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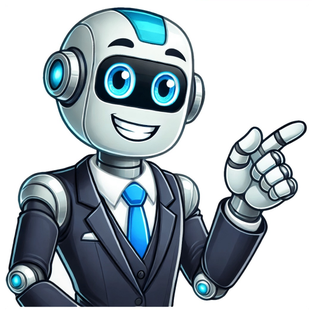

Ekg practice worksheets with answers

You have already completed the quiz before. Hence you can not start it again. You must sign in or sign up to start the quiz. You must first complete the following: Quiz complete. Results are being recorded. 0 of 14 Questions answered correctly Time has elapsed You have reached 0 of 0 point(s), (0) Earned Point(s): 0 of 0, (0) 0 Essay(s) Pending (Possible Point(s): 0) Use this EKG interpretation cheat sheet that summarizes all heart arrhythmias in an easy-to-understand fashion. One of the most useful and commonly used diagnostic tools is electrocardiography (EKG) which measures the heart's electrical activity as waveforms. An EKG uses electrodes attached to the skin to detect electric currents moving through the heart. These signals are transmitted to produce a record of cardiac activity. Arrhythmia or dysrhythmia are disturbances in the normal cardiac rhythm of the heart which occur as a result of alterations within the conduction of electrical impulses. These impulses stimulate and coordinate atrial and ventricular myocardial contractions that provide cardiac output. Ever wonder how nurses and doctors can read ECG papers with ease? How do they differentiate atrial tachycardia from atrial fibrillation, or how even to know what atrial fibrillation or tachycardia is? EKG interpretation takes some great skill, a keen eye, and a good theoretical foundation on the different arrhythmias and the concepts around the heart's conduction and the EKG machine itself. It takes time to develop a skill in interpreting EKGs, but once you get the hang of it, you'll be able to interpret any squiggly line in the EKG paper. Sinus tachycardia is a heart rate greater than 100 beats per minute originating from the sinus node. Rate: 100 to 180 beats per minute P Waves precede each QRS complex PR interval is normal QRS complex is normal Conduction is normal Rhythm is regular Causes of sinus tachycardia may include exercise, anxiety, fever, drugs, anemia, heart failure, hypovolemia, and shock. Sinus tachycardia is often asymptomatic. Management, however is directed at the treatment of the primary cause. Carotid sinus pressure (carotid massage) or a beta-blocker may be used to reduce heart rate. Sinus bradycardia is a heart rate of less than 60 beats per minute and originates from the sinus node (as the term "sinus" refers to the sinoatrial node). It has the following characteristics Rate is less than 60 beats per minute P Waves precede each QRS complex PR interval is normal QRS complex is normal Conduction is normal Rhythm is regular Causes may include drugs, vagal stimulation, hypoendocrine states, hypothermia, or sinus node involvement in MI. This arrhythmia may be normal in athletes as they have quality stroke volume. It is often asymptomatic but manifestations may include: syncope, fatigue, dizziness. Management includes treating the underlying cause and administering anticholinergic drugs like atropine sulfate as prescribed. Premature Atrial Contraction are ectopic beats that originates from the atria and they are not rhythms. Cells in the heart starts to fire or go off before the normal heartbeat is supposed to occur. These are called heart palpitations and has the following characteristics: Premature and abnormal-looking P waves that differ in configuration from normal P waves QRS complex after P waves except in very early or blocked PACs P waves often buried in the preceding T wave or identified in the preceding T wave. Causes includes coronary or valvular heart diseases, atrial ischemia, coronary artery atherosclerosis, heart failure, COPD, electrolyte imbalance and hypoxia. Usually there is no treatment needed but may include procainamide and quinidine administration (antidysrhythmic drugs) and carotid sinus massage. Atrial flutter is an abnormal rhythm that occurs in the atria of the heart. Atrial flutter has an atrial rhythm that is regular but has an atrial rate of 250 to 400 beats/minute. It has sawtooth appearance. QRS complexes are uniform in shape but often irregular in rate. Normal atrial rhythm Abnormal atrial rate: 250 to 400 beats/minute Sawtooth P wave configuration QRS complexes uniform in shape but irregular in rate Causes includes heart failure, tricuspid valve or mitral valve