

40 TACHYCARDIAS

SYMPTOMS AND SIGNS

Think about cardiac arrhythmias in patients with:

- palpitations^D
- dyspnoea^B
- chest pain^D
- dizziness or syncope^D
- cardiac arrest.^D

Ask about:

- any nausea or vomiting before collapse^A
- any cardiovascular disease, particularly any:
 - known arrhythmias^A
 - ischaemic heart disease^D
- current medication and alcohol use.^D

Note

No nausea or vomiting before collapse increases the risk of an arrhythmia.^A

Look for:

- + an irregular pulse^B
- cannon waves in the jugular venous pulse (if VT suspected^C)
- + variable amplitude of the first heart sound (if VT suspected^C)
- evidence of cardiovascular decompensation:^B
 - hypotension
 - pulmonary oedema
 - reduced level of consciousness.

INVESTIGATIONS

- U&E, creatinine.^D
- Calcium, magnesium.^D
- Cardiac enzymes.^D
- Thyroid function tests.^D
- 12-lead ECG.^A

Consider further testing if the diagnosis is uncertain and your patient is stable:

- an event recorder^A or a Holter monitor^B worn for at least 24 hours and preferably longer^C
- stress testing to induce the arrhythmia^D
- an echocardiogram.^D

Broad-complex tachycardias

- Treat as a ventricular tachycardia until proven otherwise. ^D
- Features that favour VT include: ^D
 - a history of ischaemic heart disease
 - AV dissociation
 - fusion or capture beats
 - LAD
 - 'RSR'¹ pattern in V₁
 - positive concordance across leads.

THERAPY

- Correct any electrolyte abnormality. ^A

If uncertain about the source of the arrhythmia:

- Perform carotid sinus massage or ask your patient to perform a Valsalva manoeuvre. ^D
- Give adenosine. ^A

Adenosine

- Avoid in patients:
 - with asthma
 - on theophyllines, or dipyridamole.
- Use ECG monitoring and have resuscitation equipment available.
- Warn patients about facial flushing, chest discomfort and dyspnoea. ^A
- Record the ECG during administration.
- Give 3 mg i.v. rapidly. If unsuccessful after 1 to 2 minutes, try 6 mg, 9 mg then 12 mg. ^A
- If the patient has a central line, use it. ^A
- Adenosine should:
 - reveal atrial tachycardias
 - terminate junctional re-entrant tachycardia
 - have no effect on ventricular tachycardias.

Acute onset atrial flutter

Control the ventricular rate ^A using:

- Digoxin. ^D

Digoxin

- Load patients with 500 to 1000 μ g in divided doses.
- Give 62.5 to 250 μ g daily, based on age, renal function and other medication.
- Measure digoxin levels after 5 days. ^D Take the blood test 6 to 10 hours after the last dose.
- Therapeutic range 0.8 to 2.0 ng/ml.

Alternative include:

- Calcium-channel blockers:
 - verapamil 5 mg i.v. over 5 minutes; repeat after 5 minutes to a maximum dose of 20 mg
 - diltiazem 0.25 mg/kg over 2 minutes; repeat at 0.35 mg/kg if no response. ^A
- Beta-blockers:
 - esmolol: ^A
 - load patients with 100 µg/kg/min i.v. over 1 minute
 - followed by 50 µg/kg/min over 4 minutes
 - repeat if there is no effect, and increase the 4-minute infusion by 50 µg/kg/min
 - sotalol: ^A
 - 100 mg i.v. over 5 minutes; or 80 mg orally twice daily.

Consider cardioversion to sinus rhythm ^A if your patient fails to revert spontaneously. ^D

Options include:

- DC cardioversion, ^A particularly if your patient is haemodynamically unstable

DC cardioversion

- Patients with acute onset AF or flutter can be cardioverted immediately, ^D but should be started on heparin followed by a month of warfarin. ^D
- In cases of uncertain duration, anticoagulate your patient for a month before and after cardioversion. ^C
- Consider giving an infusion of ibutilide (0.01 mg/kg over 10 minutes) before cardioversion. ^A
- Check your patient has: ^D
 - INR > 2.0 if anticoagulated
 - K > 4.0 mmol/l.
- Arrange for a general anaesthetic for your patient, and ensure your patient is starved for at least 6 hours. ^A
- Cardiovert starting at 100 J; followed by 100 J, 200 J, 300 J, 360 J. ^D

- flecainide ^A

Flecainide

Contraindicated with ischaemic heart disease. ^A

- Intravenous – give 2 mg/kg (to a maximum of 150 mg) over 30 minutes.
- Oral – give 200 mg twice daily, reducing after 3 to 5 days to 50 mg daily.

