Ritalin SR® = ~8 hours	**Overall** Methylphenidate does not appear to be associated with a clinically significantly increased risk for most major congenital malformations. Meta-analyses suggest a small absolute increased risk for cardiac malformations. Some evidence suggests possible small absolute increased risks for pre-eclampsia and preterm birth. Evidence is building that methylphenidate does not increase risk for long-term neurodevelopmental outcomes. **Congenital malformations/ fetal outcomes** Multiple international studies with large sample sizes and rigorous analyses have documented no increased risk for major congenital malformations[2,5-7,26-29]. Two meta-analyses have identified an increased risk for cardiac malformations [OR 1.59 (95% CI 1.02–2.49)][30], [pooled OR=1.32 (95% CI, 1.04 to 1.67)[31]] but this risk appears to be small (absolute risks of 1.7%[30], 1.3%[31]). This is equivalent to between 3-7 additional infants with a cardiac malformation for every 1,000 exposed to methylphenidate. One study that was not included in these meta-analyses did not find this association[32]. One study identified a possible increased risk for gastroschisis [aOR 3.0 (95% CI 1.2-7.4)][8], but the possibility of confounding by indication cannot be ruled out, and the absolute risk was small given rarity of gastroschisis (population prevalence of 0.05%[9]). Other studies have not found this association. **Pregnancy/obstetrical outcomes** Evidence shows no increased risk for placental abruption[5,10,11], gestational diabetes[5,12], postpartum hemorrhage[5,12,13], or perinatal death[5,12]. Possible increased risk for preeclampsia [aRR 1.29 (95% CI 1.11–1.49)][10], [OR 2.02 (95% CI 1.42–2.88)][11], perhaps particularly with stimulant use in the second half of pregnancy [OR 6.11 (95% CI 1.79-20.9)][14], but this risk appears to be small in most studies, and is not found in all studies[5,13]. It's also important to note the possibility of confounding by indication; one study found a higher risk for preeclampsia amongst those who used stimulants before but not during pregnancy [OR 1.2 (1.0–1.4)], but no increased risk for preeclampsia amongst those who used stimulants before and during pregnancy [OR 1.5 (0.8–2.6)[12]. Possible increased risk for preterm birth, but this risk appears to be small [aOR, 1.3 (95% CI, 1.1–1.6)][33], [aRR 1.30 (95% CI 1.10–1.55)][10], other studies have not found this association[11-13,28], and the possibility of confounding by indication cannot be ruled out[12]. Possible increased risk of spontaneous abortion, but confounding by indication cannot be ruled out [28]. **Neonatal outcomes** Evidence shows no increased risk for low birth weight[11-13,28], babies born small for gestational age[5,10,11], high birthweight[12], or 5-min Apgar <7 [5,12,13]. Possible increased risk for "perinatal complications" – most commonly jaundice (13/55 = 23.6% vs. 48/355 = 13.5%, p = 0.05), but this difference was only just statistically significant, was only seen for methylphenidate exposure close to term, and usually exposure was to methylphenidate as well as other psychiatric medications[28]. Possible increased risk for NICU admission [aOR, 1.5; 95% CI, 1.3–1.7], and central nervous system disorders [aOR, 1.9; 95% CI, 1.1–3.1][33], however, there were substantial differences between background characteristics in the exposed and unexposed groups, thus posing a challenge for interpretation and increasing risk of confounding, and another study did not find this difference[11]. **Long-term outcomes** Limited data is reassuring and has not shown any consistent associations with long term neurodevelopmental outcomes when analysis is adjusted for confounding[16-18]. A meta-analysis of two population-based cohort studies showed no increased risk for any neurodevelopmental disorder [HRadjusted 0.95 (95% CI 0.82–1.11)]; ADHD [HRadjusted 0.92 (95% CI 0.78–1.08)]; or autism spectrum disorders [HRadjusted 0.86 (95% CI 0.63–1.18)][17].	**Overall** Based on very limited data, at doses prescribed for therapeutic indications, methylphenidate use during lactation does not appear to adversely affect infants[24,34-39]. Methylphenidate is present in human milk and has been detected in the serum of infants exposed to methylphenidate via lactation- although at very low levels[24,40]. **Recommendation** Monitor infant carefully for irritability, insomnia, and feeding difficulty[3].	

Non-stimulant medications for the treatment of Attention-Deficit / Hyperactivity Disorder (ADHD)