diseases, pulmonary embolism, cor pulmonale, inferior wall MI, carditis and digoxin toxicity. Management if the patient is unstable with ventricular rate of greater than 150 bpm, prepare for immediate cardioversion. If patient is stable, drug therapy may include calcium channel blocker, beta-adrenergic blockers, or antiarhythmics. Anticoagulation may be necessary as there would be pooling of blood in the atria. Atrial fibrillation is disorganized and uncoordinated twitching of atrial musculature caused by overly rapid production of atrial impulses. This arrhythmia has the following characteristics: Atrial Rate: 350 to 600 bpm Ventricular Rate: 120 to 200 bpm P wave is not discernible with an irregular baseline PR interval is not measurable QRS complex is normal Rhythm is irregular and usually rapid unless controlled. Causes includes atherosclerosis, heart failure, congenital heart disease, chronic obstructive pulmonary disease, hypothyroidism and thyrotoxicosis. Atrial fibrillation may be asymptomatic but clinical manifestation may include palpitations, dyspnea, and pulmonary edema. Nursing goal is towards administration of prescribed treatment to decrease ventricular response, decrease atrial irritability and eliminate the cause. Premature Junctional Contraction (PJC) occurs when some regions of the heart becomes excitable than normal. It has the following characteristics. PR interval less than 0.12 seconds if P wave precedes QRS complex QRS complex configuration and duration is normal P wave is inverted Atrial and ventricular rhythms irregular Causes of PJC may include myocardial infarction or ischemia, digoxin toxicity, excessive caffeine or amphetamine use. Management includes correction of underlying cause, discontinuation of digoxin if appropriate. AV blocks are conduction defects within the AV junction that impairs conduction of atrial impulses to ventricular pathways. The three types are first degree, second degree and third degree. Rate is usually 60 to 100 bpm PR intervals are prolonged for usually 0.20 seconds QRS complex is usually normal Rhythm is regular First degree AV block is asymptomatic and may be caused by inferior wall MI or ischemia, hyperkalemia, hypokalemia, digoxin toxicity, calcium channel blockers, amiodarone and use of antidysrhythmics. Management includes correction of underlying cause. Administer atropine if PR interval exceeds 0.26 second or symptomatic bradycardia develops. Atrial rhythm is regular Ventricular rhythm is irregular Atrial rate exceeds ventricular rate PR interval progressively but only slightly, longer with each cycle until QRS complex disappears (dropped beat) PR Interval shorter after dropped beat. Clinical manifestations include vertigo, weakness, and an irregular pulse. This may be caused by Inferior wall MI, cardiac surgery, acute rheumatic fever, vagal stimulation. Treatment includes correction of underlying cause, atropine or temporary pacemaker for symptomatic bradycardia and discontinuation of digoxin if appropriate. Atrial rhythm is regular Ventricular rhythm maybe regular or irregular depending on the degree of block P-P interval constant QRS complex periodically absent or disappears Clinical manifestations same as Mobitz I. Causes includes: severe coronary artery diseases, anterior wall MI, acute myocarditis and digoxin toxicity. Treatment includes: atropine, epinephrine, and dopamine for symptomatic bradycardia. Discontinuation of digoxin if appropriate. Installation of pacemaker. Atrial rhythm regular Ventricular rhythm regular and rate slower than atrial rate No relation between P waves and QRS complexes NO constant PR interval QRS interval normal or wide and bizarre Manifestations include hypotension, angina, and heart failure. This may be caused by congenital abnormalities, rheumatic fever, hypoxia, MI, LEv's disease, Lenegre's disease and digoxin toxicity. Management includes atropine, epinephrine, and dopamine for bradycardia. Installation of pacemaker may also be considered. Early or premature ventricular contractions are caused by increased automaticity of ventricular muscle cells. PVCs usually are not considered harmful but are of concern if more than six occur in 1 minute, if they occur in pairs or triplets if they are multifocal or if they occur or near a T wave. Atrial rhythm is regular Ventricular rhythm is irregular QRS complex