Hypertensive Conditions

We are seeking an author or author group to write a manuscript for this edition of *FP Essentials*™ that will update family physicians about hypertensive conditions. This edition will cover four topics:

1. Essential (primary) hypertension in adults
2. Secondary etiologies of hypertension in adults
3. Hypertension in children and adolescents
4. Hypertensive conditions in pregnancy

The main text of the manuscript should be approximately 10,000 words in length, divided into four sections of approximately 2,500 words each with an abstract of 200 words maximum for each section. In addition, there should be key practice recommendations, a maximum of 15 tables and figures), suggested readings, and a single reference list with up to 200 references to provide support for all factual statements in the manuscript.

The edition should focus on what is new in each topic and should answer the key questions listed for each section. Each section should begin with an illustrative case, similar to the examples provided, with modifications to emphasize key points; each case should have a conclusion that demonstrates resolution of the clinical situation. The references here include information that should be considered in preparation of this monograph. However, these references are only a useful starting point.

Needs Assessment: In the United States, hypertension affects 1 in 3 adults, 3% to 4% of children and adolescents, and causes complications in approximately 10% of pregnancies.[1,2,3] It is among the strongest predictors of adverse health outcomes. Decades of progress in creating safe, effective pharmacotherapies for hypertension and evaluating the efficacy of lifestyle interventions have led to significant improvements in major cardiovascular outcomes. However, there remains uncertainty whether screening interventions for hypertension improve hypertension-related morbidity and mortality.[4] Also, target blood pressure goals differ among major guidelines, creating confusion for family physicians who are at the forefront of hypertension management. In addition, a survey of American Academy of Family Physicians (AAFP) members showed that hypertension in adults and children was in the top 50% of medical conditions for which members indicated a gap between the condition's relevance to practice and their knowledge and skills for managing the condition. This edition of *FP Essentials* will address the uncertainties and gaps by updating family physicians on hypertension management in different patient populations.

1. Viera AJ. Hypertension update: current guidelines. *FP Essent*. 2018;469:11-15.
2. Krist AH, Davidson KW, Mangione CM, et al. Screening for high blood pressure in children and adolescents: US Preventive Services Task Force recommendation statement. *JAMA*. 2020;324(18):1878-1883.
3. Poon LC, Shennan A, Hyett JA, et al. The International Federation of Gynecology and Obstetrics (FIGO) initiative on pre-eclampsia: a pragmatic guide for first-trimester screening and

prevention. *Int J Gynaecol Obstet*. 2019;145(Suppl 1):1-33. Erratum in *Int J Gynaecol Obstet*. 2019;146(3):390-391.
4. Schmidt BM, Durao S, Toews I, et al. Screening strategies for hypertension. *Cochrane Database Syst Rev*. 2020;(5):CD013212.

Section 1: Essential (Primary) Hypertension in Adults

Example case: *JS is an active 69-year-old woman with hypothyroidism and osteopenia. For the past few years, her systolic blood pressure (BP) has been increasing, with a recent office BP measurement of 152/78 mm Hg on an average of three readings. She is otherwise asymptomatic, with a 10-year atherosclerotic cardiovascular disease (ASCVD) risk score of 10%. She prefers not to take any drugs and asks what else she can do to lower her BP; however, she is open to hearing your thoughts about the possibility of drug therapy.*

Key questions to consider:

