HEART DISEASE—ABNORMAL EKG

Overview:

An *electrocardiogram (EKG)* measures the heart's electrical cycle. Each deflection represented during an EKG represents a stage in the passage of electrical impulses through the heart. The deflections occur in the following sequence: P (atria contract); Q (impulses slow down through conducting fibers); R (ventricular contraction positive charge); S (negative charge); and T (ventricles return to resting state). An "abnormal EKG" finding is sometimes the first evidence for a proposed insured that there *may* be something wrong.

Impact on Life Underwriting:

EKGs are subject to interpretation. An EKG of concern to one underwriter may be of little concern to another. Thus, the first step in dealing with an "abnormal EKG" is to obtain a second opinion. If the interpretations are of similar concern, additional testing is indicated. It would seem logical that findings of an abnormal EKG, especially if there is no prior medical history, should be discussed by the proposed insured with their regular physician for further evaluation.

Additional testing often involves a *stress electrocardiogram, often simply called stress test.* A stress test is similar to a resting EKG in that it measures the electrical activity at rest, but then continues to measure electrical changes as the person is put on a treadmill. Heart activity is measured continually as the patient's exercise load is increased to maximally tolerable levels. Measurements continue as the patient returns to rest. Stress EKGs thus document the heart's electrical activity and heart rhythm at rest, as cardiovascular activity increases, how the heart performs at peak exercise levels, and then how it responds to a return to rest. The resulting stress test evaluation is far more detailed than a resting EKG. The attending cardiologist gains vastly superior insights into the functioning of the heart muscle. A stress test can often show that the heart is fully functional and that the "abnormal resting EKG" is of no relevance. On the other hand, if there are issues of concern, the stress test can often identify the underlying issues, which then lead to treatment or additional testing.

Additional testing is often done via *stress echocardiograms*. These are ultrasounds of the heart under conditions similar to those described above for the stress EKG. But, unlike the stress EKG, which measures the electrical activity within the heart muscle, the stress echocardiogram shows ultrasound images of the heart muscle, heart valves, and blood flow. Additional testing may also involve a *coronary angiogram.* This procedure requires the injection of a dye into coronary arteries. A series of x-ray pictures are taken to show the progress of this dye and to clearly contrast the coronary arteries (i.e. the blood flow within them) from the surrounding tissues. These pictures can show narrowing or blockages of blood vessels. Finally, the most definitive but also the most invasive and risky cardiovascular evaluation comes in the form of a *cardiac catheterization*. A catheter with a tiny camera is used to study the blood vessels supplying the heart with oxygenated blood. A "*cath report*" provides a detailed description of the location and extent of arterial narrowing and the resulting diminished flow of blood to the various segments of the heart muscle. A cath report will also include a discussion of left ventricular functioning. The left ventricle, the main pumping chamber of the heart, is served by two branches of the main coronary artery (the left anterior descending and the left circumflex) which, if narrowed, can significantly impair the heart. A cath report will express left ventricular functioning in three ways:

(1) *Ejection fraction*: the amount of blood in the left ventricle that is pumped (ejected) into the aorta during one pumping action. An ejection fraction (EF) of 55% or greater is normal. An EF of 50% or less indicates some left ventricular dysfunction. An EF of 40% or less is very unfavorable; values of 30% or less are normally declined.
(2) *Wall motion*: it may be abnormal in areas deprived of proper blood supply. Various abnormalities exist. A rating is assigned depending on the type of wall motion abnormality and its impact on left ventricular functioning.
(3) *Left ventricular end-diastolic pressure*: this is the blood pressure in the left ventricle following ejection of blood into the aorta. If the heart muscle is impaired, the ejection action may not be sufficient to pump normal volumes of blood into the aorta, leaving an abnormally large supply of blood in the left ventricle after the contraction. As blood re-enters the left ventricle following contraction, if too much blood is left because of an incomplete previous ejection, the blood pressure in the left ventricle rises. Normal left ventricular end-diastolic pressure is between 8 and 12 mm HG. Any elevation in excess of 13 or 14 mm HG is an indication of impaired ventricular function and is likely rated. Moderate to high ratings based on left ventricular end-diastolic pressure alone are given for readings of 18 - 25 mm HG and any pressure reading of 26 mm HG and above is typically declined.

In conclusion, an "abnormal EKG finding" is often inconclusive. A second or third opinion may lead to a more favorable interpretation. In addition, an abnormal EKG often results in further cardiac evaluation by the proposed insured's attending physician and other experts. More detailed studies often rule out serious concern and lead to more favorable underwriting assessments - or they may lead to treatment and remedy, which again will often improve offers. SB 04/20/2001