premature, usually followed by a complete compensatory pause QRS complex is also wide and distorted, usually >0.14 second. Premature QRS complexes occurring singly, in pairs, or in threes Clinical manifestations includes palpitations, weakness, lightheadedness but it is most of the time asymptomatic. Management includes assessment of the cause and treat as indicated. Treatment is indicated if the client has underlying disease because PVCs may precipitate ventricular tachycardia or fibrillation. Assess for life threatening PVCs. Administer antiarrhythmic medication as prescribed. Ventricular tachycardia (VT) is three or more consecutive PVCs. it is considered a medical emergency because cardiac output (CO) cannot be maintained because of decreased diastolic filling (preload). Rate is 100 to 250 beats per minute P wave is blurred in the QRS complex but the QRS complex has no associate with P wave. PR Interval is not present QRS complex is wide and bizarre; T wave is in the opposite direction Rhythm is usually regular May start and stop suddenly Clinical manifestations of VT includes lightheadedness, weakness, dyspnea and unconsciousness. Causes includes MI, aneurysm, CAD, rheumatic heart diseases, mitral valve prolapse, hypokalemia, hyperkalemia, and pulmonary embolism. Anxiety may also caused VT. Management for Pulseless VT: Initiate cardiopulmonary resuscitation; follow ACLS protocol for defibrillation, ET intubation and administration of epinephrine or vasopressin. Management with Pulse VT: If hemodynamically stable, follow ACLS protocol for administration of amiodarone, if ineffective, initiate synchronized cardioversion. Ventricular fibrillation is rapid, ineffective quivering of ventricles that may be rapidly fatal. Rate is rapid and uncoordinated, with ineffective contractions Rhythm is chaotic QRS complexes wide and irregular P wave is not seen PR interval is not seen Causes of ventricular fibrillation is most commonly myocardia ischemia or infarction. It ma result from untreated ventricular tachycardia, electrolyte imbalances, digoxin or quinide toxicity, or hypothermia. Clinical manifestations may include loss of consciousness, pulselessness, loss of blood pressure, cessation of respirations, possible seizures and sudden death. Start CPR is pulseless. Follow ACLS protocol for defibrillation, ET intubation and administration of epinephrine or vasopressin. Download the printable cheat sheet for EKG interpretation below. To download, simply click on the images below and save. Part 1 – EKG Interpretation Part 2 – EKG Interpretation Part 3 – EKG Interpretation ArrhythmiasDescriptionCausesTreatmentSinus Arrhythmia Irregular atrial and ventricular rhythms. Normal P wave preceding each QRS complex. Normal variation of normal sinus rhythm in athletes, children, and the elderly. Can be seen in digoxin toxicity and inferior wall MI. Atropine if rate decreases below 40 bpm. Sinus Tachycardia Atrial and ventricular rhythms are regular. Rate > 100 bpm. Normal P wave preceding each QRS complex. Normal physiologic response to fever, exercise, anxiety, dehydration, or pain. May accompany shock, left-sided heart failure, cardiac tamponade, hyperthyroidism, and anemia. Atropine, epinephrine, quinidine, caffeine, nicotine, and alcohol use. Correction of underlying cause. Beta-adrenergic blockers or calcium channel blockers for symptomatic patients. Sinus Bradycardia Regular atrial and ventricular rhythms. Rate < 60 bpm. Normal P wave preceding each QRS complex. Normal in a well-conditioned heart (e.g., athletes). Increased intracranial pressure; increased vagal tone due to straining during defecation, vomiting, intubation, mechanical ventilation. Sinoatrial (SA) arrest or block Atrial and ventricular rhythms normal except for missing complex. Normal P wave preceding each QRS complex. Pause not equal to multiple of the previous rhythm. Infection Coronary artery disease, degenerative heart disease, acute inferior wall MI. Vagal stimulation, Valsalva's maneuver, carotid sinus massage. Treat symptoms with atropine I.V. Temporary pacemaker or permanent pacemaker if considered for repeated episodes. Wandering atrial pacemaker Atrial and ventricular rhythms vary slightly. Irregular PR interval. P waves irregular with changing configurations indicating that they aren't all from SA node or single atrial focus; may appear after the