- What are the 2021 U.S. Preventive Services Task Force (USPSTF) recommendations regarding screening for hypertension in adults? How does it compare to the 2015 USPSTF recommendation? Briefly describe the rationale for major changes.
- Based on different guidelines from various sources, define hypertension and indicate thresholds for management. Consider using tables to summarize similarities and differences. Include guidelines/recommendations from the American College of Cardiology (ACC), American Heart Association (AHA), the Eighth Joint National Committee (JNC 8), Hypertension Canada, the American College of Physicians (ACP), American Academy of Family Physicians (AAFP), American Society of Hypertension (ASH), International Society of Hypertension (ISH), and others as appropriate.
- Summarize how to take an accurate office blood pressure (BP) (ie, which cuffs/machines to use or not to use, and other parameters).
- What are the roles of office BP measurement, ambulatory BP monitoring, and home BP monitoring in the diagnosis of hypertension? Which is most accurate?
- After suspecting or diagnosing essential hypertension, what basic assessments (eg, laboratory tests, imaging) are recommended? What evidence supports these recommendations? When are additional studies (eg, echocardiography) recommended?
- How effective are lifestyle modifications for lowering BP and improving patient outcomes? Discuss Dietary Approaches to Stop Hypertension (DASH) diet, weight loss, reduced dietary sodium intake, increased dietary potassium intake, physical activity, moderation in alcohol intake, smoking cessation, and other relevant interventions. How long should lifestyle modifications be attempted before adding pharmacotherapy?
- Regarding pharmacotherapy, which drugs should be used for initial management in what situations? Is there any good evidence that drug choices should still be based on a patient's racial/ethnic group?
- Based on age and other comorbidities, what should BP targets be? Is there a difference between intensive versus standard control goals?
- For older adults, discuss a nuanced approach of balancing new evidence of improved outcomes from more intensive management of hypertension and the adverse events associated with intensive treatment.
- Based on recent systematic reviews or meta-analyses, what adverse events are associated with antihypertensive management?
- Explain the current paradigm of having BP as a key quality metric, including recommended targets and pay-for-performance initiatives. What is the role of allowing for patient autonomy in decision-making relative to treatment-to-goal versus the

allowance of not reaching the goal? Are home (nonoffice) BP readings included in determining whether or not practices are meeting quality metrics, and are home monitors covered by insurance?
- What is the role of telemedicine in hypertension management?

Initial references to consider:

- Krist AH, Davidson KW, Mangione CM, et al. Screening for hypertension in adults: US Preventive Services Task Force reaffirmation recommendation statement. *JAMA*. 2021;325(16):1650-1656.
- Siu AL. Screening for high blood pressure in adults: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2015;163(10):778-786.
- Viera AJ. Hypertension update: current guidelines. *FP Essent*. 2018;469:11-15.
- Shimbo D, Artinian NT, Basile JN, et al. Self-measured blood pressure monitoring at home: a joint policy statement from the American Heart Association and American Medical Association. *Circulation*. 2020;142(4):e42-e63.
- Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension*. 2020;75(6):1334-1357.
- Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Hypertension*. 2018;71(6):e13-e115.
- Rabi DM, McBrien KA, Sapir-Pichhadze R, et al. Hypertension Canada's 2020 comprehensive guidelines for the prevention, diagnosis, risk assessment, and treatment of hypertension in adults and children. *Can J Cardiol*. 2020;36(5):596-624.
- Qaseem A, Wilt TJ, Rich R, Humphrey LL, Frost J, Forciea MA. Pharmacologic treatment of hypertension in adults aged 60 years or older to higher versus lower blood pressure targets: a clinical practice guideline from the American College of Physicians and the American Academy of Family Physicians. *Ann Intern Med*. 2017;166(6):430-437.
- Wright JT Jr, Williamson JD, Whelton PK, et al. A randomized trial of intensive versus standard blood-pressure control. *N Engl J Med*. 2015;373(22):2103-2116. Erratum in *N Engl J Med*. 2017;21;377(25):2506.
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- Albasri A, Hattle M, Koshiaris C, et al. Association between antihypertensive treatment and adverse events: systematic review and meta-analysis. *BMJ*. 2021;372(189):n189.
- Viera AJ. Hypertension update: older adults. *FP Essent*. 2018;469:26-29.
- Arguedas JA, Leiva V, Wright JM. Blood pressure targets in adults with hypertension. *Cochrane Database Syst Rev*. 2020;(12):CD004349.

