NCPD 2.0 ANCC CONTACT HOURS

Atrial fibrillation: What nurses need to know

Improve patient outcomes by learning how to identify cardiac dysrhythmias early and set therapeutics in motion.

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Atrial fibrillation, also known as a-fib, is the most common dysrhythmia that nurses will encounter. Characterized by uncoordinated atrial activation with consequent loss of atrial mechanical function, a-fib is most likely to occur in those age 80 years and older.[1] The number of men and women affected by a-fib is projected to more than double over the next 2 decades. According to the CDC, 12.1 million people in the US will have a-fib by 2030.[1]

Approximately 2% of those affected by a-fib are younger than 65 years, whereas about 9% are age 65 years and older. White Americans are at the highest risk for a-fib, even though Black, Hispanic, and Asian Americans have more comorbid conditions.[2] Despite major advances in its management, a-fib remains a significant cause of cardiovascular morbidity and mortality, especially from stroke and heart failure (HF).

Causes of a-fib

There is no single identifiable cause of a-fib; however, obesity and obstructive sleep apnea are major risk factors.[3] The highest postoperative risk includes those who are recovering from open-heart surgery and have comorbid conditions such as coronary heart disease, HF, valvular heart disease, cardiomyopathy, hypertension, chronic lung disease, chronic kidney disease, moderate-to-heavy alcohol use, and smoking.[2] Less frequently, hyperthyroidism or viral illnesses such as pericarditis may trigger a-fib. More than 10% of cases have no identifiable cause.[4]

As data continue to emerge, nurses should pay close attention to those hospitalized with COVID-19. There is evidence that strongly associates severe COVID-19 illness resulting in hospitalization with an increased risk for developing a-fib.[5]

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Understanding the impact

A-fib is an independent risk factor for stroke, which is the most serious and debilitating of all complications, because embolic strokes usually carry with them long-term disabilities depending on the affected part of the brain. These may include expressive aphagia, dysphagia, and muscle atrophy. One in every seven thromboembolic strokes is a direct result of a-fib.[1] The risk of a-fib increases as the patient ages. In the Framingham Study, the annual risk of stroke attributable to a-fib was 1.5% among patients ages 50 through 59 years; this increased to 23.5% in patients age 80 years and older.[6]

Assessing patient history

Obtaining a thorough and complete health history is a critical part of the patient assessment process. There are many clues within a good patient history that can point the nurse to the diagnosis of a-fib. Start by asking the patient about their medical and surgical histories. Note any predisposing risk factors that are known to be associated with a-fib such as structural heart disease (look for any problems with their valves, such as aortic stenosis and mitral or tricuspid valve regurgitation); uncontrolled or poorly controlled hypertension; cardiomyopathies (enlargement and weakening of the heart muscles); systolic or diastolic HF (defined by a low or normal to high ejection fraction, respectively); and any surgeries in the thoracic area, especially cardiac surgery. Inquire about any symptoms of dizziness, lightheadedness, feeling of palpitations (patients may describe palpations as a pounding feeling in their chest or the sensation of their "heart beating fast"), or chest pressure. Ask about stress and changes in life circumstance. Ask about personal history of COVID-19 infections as well as the severity of illness. Again, although COVID-19 isn't directly linked to a-fib, personal history of infection can add to the patients' personal risk profile.

Key points

Neurologic assessment

Ask about:

- symptoms of dizziness
- orthostatic changes
- family history

Cardiovascular assessment

Monitor for:

- irregular heart rhythm
- presence of a murmur
- complaints of palpitation, shortness of breath, and/or chest pain
- pulse deficit

Respiratory assessment

Check for:

- tachypnea
- crackles
- rhonchi

Clinical manifestations: Head to toe

It's of paramount importance for nurses to perform a systematic and thorough physical assessment. Although every system should be assessed, nurses should place special focus on the neurologic, cardiovascular, and pulmonary systems.

Neurologic assessment

Brain dysfunction in a-fib can be associated with a lack of adequate cerebral perfusion from the dysrhythmia itself. A thorough neurologic examination can differentiate stroke versus perfusion-associated dysfunction that's due to the rhythm disturbance. The basic neurologic assessment starts with patient orientation status and the patient's ability to follow verbal instructions. Ask about symptoms of dizziness or orthostatic changes such as dizziness with change in position, or lightheadedness during activities of daily living. For older adults who may have varying degrees of cognitive impairment, the inclusion of family or significant others may add insight into the patient's

baseline cognitive status and help the nurse establish a functional baseline. Make clear, concise, and factual notation in the patient's electronic health record. If assessment reveals signs and symptoms of a cerebral vascular accident, then this must be escalated immediately to the provider for the patient to receive appropriate and prompt treatment to preserve function and limit disability.

