



Table 1: Tachyarrhythmias in pregnancy

Tachyarrhythmia	Incidence	Complications
SVT	22-24/100,000	<ul style="list-style-type: none"> - Worsening arrhythmia burden - Higher adjusted ORs (1.54–3.52) for severe maternal morbidity, cesarean delivery, low birth weight, preterm labor, and fetal heart rate abnormalities
Atrial fibrillation (AF)*	27/100,000	<ul style="list-style-type: none"> - Worsening arrhythmia burden - Increased mortality risk (OR 13.13, 95% CI 7.77–22.21; P <0.000)
Atrial flutter*	4/100,000	<ul style="list-style-type: none"> - Worsening arrhythmia burden

*Rare in women without structural heart disease

Table 2: Recommended maintenance medications for SVT and AF or Atrial Flutter

<ul style="list-style-type: none"> - 1st line: β-blocking agent (metoprolol > propranolol) - 2nd line: Digoxin or verapamil as second agent - 3rd line: Flecainide or sotalol if nodal blocking agents fail <p>*Flecainide is recommended for prevention of SVT in patients with WPW syndrome.</p>
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Table 3: Acute management* of SVT and AF or Atrial Flutter

SVT	<ul style="list-style-type: none"> - 1st line: Vagal maneuvers - 2nd line: IV adenosine (6 mg) - 3rd line: IV metoprolol (5-10 mg) or IV diltiazem/verapamil - Electrical cardioversion if hemodynamically unstable
AF or atrial flutter	<ul style="list-style-type: none"> - Flecainide may be considered for termination in stable patient with structurally normal hearts. - Electrical cardioversion if hemodynamically unstable

****Call rapid response during initial stages of acute management***

Smart phrases:

.MFMAFIB

Maternal atrial fibrillation and atrial flutter:

Background:

- The management of atrial fibrillation and atrial flutter are often similar in pregnancy compared with the non-pregnant state.
- The majority of atrial fibrillation and atrial flutter occur in women with structural heart disease. However, some may occur in an isolated setting.
- Pregnancy is associated with increased arrhythmia burden, and patients with a history of arrhythmia are at significant recurrence risk and increased risk of maternal morbidity.

Medication and management recommendations:

- Beta-blockers are the first-line recommendation for rate and rhythm control. Generally, starting with metoprolol as it has less of a blood pressure effect.
- Digoxin, calcium channel blockers (verapamil and diltiazem), and antiarrhythmic drugs such as flecainide can also be safely used in pregnancy to prevent recurrence.
- Electrical cardioversion is recommended for refractory cases or in cases of maternal instability with hypotension.
- Ablation is generally avoided in pregnancy but has been utilized primarily in the second and third trimesters for refractory atrial fibrillation.

Anticoagulation:

- If atrial fibrillation or atrial flutter is prolonged for more than 48 hours or in women with chronic atrial fibrillation or atrial flutter who have structural heart disease (such as mitral stenosis) or other prothrombotic conditions, LMWH or unfractionated heparin for thromboprophylaxis should be considered.
- Pregnant women with nonvalvular or isolated atrial fibrillation or atrial flutter and CHA₂DS₂-VASC score ≤ 2 are suitable candidates for therapy with low-dose aspirin alone.
- There are no validated tools available to predict stroke risk and no standardized anticoagulation regimen during pregnancies complicated by tachyarrhythmias, and prophylactic dosing of low molecular weight heparin or unfractionated heparin is reasonable for CHA₂DS₂-VASC score ≥ 3 .

Summary of Recommendations:

- Continue beta-blocker use for rate and rhythm control ***vs metoprolol ordered today***
- Initial evaluation for a new diagnosis of atrial fibrillation or atrial flutter includes assessment for hyperthyroidism (TFTs), baseline CMP/CBC/Mg/Phos/UP:C, EKG, and ambulatory Holter monitoring.
- Continued care and close surveillance throughout the pregnancy with ***, the patient's cardiologist OR referral placed today to ***.
- Maternal echocardiogram in pregnancy if not done within the last 12 months or if prior echo demonstrated abnormalities.
- If the most recent tachyarrhythmia occurrence is within the last 12 months:*
 - TOC to MFM.
 - *** Referrals to the Pregnancy Heart Team and OB Anesthesia are recommended if the patient has experienced an episode of tachyarrhythmia during pregnancy. ***
 - Delivery at UNCH

- 39-week IOL
- Consider 37-week IOL if frequent occurrences during pregnancy, coexisting cHTN, or class III obesity.
- EKG/CMP/Mg/Phos upon arrival to L&D and the use of telemetry intrapartum and 24 hours postpartum.

-If the most recent tachyarrhythmia occurrence is remote and/or NOT within the last 12 months:

- Care through the patient's primary OBGYN and cardiologist is appropriate. A one-time consult with MFM should be considered.
- Delivery at local hospital with primary OBGYN provider
- Consider 39-week IOL
- EKG/CMP/Mg/Phos upon arrival to L&D
- Mode of delivery per standard obstetric indications.

.MFMSVT

Maternal SVT

Background

-The management of SVT is often similar in pregnancy compared with the non-pregnant state.
-Pregnancy is associated with increased arrhythmia burden, and patients with a history of arrhythmia are at significant recurrence risk and increased risk of maternal morbidity. However, the first presentation of SVT during pregnancy is not uncommon.

