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Tachycardia in Pregnancy

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KEYWORDS

- Pregnancy • Tachycardia • Risk stratification • Electrocardiogram (ECG)
- Maternal cardiac evaluation

KEY POINTS

- Normal adaptation versus red flag: Maternal heart rate (HR) rises in pregnancy, but resting HR greater than 110 bpm requires evaluation to exclude pathology.
- Confirm and assess systematically: Verify true resting tachycardia, then perform targeted history and examination for cardiac and non-cardiac causes.
- Core investigations: Electrocardiogram (mandatory if >110 bpm) plus basic labs (complete blood count, thyroid-stimulating hormone, electrolytes) to identify reversible etiologies.
- Risk-based management: Mild/asymptomatic → observe; persistent/symptomatic → cardiology referral; instability or HR greater than 120 bpm → urgent/emergency care.
- Treatment principles: Focus on reversible causes and conservative care; use beta-blockers only for persistent symptoms; maintain vigilance in intrapartum and postpartum periods.

INTRODUCTION

Tachycardia is a common finding during pregnancy, reflecting normal physiologic adaptations including increased blood volume and sympathetic tone.¹ However, persistent tachycardia can also indicate underlying pathology.

Maternal heart rate begins rising as early as 5 weeks' gestation, with an average increase of 15 to 20 beats per minute (BPM), peaking by 32 weeks,^{1,2} followed by stabilization or slight decline toward term.³ A study of healthy pregnancies found median heart rates of 82 BPM at 12 weeks (3rd–97th percentile 63–105 BPM), rising to 91 BPM by 34 weeks (3rd–97th percentile 68–115 BPM).^{3,4} Notably, resting heart rate exceeded 100 BPM in over 10% of observations in otherwise healthy pregnancies,

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Abbreviations

BPM	beats per minute
ECG	Electrocardiogram

highlighting the importance of thorough evaluation to identify patients warranting additional workup.

While debate exists regarding the upper limit of normal heart rate during pregnancy, for the purposes of this article and to prioritize patient safety, a resting heart rate above 110 BPM should prompt additional investigation.^{1,5,6} Tachycardia in pregnancy exists on a spectrum, ranging from expected physiologic adaptation to an early indicator of serious underlying disease. Cardiac disease remains a leading cause of maternal mortality, and distinguishing benign physiologic changes from pathologic processes is often difficult in routine clinical practice.

This article provides a framework for the evaluation and risk stratification of pregnant patients with tachycardia who do not have known structural heart disease, cardiomyopathy, or prior arrhythmias. The goal is to identify patients who require additional workup, urgent cardiology referral, or emergent evaluation.⁷

INITIAL EVALUATION OF A PREGNANT PATIENT WITH TACHYCARDIA

Tachycardia in pregnancy should prompt clinical investigation. A structured, methodical approach can help identify underlying pathology, including cardiac, infectious, endocrine, or hematologic causes, and distinguish pathologic processes from benign physiologic pregnancy adaptations (Fig. 1). The initial evaluation should systematically assess both cardiac and non-cardiac etiologies.

Confirming a True Resting Tachycardia

Heart rate should be measured at rest after the patient has been seated quietly for several minutes to avoid misclassification due to anxiety, exertion, or pain.¹ Automated blood pressure cuffs may underestimate heart rate or report it as irregular when significant beat-to-beat variation is present.⁸ Any newly identified irregularity should prompt confirmation with a 12 lead electrocardiogram.^{5,8}

If tachycardia or an irregular heart rate is reported, a manual heart rate should be obtained by palpation of the radial artery for a full 60 seconds.^{1,6} Tachycardia across repeated measurements is more concerning than a single elevated reading.⁵

When tachycardia is identified, or when there is a significant change from baseline, obtain a complete set of vital signs if not already available. Boxes 1 and 2 provide key points to reference for history and physical examination in the setting of maternal tachycardia.

Focused Clinical History

Following confirmation of tachycardia, a clinical history should focus on distinguishing physiologic tachycardia from pathologic causes. Questions aimed at determining temporality, onset characteristics, and exacerbating factors can guide the workup.⁶

Cardiac history

Several key symptoms warrant heightened concern and should prompt additional cardiac evaluation:

Chest pain or pressure: Characterize carefully for high-risk features including exertional onset, symptoms lasting minutes, relief with rest, and radiation to the jaw or left arm, which may suggest myocardial ischemia.^{9,10} Radiation of pain to the back should

