We have pointed out that a suspected disease as a diagnostic hypothesis is usually confirmed during diagnosis when a test result with likelihood ratio (LR) greater than 10 is observed, if the disease has a test capable of generating such a result (1). Examples of confirmation in this manner include acute myocardial infarction (MI) by acute Q wave and ST elevation EKG changes (acute EKG changes), LR 13, pulmonary embolism by positive chest CT angiogram, LR 20, deep vein thrombosis by positive venous ultrasound, LR 16 (1). In this paper, we shall argue that such confirmation occurs by a confidence method using the example of confirmation of acute MI by acute EKG changes.

In the confidence method, a disease is confirmed or not with a certain confidence level if a test result lies in a certain interval (confidence interval) (2). For example, during screening for prostate cancer, the absence of prostate cancer is considered to be confirmed in a man with a confidence level of 95 percent if his PSA level lies in the confidence interval 0 to 4.

The underlying idea behind this confidence inference is that if men with levels between 0 and 4 are repeatedly drawn from a heterogenous population known to contain men with prostate cancer, then 95 percent of the men with PSA 0 to 4 will not have prostate cancer. This forms the basis for our inference with a confidence level of 95 percent that a given man with PSA between 0 and 4 does not have prostate cancer.

We shall now discuss why confirmation of acute MI by acute EKG changes can be considered to be a confidence inference.

The diagnostic accuracy of diagnosis of acute MI from acute EKG changes across patients with varying prior probabilities has been found to be 85 percent (3).

We can interpret this diagnostic accuracy as indicating that if patients with acute EKG changes are repeatedly drawn from a heterogenous population known to contain patients with acute MI (these are patients in whom we suspect acute MI from a presentation), then 85 percent of these patients will have acute MI.

Therefore with the confidence method, we can confirm acute MI in a given patient with acute EKG changes with a confidence level of 85 percent.
The confidence method of confirmation in this patient differs from the standard confidence method in two respects:

(a) The confidence level in this patient is 85 percent while it is usually 95 or 90 percent in the standard method.
(b) The test result acute EKG changes in this patient is a point value, while a test result lies in an interval in the standard confidence method.

These differences, we believe, are minor and do not affect the confidence nature of confirmation in this patient.

The confidence method of confirmation of acute MI has several advantages as follows:

(1) It is extremely simple, as acute MI is confirmed with a high confidence level as soon as acute EKG changes are observed in a patient. No calculation involving combination of evidence from different sources such as in the Bayesian method is required here.

(2) Acute MI is confirmed in every patient with acute EKG changes with high confidence level regardless of prior probability of acute MI.

(3) This confirmation of acute MI in a given patient is validated by our experience of finding diagnosis of acute MI from acute EKG changes to be correct in 85 percent (8 to 9 out of 10) patients seen by us in the past.

(4) This confirmation is objective as all physicians readily agree with it.

The confidence method is a relatively simple method of confirming a suspected disease as a diagnostic hypothesis in different patients with varying prior probabilities.

References