Medication First-line Second-line Third-line	Dosage Range[1]	Short-acting vs. Long-acting	Exposure – Pregnancy	Exposure – Lactation	Additional Considerations/ Monitoring
Atomoxetine (Strattera®)					
Second line	**Usual starting dose:** 40 mg po daily **Titration:** Dose is usually adjusted every 7-14 days; to 60 then 80 mg/day Total maximum dose is recommended as the lesser of 1.4 mg/kg/day or 100 mg/day	**Long-acting** Duration of action: Up to 24 hours	**Overall** Atomoxetine does not appear to be associated with a clinically significantly increased risk for major congenital malformations, including cardiac malformations, or many significant adverse obstetrical outcomes, although data are limited. Some evidence suggests possible small absolute increased risk for preterm birth. Evidence is building that atomoxetine does not increase risk for long-term neurodevelopmental outcomes. **Congenital malformations/ fetal outcomes** Multiple international studies with rigorous analyses have documented no increased risk for major congenital malformations, including cardiac malformations[5,13,29,41]. One study identified a possible increased risk for gastroschisis [aOR 3.0 (95% CI 1.2-7.4)][8], but the possibility of confounding by indication cannot be ruled out, and the absolute risk was small given rarity of gastroschisis (population prevalence of 0.05%[9]). Other studies have not found this association. **Pregnancy/obstetrical outcomes** Evidence shows no increased risk for preeclampsia[10,13], placental abruption[5,10], gestational diabetes[5], postpartum hemorrhage[5,13], or perinatal death[5]. Possible increased risk for preterm birth, but this risk appears to be small [aOR, 1.3 (95% CI, 1.1–1.6)][33], [OR, 1.83 (95% CI, 1.0–3.36)][13], other studies have not found this association[10], and the possibility of confounding by indication cannot be ruled out. **Neonatal outcomes** Evidence shows no increased risk for low birth weight[13], babies born small for gestational age[5,10], or 5-min Apgar <7[5,13]. **Long-term outcomes** Limited data is reassuring and has not shown any consistent associations with long term neurodevelopmental outcomes when analysis is adjusted for confounding[17,18]. A meta-analysis of two population-based cohort studies showed no increased risk for any neurodevelopmental disorder [HRadjusted 0.95 (95% CI 0.82–1.11)]; ADHD [HRadjusted 0.92 (95% CI 0.78–1.08)]; or autism spectrum disorders [HRadjusted 0.86 (95% CI 0.63–1.18)].[17]	There are no published studies of atomoxetine exposure through lactation. Based on the pharmacokinetics of the drug (low molecular weight, long half-life), it will likely be present in human milk. The effects on a nursing infant are unknown and references caution it's use while lactating at this time[3,40].	
Bupropion (Wellbutrin®, Zyban®)					
Second line	**SR:** **Usual starting dose:** 100 – 150 mg po daily **Maintenance dose:** 100 – 150 mg po BID **XL:** **Usual starting dose:** 150 mg po daily **Maintenance dose:** 150 – 300 mg po daily **Maximum dose:** 450 mg per day[153]	**Long-acting** Duration of action: SR ~12 hours XL ~24 hours	**Overall** Bupropion does not appear to be associated with a clinically significantly increased risk for most major congenital malformations. Possible small absolute increased risk for cardiac malformations. It also does not appear to be associated with a clinically significantly increased risk for many significant adverse obstetrical outcomes, although data are limited. Some evidence suggests possible small absolute increased risk for NICU admission when bupropion is taken in third trimester. Very limited long-term data available. There are no published studies of bupropion in pregnancy specifically for the treatment of ADHD, and it is important to note that some of the published data is for bupropion used in pregnancy for smoking cessation. **Congenital malformations/ fetal outcomes** Multiple international studies with rigorous analyses have documented no increased risk for major congenital malformations[43-49]. A small absolute increase in the risk of cardiovascular malformations has been associated with first trimester exposure to bupropion monotherapy[50,51] (meta-analysis: OR 1.23 (95% CI 1.01-1.49)[52]. Two studies documented an association specifically with left ventricular outflow tract obstruction heart defects (incidence 0.279% vs. 0.07% with exposure to other antidepressants[50,51]). However, confounding by indication cannot be ruled out, and other studies have not found this association[53-55]. Possible increased risk for diaphragmatic hernia [aOR 2.77; 95% CI, 1.34-5.71][54] – one study, possible confounding by indication[56], small absolute risk given rarity of diaphragmatic hernia (population prevalence of 0.012-0.031%[57,58]), and other studies have not found this association. **Pregnancy/obstetrical outcomes** Evidence shows no increased risk for preterm birth[44,47,49,55], postpartum hemorrhage[59], or perinatal death[55]. Possible increased risk of spontaneous abortion[47]. **Neonatal outcomes** Evidence shows no increased risk for low birth weight[44,47,49], babies born small for gestational age[44], neonatal pulmonary hypertension[55], neonatal seizures[55], or 5-min Apgar <7 [44,55]. Possible increased risk for poor neonatal adaptation, but this has been reported in only one case, specifically presenting with seizures due to prolonged hypoglycemia as a result of severe hyperinsulinism[60]. In three larger studies (N=406[61], N=1448[62], and N=3,694[55]), there was an increased risk of poor neonatal adaptation with antidepressants overall, but not for bupropion specifically. Possible small increased risk for NICU admission when taken in the third trimester[55,63]. **Long-term outcomes** Further research is needed to clarify possible increased risk of ADHD[64], and to disentangle likely confounding by indication.	**Overall - caution is advised** Very limited data (22 cases)[3,39,65-70]. Bupropion is present in human milk and has been detected in the serum of infants exposed to bupropion via lactation- although at very low levels (sometimes undetectable)[40]. Generally, no adverse events reported, but there have been two case reports of seizures in infants exposed to bupropion through lactation[67,68]. **Recommendation** Monitor infant carefully for vomiting, diarrhea, jitteriness, sedation, and/or seizures.	
Clonidine[a]					
Third line	**Usual starting dose:** 0.05 - 0.1 mg po QHS **Titration:** Increase by 0.1 mg BID – TID to a max of 0.4 mg per day[173]	**Short-acting** Duration of action ~6-12 hours	**Overall** Clonidine could be considered as an adjunct agent in the treatment of ADHD following a risk/ benefit discussion acknowledging the limited information on both safety in pregnancy and efficacy for the treatment of ADHD in adults. Very limited published information indicates that clonidine is likely not associated with adverse fetal outcomes, but there is only one study assessing the safety of clonidine in pregnancy specifically for the treatment of ADHD. **Congenital malformations/ fetal outcomes** There are studies documenting use of clonidine during pregnancy for the treatment of hypertension or hyperemesis gravidarum, which have found no increased risk for major or minor malformations[72-76]. One case report of clonidine for the treatment of hypertension throughout pregnancy resulted in an infant born with Roberts` syndrome[77]. **Long-term outcomes** Data from one large population-based study are reassuring[18]. This study (*N*=1,068,073, *n*(ADHD medication group)=2,168) demonstrated no associations, when analysis was adjusted for confounding, with the long-term outcomes: neurodevelopmental psychiatric disorders, impairments in vision or hearing, epilepsy, seizures, or growth impairment during childhood or adolescence. However, the number of patients taking clonidine specifically in this study is unclear and likely small; the modafinil and clonidine groups were combined in the results.	**Overall - caution is advised** Little published data are available regarding clonidine use while lactating, but the majority of cases reported were not associated with any adverse effects for the infants[78,79]. However, there is one case report of an infant developing drowsiness, hypotonia, suspected generalized seizures, and episodes of apnea. The infant was exposed to 0.15mg daily during pregnancy and early postpartum. All symptoms resolved within 24 hours of breastfeeding cessation[80]. Clonidine is found in human milk and is also detectable in infant serum following exposure via lactation[40,78,81]. The M:P ratio has been reported as 2 with a relative infant dose (RID) up to 7.1%[40]. Infants should be monitored for drowsiness and hypotonia.	
Guanfacine[a] (Intuniv XR®)					
Approved in Canada for treatment in children and adolescents ages 6 - 17 years only[1] **Second line (adolescents)** **Third line (adults)**	**Usual starting dose:** 1 mg once daily. **Titration:** Titrate dose by 1 mg/week based on response and as tolerated to the recommended target dose range: 0.05 to 0.12 mg/kg/day or 1 to 7 mg/day[82]	**Long-acting** Duration of action: Up to 24 hours	**Overall** Guanfacine could be considered in the treatment of ADHD following a risk/benefit discussion acknowledging the very limited information on its safety in pregnancy and the limited data on efficacy for the treatment of ADHD in adults. There are no published studies of guanfacine in pregnancy specifically for the treatment of ADHD. Alternative agents would be preferred. The only published study evaluating guanfacine in pregnancy was for the treatment of hypertension in 30 patients with preeclampsia[83]. No congenital malformations were reported, however, all patients were outside of the first trimester, so this cannot be assessed from this study. Six of the infants (20%) had low birth weight but all were reported to later develop normally.	**Overall - caution is advised** There are no published studies of exposure to guanfacine through lactation.	
Viloxazine[a]					
Not currently approved by Health Canada **Third line**	**Usual starting dose:** 200 mg po once daily **Titration:** Titrate by 200 mg increments at weekly intervals based on response and tolerability; maximum daily dose: 600 mg/day[84].	**Long-acting** Duration of action: Up to 24 hours	**Overall** Viloxazine could be considered as an agent in the treatment of ADHD following a risk/benefit discussion acknowledging that there is no information published on its safety in pregnancy and there is limited data on its efficacy for the treatment of ADHD in adults. Alternative agents would be preferred. There are no published studies of viloxazine in pregnancy.	**Overall - caution is advised** There are no published studies of exposure to viloxazine through lactation.	