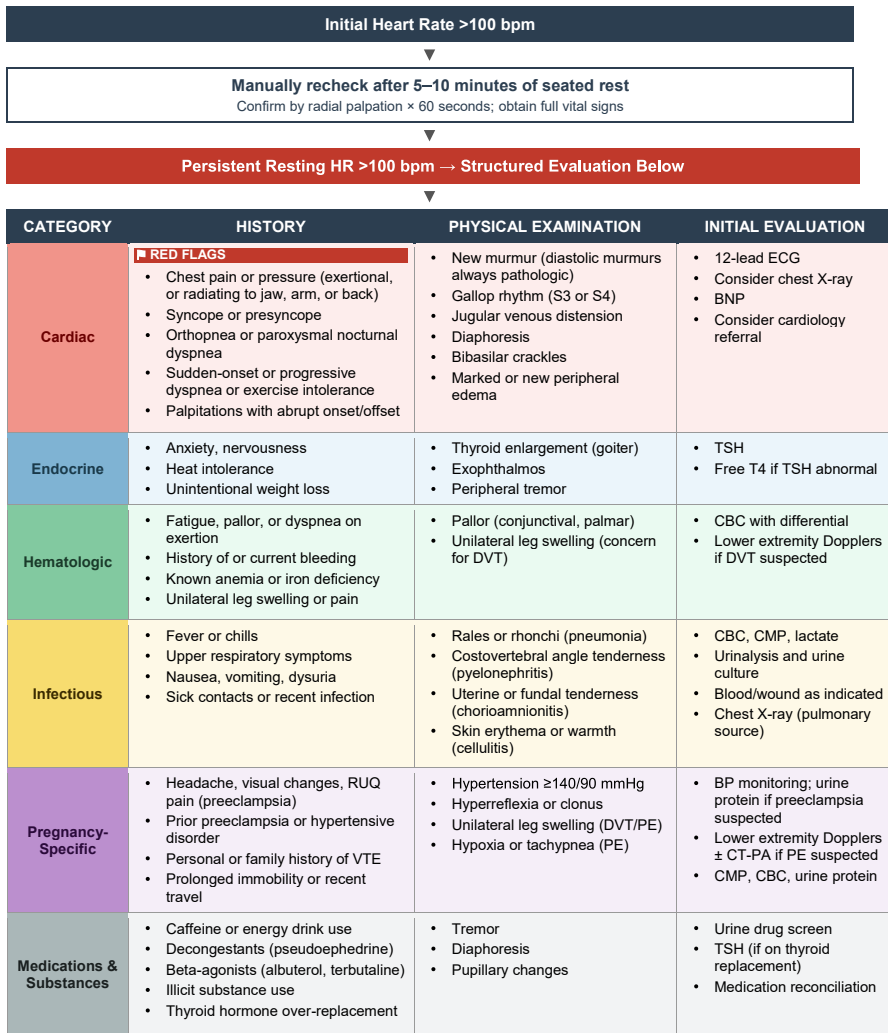


Fig. 1. Clinical evaluation of tachycardia in pregnancy: history, physical examination, and diagnostic workup. BNP, B-type natriuretic peptide; BP, blood pressure; CBC, complete blood count; CMP, comprehensive metabolic panel; CT-PA, computed tomography pulmonary angiography; DVT, deep vein thrombosis; ECG, electrocardiogram; HR, heart rate; LFT, liver function tests; PE, pulmonary embolism; RUQ, right upper quadrant; TSH, thyroid-stimulating hormone; VTE, venous thromboembolism. *Note:* Diastolic murmurs are always pathologic and warrant cardiology evaluation. Automated ECG readings frequently flag normal pregnancy variants as abnormal; clinician correlation with symptoms is required. $\text{SpO}_2 \leq 94\%$, $\text{RR} \geq 30$, or $\text{SBP} \geq 160$ mm Hg with tachycardia should prompt urgent evaluation.

raise concern for large-vessel pathology, including aortic dissection.¹¹ In women, nausea, diaphoresis, epigastric discomfort, or unexplained fatigue may represent ischemic equivalents and warrant the same careful evaluation as chest pain.¹²

Palpitations: Assess for sudden versus gradual onset and offset, duration, and association with presyncope or syncope.¹ Syncope or near-syncope is particularly

concerning when unexplained, exertional, or associated with ongoing tachycardia and warrants urgent evaluation.¹³

Dyspnea: Shortness of breath should be interpreted in the context of gestational age, as it is often difficult to distinguish pregnancy-associated dyspnea from cardiac etiology. Orthopnea, defined as worsening shortness of breath while lying flat, and paroxysmal nocturnal dyspnea, defined as awakening from sleep with shortness of breath, are more specific symptoms for heart failure, although validation in pregnancy has been limited to a small number of descriptive studies.^{14–16} Fatigue and exercise intolerance, especially if sudden in onset, are red flags that should trigger additional evaluation.¹⁴

Note: Orthopnea, persistent tachycardia, and breathlessness at rest are not normal in pregnancy and warrant evaluation, even in the absence of other concerning findings.

Dizziness: Assess the relationship to position changes, exertion, and tachycardia. Dizziness that is temporally associated with palpitations or tachycardia is more concerning for cardiac etiology, while positional (eg, lying or seated to standing) suggests an orthostatic etiology.

Non-cardiac history

History should not be limited to cardiac etiologies. The evaluation should systematically consider endocrine, hematologic, infectious, and metabolic causes of tachycardia. Specific areas to explore include

Endocrine: Screen for symptoms of thyroid dysfunction, including heat intolerance, tremor, weight changes, and anxiety. Hyperthyroidism, though less common than hypothyroidism, occurs in approximately 0.2% of pregnancies and can commonly present with tachycardia.¹⁷

Hematologic: Inquire about recent bleeding, known anemia, or symptoms of blood loss. While mild to moderate anemia is often asymptomatic, tachycardia may emerge as anemia advances due to the compensatory increase in cardiac output required to maintain oxygen delivery in the setting of reduced red cell mass.¹⁸ Iron deficiency can also independently cause syncope, palpitations, ECG abnormalities, and worsening of heart failure.^{19,20}

Infectious: Assess for fever, recent infections, or infectious exposures that may explain tachycardia. Fundal tenderness can point toward intrauterine infection.