QRS complex. QRS complexes uniform in shape but irregular in rhythm. Rheumatic carditis due to inflammation involving the SA node. Digoxin toxicity Sick sinus syndrome No treatment if patient is asymptomatic Treatment of underlying cause if patient is symptomatic. Premature atrial contraction (PAC) Premature, abnormal-looking P waves that differ in configuration from normal P waves. QRS complexes after P waves except in very early or blocked PACs. P wave often buried in the preceding T wave or identified in the preceding T wave. May prelude supraventricular tachycardia. Stimulants, hyperthyroidism, COPD, infection and other heart diseases. Usually no treatment is needed. Treatment of underlying cause if patient is symptomatic. Carotid sinus massage. Paroxysmal Supraventricular Tachycardia Atrial and ventricular rhythms are regular. Heart rate > 160 bpm; rarely exceeds 250 bpm. P waves regular but aberrant; difficult to differentiate from preceding T wave. P wave preceding each QRS complex. Sudden onset and termination of arrhythmia When a normal P wave is present, it's called paroxysmal atrial tachycardia; when a normal P wave isn't present, it's called paroxysmal junctional tachycardia. Physical exertion, emotion, stimulants, rheumatic heart diseases. Intrinsic abnormality of AV conduction system. Digoxin toxicity. Use of caffeine, marijuana, or central nervous system stimulants. If patient is unstable prepare for immediate cardioversion. If patient is stable, vagal stimulation, or Valsalva's maneuver, carotid sinus massage. Adenosine by rapid I.V. bolus injection to rapidly convert arrhythmia. If patient has normal ejection fraction, consider calcium channel blockers, beta-adrenergic blocks or amiodarone. If patient has an ejection fraction less than 40%, consider amiodarone. Atrial flutter Atrial rhythm regular, rate, 250 to 400 bpm Ventricular rate variable, depending on degree of AV block Saw-tooth shape P wave configuration. QRS complexes uniform in shape but often irregular in rate. Heart failure, tricuspid or mitral valve disease, pulmonary embolism, cor pulmonale, inferior wall MI, carditis. Digoxin toxicity. If patient is unstable with ventricular rate > 150bpm, prepare for immediate cardioversion. If patient is stable, drug therapy may include calcium channel blockers, beta-adrenergic blocks, or antiarrhythmics. Anticoagulation therapy may be necessary. Atrial Fibrillation Atrial rhythm grossly irregular rate > 300 to 600 bpm. Ventricular rhythm grossly irregular, rate 160 to 180 bpm. PR interval indiscernible. No P waves, or P waves that appear as erratic, irregular base-line fibrillatory waves Heart failure, COPD, thyrotoxicosis, constrictive pericarditis, ischemic heart disease, sepsis, pulmonary embolus, rheumatic heart disease, hypertension, mitral stenosis, atrial irritation, complication of coronary bypass or valve replacement surgery If patient is unstable with ventricular rate > 150bpm, prepare for immediate cardioversion. If stable, drug therapy may include calcium channel blockers, beta-adrenergic blockers, digoxin, procainamide, quinidine, ibutilide, or amiodarone. Anticoagulation therapy to prevent emboli. Dual chamber atrial pacing, implantable atrial pacemaker, or surgical maze procedure may also be used. Junctional Rhythm Atrial and ventricular rhythms are regular. Atrial rate 40 to 60 bpm. Ventricular rate usually 40 to 60 bpm. P waves preceding, hidden within (absent), or after QRS complex; usually inverted if visible. PR interval (when present) < 0.12 second QRS complex configuration and duration normal, except in aberrant conduction. Inferior wall MI, or ischemia, hypoxia, vagal stimulation, sick sinus syndrome. Acute rheumatic fever. Valve surgery Digoxin toxicity Correction of underlying cause. Atropine for symptomatic slow rate Pacemaker insertion if patient is refractory to drugs Discontinuation of digoxin if appropriate. Premature Junctional Conjunctions Atrial and ventricular rhythms are irregular. P waves inverted; may precede be hidden within, or follow QRS complex. QRS complex configuration and duration normal. MI or ischemia Digoxin toxicity and excessive caffeine or amphetamine use Correction of underlying cause. Discontinuation of digoxin if appropriate. First-degree AV block Atrial and ventricular rhythms regular PR interval > 0.20 second. P wave preceding each