[a]Limited data are available about the efficacy, safety, and tolerability of clonidine, guanfacine, and viloxazine for the treatment of ADHD in adults.

Table 6 References

1. Canadian ADHD Practice Guidelines 4.1. Edition. CADDRA. https://www.caddra.ca/canadian-adhd-practice-guidelines/.
2. Ornoy A. Pharmacological Treatment of Attention Deficit Hyperactivity Disorder During Pregnancy and Lactation. *Pharm Res*. 2018;35(3):1-11.
3. Briggs G, Towers C, Forinash A, et al. *Drugs in Pregnancy and Lactation: A Reference Guide to Fetal and Neonatal Risk*. Lippincott Williams & Wilkins; 2022.
4. Garey JD, Lusskin SI, Scialli AR. Teratogen update: Amphetamines. *Birth Defects Res*. 2020;112(15):1171-1182.
5. Jiang H, Zhang X, Jiang C, Fu H. Maternal and neonatal outcomes after exposure to ADHD medication during pregnancy: A systematic review and meta-analysis. *Pharmacoepidemiol Drug Saf*. 2019;28(3):288-295.
6. Huybrechts KF. Association Between Methylphenidate and Amphetamine Use in Pregnancy and Risk of Congenital Malformations: A Cohort Study From the International Pregnancy Safety Study Consortium. *JAMA Psychiatry*. 2018;75:167.
7. Szpunar MJ, Freeman MP, Kobylski LA, et al. Risk of Major Malformations in Infants After First-Trimester Exposure to Stimulants: Results From the Massachusetts General Hospital National Pregnancy Registry for Psychiatric Medications. *J Clin Psychopharmacol*. 2023;43(4):326-332.
8. Anderson KN, Dutton AC, Broussard CS, et al. ADHD Medication Use During Pregnancy and Risk for Selected Birth Defects: National Birth Defects Prevention Study, 1998–2011. *J Atten Disord*. 2020;24(3).
9. Jones AM, Isenburg J, Salemi JL, et al. Increasing Prevalence of Gastroschisis — 14 States, 1995–2012. *MMWR Morb Mortal Wkly Rep*. 2019;65(2):23-26.
10. Cohen JM, Hernández-Díaz S, Bateman BT, et al. Placental Complications Associated With Psychostimulant Use in Pregnancy. *Obstet Gynecol*. 2017;130(6):1192-1201.
11. Camacho X, Zoega H, Gomes T, et al. The association between psychostimulant use in pregnancy and adverse maternal and neonatal outcomes: results from a distributed analysis in two similar jurisdictions. *Int J Epidemiol*. 2023 Feb 8;52(1):190-202.
12. Poulton AS, Armstrong B, Nanan RK. Perinatal Outcomes of Women Diagnosed with Attention-Deficit/Hyperactivity Disorder: An Australian Population-Based Cohort Study. *CNS Drugs*. 2018;32(4):377-386.
13. Källén B, Borg N, Reis M. The Use of Central Nervous System Active Drugs During Pregnancy. *Pharmaceuticals*. 2013;6:1221.
14. Newport DJ, Hostetter AL, Juul SH, Porterfield SM, Knight BT, Stowe ZN. Prenatal Psychostimulant and Antidepressant Exposure and Risk of Hypertensive Disorders of Pregnancy. *J Clin Psychiatry*. 2016;77(11):1538-1545.
15. Rose SJ, Hathcock MA, White WM, Borowski K, Rivera-Chiauzzi EY. Amphetamine-Dextroamphetamine and Pregnancy: Neonatal Outcomes After Prenatal Prescription Mixed Amphetamine Exposure. *J Atten Disord*. 2021;25(9):1295-1301.
16. Suarez EA, Bateman BT, Hernandez-Diaz S et al. Prescription Stimulant Use During Pregnancy and Risk of Neurodevelopmental Disorders in Children *JAMA Psychiatry*. 2024 Jan 24;81(5):477–488.
17. Bang Madsen K, Larsson H, Skoglund C, et al. In utero exposure to methylphenidate, amphetamines and atomoxetine and offspring neurodevelopmental disorders - a population-based cohort study and meta-analysis. *Mol Psychiatry*. 2025 Sep;30(9):3885-3894.
18. Bang Madsen K, Robakis TK, Liu X, et al. In utero exposure to ADHD medication and long-term offspring outcomes. *Mol Psychiatry*. 2023;28(4):1739-1746.
19. Öhman I, Wikner BN, Beck O, Sarman I. Narcolepsy Treated with Racemic Amphetamine during Pregnancy and Breastfeeding. *J Hum Lact*. 2015;31(3):374-376.
20. Steiner E, Villén T, Hallberg M, Rane A. Amphetamine secretion in breast milk. *Eur J Clin Pharmacol*. 1984;27(1):123-124.
21. Benassayag Kaduri N, Hazan A, De-Haan T, et al. Amphetamine use for attention deficit hyperactive disorder during breastfeeding and children's neurodevelopmental outcomes: A pilot study. *Psychiatry Research*. 2024;339(116047).
22. Russell DJ, Wyrwoll CS, Preen DB, et al. Investigating maternal and neonatal health outcomes associated with continuing or ceasing dexamphetamine treatment for women with attention-deficit hyperactivity disorder during pregnancy: a retrospective cohort study. *Arch Womens Ment Health*. 2024 Oct;27(5):785-794.
23. Ilett KF, Hackett LP, Kristensen JH, Kohan R. Transfer of dexamphetamine into breast milk during treatment for attention deficit hyperactivity disorder. *Br J Clin Pharmacol*. 2007;63(3):371-375.
24. Hackett LP, Ilett KF, Kristensen JH, Kohan R, Hale TW. Infant dose and safety of breastfeeding for dexamphetamine and methylphenidate in mothers with attention deficit hyperactivity disorder. *Proc 9th Int Congr Ther Drug Monit Clin Toxicol*. 2005;27:220-221.
25. Lisdexamfetamine. Lexicomp online database. Lexicomp Inc. 2022. Available at: http://online.lexi.com. Accessed January 3, 2023.