Cardiovascular assessment

The cardiovascular assessment can provide the nurse with the most relevant and accurate information regarding the patient's hemodynamic status. Clinical findings may include tachycardia (heart rate faster than 100 beats/minute), an irregular heart rhythm, presence of a murmur, complaints of palpitation, shortness of breath, and/or chest pain.

Assess and note any pulse deficit (the difference between the apical pulse and a peripheral pulse). This is an important finding because in a-fib, pulse intensity is lost from the apex to the systemic circulation.

Include any findings that may give clues to diminished peripheral circulation such as pale fingertips, delayed capillary refill, cool peripheral body temperature, and weak or thready radial or pedal pulses.

Respiratory assessment

The respiratory assessment can provide clues to the heart rhythm disturbance. Patients may present with tachypnea (more than 20 breaths/minute). Auscultation of the lung fields may reveal abnormal respiratory sounds such as crackles (suggesting fluid in the lung fields). This is especially important if the patient is at risk for fluid volume overload. Comorbid conditions such as HF or cardiomyopathy place the patient at increased risk. If rhonchi are present, then nurses must meticulously clear the secretions. This will minimize the risk of elevated right intracardiac pressures, reducing the risk of the development of a-fib during critical illness.[5] There is a 10% higher incidence of developing a-fib during hospitalization for severe pneumonia, acute respiratory distress syndrome, and sepsis.[5] Therefore, nurses must be alerted for this rhythm disorder among these vulnerable groups.

Types of a-fib

- Paroxysmal a-fib occurs intermittently and lasts between 24 and 48 hours but can persist for up to 7 days with spontaneous termination.
- Persistent a-fib occurs when episodes last longer than 7 days and don't terminate spontaneously. This type will require either electrical cardioversion or pharmacologic intervention to terminate.
- Long-standing persistent a-fib (also known as chronic a-fib) lasts for more than 1 year. Catheter ablation therapy may be needed to control or restore rhythm.
- Lone a-fib can be paroxysmal, persistent, or permanent and is defined as AF in those younger than 60 years with no clinically detectable structural cardiovascular disease.

Lab tests and diagnostic studies

There is no single lab test to detect a-fib; however, clues from the patient's history and physical examination can help determine the most valuable diagnostic tests and studies to perform. A basic metabolic panel (BMP) is useful to identify fluid status, electrolyte imbalance, and renal function. Calcium and magnesium levels should also be included and must be requested because they're not included in the BMP. A troponin level (which measures a specific protein that's released into the bloodstream because of heart muscle damage) and brain natriuretic peptide level will help to sort out the possible contributing factors such as myocardial injury or HF. A brain natriuretic peptide level is an indication of heart muscle (myocardial muscle) stretching. This occurs most frequently in fluid volume overload resulting in HF. A chest X-ray can be helpful to screen for any pulmonary pathology such as consolidations, infiltrates, or fluids in the lung space.

The most important test is the ECG. A 12-lead ECG will allow the nurse to see and interpret the heart rate and rhythm. The hallmark of a-fib is an irregular rhythm, coupled with an indistinguishable P wave. If those two criteria exist on the ECG, then the diagnosis is a-fib until proven otherwise.

If a patient has complaints and a health history that may be explained by a-fib, and the ECG doesn't support this diagnosis, then it's prudent to monitor the patient for a longer period. A Holter monitor, portable event monitor, or a transtelephonic monitor would be appropriate in this situation.

Management and treatment

The goal of a-fib treatment is to restore normal heart rhythm (regular sinus rhythm), control heart rate, prevent clot formation, and decrease the risk of strokes.

Rate control

If a-fib is present and the patient's heart rate is rapid (a-fib with rapid ventricular response [RVR], also known as rapid a-fib or a-fib with RVR), then the goal is to slow down the heart rate to regain adequate cardiac output. This can be achieved by an I.V. infusion of a rate control medication such as the calcium channel blocker diltiazem or an I.V. push of a beta-blocker such as metoprolol. The most common I.V. infusion to treat a-fib with RVR is diltiazem. Patients who receive this infusion should be on continuous telemetry monitoring.