QRS complex. QRS complex normal. Correction of the underlying cause. Possibly atropine if PR interval exceeds 0.26 second or symptomatic bradycardia develops. Cautious use of digoxin, calcium channel blockers, and beta-adrenergic blockers. Second-degree AV block Mobitz I (Wenckebach) Atrial rhythm regular. Ventricular rhythm irregular. Atrial rate exceeds ventricular rate. PR interval progressively, but only slightly, longer with each cycle until QRS complex disappears. PR interval shorter after dropped beat. Atropine, epinephrine, and dopamine for symptomatic bradycardia. Temporary or permanent pacemaker for symptomatic bradycardia. Discontinuation of digoxin if appropriate. Third-degree AV block (complex heart block) Atrial rhythm regular. Ventricular rhythm regular and rate slower than atrial rate. No relation between P waves and QRS complexes. No constant PR interval. QRS interval normal (nodal pacemaker) or wide and bizarre (ventricular pacemaker). Inferior or anterior wall MI, congenital abnormality, rheumatic fever. Atropine, epinephrine, and dopamine for symptomatic bradycardia. Temporary or permanent pacemaker for symptomatic bradycardia. Premature ventricular contraction (PVC) Atrial rhythm regular Ventricular rhythm irregular QRS complex premature, usually followed by a complete compensatory pause QRS complex wide and distorted, usually >0.14 second. Premature QRS complexes occurring singly, in pairs, or in threes; alternating with normal beats; focus from one or more sites. Ominous when clustered, multifocal, with R wave on T pattern. Heart failure; old or acute myocardial ischemia, infarction, or contusion. Myocardial irritation by ventricular catheters such as a pacemaker. Hypercapnia, hypokalemia, hypocalcemia. Drug toxicity by cardiac glycosides, aminophylline, tricyclic antidepressants, beta-adrenergic. Caffeine, tobacco, or alcohol use. Psychological stress, anxiety, pain If warranted, procainamide, lidocaine, or amiodarone I.V. Treatment of underlying cause. Discontinuation of drug causing toxicity. Potassium chloride IV if PVC induced by hypokalemia. Magnesium sulfate IV if PVC induced by hypomagnesaemia. Ventricular Tachycardia Ventricular rate 140 to 220 bpm, regular or irregular. QRS complexes wide, bizarre, and independent of P waves P waves no discernible May start and stop suddenly Myocardial ischemia, infarction, or aneurysm Coronary artery disease Rheumatic heart disease Mitral valve prolapse, heart failure, cardiomyopathy Ventricular catheters. Hypokalemia, Hypercalcemia. Pulmonary embolism. Digoxin, procainamide, epinephrine, quinidine toxicity, anxiety. If pulseless: initiate CPR; follow ACLS protocol for defibrillation. If with pulse: If hemodynamically stable, follow ACLS protocol for administration of amiodarone; if ineffective initiate synchronized cardioversion. Ventricular Fibrillation Ventricular rhythm and rate are rapid and chaotic. QRS complexes wide and irregular, no visible P waves Myocardial ischemia or infarction, R-on-T phenomenon, untreated ventricular tachycardia, Hypokalemia, hyperkalemia, Hypercalcemia, alkalosis, electric shock, hypothermia. Digoxin, epinephrine, or quinidine toxicity. If pulseless: start CPR, follow ACLS protocol for defibrillation, ET intubation, and administration f epinephrine or vasopressin, lidocaine, or amiodarone; ineffective consider magnesium sulfate. Asystole No atrial or ventricular rate or rhythm. No discernible P waves, QRS complexes, or T waves Myocardial ischemia or infarction, aortic valve disease, heart failure, hypoxemia, hypokalemia, severe acidosis, electric shock, ventricular arrhythmias, AV block, pulmonary embolism, heart rupture, cardiac tamponade, hyperkalemia, electromechanical dissociation. Cocaine overdose. FacebookEmailPrintBufferPinterestShare The EKG practice tests (drills) provide a fast and interactive method for EKG strip practice. Users are asked to interpret the EKG using a multiple choice format. Immediate feedback is available after answering each question. These EKG practice tests can be used on desktops, tablets and smartphones. EKG Practice Drills Our EKG rhythm practice strip present 25 tracings for EKG interpretation. These graded EKG quizzes can be selected based upon the user's educational objectives. Quiz EKG tracings are randomly selected from our database of over 600 tracings, so the quiz