Section 2: Secondary Etiologies of Hypertension in Adults

Example case: *RG is a 40-year-old man with a history of obesity, prediabetes, and depression, who comes to your office with daytime fatigue and blood pressure of 142/90 mm Hg (an average of three office readings). The A1c level is 6.1%; basic metabolic panel results are unremarkable; urinalysis shows no protein; and lipid panel results are notable for low high-density lipoprotein level. The 10-year atherosclerotic cardiovascular disease (ASCVD) risk score is 8%. He reports snoring with periods of apnea, so you refer him for a sleep study, advise him to start daily walks, recommend the Dietary Approaches to Stop Hypertension (DASH) diet, and schedule a follow-up visit in 2 months.*

Key questions to consider:

- What is the difference between primary and secondary hypertension? What is the prevalence of secondary hypertension?
- Based on different age groups (eg, young adult, middle-aged adult, older adult), discuss the most common etiologies of secondary hypertension, including hyperaldosteronism, hypothyroidism, atherosclerotic renal artery stenosis, obstructive sleep apnea, and renal failure. Consider less common etiologies, such as pheochromocytoma, Cushing syndrome, and drug-induced hypertension? Regarding drug-induced hypertension, which drugs are the most common cause?
- Why is it important to differentiate secondary from primary (essential) hypertension?
- When should adults presenting with hypertension be evaluated for secondary etiologies?
- What history and physical examination findings, as well as comorbidities, should prompt the clinician to consider secondary hypertension? What signs and symptoms are suggestive of secondary hypertension?
- When are laboratory tests, imaging, and other assessments indicated in the diagnosis of secondary hypertension? What findings should the clinician examine? How accurate are they?
- How common is primary aldosteronism? What is the recommended diagnostic evaluation and management?
- Based on etiology, provide a framework on how secondary hypertension should be managed and how this may differ from primary hypertension management.
- Discuss lifestyle interventions, pharmacotherapy, and surgical therapies for secondary hypertension. How effective are these managements in secondary hypertension?
- Although not rigorously evaluated in the medical literature, psychosocial factors have been suggested as risk factors for hypertension. What is the evidence behind this?
- Is there evidence that social determinants of health may contribute to the racial/ethnic disparities in hypertension?
- When should a patient be referred to a hypertension subspecialist for further evaluation and guidance in treatment?
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Initial references to consider:

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- Viera AJ, Neutze DM. Diagnosis of secondary hypertension: an age-based approach. *Am Fam Physician*. 2010;82(12):1471-1478.
- Camelli S, Bobrie G, Postel-Vinay N, Azizi M, Plouin PF, Amar L. Prevalence of secondary hypertension in young hypertensive adults. *J Hypertens*. 2015;33(Suppl 1):e47.
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- Jaffe G, Gray Z, Krishnan G, et al. Screening rates for primary aldosteronism in resistant hypertension: a cohort study. *Hypertension*. 2020;75(3):650-659.
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- Kressin NR, Terrin N, Hanchate AD, et al. Is insurance instability associated with hypertension outcomes and does this vary by race/ethnicity? *BMC Health Serv Res*. 2020;20(1):216.

Section 3: Hypertension in Children and Adolescents

Example case: *KL is a healthy 9-year-old boy who comes to your office for a well-child examination. His weight and vital signs are healthy, except for the systolic blood pressure (SBP), which is at the 95th percentile for his age, sex, and height. You confirm this elevated SBP on two subsequent visits. In evaluating for secondary etiologies, you obtain urinalysis, results of which are normal; however, basic metabolic panel results reveal an elevated creatinine level. Electrolyte levels are normal, and lipid panel results are unremarkable. His mother asks you why the BP is elevated and wants to know what the next steps are.*

Key questions to consider:

- What is the prevalence of childhood and adolescent hypertension? How often does it lead to cardiovascular disease in adulthood?
- Regarding screening for hypertension in children and adolescents, summarize the 2020 U.S. Preventive Services Task Force (USPSTF) recommendation. How does it compare to the 2013 USPSTF recommendation?
- How does the 2020 USPSTF screening recommendation differ from the most current recommendations from the American Academy of Pediatrics (AAP), the American Heart Association (AHA), the National Heart, Lung, and Blood Institute (NHLBI), and the American Academy of Family Physicians (AAFP)?
- Using the most recent AAP guideline, differentiate elevated blood pressure (BP) from hypertension. What are the diagnostic criteria?
- How has the revised definition of hypertension changed the prevalence of the disease? Has it resulted in improved patient-oriented outcomes?
- What are the roles of office BP measurement and ambulatory BP measurement in the diagnosis of hypertension in children and adolescents?
- Which risk factors are associated with primary hypertension in children and adolescents? What are the common and uncommon etiologies?
- In which clinical scenarios should children be evaluated for secondary etiologies of hypertension? What are the most common secondary etiologies by age?
- What history and physical examination findings are useful in the evaluation of children and adolescents with hypertension?
- When are laboratory tests, electrocardiography, echocardiography, and other specialized tests and imaging indicated in the evaluation of children and adolescents with hypertension?
- How effective are lifestyle modifications (eg, dietary interventions, exercise, weight loss) in the management of childhood hypertension?
- When is pharmacotherapy indicated, and which drugs should be used? How effective are they? What are the guidelines for de-escalation or pharmacotherapy discontinuation?
- When should a child or adolescent with hypertension be referred to a pediatric cardiology or hypertension subspecialist?

Initial references to consider:

- Krist AH, Davidson KW, Mangione CM, et al. Screening for high blood pressure in children and adolescents: US Preventive Services Task Force recommendation statement. *JAMA*. 2020;324(18):1878-1883.
- Gartlehner G, Vander Schaaf EB, Orr C, Kennedy SM, Clark R, Viswanathan M. *Screening for Hypertension in Children and Adolescents: Systematic Review for the U.S. Preventive Services Task Force*. Evidence Synthesis No. 193. Agency for Healthcare Research and Quality; 2020. AHRQ publication 20-05261-EF-1.
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- Flynn JT, Daniels SR, Hayman LL, et al. Update: ambulatory blood pressure monitoring in children and adolescents: a scientific statement from the American Heart Association. *Hypertension*. 2014;63(5):1116-1135.
- Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents; National Heart, Lung, and Blood Institute. Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. *Pediatrics*. 2011;128(Suppl 5):S213-S256.
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- Hardy ST, Urbina EM. Blood pressure in childhood and adolescence. *Am J Hypertens*. 2021;34(3):242-249.
- Brady TM, Altemose K, Urbina EM. Impact of the 2017 American Academy of Pediatrics' clinical practice guideline on the identification and risk stratification of youth at increased cardiovascular disease risk. *Hypertension*. 2021;77(6):1815-1824.
- Chaturvedi S, Lipszyc DH, Licht C, Craig JC, Parekh R. Pharmacological interventions for hypertension in children. *Cochrane Database Syst Rev*. 2014;(2):CD008117.

Section 4: Hypertensive Disorders in Pregnancy

Example case: *LL is a 27-year-old, gravida 2, para 1, at 27 weeks' and 5 days' gestation, with a history of preeclampsia during a prior pregnancy. The blood pressure reading at the 28-week prenatal visit is 150/100 mm Hg. She reports mild bipedal swelling but reports no visual changes, headache, abdominal pain, vaginal bleeding, or fluid loss. She also reports normal fetal movements. She is concerned because of the history of preeclampsia and wants to know what she should do next.*

Key questions to consider:

- Define gestational hypertension, chronic hypertension in pregnancy, preeclampsia, and preeclampsia superimposed on chronic hypertension. What are the prevalence and clinical features of each?
- Which interventions (eg, exercise, aspirin, calcium, vitamin D, omega-3 fatty acids) are effective in preventing hypertensive disorders in pregnancy? When should they be used?
- Using data from meta-analyses, how accurate is the U.S. Preventive Services Task Force (USPSTF) guideline in predicting preeclampsia to guide aspirin prophylaxis? Discuss the low detection rate for preeclampsia, especially among nulliparous women, when using the USPSTF criteria for aspirin prophylaxis.
- What tests are useful in the diagnosis and evaluation of pregnant women who are hypertensive?
- Based on best evidence and/or guidelines, discuss the perinatal, intrapartum, and postpartum management of pregnant women with each of the hypertensive disorders, including what drugs are contraindicated.
- Discuss blood pressure goals, monitoring, and optimal timing of delivery for pregnant women with each of the hypertensive disorders. How do these interventions affect outcomes?
- What important patient-oriented outcomes are affected by treatment of mild to moderate hypertension in pregnancy? What about the management of severe hypertension?
- Discuss the clinical features, diagnosis, and management of HELLP (hemolysis, elevated liver enzymes, and low platelet count) syndrome and eclampsia. Does blood pressure control influence the development of these syndromes?
- Focusing on hypertension, how do structural racism and implicit bias affect maternal health outcomes in women of color? Discuss ethical considerations and systemic interventions that may reduce maternal health disparities and inequities.

Initial references to consider:

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- American College of Obstetricians and Gynecologists. Practice Bulletin No. 222: gestational hypertension and preeclampsia. *Obstet Gynecol*. 2020;135(6):e237-e260.
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- Hofmeyr GJ, Lawrie TA, Atallah ÁN, Torloni MR. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. *Cochrane Database Syst Rev*. 2018;(10):CD001059.
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- Al-Rubaie ZTA, Askie LM, Hudson HM, Ray JG, Jenkins G, Lord SJ. Assessment of NICE and USPSTF guidelines for identifying women at high risk of pre-eclampsia for tailoring aspirin prophylaxis in pregnancy: an individual participant data meta-analysis. *Eur J Obstet Gynecol Reprod Biol*. 2018;229:159-166.
- Ashworth DC, Maule SP, Stewart F, Nathan HL, Shennan AH, Chappell LC. Setting and techniques for monitoring blood pressure during pregnancy. *Cochrane Database Syst Rev*. 2020;(8):CD012739.
- Abalos E, Duley L, Steyn DW, Gialdini C. Antihypertensive drug therapy for mild to moderate hypertension during pregnancy. *Cochrane Database Syst Rev*. 2018;(10):CD002252.
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- American College of Obstetricians and Gynecologists. Committee Opinion No. 692: emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. *Obstet Gynecol*. 2017;129(4):e90-e95.
- Cairns AE, Pealing L, Duffy JMN, et al. Postpartum management of hypertensive disorders of pregnancy: a systematic review. *BMJ Open*. 2017;7(11):e018696.
- Churchill D, Duley L, Thornton JG, Moussa M, Ali HS, Walker KF. Interventionist versus expectant care for severe pre-eclampsia between 24 and 34 weeks' gestation. *Cochrane Database Syst Rev*. 2018;(10):CD003106.
- Cluver C, Novikova N, Koopmans CM, West HM. Planned early delivery versus expectant management for hypertensive disorders from 34 weeks gestation to term. *Cochrane Database Syst Rev*. 2017;(1):CD009273.
- Scott KA, Britton L, McLemore MR. The ethics of perinatal care for Black women: dismantling the structural racism in "mother blame" narratives. *J Perinat Neonatal Nurs*. 2019;33(2):108-115.

- Green TL, Zapata JY, Brown HW, Hagiwara N. Rethinking bias to achieve maternal health equity: changing organizations, not just individuals. *Obstet Gynecol*. 2021;137(5):935-940.
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