26. Dideriksen D, Pottegård A, Hallas J, Aagaard L, Damkier P. First trimester in utero exposure to methylphenidate. *Basic Clin Pharmacol Toxicol*. 2013;112(2):73-76.
27. Pottegard A, Hallas J, Andersen JT, et al. First-trimester exposure to methylphenidate: a population-based cohort study. *J Clin Psychiatry*. 2014;75(1).
28. Diav-Citrin O, Shechtman S, Arnon J, et al. Methylphenidate in Pregnancy: A Multicenter, Prospective, Comparative, Observational Study. *J Clin Psychiatry*. 2016;77(9).
29. di Giacomo E, Confalonieri V, Tofani F, et al. Methylphenidate and Atomoxetine in Pregnancy and Possible Adverse Fetal Outcomes: A Systematic Review and Meta-Analysis. *JAMA Netw Open*. 2024 Nov 4;7(11):e2443648.
30. Koren G, Barer Y, Ornoy A. Fetal safety of methylphenidate-A scoping review and meta analysis. *Reprod Toxicol*. 2020;93:230-234.
31. Richardson JL, George N, Greenall AJ, et al. Cardiac malformation risks following maternal first trimester methylphenidate use. *J Clin Psychiatry*. 2023;84(4):22br14755.
32. Damer EA, Edens MA, Loos MLM, et al. Fifteen years' experience with methylphenidate for attention-deficit disorder during pregnancy: Effects on birth weight, Apgar score and congenital malformation rates. *Gen Hosp Psychiatry*. 2021;73:9-15.
33. Nörby U, Winbladh B, Källén K. Perinatal outcomes after treatment with ADHD medication during pregnancy. *Pediatrics*. 2017;140:20170747.
34. Bolea-Alamanac BM, Green A, Verma G, Maxwell P, Davies SJC. Methylphenidate use in pregnancy and lactation: a systematic review of evidence. *Br J Clin Pharmacol*. 2014;77(1):96-101.
35. Hackett LP, Kristensen JH, Hale TW, Paterson R, Ilett KF. Methylphenidate and breast-feeding. *Ann Pharmacother*. 2006;40(10):1890-1891.
36. Spigset O, Brede WR, Zahlsen K. Excretion of methylphenidate in breast milk. *Am J Psychiatry*. 2007;164:348.
37. Collin-Lévesque L, El-Ghaddaf Y, Genest M, et al. Infant Exposure to Methylphenidate and Duloxetine During Lactation. *Breastfeed Med*. 2018;13(3):221-225.
38. Bello G, Poirier J, Sharkey KM. Successful lactation after resuming methylphenidate in a woman with narcolepsy. *J Clin Sleep Med* 2022;18:1891–4.
39. Kim J, Nichols DA, Zhang T, et al. Managing attention-deficit/ hyperactivity disorder in a breastfeeding mother: A case report. *Pharmacotherapy* 2025;45:529–34.
40. Thomas W, Hale P. *Hale's Medications & Mothers' Milk™ 2021 : A Manual of Lactational Pharmacology*. 19th ed. Springer Publishing Company; 2021.
41. Bröms G, Hernandez-Diaz S, Huybrechts KF, et al. Atomoxetine in Early Pregnancy and the Prevalence of Major Congenital Malformations: A Multinational Study. *J Clin Psychiatry*. 2023 Jan 16;84(1):22m14430.
42. Bupropion. Lexicomp Online Database. Lexicomp Inc. 2023. Available at: http://online.lexi.com. Accessed January 3, 2023.
43. Tran DT, Cohen JM, Donald S, et al. Risk of Major Congenital Malformations Following Prenatal Exposure to Smoking Cessation Medicines. *JAMA Intern Med*. 2025 Jun 1;185(6):656-667.
44. Kranzler HR, Washio Y, Zindel LR, et al. Placebo-controlled trial of bupropion for smoking cessation in pregnant women. *Am J Obstet Gynecol MFM*. 2021;3(6):100315.
45. Einarson A, Choi J, Einarson TR, Koren G. Incidence of major malformations in infants following antidepressant exposure in pregnancy: results of a large prospective cohort study. *Can J Psychiatry*. 2009;54(4):242-246.
46. GlaxoSmithKline. Bupropion Pregnancy Registry - Final Report. https://pregnancyregistry.gsk.com/documents/bup_report_final_2008.pdf. Published online September 1, 1997.
47. Chun-Fai-Chan B, Koren G, Fayez I, et al. Pregnancy outcome of women exposed to bupropion during pregnancy: A prospective comparative study. *Am J Obstet Gynecol*. 2005;192(3):932-936.
48. Cole JA, Ephross SA, Cosmatos IS, Walker AM. Paroxetine in the first trimester and the prevalence of congenital malformations. *Pharmacoepidemiol Drug Saf*. 2007;16(10):1075-1085.
49. Turner E, Jones M, Vaz LR, Coleman T. Systematic Review and Meta-Analysis to Assess the Safety of Bupropion and Varenicline in Pregnancy. *Nicotine Tob Res*. 2019;21(8):1001-1010.
50. Alwan S. Maternal use of bupropion and risk for congenital heart defects. *Am J Obstet Gynecol*. 203(1):52.e1-6.
51. Thyagarajan V, Robin Clifford C, Wurst KE, Ephross SA, Seeger JD. Bupropion therapy in pregnancy and the occurrence of cardiovascular malformations in infants. *Pharmacoepidemiol Drug Saf*. 2012;21(11):1240-1242.
52. De Vries C, Gadzhanova S, Sykes MJ, Ward M, Roughead E. A Systematic Review and Meta-Analysis Considering the Risk for Congenital Heart Defects of Antidepressant Classes and Individual Antidepressants. *Drug Saf*. 2021;44(3):291-312.
53. Huybrechts KF. Antidepressant use in pregnancy and the risk of cardiac defects. *N Engl J Med*. 2014;370:2397-2407.
54. 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;77(12):1246-1255.
55. Marks C, Silvola R, Teal E, Quinney SK, Haas DM. Comparing newborn outcomes after prenatal exposure to individual antidepressants: A retrospective cohort study. *Pharmacotherapy*. 2021;41(11):907-914.