can be repeated many times. Scoring as well as immediate answer feedback are provided. Our quizzes include: Comprehensive (over 50 categories) Physician Assistant Nurse Practitioner EKGs for Nurses EKGs for ACLS EKGs for NCLEX Prep Patient Monitor Simulator Basic EKG Quizzes - StandardizedEKG Graded Quizzes We are pleased to announce our new EKG training modules. These modules provide in-depth training in EKG basics, rhythm analysis and a wide range of EKG topics. Each module includes lessons, interactive drills and a course quiz. EKG Training Modules Our EKG coach breaks down interpretation into five analysis steps followed by classification of the EKG tracing. Scoring based upon both analysis and interpretation are available.. EKG Rhythm Interpretation Coach Our EKG Interpretation Cheat Sheets provides information on reading EKG strips with over forty different abnormal EKG examples. For each arrhythmia, there are EKG strip examples and descriptive text with qualifying criteria. We also provide an annotated tracing with a summary of the key features and values. EKG Reference Guide EKG-Schulung Entrenamiento-EKG Entrainement-ECG An EKG, also called an ECG or electrocardiogram, is a recording of the heart's electrical activity. It is a quick and painless procedure. EKGs captures a tracing of cardiac electrical impulse as it moves from the atrium to the ventricles. These electrical impulses cause the heart to contract and pump blood. EKGs are interpreted by medical professionals to understand the following: Heart rate Heartbeat regularity Strength and timing of the electrical signals Any possible abnormal conditions A summary of each of the most common EKG types is provided below. Accelerated Idioventricular Rhythm The EKG rhythm will appear regular. The heart rate is 50-120 bpm, which is faster than a ventricular rhythm but slower than ventricular tachycardia. The P wave is absent and PR interval is not measurable. The QRS complex will typically be wide (>0.10 sec) and bizarre looking. Accelerated Junctional Rhythm The EKG rhythm will appear regular with heart rate that is normal (60-100 bpm). The P wave is present before, during (hidden) or after QRS. If visible it is inverted. The PR interval is not measurable. The QRS complex will typically be normal (0.06-0.10 sec). Asystole Cardiac electrical activity is absent. No EKG rhythm can be observed. The P wave and QRS complex are not visible. Confirm using multiple leads. Atrial Fibrillation The EKG rhythm will appear irregular. Heart rate is very fast: over 350 bpm for atrial, but ventricular rate may be slow, normal or fast. The P wave features are absent - erratic waves are present. The PR interval is absent. The QRS complex will typically be normal but may be widened if there are conduction delays. Please enroll in one of our paid plans to view an additional 35 EKG abnormalities. Use the Join button in the upper right of this page. Atrial Flutter The atrial heart rate is rapid (250-350 bpm), but ventricular rate is often slower. EKG rhythm will appear regular. P wave and PR interval are not observable, but saw-toothed flutter waves are present. The QRS complex will typically be normal (0.06-0.10 sec). Bundle Branch Block The EKG rhythm P wave features should appear normal and the PR interval is normal (0.12-0.20 sec). The QRS complex will typically be wide (>0.12 sec). First Degree Heart Block The P wave will be normal while the PR interval is prolonged (>0.20 sec). The QRS complex will typically be normal (0.06-0.10 sec). A first degree av block occurs when electrical impulses moving through the atrioventricular (AV) node are delayed (but not blocked). The adjective first degree indicates slowed conduction without missed beats. Idioventricular Rhythm The EKG rhythm will appear regular with a very slow heart rate(20-40 bpm). The P wave will be absent and the PR interval is not measurable. The QRS complex will typically be wide (>0.10 sec) and a bizarre appearance. Junctional Escape Rhythm The EKG rhythm will appear regular. Heart rate that is slow (40-60 bpm). The P wave will be present before, during (hidden) or after QRS, if visible it is inverted. The PR interval is not measurable. The QRS complex will typically be normal (0.06-0.10 sec). Junctional Tachycardia The EKG rhythm will appear regular with a fast heart rate (100-180 bpm). The P wave can