Once the heart rate slows down (between 100 and 110 beats/minute), the patient should receive an oral dose of diltiazem. Wait for approximately 2 to 3 hours before discontinuing the diltiazem infusion. Other rate control options include digoxin and verapamil. There is a very narrow therapeutic level for digoxin; therefore, patients must undergo frequent blood testing during therapy. Maintaining the patient within the therapeutic level is essential in gaining heart rate control and preventing digoxin toxicity. (See *Signs and symptoms of digoxin toxicity.*) Verapamil is a calcium channel blocker that's used less frequently in rapid a-fib, which is mostly due to its availability. It's commonly used as a maintenance therapy.

Antiarrhythmics

Antiarrhythmics are a category of medications used to convert a-fib back into sinus rhythm. Amiodarone is the most frequently used. In the acute phase of a-fib with RVR, an amiodarone infusion may be started while the patient is loaded on oral doses before the infusion is discontinued. Other antiarrhythmics include sotalol, procainamide, disopyramide, flecainide acetate, propafenone, and dofetilide. These medications carry some severe and sometimes life-threatening adverse reactions. Accordingly, if patients are prescribed these antiarrhythmics, nurses must be vigilant and continuously monitor for the development of prolonged QT intervals, heart blocks, and other conduction disorders.

Anticoagulant medications

Most patients with a-fib should receive long-term oral anticoagulation therapy to decrease the risk of ischemic stroke and other embolic events. The overall benefit from anticoagulation outweighs the associated increased risk of bleeding.[3] The

Signs and symptoms of digoxin toxicity

Signs	Symptoms
Gastrointestinal	Nausea and vomiting, weight loss, anorexia, abdominal pain.
Bradycardia	Dizziness and lightheadedness.
Neurological	Headache, drowsiness, confusion, hallucinations, seizure (rare).
Vision	Photophobia, decreased visual acuity, yellow halos around lights.

The most vulnerable for digoxin toxicity are older adults who have renal impairment or worsening renal function, dehydration, electrolyte disturbances, or drug interactions.

choice of anticoagulation therapy will vary depending on the underlying cause and other associated comorbid conditions. Anticoagulant categories include direct oral anticoagulants such as dabigatran, rivaroxaban, apixaban, and edoxaban, or a vitamin K agonist such as warfarin. The advantage of direct oral anticoagulant medications is that the dose isn't international normalized ratio-dependent, so blood testing isn't necessary. This is particularly attractive and convenient for older adults with mobility limitations and those with busy lifestyles.

Regardless of the type of anticoagulation therapy, nurses must ensure that patients receive proper education on the need to adhere to their medication regimen and to report any signs of bleeding. Give the patient adequate time and attention to verbalize the feeling of anxiety that usually accompanies rhythm disorders and anticoagulation therapy. Patient adherence to anticoagulation therapy is critical to avoid the risk of a life-threatening embolic event.

Procedures

Invasive procedures are options that patients should consider if medical therapy fails or if the patient can't tolerate medical therapy.[1] Many of these approaches can be performed with minimally invasive endoscopic or "keyhole" surgical techniques.

Such procedures include synchronized electrical cardioversion, in which a synchronized shock is delivered to the patient while he or she is mildly sedated. Cardioversion may successfully convert the rhythm back to sinus, but patients will still require antiarrhythmic medications to maintain normal sinus rhythm. Candidates for this procedure must be fully anticoagulated and have an echocardiogram prior to cardioversion to ensure that there's no thrombus present in the left atrial appendage. This procedure is conducted under mild-to-moderate conscious sedation and the role of the nurse includes monitoring vital signs and continuously assessing the patient's tolerance to the procedure, including pain levels.