56. Finn J, Suhl J, Kancherla V, et al. Maternal cigarette smoking and alcohol consumption and congenital diaphragmatic hernia. *Birth Defects Res*. 2022;114(13):746-758.
57. Peppa M, Stavola BL, Loukogeorgakis S, Zylbersztejn A, Gilbert R, Coppi P. Congenital diaphragmatic hernia subtypes: Comparing birth prevalence, occurrence by maternal age, and mortality in a national birth cohort. *Paediatr Perinat Epidemiol Publ Online*. Published online 2022.
58. Mohamed MA, Aly H. Birth region, race and sex may affect the prevalence of congenital diaphragmatic hernia, abdominal wall and neural tube defects among US newborns. *J Perinatol*. 2012;32(11):861-868.
59. Bobo WV, White L, Hodge D, et al. "Maternal Use of Antidepressants in Pregnancy and the Risk of Postpartum Hemorrhage: An Electronic Health Record-Based Cohort Study." *Hum Psychopharmacol*. 2025;40(5):e70015.
60. Gisslen T, Nathan B, Thompson T, Rao R. Hyperinsulinism associated with gestational exposure to bupropion in a newborn infant. *J Pediatr Endocrinol Metab*. 2011;24(9-10):819-822.
61. Gastaldon C, Arzenton E, Raschi E, Spigset O, Papola D, Ostuzzi G, Moretti U, Trifirò G, Barbui C, Schoretsanitis G. Neonatal withdrawal syndrome following in utero exposure to antidepressants: a disproportionality analysis of VigiBase, the WHO spontaneous reporting database. *Psychol Med*. 2023 Sep;53(12):5645-5653.
62. Brumbaugh JE, Ball CT, Crook JE, Stoppel CJ, Carey WA, Bobo WV. Poor Neonatal Adaptation After Antidepressant Exposure During the Third Trimester in a Geographically Defined Cohort. *Mayo Clin Proc Innov Qual Outcomes*. 2023 Mar 7;7(2):127-139.
63. Tharp MA, Silvola RM, Marks C, Teal E, Quinney SK, Haas DM. Does lack of exposure to individual antidepressants at different points during pregnancy associate with reduced risk of adverse newborn outcomes? *BMC Pregnancy Childbirth*. 2022 Dec 9;22(1):926.
64. Figueroa, R. Use of Antidepressants During Pregnancy and Risk of Attention-Deficit/Hyperactivity Disorder in the Offspring. *J Dev Behav Pediatr*. 2010 31(8):641-648.
65. Baab SW, Peindl KS, Piontek CM, Wisner KL. Serum bupropion levels in 2 breastfeeding mother-infant pairs. *J Clin Psychiatry*. 2002;63(10):910-911.
66. Davis MF, Miller HS, Nolan PE. Bupropion levels in breast milk for 4 mother-infant pairs: more answers to lingering questions. *J Clin Psychiatry*. 2009;70(2):297-298.
67. Chaudron LH, Schoenecker CJ. Bupropion and Breastfeeding: A Case of a Possible Infant Seizure. *J Clin Psychiatry*. 2004;65:2164.
68. Neuman G, Colantonio D, Delaney S, Szynkaruk M, Ito S. Bupropion and Escitalopram During Lactation. *Ann Pharmacother*. 2014;48(7):928-931.
69. Haas JS, Kaplan CP, Barenboim D, Jacob P, Benowitz NL. Bupropion in breast milk: an exposure assessment for potential treatment to prevent post-partum tobacco use. *Tob Control*. 2004;13(1):52-56.
70. Nonacs RM, Soares CN, Viguera AC, Pearson K, Poitras C JR, L.S. Bupropion SR for the treatment of postpartum depression: a pilot study. *Int J Neuropsychopharmacol*. 2005;8(3):445-449.
71. Lee M, Regier L, Jensen B, Tang A. ADHD: Overview & Pharmacotherapy. Available at: https://www.rxfiles.ca/rxfiles/. Accessed January 3, 2023.
72. Horvath JS, Phippard A, Korda A, Henderson-Smart DJ, Child A, Tiller DJ. Clonidine hydrochloride–a safe and effective antihypertensive agent in pregnancy. *Obstet Gynecol*. 1985;66(5):634-638.
73. Tuimala R, Punnonen R, Kauppila E. Clonidine in the treatment of hypertension during pregnancy. *Ann Chir Gynaecol Suppl*. 1985;197:47-50.
74. Maina A, Arrotta M, Cicogna L, et al. Transdermal clonidine in the treatment of severe hyperemesis. A pilot randomised control trial: CLONEMESI. *BJOG*. 2014;121(12):1556-1562.
75. Johnston CI, Aickin DR. The control of high blood pressure during labour with clonidine ("catapres"). *Med J Aust*. 1971;2(3):132-135.
76. LeMoine PM, Coggins G. The use of clonidine, Catapres, in hypertensive and toxemic syndromes of pregnancy. *Aust N Z J Med*. 1973;3(432).
77. Stoll C, Levy JM, Beshara D. Roberts's syndrome and clonidine. *J Med Genet*. 1979;16(6):486-488.
78. Hartikainen-Sorri AL, Heikkinen JE, Koivisto M. Pharmacokinetics of clonidine during pregnancy and nursing. *Obstet Gynecol*. 1987;69(4):598-600.
79. Bunjes R, Schaefer C, Holzinger D. Clonidine and breast-feeding. *Clin Pharm*. 1993;12(3):178-179.
80. Sevrez C, Lavocat MP, Mounier G, et al. Transplacental or breast milk intoxication to clonidine: a case of neonatal hypotonia and drowsiness. *Arch Pediatr*. 2014;21(2):198-200.
81. Clonidine. Drugs and lactation database (LactMed). National Library of Medicine. 2018. Available at: https://www.ncbi.nlm.nih.gov/books/NBK501628/. Accessed January 3, 2023.
82. Guanfacine. Lexicomp online database. Lexicomp Inc. 2022. Available at: http://online.lexi.com. Accessed January 3, 2023.
83. Philipp E. Guanfacine in the treatment of hypertension due to pre-eclamptic toxaemia in thirty women. *Br J Clin Pharmacol*. 1980;10 Suppl 1:137-140.
84. Viloxazine. Lexicomp online database. Lexicomp Inc.. 2023. Available at: http://online.lexi.com. Accessed January 3, 2023.