Pregnancy-specific risk factors: Review for current or prior preeclampsia and assess thromboembolic risk factors.²¹

Medications and substances: Review all medications and substance exposures, including commonly overlooked agents such as caffeine, energy drinks,

Box 1

Key points from history taking in the setting of maternal tachycardia

Key Takeaways: Focused History Taking for Tachycardia

- **High-risk cardiac symptoms:** Chest pain, syncope or presyncope, paroxysmal nocturnal dyspnea, orthopnea, and new or progressive exercise intolerance
- **Cast a wide net:** Systematically consider non-cardiac contributors
- **Do not overlook substances**
- **Pregnancy-specific risk factors:** Screen for signs and symptoms of preeclampsia and assess thromboembolic risk factors

Box 2**Key takeaway points for physical examination in the setting of tachycardia**

Key Takeaways: Targeted Physical Examination

Cardiovascular Findings

- Systolic flow murmurs are often physiologic, but diastolic murmurs are always pathologic

Signs of Volume Overload

- Marked pitting edema, bibasilar crackles, and elevated jugular venous pressure

Distinguishing Edema Patterns

- Mild bilateral lower extremity edema is often physiologic; *unilateral leg swelling* requires evaluation

Non-Cardiac Contributors

- Thyroid: assess for goiter or peripheral tremor
- Infectious: evaluate for respiratory illness, costovertebral angle tenderness, uterine tenderness, or cellulitis

Fetal Heart Rate as an Adjunct

- Non-reassuring or persistently tachycardic fetal heart rate may reflect systemic maternal pathology

decongestants, beta-agonists, and illicit substances all of which can directly contribute to tachycardia.²²

Family history: A family history of sudden cardiac death or inherited arrhythmia syndromes should prompt heightened concern and cardiology involvement, though this does not typically require emergency evaluation in the absence of active symptoms.²³

Targeted Physical Examination

In evaluating a pregnant individual with tachycardia, the physical examination should focus on identifying signs of hemodynamic instability, heart failure, poor perfusion, and potential non-cardiac causes. A systematic approach helps distinguish physiologic changes of pregnancy from pathologic findings.

Assess for signs of hemodynamic instability or impending shock. Blood pressure abnormalities are particularly important, as hypertension may represent preeclampsia while hypotension may signal impending shock.¹⁶ Hypotension accompanied by altered mental status, cool extremities, or delayed capillary refill should raise concern for cardiogenic shock and prompt emergent evaluation.^{5,7}

Cardiovascular: Cardiac auscultation should assess for new murmurs, gallops, or irregular rhythms. Systolic flow murmurs occur in up to 90% of pregnant patients due to increased cardiac output and in isolation do not require cardiology referral.⁵ However, diastolic murmurs are always pathologic and warrant additional investigation.⁵ New murmurs accompanied by other concerning findings or symptoms should prompt cardiology evaluation. A gallop rhythm (S3 or S4) may suggest ventricular dysfunction and warrants further assessment.

Assess for signs of volume overload and heart failure. While mild peripheral edema is common in pregnancy, marked pitting edema, especially when accompanied by other findings, warrants investigation.²⁴ Distended jugular veins are not a normal finding and suggest elevated central venous pressure. Unilateral leg swelling can point toward thromboembolism and requires further evaluation.

Pulmonary: Auscultate the lung fields for crackles, particularly at the bases, which may indicate pulmonary edema or heart failure.²⁴ However, also consider infectious causes such as pneumonia.

Endocrine: Examine the neck for thyroid enlargement (goiter) and assess for peripheral tremor, which may suggest hyperthyroidism.

Infectious: In the acute setting with an ill-appearing patient, assess for signs of infection including pulmonary findings, costovertebral angle tenderness (pyelonephritis), uterine tenderness (chorioamnionitis), or skin changes consistent with cellulitis.

Fetal assessment in the triage setting

In a triage or acute care setting, evaluation of the fetal heart rate can aid in determining maternal status. While not diagnostic, a non-reassuring fetal heart rate or a persistently tachycardic fetus may reflect a systemic maternal process such as infection, substance exposure, or endocrine disease affecting the pregnancy.²⁵ A reassuring fetal heart rate in the setting of maternal tachycardia can provide some reassurance regarding maternal hemodynamic stability.

INITIAL DIAGNOSTIC WORKUP

Diagnostic testing should be guided by clinical suspicion, with the goal of identifying common or reversible causes while avoiding extensive workup for physiologic causes.

Electrocardiogram (ECG): All patients with a confirmed resting heart rate greater than 110 beats per minute should undergo a 12-lead electrocardiogram.¹ Ideally, this should be completed in the clinic when tachycardia is identified, given the paroxysmal nature of arrhythmias. The ECG can confirm sinus tachycardia and identify concerning rhythm disturbances or conduction abnormalities that require urgent evaluation.¹⁴

Important note on interpreting automated ECG readings: The automated computer interpretation of an ECG can provide helpful initial guidance when triaging a pregnant patient with tachycardia, but it always requires careful clinician review. Automated readings frequently flag normal pregnancy variants as abnormal, including sinus tachycardia, axis shifts, and rate-related interval changes. Correlation with clinical findings and symptoms is essential to avoid unnecessary escalation while remaining vigilant for true pathology. If uncertainty exists, consultation with a cardiologist or anesthesia can assist in determining if additional workup is needed.

Basic laboratory testing: For patients with persistent resting tachycardia, unexplained symptoms, or unclear etiology, basic laboratory evaluation is appropriate:

Complete blood count: Assess for anemia and leukocytosis, which contribute to tachycardia through different mechanisms. Anemia causes compensatory tachycardia due to low oxygen-carrying capacity, while leukocytosis suggests infection, which can manifest with a responsive tachycardia.