- ibutilide ^A 0.01 mg/kg to a maximum of 1 mg over 10 minutes
- amiodarone. ^A

Amiodarone

Loading dose:

- Intravenous
 - Preferably via a central line.
 - Give 300 mg (5 mg/kg) in 250 ml 5.0% glucose over 1 hour, followed by 900 mg over 24 hours.
- Oral:
 - Give 200 mg every 8 hours for 1 week, then 200 mg every 12 hours for 1 week, then start maintenance therapy.

Maintenance dose:

- Patients should be given a total loading dose of 4200 mg before starting on maintenance therapy. ^D
- Give 100 to 200 mg daily.

Supraventricular tachycardia

- Try carotid sinus massage or ask your patient to perform a Valsalva manoeuvre. ^D
- Give adenosine. ^A

Adenosine

- Avoid in patients:
 - with asthma
 - on theophyllines, or dipyridamole.
- Use ECG monitoring and have resuscitation equipment available.
- Warn patients about facial flushing, chest discomfort and dyspnoea. ^A
- Record the ECG during administration.
- Give 3 mg rapidly. If unsuccessful after 1 to 2 minutes, try 6 mg, 9 mg then 12 mg. ^A
- If the patient has a central line, use it. ^A
- Adenosine should:
 - reveal atrial tachycardias
 - terminate junctional re-entrant tachycardia
 - have no effect on ventricular tachycardias.

If this fails, consider one of:

- DC cardioversion. ^A
- Calcium channel blockers:
 - diltiazem: 0.25 mg/kg over 2 minutes, repeat at 0.35 mg/kg if no response. ^A
- Beta-blockers:
 - esmolol: ^C
 - load patients with 100 µg/kg/min i.v. over 1 minute
 - followed by 50 µg/kg/min over 4 minutes

- repeat if there is no effect, and increase the 4-minute infusion by 50 µg/kg/min
- nadolol: ^A 40 mg orally
- sotalol: ^B 100 mg i.v. over 5 minutes; or 80 mg orally twice daily.
- Propafenone: ^B 150 mg orally three times a day (reduce dose if < 70 kg).

Wolff–Parkinson–White syndrome

Note

Avoid using digoxin or verapamil – they may exacerbate the arrhythmia. ^D

Terminate the rhythm using any of:

- Adenosine. ^D (See above for further information.)
- Amiodarone. ^D (See above for further information.)
- Flecainide. ^D (See above for further information.)
- Procainamide. ^D Give a bolus of 10 mg per kg at a rate of 100 mg per minute.
- Esmolol. ^D (See above for further information.)
- Diltiazem 0.25 mg/kg over 2 minutes; repeat at 0.35 mg/kg if no response. ^A

Ventricular tachycardia

Note

Do not treat patients with recent myocardial infarction who have frequent ventricular ectopics with class Ic anti-arrhythmics, e.g. flecainide or encainide. ^A

- Cardiovert patients who are haemodynamically compromised. ^A
- Give amiodarone. ^A (See above for further information.)

Alternatives include:

- sotalol ^A – 100 mg i.v. over 5 minutes, or 80 mg orally twice daily
- procainamide – give a bolus of 10 mg per kg at a rate of 100 mg per minute.

REVIEW

Paroxysmal atrial flutter

- Consider long-term anti-arrhythmic therapy in symptomatic cases. ^D
- Start medication in hospital. ^C

Consider using one of:

- flecainide – at least 50 mg twice daily ^A
- sotalol – at least 120 mg twice daily ^A
- ablation therapy. ^D

Paroxysmal supraventricular tachycardia

- Consider anti-arrhythmic medication for patients with recurrent symptomatic arrhythmias. ^D
- Start medication in hospital. ^C

Consider using one of:

- flecainide – at least 50 mg twice daily ^A
- sotalol 80 mg to 160 mg twice daily ^A
- propafenone 300 mg twice daily ^B
- ablation therapy. ^D

Ventricular arrhythmias

Consider:

- amiodarone ^A
- ablation therapy ^D
- inserting an implantable defibrillator ^A with endocardial leads: ^B
 - Consider adding one of:
 - amiodarone ^B
 - metoprolol ^A 12.5 mg to 50 mg three times a day
 - sotalol ^A 80 mg to 160 mg twice daily.