appear before, during (hidden) or after QRS, if visible it is inverted. Observe that the PR interval is absent or short. The QRS complex will typically be normal (0.06-0.10 sec). Multifocal Atrial Tachycardia The EKG rhythm will appear irregular with a fast heart rate (> 100 bpm). The P wave features often change shape and size from beat to beat with at least three differing forms. Observe that the PR interval is variable. The QRS complex will typically be normal (0.06-0.10 sec). In addition, the T wave can be distorted. Normal Sinus Rhythm The EKG rhythm will appear regular with a normal (60-100 bpm) heart rate. The P wave appears normal and precedes each QRS. Observe that the PR interval is normal (0.12-0.20 sec). The QRS complex will typically be normal (0.06-0.10 sec). Pacemaker Failure to Capture The EKG rhythm will appear irregular with heart rate that is slow or normal. Observe that the pacemaker spikes are not followed by p waves or QRS complexes. Pacemaker Failure to Pace The EKG rhythm will appear irregular and pacemaker spikes do not appear. Pacemaker Single Chamber Atrial The EKG rhythm will appear regular with heart rate that is normal. The P wave and PR interval will both appear normal. The QRS complex is also normal. Pacemaker spikes will precede the P wave. Premature Atrial Complex The EKG rhythm will appear irregular with heart rate that is usually normal but depends on underlying rhythm. The P wave will appear premature, positive and a shape that is abnormal. Observe that the PR interval is normal or longer. The QRS complex will typically be 0.10 sec or less. Premature Junctional Complex The EKG rhythm will appear regular with premature beats with heart rate that is the underlying rate. The P wave is present before, during (hidden) or after QRS. If the P wave is visible, it is inverted. Observe that the PR interval is absent or short. The QRS complex will typically be normal (0.06-0.10 sec). Premature Ventricular Complex The EKG rhythm will appear irregular with heart rate that is the underlying rate. The P wave features absent. Observe that the PR interval is not measurable. The QRS complex will typically be wide (> 0.10 sec) with a bizarre appearance. Premature Ventricular Complex Bigeminy The EKG rhythm will appear irregular with an absent P wave and the PR interval is not measurable. The QRS complex will typically be wide (> 0.10 sec) with a bizarre appearance. The PVC appears on every second beat. Premature Ventricular Complex Quadrigeminy The EKG rhythm will appear irregular. The P wave is absent and the PR interval is not measurable. The QRS complex will typically be wide (> 0.10 sec) and bizarre in appearance. The PVC appears every fourth beat. Premature Ventricular Complex Trigeminy The EKG rhythm will appear irregular. The P wave is absent and the PR interval is not measurable. The QRS complex will typically be wide (> 0.10 sec) with a bizarre appearance. The PVC appears every third beat. Second Degree Heart Block Type I The EKG rhythm will appear irregular but with progressively longer pr interval lengthening. The P wave is normal. Observe that the PR interval becomes progressively longer until a QRS complex is missed, then cycle repeats. The QRS complex will typically be normal (0.06-0.10 sec). Second Degree Heart Block Type II The EKG rhythm will appear regular (atrial) and irregular (ventricular) with heart rate that is characterized by atrial rate that is usually faster than ventricular rate (usually slow). The P wave has a normal form, but more P waves than QRS complexes. The PR interval is normal or prolonged. The QRS complex will typically be normal or wide. Sinoatrial Block The EKG rhythm will appear irregular when SA block occurs with a normal or slow heart rate. The P wave will be normal and the PR interval will be normal (0.12-0.20 sec). The QRS complex will typically be normal (0.06-0.10 sec). The pause time is an integer multiple of the p-p interval. Sinus Arrest The EKG rhythm will appear irregular due to a pause. Heart rate will be normal to slow. The P wave is normal. The PR interval is normal (0.12-0.20 sec). The QRS complex will typically be normal (0.06-0.10 sec). Pause time is not an integer multiple of the p-p interval. Sinus Arrhythmia The EKG rhythm will appear irregular, varying with respiration with heart rate that is normal (60-100 bpm) and rate may