Electrophysiology of the Normal Heart

PLOTTING THE MEAN ELECTRICAL AXIS

A method for determining the mean electrical axis in the frontal plane follows:

The mean electrical axis of the QRS can best be determined by the identification of the transitional QRS complex, the one in which the positive and negative components are equal. In this electrocardiogram (Fig. 23), note that the QRS of L2 is predominantly negative and minus aV$_R$ positive. The transitional zone, therefore, lies between them, that is, between plus 30 and plus 60 degrees. The mean electrical axis is at right angles to the transitional zone and on its positive side. The plotted mean electrical axis of QRS is therefore beyond minus 30 and less than minus 60 degrees.

The mean electrical axis of T is similarly calculated. In this electrocardiogram (Fig. 23) the maximum T voltage is found in leads 1 and aV$_L$. Therefore, the mean electrical axis of T is markedly to the left. T is slightly positive in minus aV$_R$ and negative in lead 2. Therefore, the transitional zone of T lies between these lead lines. The mean electrical axis of T, which is 90 degrees away is, therefore, left of minus 30 degrees.

Alternate Method for Plotting MEA. The six frontal leads are studied in their relationship to each other in the circular frame of reference. Note that the augmented limb leads are about two-thirds of the voltage of the bipolar limb leads. Add approximately one-third to achieve their true voltage relationship to the standard limb leads. Note also that minus aV$_R$ is the mirror image of plus aV$_R$. The complex with the largest total positive QRS voltage is the one that is nearest to the line of extension of the mean electrical axis. The complexes on either side of it are examined. The next largest is determined. The mean electrical axis lies between these two and nearer the larger complex. The following electrocardiogram illustrates this method. The six frontal leads are pre-

sented. They are reoriented on the circular frame of reference and the mean electrical axis is plotted.

In the illustration (Fig. 23), the QRS with the maximum positive voltage is located in lead aV$_L$. The next highest QRS is in lead 1. Since the QRS is largest in lead aV$_L$, the mean electrical axis lies close to the lead axis of this lead, minus 30 degrees.

EXERCISES IN PLOTTING THE MEAN ELECTRICAL AXIS

Several electrocardiograms illustrating these principles are presented on pages 12-15 so that the reader may attain proficiency with this method (Fig. 24).
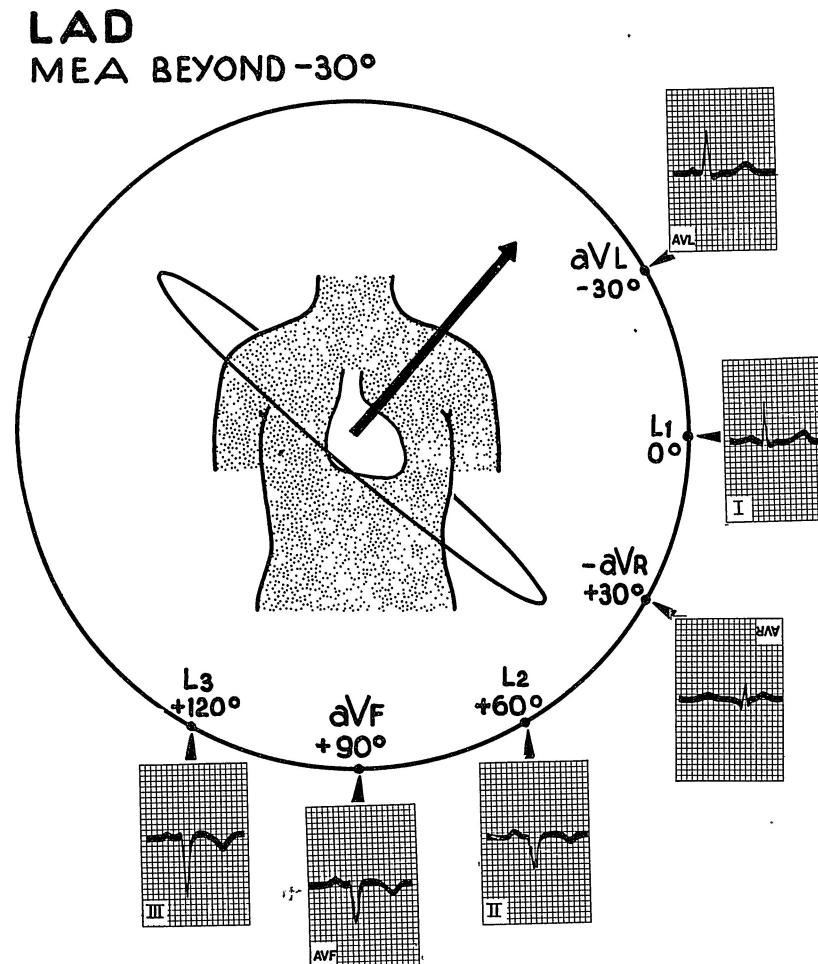

LAD
MEA BEYOND -30°

FIGURE 23. Description and analysis of figure are found in adjoining text, page 12