Implantable defibrillators

Half of patients will receive a shock in the next 2 years. ^B

Outcome

- Only a third of patients with paroxysmal atrial flutter are in sinus rhythm at 2 years. ^A
- 70% of patients with paroxysmal SVT who are not on medication have a recurrent episode within 3 months. ^B
- Half of patients with a ventricular arrhythmia have another episode within 12 months, ^B and around 30% are dead within a year – many suddenly. ^B

41 UPPER GASTROINTESTINAL BLEEDING

SYMPTOMS AND SIGNS

Ask about:

- any haematemesis or melaena before admission and its colour ^C and amount ^D
- other illnesses including:
 - previous peptic ulcers ^B
 - *H. pylori* infection ^B
 - alcohol-related disorders ^B
 - liver cirrhosis, oesophageal varices or portal vein thrombosis ^B
 - renal failure ^A
 - disseminated malignancy ^A
 - heart disease and heart failure ^A
- current medication, particularly:
 - anticoagulants ^A
 - non-steroidal anti-inflammatory drugs (NSAIDs). ^A

Common causes include: ^B

- gastric or duodenal ulcers
- gastric erosions
- varices
- a Mallory–Weiss tear
- oesophagitis.

Rarer causes include:

- tumours ^B
- angiodysplasia.

Look for:

- evidence of acute bleeding: ^B
 - + supine tachycardia
 - + supine hypotension (systolic blood pressure < 95 mmHg)
 - + postural pulse increase of > 30 beats/min or severe dizziness on sitting upright, and if normal then on standing

Note

Postural hypotension does not usefully diagnose acute blood loss. ^B

- evidence of anaemia: ^A
 - + conjunctival pallor ^A
 - + facial pallor ^B
 - + palmar pallor ^B
 - + dyspnoea ^C

- evidence of cirrhosis, specifically: ^A
 - + facial telangiectasia ^A
 - + spider naevi ^A
 - + abdominal wall veins ^A
 - + white nails ^A
 - + obesity ^A
 - + peripheral oedema. ^A

Risk of cirrhosis ^B

High (> 80%) if:

- all 6 signs present and peripheral oedema
- ≥ 4 signs if no peripheral oedema
- ≥ 3 signs if facial telangiectasia and no peripheral oedema.

Moderate if:

- any other combination.

Low (< 20%) if:

- no facial telangiectasia and ≤ 2 other signs.

Perform a rectal examination and a faecal occult blood test. ^A

Look at the appearance of any vomit or nasogastric aspirate:

- + Test it using a gastrocult dipstick. ^A

INVESTIGATIONS

- Blood count. ^D
- Clotting. ^A
- Group and save serum, or cross-match 2 to 6 units depending on blood loss. ^D
- U&E, creatinine. ^A

Urea:creatinine ratio

A urea:creatinine ratio > 100 helps diagnose an upper GI bleed. ^A

- Liver function tests. ^A
- Glucose. ^D
- Blood cultures. ^D
- Arterial blood gases. ^D

Consider inserting:

- a central venous catheter to monitor fluid resuscitation ^D
- a urinary catheter to monitor urine output. ^D

Peptic ulcer disease

Test for *H. pylori*^A using any of:

- ± CLO test^C
- ± histology, looking for antral inflammation^C
- ± urease breath test.^C

THERAPY

- Resuscitate your patient.^A
- Insert two large bore i.v. cannulas.^D
- Give blood if required.
- If PT is prolonged:
 - Give factor concentrate^C or FFP.^D
 - Stop any anticoagulants.^C
 - Consider giving 5 mg vitamin K by slow i.v. infusion.^A
- Order an endoscopy:^A
 - urgently^A to control bleeding
 - to make a diagnosis and determine future risk of bleeding or death.^A

Endoscopy

Look for evidence of endoscopic stigmata of recent haemorrhage:^A

- ± blood in the upper GI tract
- ± an adherent clot
- ± a visible or spurting vessel.

Complications of endoscopy such as perforation, aspiration and haemorrhage are very rare.^B

- While waiting for endoscopy consider giving:
 - somatostatin^A 6 mg in 500 ml saline i.v. over 24 hours for 5 days
 - octreotide^A

Octreotide

- Give a bolus of octreotide 50 µg i.v. followed by
- Octreotide 500 µg in 50 ml 0.9% saline at 5 ml/h.