Thyroid-stimulating hormone: Thyroid disease is a common and reversible contributor to tachycardia in pregnancy and should be screened in all patients with unexplained tachycardia.⁶ This is especially important if tachycardia is accompanied by weight loss, tremor, anxiety, or heat intolerance.

Basic metabolic panel: Consider if there is concern for electrolyte abnormalities from recent illness, hyperemesis, or dehydration. Electrolyte derangements can directly cause tachyarrhythmias or contribute to the severity of tachycardia.

Infectious workup: If findings suggest an infectious etiology, obtain appropriate studies including urinalysis and urine culture for genitourinary sources, chest radiograph for pulmonary causes, or respiratory viral panel as indicated.

Additional testing: Additional diagnostic testing may be considered depending on clinical suspicion. If red-flag signs or symptoms for cardiac causes are identified, a

BNP should be considered. Radiologic studies, such as chest radiograph, lower extremity Dopplers or computed tomography for pulmonary embolism can also be considered depending on presenting symptoms.

RISK STRATIFICATION AND DISPOSITION

One of the key clinical questions when evaluating tachycardia in pregnancy is: *Does this patient require emergent evaluation, specialist referral, or can they be safely managed in the community?* This section provides a framework for risk stratification based on clinical findings, vital signs, and electrocardiographic features, [Fig. 2](#), [Box 3](#). Many patients with tachycardia can be managed safely in the outpatient setting

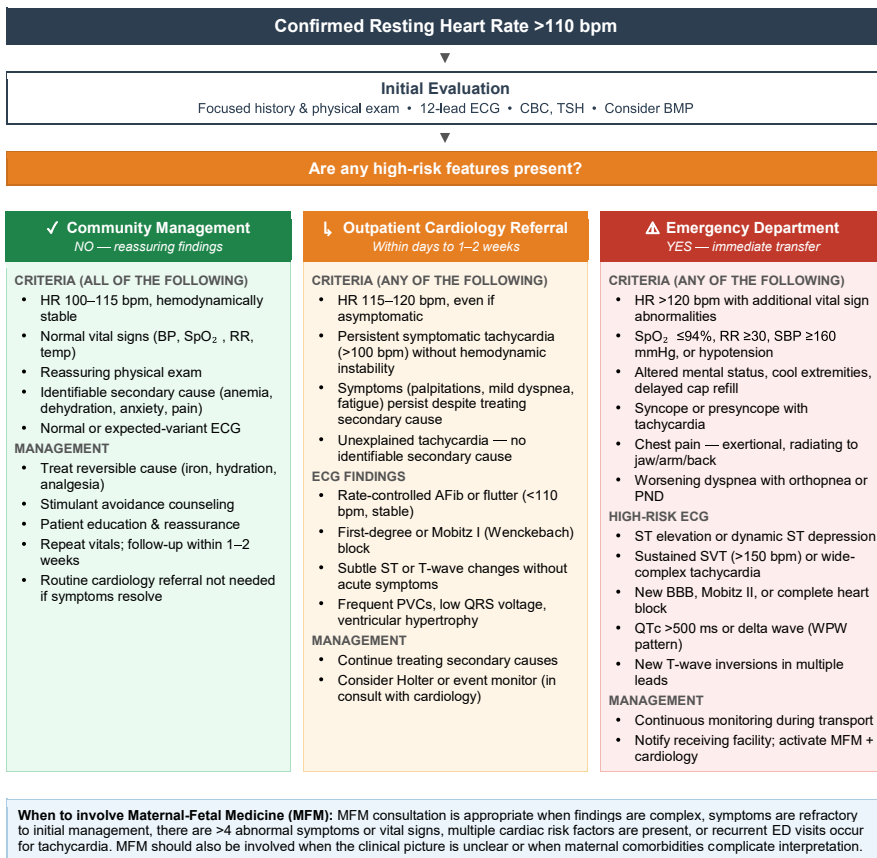


Fig. 2. Risk stratification and disposition of tachycardia in pregnancy. AFib, atrial fibrillation; BBB, bundle branch block; BMP, basic metabolic panel; BP, blood pressure; CBC, complete blood count; ECG, electrocardiogram; HR, heart rate; MFM, maternal-fetal medicine; PND, paroxysmal nocturnal dyspnea; PVC, premature ventricular contraction; RR, respiratory rate; SBP, systolic blood pressure; SpO₂, oxygen saturation; SVT, supraventricular tachycardia; TSH, thyroid-stimulating hormone; WPW, Wolff-Parkinson-White. *Note:* Orthopnea, persistent tachycardia, and breathlessness at rest are not normal in pregnancy and warrant evaluation even in the absence of other concerning findings. Do not await laboratory results before escalating care if hemodynamic instability is present.

Box 3**Key points of initial diagnostic workup**

Key Takeaways: Initial Diagnostic Workup

First-Line Studies—Obtain in All Patients with Persistent Resting Tachycardia

- *12 lead ECG*: Identify rhythm or conduction abnormalities
- *Complete blood count*: assess for anemia or leukocytosis suggesting infection
- *Thyroid stimulating hormone*: screening for hyperthyroidism
- *Basic metabolic panel*: consider if there is concern for electrolyte abnormalities

Targeted Studies—Based on Clinical Suspicion

- *Infectious workup* based on suspected source

When to Escalate Regardless of Workup

- Syncope, chest pain, hypoxia, hemodynamic instability, or signs of volume overload

with appropriate monitoring, identification, and treatment of reversible causes. **Box 4** provides an overview of how to triage and refer patients based on presentation.