4.6.2. Pharmacotherapy during Breastfeeding

Research on the safety of ADHD medications in breastfeeding (see Box 1 regarding language) is limited and are primarily case reports. Monitor each baby individually for adverse effects. Generally, a relative infant dose (RID) in human milk under 10% is considered safe for breastfeeding[206]. Methylphenidate is secreted in very small amounts in human milk, with RIDs under 1% and it is generally not detected in infant's blood with no reported adverse effects in infants[207,208,209,210]. Therefore, it is broadly considered safe in breastfeeding[211,212,213].

While amphetamines are more highly transferred into human milk, reports of medical treatment with amphetamines during lactation still showed relative infant doses (RIDs) below 10%, with low but detectable amounts in infant plasma and no notable adverse effects on early development[214,215,216,208]. Overall, the use of stimulant medications for the treatment of ADHD is compatible with breastfeeding or feeding expressed human milk if that is desired. **As a general rule, it is not necessary to stop stimulant medications as prescribed for ADHD to breastfeed or feed expressed human milk. Likewise, it is not necessary to stop breastfeeding or feeding expressed human milk to take stimulant medications as prescribed for ADHD.**

206 Howard CR, Lawrence RA. Drugs and Breastfeeding. *Clin Perinatol*. 1999;26(2):447-478.
207 Hackett LP, Kristensen JH, Hale TW, Paterson R, Ilett KF. Methylphenidate and breast-feeding. *Ann Pharmacother*. 2006;40(10):1890-1891.
208 Spigset O, Brede WR, Zahlsen K. Excretion of methylphenidate in breast milk. *Am J Psychiatry*. 2007;164:348.
209 Collin-Lévesque L, El-Ghaddaf Y, Genest M, et al. Infant Exposure to Methylphenidate and Duloxetine During Lactation. *Breastfeed Med*. 2018;13(3):221-225.
210 Hackett LP, Ilett KF, Kristensen JH, Kohan R, Hale TW. Infant dose and safety of breastfeeding for dexamphetamine and methylphenidate in mothers with attention deficit hyperactivity disorder. *Proc 9th Int Congr Ther Drug Monit Clin Toxicol*. 2005;2005;27(2):220-221.
211 Kittel-Schneider S, Quednow BB, Leutritz AL, McNeill RV, Reif A. Parental ADHD in pregnancy and the postpartum period – A systematic review. *Neurosci Biobehav Rev*. 2021;124:63-77.
212 Ornoy A. Pharmacological Treatment of Attention Deficit Hyperactivity Disorder During Pregnancy and Lactation. *Pharm Res*. 2018;35(3):1-11.
213 Bolea-Alamanac BM, Green A, Verma G, Maxwell P, Davies SJC. Methylphenidate use in pregnancy and lactation: a systematic review of evidence. *Br J Clin Pharmacol*. 2014;77(1):96-101.
214 Öhman I, Wikner BN, Beck O, Sarman I. Narcolepsy Treated with Racemic Amphetamine during Pregnancy and Breastfeeding. *J Hum Lact*. 2015;31(3):374-376.
215 Steiner E, Villén T, Hallberg M, Rane A. Amphetamine secretion in breast milk. *Eur J Clin Pharmacol*. 1984;27(1):123-124.
216 Ilett KF, Hackett LP, Kristensen JH, Kohan R. Transfer of dexamphetamine into breast milk during treatment for attention deficit hyperactivity disorder. *Br J Clin Pharmacol*. 2007;63(3):371-375.