- terlipressin 2 mg i.v. every 4 hours for up to 72 hours.^A
- Give thiamine 100 mg^D i.v.^C to alcoholics or malnourished patients.^D
- Discuss any patients likely to rebleed with surgeons and anaesthetists to determine criteria for surgery.^D

Note

Use the Rockall score^A (see Table 41.1) to help identify patients at risk of rebleeding or dying.

Table 41.1 Rockall score – rank your patient for risk of rebleeding or dying^A

	Score 0	Score 1	Score 2	Score 3
Age	• aged < 60	• aged 60 to 79	• aged > 80	
Shock	• pulse < 100 • systolic b.p. > 100 mmHg	• pulse > 100 and systolic BP > 100 mmHg	• pulse > 100 and systolic BP < 100 mmHg	
Co-morbidity	• no major co-morbidity		• cardiac failure • ischaemic heart disease • any other co-morbidity	• renal failure • liver failure • disseminated malignancy
Endoscopic stigmata	• none • dark spot seen		• blood in upper GI tract • adherent clot • visible or spurting vessel	
Diagnosis	• Mallory–Weiss tear • no lesion seen and no stigmata of recent haemorrhage	• all other diagnoses	• malignancy of upper GI tract	

Pre-endoscopy score	Risk of dying	Post-endoscopy score	Risk of dying	Risk of rebleeding
7	75%	8+	40%	37%
6	62%	7	23%	37%
5	35%	6	12%	27%
4	21%	5	11%	25%
3	12%	4	8%	15%
2	6%	3	2%	12%
1	3%	0 to 2	0%	6%
0	0%			

Peptic ulcers

Arrange for endoscopic haemostasis.

Give:

- a proton pump inhibitor, ^A e.g. omeprazole 40 mg daily
- antacids. ^A

Varices

- Arrange for endoscopic ligation ^B or sclerotherapy ^A within 6 hours. ^B
- Give octreotide or somatostatin. ^A

Somatostatin

Somatostatin 6 mg in 500 ml saline i.v. over 24 hours for 5 days.

Octreotide

Octreotide 500 µg in 50 ml 0.9% saline at 50 µg per hour (i.e. 5 ml/h.)

Consider:

- balloon tamponade ^A for patients who do not stop bleeding ^D
- transjugular intrahepatic portosystemic shunts (TIPS). ^D

REVIEW

Monitor: ^D

- vital signs and urine output
- blood count
- clotting
- electrolytes.

Consider:

- iron supplements, ^B e.g. ferrous sulphate 200 mg three time a day ^D
- tranexamic acid ^A for patients likely to rebleed (3 to 6 g i.v. for 3 days, followed by 3 to 6 g orally for 3 to 5 days). ^D

Patients with a Mallory–Weiss tear or an ulcer can start eating immediately on recovery from endoscopy. ^D

Rebleeding

Perform repeat endoscopy on patients with: ^A

- vomiting of fresh blood
- hypotension and melaena
- requirement for 4 units of blood in the first 72 hours after endoscopic treatment.

Consider surgery if there is persistent or recurrent haemorrhage despite endoscopic therapy. ^D

Ulcers and erosions

- A routine repeat endoscopy is not necessary. ^D
- Advise patients to stop smoking. ^B
- Stop NSAIDs. ^A If patients need to continue, consider:
 - COX-2 inhibitors, e.g. rofecoxib ^A 12.5 to 25 mg daily or celecoxib ^B
 - topical NSAIDs ^B
 - ibuprofen ^B at the lowest possible dose ^B
 - adding in regular omeprazole 40 mg daily ^A or misoprostol ^A 200 µg 2 to 4 times daily. ^D
- Give *H. pylori* eradication therapy ^A using triple therapy: ^B
 - a proton-pump inhibitor plus any two of amoxicillin, clarithromycin or a nitroimidazole ^B
 - a bismuth compound plus a nitroimidazole plus tetracycline. ^B

Sample triple therapy regimen: a 7-day course

- omeprazole 20 mg twice daily
- clarithromycin 500 mg twice daily
- amoxicillin 1 g twice daily.

- Continue proton-pump inhibitors long-term. ^A

Varices

- Arrange for endoscopic ligation ^A or sclerotherapy ^A until varices are obliterated.
- Give beta-blockers, ^A e.g. propranolol MR 80 mg daily or isosorbide mononitrate MR ^A 60 mg daily.

Outcomes

- One in seven patients dies in hospital ^A – one in 15 from further bleeding.
- Peptic ulcers heal slowly and a third of patients have a relapse within a year. ^B
- A third of patients with varices rebleed within 1 year. ^B A third are dead within 2 months. ^A