Reassuring Findings: Community Management Appropriate

Patients with mild tachycardia (100–115 BPM) who are asymptomatic or have minimal symptoms can typically be managed in the community with appropriate follow-up. This is particularly true when vital signs are otherwise normal, including blood pressure, oxygen saturation, and respiratory rate, and the physical examination is reassuring. The presence of an identifiable secondary cause, such as anemia, dehydration, anxiety, or pain, further supports community-based management.

Electrocardiogram interpretation

A normal or mildly abnormal ECG in the context of sinus tachycardia is reassuring. It is important to recognize that several ECG changes represent normal physiologic

Box 4**Key points for triaging and urgency of assessment based on clinical presentation**

Key Takeaways: Risk Stratification and Disposition

Safe for Community Management

- Heart rate 100–115 bpm, asymptomatic or minimally symptomatic, with normal vital signs, ECG and reassuring physical examination
- Identifiable and addressable secondary causes

Needs Outpatient Cardiology Referral (within days to 1–2 weeks)

- Persistent symptomatic tachycardia (>100 bpm) without hemodynamic instability
- Moderate tachycardia (115–120 bpm), even if asymptomatic
- Symptoms (palpitations, mild dyspnea, fatigue) despite treatment of secondary causes
- ECG findings: rate-controlled atrial fibrillation or flutter, first-degree or Wenckebach (Mobitz I) block, minor repolarization changes, frequent premature ventricular contractions, or unexplained findings

Requires Emergency Department Evaluation

- Heart rate greater than 120 bpm with additional vital sign abnormalities or hemodynamic instability
- High-risk symptoms: syncope or presyncope with tachycardia, exertional chest pain with radiation, worsening dyspnea with orthopnea or paroxysmal nocturnal dyspnea, confusion or severe dizziness
- *High-risk ECG*: acute ischemic changes, sustained supraventricular tachycardia, wide-complex tachycardia, new bundle branch block, Mobitz type II or third-degree block, marked QT prolongation (>500 ms), or pre-excitation pattern (Wolff-Parkinson-White)

variants in pregnancy and are frequently flagged by automated readings. Sinus tachycardia with heart rates between 100 and 115 BPM in normal sinus rhythm falls within expected parameters for pregnancy. Similarly, mild leftward axis shifts occur due to diaphragm elevation and cardiac rotation, while small Q waves in leads III or aVF reflect positional changes. The PR and QT intervals often shorten at faster heart rates due to increased sympathetic tone, and minor ST-segment or T-wave changes may be rate-related rather than pathologic. Isolated premature atrial contractions are common and benign in pregnancy.

Management approach

The focus should be on addressing secondary causes through practical interventions: treating anemia, ensuring adequate hydration, and optimizing pain control. Reassurance and patient education are essential components of care. Patients should have repeat vital signs and clinical assessment as indicated, with follow-up scheduled within 1 to 2 weeks or sooner if symptoms develop. Routine cardiology referral is not needed if symptoms resolve with treatment of the underlying secondary cause.

When to involve maternal–fetal medicine. Maternal–fetal medicine (MFM) consultation is warranted when evaluation identifies causes requiring specialized management beyond community-based care.²⁶ This includes patients with symptoms refractory to initial supportive measures such as iron supplementation or hydration, or those requiring recurrent emergency department evaluations for tachycardia. MFM involvement is also appropriate when the clinical picture is complex, such as when there are concerning physical examination findings, more than 4 abnormal symptoms or vital signs, multiple risk factors for cardiac disease, or maternal comorbidities that complicate interpretation of findings.²⁶

Intermediate Risk: Outpatient Cardiology Evaluation

Some patients are hemodynamically stable but have features warranting specialist evaluation, typically within days to 1 to 2 weeks. This category includes patients with persistent symptomatic tachycardia (>100 BPM) without hemodynamic instability, unexplained tachycardia without an identifiable secondary cause, or moderate tachycardia (115–120 BPM) even when asymptomatic. Patients whose symptoms—such as palpitations, mild dyspnea on exertion, or fatigue—persist despite treatment of secondary causes also fall into this category.

Electrocardiogram findings warranting cardiology referral

Several ECG findings, while not requiring emergency evaluation, should prompt expedited outpatient cardiology referral (within 1–2 weeks). Rate-controlled atrial fibrillation or flutter, defined as a ventricular rate less than 110 BPM in a hemodynamically stable patient, warrants cardiology evaluation.⁶ New conduction abnormalities such as first-degree heart block (prolonged PR interval) or Mobitz type I (Wenckebach) second-degree heart block should be reviewed by a cardiologist; however these can be benign in young, healthy women. Low QRS voltage may suggest pericardial effusion or an infiltrative cardiomyopathy. Frequent premature ventricular contractions, particularly when symptomatic or associated with other clinical findings, may be reflective of underlying structural heart disease and warrant further evaluation.