Methylphenidate and amphetamines increase levels of dopamine, which is an inhibitor of the human milk producing hormone prolactin, which raises concerns regarding milk production particularly for those who haven't started lactating[217]. While methylphenidate and amphetamines have indeed been shown to lower prolactin levels in postpartum people[218,219,220,221], most of these studies did not report data on milk production. One study that did, found that amphetamine did not interfere with milk supply[212]. It has also been suggested that prolactin levels may not significantly impact milk production for those who have already established lactation[215]. Therefore, caution is recommended and a review of medications may be indicated for individuals using stimulant medications who would like to breastfeed, but are having difficulty establishing lactation.

Bupropion also has relative infant doses (RIDs) compatible with lactation, is generally not detected in infant blood, and most infants receiving human milk do not experience adverse medical effects[222,223,224]. However, there have been two case reports of seizures in infants exposed to bupropion through human milk[225,226].

There is limited safety data on atomoxetine during lactation, but some references caution against it due to the drug's pharmacokinetic properties[227,228]. More research on the safety of ADHD medications during lactation would help patients and clinicians make more informed decisions regarding ADHD treatment in this context. **We suggest caution with respect to taking non-stimulant medications for ADHD while breastfeeding or feeding expressed human milk.**

217 Fitzpatrick RB. LactMed. *J Electron Resour Med Libr.* 2007;4(1-2):155-166. doi:10.1300/J383v04n01_14
218 Upadhyaya HP, Brady KT, Liao J, et al. Neuroendocrine and behavioral responses to dopaminergic agonists in adolescents with alcohol abuse. *Psychopharmacol Berl.* 2003;166(2):95-101.
219 Petraglia F, Leo V, Sardelli S, et al. Prolactin changes after administration of agonist and antagonist dopaminergic drugs in puerperal women. *Gynecol Obstet Invest.* 1987;23(2):103-109.
220 DeLeo V, Cella SG, Camanni F, Genazzani AR, Müller EE. Prolactin lowering effect of amphetamine in normoprolactinemic subjects and in physiological and pathological hyperprolactinemia. *Horm Metab Res.* 1983;15(9):439-443.
221 Camanni F, Genazzani AR, Leo V, et al. Effect of two indirectly acting dopamine agonists on prolactin secretion in normo- and hyperprolactinemic subjects: comparison with the effect of nomifensine. *Neuroendocrinology.* 1981;33(5):300-305.
222 Baab SW, Peindl KS, Piontek CM, Wisner KL. Serum bupropion levels in 2 breastfeeding mother-infant pairs. *J Clin Psychiatry.* 2002;63(10):910-911.
223 Davis MF, Miller HS, Nolan PE. Bupropion levels in breast milk for 4 mother-infant pairs: more answers to lingering questions. *J Clin Psychiatry.* 2009;70(2):297-298.
224 Briggs GG, Samson JH, Ambrose PJ, Schroeder DH. Excretion of Bupropion in Breast Milk. *Ann Pharmacother.* 1993;27(4):431-433.
225 Chaudron LH, Schoenecker CJ. Bupropion and Breastfeeding: A Case of a Possible Infant Seizure. *J Clin Psychiatry.* 2004;65:2164.
226 Neuman G, Colantonio D, Delaney S, Szynkaruk M, Ito S. Bupropion and Escitalopram During Lactation. *Ann Pharmacother.* 2014;48(7):928-931.
227 Briggs G, Towers C, Forinash A, et al. *Drugs in Pregnancy and Lactation: A Reference Guide to Fetal and Neonatal Risk*. Lippincott Williams & Wilkins; 2022.
228 Thomas W, Hale P. *Hale's Medications & Mothers' Milk™ 2021 : A Manual of Lactational Pharmacology.* 19th ed. Springer Publishing Company; 2021.

We suggest caution for breastfeeding if a patient is taking multiple medications (e.g., antidepressants, benzodiazepines, and ADHD medications), and suggest considering alternative infant feeding options.

From a health promotion and prevention perspective, it is important to note that breastfeeding was identified to have a statistically significant protective effect against the development of ADHD (Class IV - weak association) in an umbrella review of meta-analyses[229].

Overall, the decision to breastfeed or feed expressed human milk by bottle while using ADHD medication should involve a risk-benefit analysis with the treating prescriber, and the infant's development should be carefully monitored.

4.6.3. Pharmacotherapy — General Principles

The consensus is that the magnitude of documented risks is very low for ADHD medications, and they should not be stopped if they are required for the daily functioning of the pregnant or lactating person[230]. As stimulants have a rapid onset, they could be used intermittently on an as-needed basis to help maximize functioning while minimizing overall fetal or infant exposure[231]. In the postpartum period, the use of short-acting formulations could be considered to minimize infant exposure during lactation, and to support the mother/birth parent's sleep (given that long-acting formulations are known to impact sleep). It is important to weigh these potential benefits against the challenges of taking short-acting formulations multiple times a day, especially given impaired executive functioning in the postpartum. It could be useful to explore whether patients have tried short-acting formulations in the past, and how successful that has been. Another option is switching from stimulants to bupropion during the pregnancy and breastfeeding, especially for those with co-occurring depression, given available safety data for this drug in the perinatal period[232]. However, bupropion is not as effective as stimulants for ADHD[233]. For general principles regarding medication management for ADHD in the perinatal period, see Table 7.

229 Kim JH, Kim JY, Lee J, et al. Environmental risk factors, protective factors, and peripheral biomarkers for ADHD: an umbrella review. *Lancet Psychiatry*. 2020;7(11):955-970.
230 Kittel-Schneider S, Quednow BB, Leutritz AL, McNeill RV, Reif A. Parental ADHD in pregnancy and the postpartum period - A systematic review. *Neurosci Biobehav Rev*. 2021;124:63-77.
231 Freeman MP. ADHD and Pregnancy. *Am J Psychiatry* 2014;171:723-728.
232 Baker AS, Freeman MP. Management of Attention Deficit Hyperactivity Disorder During Pregnancy. *Obstet Gynecol Clin North Am*. 2018;45(3):495-509.
233 Peterson K, McDonagh MS, Fu R. Comparative benefits and harms of competing medications for adults with attention-deficit hyperactivity disorder: A systematic review and indirect comparison meta-analysis. *Psychopharmacol Berl*. 2008;197(1):1-11.

