If the two drugs were equally effective, it would be expected that half the pairs would be scored plus and the other half minus; that expectancy is represented by the lower decision line labeled P_0 in figure 1. For this case, the serial record of plus and minus pairs would ascend at about a 45° angle, crossing P_0 after perhaps 30 or 40 pairs had been evaluated. How soon the decision line would be crossed would depend upon the vagaries of sampling.

An alternative hypothesis must also be specified. If drug A were superior, the members of the pairs receiving that drug should, on the average, show greater improvement and the proportion of pairs scored plus should be greater than 50 per cent. A percentage that is felt to be clinically meaningful has to be designated for the upper decision line. The alternative hypothesis, labeled P_1 in figure 1, that 65 per cent or more of the pairs should favor drug A, was formulated after consulting several psychiatrists who were especially knowledgeable concerning patients' response to drugs. Calculation of the average sample number necessary to reach a decision also showed that, with this value, a decision could be expected to be reached before the number of observational units available were exhausted. A coefficient of risk of 0.05 was attached to both of these alternative hypotheses and is indicated as alpha and beta in figure 1. With these four values, the slope and intercept of these lines can be quickly calculated.[11]

It has been indicated what should happen if the two treatments were equally effective. If drug A were superior in 100 per cent of the pairs, the serial record of plus and minus pairs would go straight up to cross P_1 after 11 pairs had been evaluated. If the superiority of drug A were not quite that great, it might require additional pairs, again depending upon the sampling. If drug B were superior in 100 per cent of the pairs, the serial line would be plotted horizontally and cross P_0 after eight pairs of patients had been evaluated. In this event, it would be concluded that drug A was not importantly better than drug B. Again, if the percentage in favor of B were less than 100 per cent, more pairs might be required to reach this decision.

Using this sequential channel does not adequately provide for the contingency that drug B is better than drug A. Only the two decisions shown are permitted. If, however, another channel is superimposed on the first, as is shown in figure 2, the test is extended to include this additional possibility. The two lines defining the zone of no important difference should extend downward and to the left, although this is not shown in figure 2. If the sampling line of plus and minus pairs crosses both of these extended lines, the decision is that of no important difference. A number of instances in which such a decision was reached in this manner will be found in subsequent figures. The same graph shown in figure 2 served all of the drug comparisons.

RESULTS

Figures 3 through 6 present the results after one month of treatment on a fixed dosage schedule. Figure 3 contains five channels, one for each phenothiazine compared to phenobarbital. The following decisions were reached: prochlorperazine, chlorpromazine, perphenazine, and trifluprom azine were better than phenobarbital in reducing morbidity; mepazine was not importantly different from phenobarbital. Figure 4 compares mepazine