Repolarization changes deserve particular attention and must be interpreted in the full clinical context. Subtle ST-segment changes and T-wave abnormalities, including T-wave flattening or T-wave inversion, encompass a broad spectrum from benign physiologic variants to early indicators of serious underlying pathology.²⁷ When chronic and isolated, mild T-wave flattening or inversion in the absence of symptoms

or other abnormal findings may represent a normal variant. However, these same findings in the setting of a concerning clinical history (including exertional symptoms, palpitations, syncope, or a family history of sudden cardiac death) may reflect ischemia, cardiomyopathy, or other significant structural disease and warrant urgent cardiology evaluation.^{5,6} Deep, symmetric T-wave inversions are more concerning and do warrant cardiology evaluation regardless of symptoms.

In practice, automated ECG reports frequently flag nonspecific ST-T wave changes, typically subtle ST depression or ST/T-wave flattening of less than 1 mm, that require clinical interpretation rather than automatic escalation. In a hemodynamically stable patient with no concerning features on history or examination, expectant management with close follow-up is reasonable. However, new or evolving changes compared to a prior tracing, or findings that persist on repeat ECG, should lower the threshold for cardiology referral.²⁷

Care coordination

Intermediate-risk patients can remain in community care with close follow-up while awaiting their cardiology appointment. Continue addressing any secondary causes and consider ambulatory cardiac monitoring, such as a Holter or event monitor, in consultation with cardiology.

High Risk: Emergency Department Evaluation

Immediate referral to the emergency department is warranted for patients presenting with critical vital sign abnormalities or signs of hemodynamic instability. Persistent tachycardia above 120 BPM, especially when combined with other vital sign abnormalities, should prompt urgent evaluation.²⁶ Hypotension, particularly when accompanied by altered mental status or signs of poor perfusion, is especially alarming.

While every hospital system has a different mechanism for triaging pregnant patients, patients with signs of hemodynamic instability should be assessed in the emergency room with the capacity to immediately evaluate and stabilize a life-threatening condition, regardless of gestational age.

Hemodynamic instability and high-risk symptoms

Signs of cardiogenic shock demand immediate attention: hypotension with altered mental status, cool extremities, delayed capillary refill, or mottled skin.^{5,7} Syncope or presyncope, worsening dyspnea with orthopnea or paroxysmal nocturnal dyspnea warrant urgent assessment.¹⁶ Any symptoms suggesting inadequate cerebral perfusion, such as confusion, marked fatigue, or severe dizziness, require immediate evaluation.

Chest pain or pressure with high-risk features (including exertional onset, radiation to the jaw, arm, or back, or symptoms lasting several minutes) should raise concern for myocardial ischemia or dissection. It is important to recognize, however, that ischemic symptoms in women are not limited to chest pain and should not be labeled “atypical,” as this framing is both outdated and risks minimizing clinically significant presentations. Women with ischemia are more likely than men to present with nausea or vomiting, diaphoresis, epigastric or upper abdominal discomfort, pain between the shoulder blades, unexplained fatigue, or palpitations, and these symptoms may occur alongside or instead of chest pain.¹²

High-risk electrocardiogram findings

Several electrocardiographic features require urgent evaluation, including
Emergency Room

- Acute ischemic changes (ST-segment elevation or dynamic ST-segment depression)
- Sustained supraventricular tachycardia above 150 BPM (unstable)
- Wide-complex tachycardia (assumed to be ventricular tachycardia until proven otherwise)
- New bundle branch block (left or right) (symptomatic)
- Mobitz type II second-degree heart block (dropped beats with a stable PR interval)
- Complete (third-degree) heart block

L&D Triage (if it has capacity for assessment and management)

- Sustained supraventricular tachycardia above 150 BPM (stable)
- New bundle branch block (left or right) (asymptomatic)

Marked QT prolongation, particularly QTc greater than 500 ms, is concerning especially in patients on QT-prolonging medications. A pre-excitation pattern with a delta wave suggesting Wolff-Parkinson-White syndrome in the setting of tachycardia requires urgent assessment. New T-wave inversions in multiple leads may suggest ischemia or cardiomyopathy and should be evaluated urgently.^{5,6} Any rhythm associated with hemodynamic instability requires immediate emergency department evaluation.

A Practical Note on ECG Interpretation: When a concerning history or physical examination finding is present, and there is uncertainty in ECG interpretation, clinicians should feel empowered to seek support as the overarching goal is ensuring the safety of the pregnant patient. The most appropriate resource will depend on clinical urgency, geographic location, and local availability. In many settings, emergency medicine colleagues are the most immediately accessible point of contact. Cardiology consultation should be pursued when available and the clinical picture warrants it. When neither is readily accessible for timely input, internal medicine or primary care physicians can provide valuable support in the acute setting.

Management approach

High-risk patients require immediate transport to the emergency department with continuous monitoring during transport if available. Contact the receiving facility to facilitate rapid evaluation and recommend maternal-fetal medicine and cardiology consultation in the emergency setting.

When to Consider Echocardiography

Echocardiography is not routinely required for all patients with tachycardia but should be considered when tachycardia is accompanied by concerning symptoms (syncope, significant dyspnea, and chest pain), abnormal physical examination findings suggesting structural heart disease (new murmur, gallop, signs of heart failure), or ECG abnormalities suggestive of cardiomyopathy or structural disease. For patients approaching delivery with concerning findings, echocardiographic assessment may influence peripartum management decisions.⁵

Consider cardiology referral before ordering

In many cases, referring to cardiology or a cardio-obstetrics team prior to ordering echocardiography is preferable. Cardiologists can determine whether imaging is truly indicated and ensure the study addresses the relevant clinical question, potentially including specialized views or techniques such as contrast studies or strain-based

assessments. This approach reduces the likelihood of incomplete studies or repeat imaging.^{5,7,13}

MANAGEMENT OF SINUS TACHYCARDIA IN PREGNANCY

Management of sinus tachycardia during pregnancy should focus on identifying and correcting reversible contributors and alleviating bothersome symptoms while minimizing unnecessary intervention. When a comprehensive evaluation does not identify a cardiac or concerning non-cardiac etiology, management may be directed toward symptom relief rather than rate normalization. In the absence of hemodynamic compromise or identifiable pathology, a resting heart rate below 120 bpm does not require pharmacologic treatment unless it is producing bothersome. With a thoughtful, stepwise approach, most cases can be managed conservatively with good maternal and fetal outcomes (**Box 5**).