Table 7. *General principles regarding perinatal ADHD medication management.*

Preconception (a good time to optimize medication regimens)	• Discuss the available evidence regarding risks of medication use in pregnancy versus risks of no medication use in pregnancy with the patient to support collaborative decision making. • Reassuring safety data for **stimulant medication** use in pregnancy; if patients strongly prefer to avoid medication in pregnancy, could consider trial off or intermittent use. • Reassuring safety data for **second-line non-stimulant medication** use in pregnancy; if patients strongly prefer to avoid medication in pregnancy, could consider a trial of gradually discontinuing the medication **if it is not likely to severely impact daily functioning**. • If taking one of the **third-line non-stimulant medications** for ADHD, consider a trial of gradually discontinuing the medication (given more limited data) **if it is not likely to severely impact daily functioning**. • If unable to discontinue the **third-line non-stimulant medication**, continue with the current medication, at the lowest effective dose, or consider switching to a stimulant option.
Pregnancy	• Discuss the available evidence regarding risks of medication use in pregnancy versus risks of no medication use in pregnancy with the patient to support collaborative decision making. • Reassuring safety data for **stimulant medication** use in pregnancy; if patients strongly prefer to avoid medication in pregnancy, could consider trial off or intermittent use **if it is not likely to severely impact daily functioning (stability during pregnancy is particularly important)**. • Reassuring safety data for **second-line non-stimulant medication** use in pregnancy; if patients strongly prefer to avoid medication in pregnancy, could consider a trial of gradually discontinuing the medication **if it is not likely to severely impact daily functioning (stability during pregnancy is particularly important)**. • Given more limited available safety data for **third-line non-stimulant medications** for ADHD in pregnancy, could consider gradually lowering the dose to find lowest effective dose (possibly complete discontinuation), or switching to a stimulant.

Pregnancy *(continued)*	• There is currently no published evidence to suggest dose alterations are needed during pregnancy for the medications used to treat ADHD. However, due to physiologic changes in pregnancy that can alter medication pharmacokinetics, monitor patient response and adjust as needed.
	• Monitor pregnancy carefully, including fetal growth, blood pressure checks, and ensuring appropriate weight gain.
	• Preparing for birth/postpartum:
	  ◦ For patients taking multiple psychiatric medications, inform them that the baby will be monitored at birth for symptoms of poor neonatal adaptation. Reassure that these symptoms, such as jitteriness and temperature instability, are short-term and usually do not require treatment.
	  ◦ Discuss infant feeding goals, provide evidence-informed counselling on medication use during lactation, and review feeding options.

At Birth & Breastfeeding	• For patients who are breastfeeding and/or feeding expressed human milk, discuss the available evidence regarding risks of medication use versus risks of no medication use during lactation with the patient to support collaborative decision making.
	• If taking a **stimulant medication**, maintain therapeutic dose at the time of delivery and during breastfeeding.
	  ◦ If patient chooses to continue medication and breastfeed, monitor baby for irritability, insomnia, and feeding difficulty.
	• If taking one of the **non-stimulant medications** for the treatment of ADHD, or if taking **multiple medications**, review the limited data available regarding medication use during breastfeeding, in the context of reviewing all options for infant feeding, to support collaborative decision making.
	  ◦ If patient chooses to continue medication and breastfeed, monitor baby for vomiting, diarrhea, jitteriness, sedation, hypotonia and/or seizures depending on specific medication.
	• Monitor milk supply and infant early development carefully; ensure infants are gaining weight appropriately and meeting appropriate milestones. Further guidance for monitoring newborn and infant growth is available on the Perinatal Services BC Health Hub: https://www.psbchealthhub.ca/clinical-guidance/531.

Resources

General ADHD resources

The Canadian ADHD Resource Alliance (CADDRA): https://www.caddra.ca/

Attention Deficit Disorder Association (ADDA): https://add.org/

Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD): https://chadd.org/

Centre for ADHD Awareness, Canada (CADDAC): https://caddac.ca/

Resources to inform medication use during pregnancy and/or breastfeeding

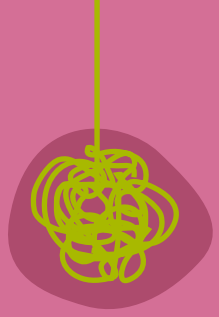
MotherToBaby: https://mothertobaby.org/

LactMed: https://www.ncbi.nlm.nih.gov/books/NBK501922/

Healthy Pregnancy Hub: https://www.healthypregnancyhub.ca/

Resources for ADHD in the perinatal period

ADHD coaching for the perinatal period (MSP covered): https://www.adhdpregnancy.ca/



BC WOMEN'S HOSPITAL+ HEALTH CENTRE
Provincial Health Services Authority

BC Women's Provincial Reproductive Mental Health Program

Mental Health Building
(Room p1-228)
4500 Oak Street
Vancouver, BC V6H 3N1

Tel. 604-875-2025

https://www.bcwomens.ca/our-services/mental-health-substance-use/reproductive-mental-health

Perinatal Services BC
Provincial Health Services Authority

Perinatal Services BC

#200 – 1333 West Broadway,
Vancouver, BC V6H 4C1

Tel. 604-877-2121

https://www.psbchealthhub.ca/

The purpose of these guidelines is to support healthcare professionals in the detection and coordinated management of pregnant and postpartum individuals with attention-deficit/hyperactivity disorder. Every attempt has been made to ensure that the information contained herein is clinically accurate and current, but some issues may be subject to practice interpretation. Decision making in a specific context is the responsibility of attending healthcare professionals. Nothing contained in these guidelines should in any way be construed as being either official or unofficial policy of Children's and Women's Health Centre of British Columbia Branch, Perinatal Services BC, or the BC Provincial Health Services Authority (together, the 'Societies'). The Societies assume no responsibility or liability arising from any error in or omission of information or from any use of any information, link, contact, opinion, or advice provided in these guidelines.