Medication and management recommendations:

-Beta-blockers are the first-line recommendation for rate and rhythm control. Generally, starting with metoprolol as it has less of a blood pressure effect. Digoxin, calcium channel blockers (verapamil and diltiazem), and antiarrhythmic drugs such as flecainide and sotalol can be safely used in pregnancy to prevent recurrence.
-Electrical cardioversion is recommended in cases of maternal instability with hypotension.
-Ablation is generally avoided in pregnancy but has been utilized primarily in the second and third trimesters for refractory atrial fibrillation.

Summary of Recommendations:

-Continue beta-blocker use for rate and rhythm control ***vs metoprolol ordered today***
-Initial evaluation for a new diagnosis of SVT includes assessment for hyperthyroidism (TFTs), baseline CMP/CBC/Mg/Phos/UP:C, EKG, and ambulatory Holter monitoring.
-Continued care and close surveillance throughout the pregnancy with ***, the patient's cardiologist OR referral placed today to ***.
-Maternal echocardiogram in pregnancy if not done within the last 12 months or if prior echo demonstrated abnormalities.

-If the most recent tachyarrhythmia occurrence is within the last 12 months:

- TOC to MFM.
- *** Referrals to the Pregnancy Heart Team and OB Anesthesia are recommended if the patient has experienced an episode of tachyarrhythmia during pregnancy. ***
- Delivery at UNCH
- 39-week IOL
- Consider 37-week IOL if frequent occurrences during pregnancy, coexisting CHTN, or class III obesity.
- EKG/CMP/Mg/Phos upon arrival to L&D and the use of telemetry intrapartum and 24 hours postpartum.

-If the most recent tachyarrhythmia occurrence is remote and/or NOT within the last 12 months:

- Care through the patient's primary OBGYN and cardiologist is appropriate. A one-time consult with MFM should be considered.
- Delivery at local hospital with primary OBGYN provider
- Consider 39-week IOL
- EKG/CMP/Mg/Phos upon arrival to L&D
- Mode of delivery per standard obstetric indications.

.MFMWPW

Wolff Parkinson White Syndrome in Pregnancy:

Background:

- Data regarding WPW syndrome in pregnancy is limited to case reports and case series, with data regarding pregnancy outcomes in the setting of SVT more available.
- WPW is a well-known cause of tachyarrhythmias and can present as a WPW pattern on EKG alone or WPW syndrome, which includes the pattern plus symptoms, generally SVT.
- Data does suggest an increased risk of maternal morbidity and cesarean in patients with WPW.

Medication and management recommendations:

- Beta-blockers are the first-line recommendation for rate and rhythm control. Generally, starting with metoprolol as it has less of a blood pressure effect. Avoid Digoxin and calcium channel blockers (verapamil and diltiazem). Second-line agents include flecainide.

Summary of Recommendations:

- Continue beta-blocker use for rate and rhythm control ***vs metoprolol ordered today***
- Initial evaluation for a new diagnosis of WPW includes assessment for hyperthyroidism (TFTs), baseline CMP/CBC/Mg/Phos/UP:C, EKG, and ambulatory Holter monitoring.
- Continued care and close surveillance throughout the pregnancy with ***, the patient's cardiologist OR referral placed today to ***.
- Maternal echocardiogram in pregnancy if not done within the last 12 months or if prior echo demonstrated abnormalities.

-If the most recent tachyarrhythmia occurrence is within the last 12 months:

- TOC to MFM.
- *** Referrals to the Pregnancy Heart Team and OB Anesthesia are recommended if the patient has experienced an episode of tachyarrhythmia during pregnancy. ***
- Delivery at UNCH
- 39-week IOL
- Consider 37-week IOL if frequent occurrences during pregnancy, coexisting cHTN, or class III obesity.
- EKG/CMP/Mg/Phos upon arrival to L&D and the use of telemetry intrapartum and 24 hours postpartum.

-If the most recent tachyarrhythmia occurrence is remote and/or NOT within the last 12 months:

- Care through the patient's primary OBGYN and cardiologist is appropriate. A one-time consult with MFM should be considered.
- Delivery at local hospital with primary OBGYN provider
- Consider 39-week IOL
- EKG/CMP/Mg/Phos upon arrival to L&D
- Mode of delivery per standard obstetric indications.

CHA₂DS₂-VASc	
Components	Score
<i>Congestive HF</i>	1
<i>Hypertension</i>	1
<i>Age ≥ 75</i>	2
<i>Diabetes mellitus[#]</i>	1
<i>Stroke/TIA/TE</i>	2
<i>Vascular disease^{**}</i>	1
<i>Age 65 to 74 years</i>	1
<i>Female sex</i>	1
<i>Maximum score</i>	9

CHA₂DS₂-VASc acronym	Ischemic stroke rate (% per year)*
0	0.2
1	0.6
2	2.2
3	3.2
4	4.8
5	7.2
6	9.2
7	11.2
8	10.8
9	12.2

CHA₂DS₂-VASc score ≥3 recommend anticoagulation.

[#]The score does not incorporate gestational diabetes, but this could be considered as an additional risk factor

^{**}Vascular disease: such as prior myocardial infarction (MI) and peripheral arterial disease (PAD).

*These unadjusted (not adjusted for the possible use of aspirin) stroke rates were published in 2012. Actual rates of stroke in contemporary pregnant cohorts likely vary from these estimates but can be used as reference points. One small retrospective study demonstrated that the CHA₂DS₂-VASc score may underestimate the risk of stroke in pregnant patients.

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