Addressing Reversible Causes

Hydration and fluid status

Optimization of fluid status is a first-line intervention. Pregnant patients are susceptible to relative hypovolemia due to increased plasma volume demands, nausea, vomiting, and decreased oral intake. Encouraging regular hydration, liberal oral fluids, and electrolyte-containing beverages when appropriate may reduce resting heart rate and improve symptoms, especially in hot or dry environments or seasons.²⁸

Iron deficiency and anemia

Iron deficiency and anemia should be addressed when identified. Even mild anemia may contribute to compensatory tachycardia due to reduced oxygen-carrying capacity.¹⁸ Oral iron is appropriate for most patients and should be accompanied by counseling on adherence, gastrointestinal side effects, and the expected timeline for improvement.²⁹ In cases of moderate to severe anemia, poor tolerance of oral iron, or inadequate response, intravenous iron may be considered.²⁹ Improvement in heart rate may lag behind hemoglobin correction, and patients should be counseled accordingly.

Other reversible causes

Additional common and treatable contributors to sinus tachycardia in pregnancy should be systematically identified and addressed. Thyroid dysfunction, particularly subclinical or overt hyperthyroidism,⁶ can contribute to symptoms and treatment should be considered with guidance from maternal-fetal medicine and endocrinology specialists. Infectious etiologies should be treated promptly as fever and systemic

Box 5

Key takeaways from lifestyle management for tachycardia

Key Takeaways: Non-Pharmacologic Management Strategies

- **Hydration:** encourage adequate fluid intake throughout pregnancy; consider electrolyte-containing beverages
- **Sleep and stress reduction:** promote regular sleep habits and identify modifiable stressors;
- **Stimulant avoidance:** review medications and advise avoidance of potential causes
- **Physical activity:** encourage graded aerobic exercise as tolerated
- **Behavioral health support:** consider referral when anxiety is identified as a contributor

inflammation drive tachycardia. Medications and substances that may contribute to tachycardia (including caffeine, energy drinks, decongestants, beta agonists, and illicit substances) should be identified and discontinued.

Non-Pharmacologic Strategies: First-Line Approach

Non-pharmacologic measures should be emphasized as the preferred initial approach for persistent symptomatic tachycardia because most symptoms will resolve after delivery without the need for ongoing medication. These strategies are safe, well-tolerated, and often effective. Graded physical activity as tolerated, adequate sleep, and avoidance of stimulants such as caffeine and energy drinks have all been shown to improve cardiac health and reduce resting heart rate.^{30,31}

Reassurance and education

In patients with isolated sinus tachycardia and a reassuring evaluation, education and reassurance are foundational, as anxiety itself may exacerbate symptoms and perpetuate tachycardia. Up to one-third of patients with symptomatic complaints of palpitations have anxiety as an underlying contributor.²⁸ Clear counseling that a modestly elevated resting heart rate can be a normal feature of pregnancy is often therapeutic. For patients with anxiety-related symptom amplification, anticipatory guidance and, when appropriate, behavioral health support may significantly reduce symptom burden.²⁸

These measures should be optimized before considering pharmacologic intervention, and many patients will experience adequate symptom control with conservative management alone.

Pharmacologic Management: When Non-Pharmacologic Measures Are Insufficient

For patients with persistent, bothersome symptoms despite optimization of nonpharmacologic strategies, pharmacologic therapy can be considered, typically in consultation with cardiology. Beta-blockers are considered first-line pharmacologic therapy based on their extensive safety profile in pregnancy, and long-standing safe use in treating various maternal conditions.³² Metoprolol or propranolol are the preferred beta-blockers¹³ and can be initiated orally for ongoing management.

INTRAPARTUM AND POSTPARTUM CONSIDERATIONS

Labor and delivery management

For most patients with isolated sinus tachycardia and a reassuring antenatal evaluation, labor and delivery can proceed with standard obstetric management. During labor, maternal heart rate commonly increases in response to pain, anxiety, exertion, dehydration, or to parturition itself. Anticipating these changes and addressing modifiable contributors proactively can minimize sustained tachycardia and facilitate interpretation of intrapartum vital sign trends.

Supportive measures during labor

Hydration: Adequate intravenous or oral hydration should be maintained throughout labor, particularly in patients with prolonged labor courses or limited oral intake.

Pain control: Early attention to analgesia, including neuraxial analgesia when appropriate and desired, may reduce sympathetic activation and attenuate sustained elevation in heart rate.³³ Continuous emotional support and reassurance can also play an important role in limiting anxiety-driven tachycardia.³⁴

Intrapartum monitoring and reassessment

Maternal vital signs should be monitored routinely throughout labor, with attention to trends rather than isolated values. A persistently elevated resting heart rate

accompanied by hypotension, fever, hypoxia, or new symptoms should prompt reassessment. When tachycardia escalates or fails to respond to supportive measures, a broad differential should be maintained. Common intrapartum etiologies include intra-amniotic infection, hemorrhage, dehydration, and medication side effects (including uterotonic agents and sympathomimetics). Cardiac pathology is an uncommon but important cause of new-onset tachycardia during labor and should not be dismissed without careful clinical assessment.