Ablation of the atrial-ventricular (AV) node is another procedure used to convert a-fib back into sinus rhythm.[4] Radiofrequency ablation usually requires more than one treatment to resolve a-fib or maintain a patient in sinus rhythm. Rarely is one treatment enough, particularly in patients with other comorbid conditions.[4] This procedure is performed by inserting a catheter through the veins, usually femoral, and delivering radiofrequency energy to sever or injure the AV node. Because the result of this procedure is permanent, a permanent pacemaker must be implanted to maintain an adequate heart rate.[4] Further, AV nodal ablation isn't curative, so anticoagulant medications must be continued to reduce the high risk of stroke.[4]

The Maze Procedure consists of a series of precise incisions or lesions that are made in the right and left atria to confine the electrical impulses to defined pathways to reach the AV node.[4] These incisions prevent abnormal impulses from affecting the atria and causing a-fib. Traditionally, the procedure uses a technique in which precise surgical scars are created in the atria. It may also be performed using newer technologies designed to follow the pattern of the surgical incisions with ablative lines.[9] Microwave, laser, ultrasound, or cryotherapy (freezing) technology produces scar tissue that blocks the abnormal electrical impulses from being conducted through the heart and promotes the normal conduction of impulses through the proper pathway.[7]

Device therapy

Permanent pacemaker

A permanent pacemaker is a battery-operated device that's implanted under the skin, usually under the left clavicular bone. It's programmed to maintain heart rate, typically at 60 beats/minute. Patients can have a pacemaker that controls

their heart rate 100% of the time or one that operates "on demand," meaning it works only when the individual's heart rate falls below a preprogrammed rate.

Left atrial appendage closure

The left atrial appendage (LAA) is a small, ear-shaped sac in the muscle wall of the left atrium. Its function remains unclear.[7] When a patient has a-fib, the electrical impulses that control the heartbeat don't travel in an orderly fashion through the heart. Instead, many impulses begin at the same time and spread through the atria. The rapid and irregular impulses don't give the atria time to contract and/or effectively squeeze blood into the ventricles. The LAA acts as a little pouch; blood collects there and can form clots there and in the atria. Once a blood clot is formed, it can be pumped out of the heart, travel to the brain, and result in a stroke.[7] LAA closure is performed to seal off the appendage. This procedure is performed for a select group of patients who otherwise can't tolerate anticoagulation therapy, either because of frequent falls, gastrointestinal bleeds requiring transfusions, or other contraindications to anticoagulation therapy.

There are currently three options available to close off the LAA. The WATCHMAN device is FDA-approved for LLA closure.[7] It's an umbrella-shaped instrument that, when deployed, conforms to the left atrial appendage and adheres to the tissue via 10 active fixation anchors that increase stability. This reduces blood stagnation and decreases the risk of LAA clot formation. The second technique to close the LAA is the lariat procedure, which closes the LAA by suturing it shut.[8] Unlike the WATCHMAN device or the lariat procedure, the AtriClip is a device used in a procedure where the left atrial appendage is surgically excised, and the tissue is stapled closed with a clip.[7] AtriClip is reserved for those who are undergoing other cardiac surgeries such as open-heart coronary bypass grafts or valvular replacement surgeries.[7]

The choice of procedure is dependent on the individual risk profile and the availability of a trained physician to perform the procedure.

Lifestyle changes

In addition to medications, lifestyle changes can improve heart health and overall well-being. Instruct patients to avoid activities that provoke rhythm disorders. Such activities include excessive alcohol and or caffeine use, tobacco, or drugs such as cocaine and amphetamines. If on anticoagulants, avoid activities that can cause injury. If the patient notices that they're having symptoms of palpitations, dizziness, or feel faint, they should report these symptoms to their healthcare providers for medication adjustments or to further investigate the cause.

If applicable, smoking cessation counseling and support to quit must be included in the plan of care. Moderation of alcohol consumption is key to limit reoccurrence or progression of dysrhythmias. Include instructions regarding limiting caffeine use and educate patients on the various products that contain caffeine, such as tea, energy drinks, soft drinks, and some over-the-counter medications, particularly cough and cold medications.

Controlling hypertension, particularly through adherence to medication, is important in the overall management of a-fib. Patients must understand the impact of persistent or uncontrolled hypertension on their overall cardiovascular health. Weight loss and glycemic control are also important for overall health and well-being.

Better patient outcomes

Nurses, now more than ever, are caring for older and sicker patients. The ability to identify cardiac dysrhythmias early and set therapeutics in motion can transform patient outcomes and

significantly impact patients' overall quality of life. Being aware of and up-to-date on the most current guidelines when caring for a patient with a-fib will help to reduce risk of stroke, improve patient outcomes, and improve the quality of life issues faced by patients and their loved ones. Further, it will reduce the overall healthcare expenditures related to complications such as stroke and rehospitalization. ■

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