increase during inspiration. The P wave is normal and the PR interval is also normal (0.12-0.20 sec). The QRS complex will typically be normal (0.06-0.10 sec). Heart rate frequently increases with inspiration, decreasing with expiration. Sinus Bradycardia The EKG rhythm will appear regular with a slow heart rate (under 60 bpm). The P wave and the PR interval are normal. The QRS complex will typically be normal (0.06-0.10 sec). Sinus Tachycardia The EKG rhythm will appear regular with a fast heart rate (> 100 bpm). The P wave will be normal but may merge with T wave at very fast rates. Observe that the PR interval is>normal (0.12-0.20 sec). The QRS complex will typically be normal (0.06-0.10 sec). The QT interval shortens with increasing heart rate. Supraventricular Tachycardia The EKG rhythm will appear regular and heart rate that will be fast (150-250 bpm). The P wave will be merged with T wave. The PR interval is normal (0.12 sec) but can be difficult to measure. The QRS complex will typically be normal (.10 sec). Third Degree Heart Block The EKG rhythm will appear regular, but atrial and ventricular rhythms are independent. Heart rate is characterized by atrial rate usually normal but faster than the ventricular rate. The P wave will have normal shape and size but may appear within QRS complexes. The PR interval is absent: the atria and ventricles beat independently. The QRS complex will typically be normal, but wide if junctional escape focus. Ventricular Fibrillation The EKG rhythm will appear highly irregular with an unmeasurable heart rate. The P wave is absent, the PR interval is not measurable and no QRS complex. The EKG tracings is a wavy line. Ventricular Tachycardia The EKG rhythm will appear regular with heart rate that is fast (100-250 bpm). The P wave is absent and the PR interval is not measurable. The QRS complex will typically be wide (>0.10 sec) with a bizarre appearance. Ventricular Tachycardia Monomorphic The EKG rhythm will appear regular with a fast (100-250 bpm) heart rate. The P wave is absent and the PR interval is not measurable. The QRS complex will typically be wide (>0.10 sec) and bizarre looking. Ventricular Tachycardia Polymorphic The EKG rhythm will appear regular or irregular with heart rate that is fast (100-300 bpm). The P wave is absent and the PR interval is not measurable. The QRS complex will typically be normal or wide (>0.10 sec) with a bizarre shape. Ventricular Tachycardia Torsade de Pointes The EKG rhythm will appear irregular with heart rate that is fast (200-250 bpm). The P wave is absent and the PR interval is not measurable. The QRS complex will typically be wide (>0.10 sec). Its shape is characterized by a gradual change in the EKG amplitude and a twisting of the QRS complexes around a line. Wandering Atrial Pacemaker The EKG rhythm will appear to be irregular with a normal heart rate. The P wave can be observed changing shape and size from beat to beat (at least three different forms). The PR interval is variable in duration. The QRS complex will typically be normal (0.06-0.10 sec) and the T wave normal. If heart rate exceeds 100 bpm, then rhythm may be multifocal atrial tachycardia (MAT). Wolff-Parkinson-White Syndrome The EKG rhythm will appear regular unless atrial fibrillation present. Heart rate is normal (60-100 bpm). The P wave is normal. Observe that the PR interval is can be short (less than 0.12 sec). The QRS complex will typically be wide (over 0.12 sec). A delta wave (positive or negative) distorts the early part of the QRS complex. Sources Electrocardiography for Healthcare Professionals, 5th Edition Kathryn Booth and Thomas O'Brien ISBN10: 1260064778, ISBN13: 9781260064773 McGraw Hill, 2019 Rapid Interpretation of EKG's, Sixth Edition Dale Dublin Cover Publishing Company 12 Lead EKG for Nurses: Simple Steps to Interpret Rhythms, Arrhythmias, Blocks, Hypertrophy, Infarcts, & Cardiac Drugs Aaron Reed Create Space Independent Publishing Heart Sounds and Murmurs: A Practical Guide with Audio CD-ROM 3rd Edition Elsevier-Health Sciences Division Barbara A. Erickson, PhD, RN, CCRN The Virtual Cardiac Patient: A Multimedia Guide to Heart Sounds, Murmurs, EKG Jonathan Keroes, David Lieberman Publisher: Lippincott Williams & Wilkin) ISBN-10: 0781784425; ISBN-13: 978-0781784429 Project Semilla, UCLA Emergency Medicine, EKG Training Breena R. Taira, MD, MPH