Postpartum Period

Expected physiologic changes

Following delivery, maternal cardiovascular physiology gradually re-adapts to a non-pregnant state. Heart rate typically begins to decline in the days after delivery, though can remain elevated compared to pre-pregnancy baseline for the first several days postpartum.³⁵ Normalization is generally expected by approximately 6 weeks postpartum.³⁶ Transient tachycardia is common in the immediate postpartum setting and is often related to pain, anemia, fluid shifts, sleep deprivation, or emotional stress.

Evaluation of new or persistent postpartum tachycardia

New, persistent, or worsening tachycardia should prompt structured clinical evaluation. A suggested initial work up includes a complete blood count to assess for anemia or leukocytosis, physical examination for signs of infection, serum lactate if systemic illness is suspected, and urine or blood cultures as clinically indicated. A trial of fluid resuscitation may also be appropriate.³⁶

Common etiologies to consider:

- Peripartum infection: endometritis, wound infection, mastitis, urinary tract infection
- Hemorrhage and anemia
- Venous thromboembolic: elevated thromboembolic risk in postpartum period, particularly following cesarean delivery, prolonged immobility, or neuraxial anesthesia.¹⁴

Cardiac disease in the postpartum period

Cardiac disease can also manifest in the postpartum period and should remain on the differential for persistent or unexplained tachycardia. Several conditions deserve particular attention in this setting:

- Spontaneous coronary artery dissection: hormonal shifts affecting arterial wall integrity in the early postpartum period make this an important and often under-recognized cause of acute coronary syndrome in otherwise healthy postpartum patients³⁶
- Peripartum cardiomyopathy: new-onset heart failure without prior structural heart disease, typically presents in the final month of pregnancy through 5 months postpartum, and tachycardia may be an early or dominant feature.³⁷
- Hypertensive emergencies and aortic dissection: may present with tachycardia and should be considered when accompanied by severe hypertension, chest or back pain, or neurologic symptoms.

Discharge counseling

Thoughtful discharge counseling is an essential component of postpartum care for patients with a history of tachycardia during pregnancy. Patients should be reassured about gradual normalization of heart rate over the weeks following delivery. Patients

should be educated and empowered with clear, actionable guidance on symptoms that warrant prompt medical attention.

Warning signs that should prompt early return to care include:

- Persistent or worsening palpitations
- Syncope or near-syncope
- Chest pain or pressure
- Shortness of breath, orthopnea, or paroxysmal nocturnal dyspnea
- Fever or signs of infection
- Heavy or ongoing vaginal bleeding
- Severe or worsening fatigue out of proportion to expected recovery

Early postpartum follow-up may be appropriate for patients with persistent tachycardia, significant antenatal symptoms, or anxiety related to cardiovascular symptoms.

SUMMARY

Despite overlap with normal pregnancy symptoms, persistent tachycardia is repeatedly highlighted in maternal mortality reviews and safety toolkits as a “red flag” particularly when accompanied by breathlessness at rest, orthopnea, syncope, chest pain, hypoxia, or severe hypertension.^{26,38} Delayed recognition of cardiovascular disease contributes to preventable maternal deaths.

CLINICS CARE POINTS

- While heart rate is elevated from baseline in pregnancy, a confirmed resting heart rate greater than 100 should be further evaluated.
- Red flag symptoms for cardiac disease in pregnant women include more than just chest pain - nausea, diaphoresis, epigastric pain and unexplained fatigue or heart failure such as orthopnea, paroxysmal nocturnal dyspnea and dyspnea at rest are not normal in pregnancy and should all trigger further evaluation.
- Common findings of cardiac disease in pregnancy may include signs of fluid overload such as new edema or bibasilar crackles or new murmurs. While systolic flow murmurs are often expected in pregnancy, diastolic murmurs or S3 & S4 heart sounds are not.
- The basic work up for maternal tachycardia includes a 12-lead ECG, laboratory testing such as a complete blood count, thyroid stimulating hormone, and/or basic metabolic panel with other testing guided by history and physical.
- Use of ECG automated interpretation should be used with caution given possible normal pregnancy variants, and correlation with clinical presentation is necessary to appropriately risk stratify.
- Minimally or asymptomatic patients with reassuring vitals and ECG can remain in the community for management.
- Patients with symptomatic but stable tachycardia, tachycardia above 115 or concerning non-acute ECG should be referred for cardiology or maternal fetal medicine management.
- Vital sign instability, resting tachycardia > 120, red flag symptoms or acute or high risk ECG findings should be referred to the emergency department immediately.
- Management of mild tachycardia includes optimization hydration, treating anemia, graded exercise, avoiding stimulants and treating pain, if present. Reassurance and follow up is needed, with referral if symptoms do not improve.
- Maternal tachycardia is common both intrapartum and postpartum, and any new onset persistent tachycardia, especially with symptoms, should be evaluated to ensure appropriate risk stratification.

- Provider vigilance and clear discharge counseling on cardiac warning signs is key to help with timely return to care, as delayed recognition of cardiac disease is a leading cause of maternal morbidity and mortality.

DISCLOSURES

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