Atrial Fibrillation (AF): Causes, Sequela, Risk Factors, and Management

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Atrial Fibrillation (AF) is a common cardiac rhythm disturbance encountered in the healthcare field [January et al., 2014, p. 4]. Nurses ought to remain up to date with their current understanding and treatment of AF.

**Definition**

A rapid, disorganized atrial rhythm (Gutierrez et al., 2016, p. 462).

**Diagnosis by ECG**

- No p waves
- Irregularly, irregular R-R interval
- Possible presence of fibrillatory waves (Adapted from January et al., 2016, p. 462).

**Classification**

- Paroxysmal AF: Typically lasts <1 week and spontaneously converts to sinus rhythm.
- Persistent AF: Continuous during hospitalization (January et al., 2014, p. 7).

**Symptoms**

- May be asymptomatic
- Palpitations
- Syncope
- Chest pain
- Shortness of breath
- Weakness
- Irregular pulse

Adapted from Gutierrez et al., 2016, p. 466.

**Risk Factors**

- Age > 65
- Hypertension
- Coronary artery disease
- Cardiomyopathy
- AV valve disorders
- Hyperthyroidism
- Lung disease

Adapted from January et al., 2014, p. 7.

**Cause(s), Sequela, Risk Factors, and Management Strategies**

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**Importance**

Atrial fibrillation (AF) is a common rhythm disturbance encountered in the healthcare field [January et al., 2014, p. 4]. Nurses ought to remain up to date with their current understanding and treatment of AF.

**Terms to Know**

- Anatomical re-entry features a refractory core (typically scarred or ischemic tissue), a “slow” pathway, and a “fast” pathway. Signals travel around the core through the fast pathway and are slowed enough by the slow pathway to cause the fast pathway to become excitatory again just before the slowed signal arrives. This forms a loop of re-entry [Saman et al., 2014, p. 49-50]. See below.

**Vein Signals**

- Myocardial sleeves are known to extend into veins connected to the myocardium (pulmonary veins, superior/inferior vena cava, coronary sinus, and Marshall’s vein). The pulmonary veins (PV) play a much more significant role in AF than the other veins.

**Pathophysiology**

- The sleeves are capable of generating ectopic electrical signals and initiating impulses.
- They display variability in conduction properties and refractoriness which may enable them to maintain AF through re-entry.
- Vein signals appear to be the primary contributors in paroxysmal AF.
- Re-entry in AF is believed to be primarily functional.
- However, this functional source is usually isolated to a common anatomical region (the pulmonary veins). (Adapted from January et al., 2014, p. 12).

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**Rotors**

- Complicated form of functional re-entry which appears to be more important in persistent AF (Spitzer et al., 2017, p. 31).
- Uniformly shaped, circular subendocardial reentry with single wavefronts that encircle a non-excitable core, rotors have “singularities,” which are regions surrounded by spiral waves that disperse into the atrial “milieu” (Krummen et al., 2015, p. 143).

**Consequences**

- Angiotensin: Beyond the scope of this presentation due to the complexity of the recommendations. See Norby et al., 2017, p. 239-249.

**DC Cardioversion (Biphasic)**

- Internal or external BM: 100 was equally effective to 249 in first shock success. Overweight or greater BMI: 205 was significantly more effective in first shock success (Glover et al., 2008, p. 814).

**Management Drug Therapy**

- Rate control: beta antagonists, nondihydropyridine calcium channel blockers, amiodarone, digoxin (January et al., 2014, p. 29).

**References**

- Zaman et al., 2019
- Son et al., 2019
- Gutierrez et al., 2016, p. 466
- Gutierrez et al., 2016, p. 462
- Gutierrez et al., 2016, p. 462