HOW IS **MED-IC®** BEING USED IN CLINICAL TRIALS?

Allan Wilson MD PHD

Electronic compliance monitoring (ECM) adds cost to a clinical trial but offers enormous return on the investment (ROI). This is why progressive clinical trials are using Med-ic®.

A clinical trial is simply an exercise in optimizing a signal-to-noise ratio. The signal is the desired clinical effect; the noise everything else that obscures the signal. Poor patient compliance with medication has long been known to be a large source of noise – noise that can now be measured by Med-ic®.

Compliance information is used in a number of ways.

1) To screen patients for compliance characteristics prior to enrolling them in a trial. A short placebo pre-trial identifies those who are compliant. Noncompliant subjects are either removed from consideration or targeted education is used to train them to be more compliant before they are enrolled in the study proper.

2) The best use of compliance data is to give feedback to subjects about their compliance as they move through a clinical trial. At follow-up visits packages are scanned, compliance data reviewed with the subjects, and targeted motivational counseling used to improve compliance during the remainder of the trial. If all treatment groups participate in the process, this simply reduces the error variance and increases the power of the study. This means fewer subjects are required to detect a statistically significant effect, reducing the cost and duration of the trial. Quicker regulatory approval translates into longer patent protection and enormous return on investment.

3) Many Med-ic®-enabled clinical trials have used compliance data to assess subjects' compliance *post hoc* (on completion of the trial). This data mining can throw light on many aspects of subject behavior and can be tailored to the interests of the sponsor. For example, in a recent trial it was found that 40 percent of subjects deblistered their medication on at least one occasion, something that would have otherwise gone undetected. This implicated poor package design and resulted in the sponsor using improved packaging for subsequent trials.

   A Phase II trial showed no difference between treatment groups according to the primary outcome analyses. The subjects were stratified *post hoc* according to their compliance and the IND was highly effective for the subjects who actually took the drug it as prescribed. The drug was not abandoned.

4) Med-ic® can serve as part of a REMS (Risk Estimation and Mitigation Strategy) for trials where noncompliance can have serious consequences beyond those associated with simple data accuracy. Opoids, for example, can result in fatal overdose when taken to excess, and these drugs are often diverted for sale on the street. ECM detects the deblistering that might suggest such activities and allows the investigator to implement an intervention strategy.

5) Med-ic® can detect subtle medication-related bias effects that can lead to erroneous conclusions about drug efficacy. For example, subjects in a treatment group might experience subtle positive (eg: mild euphoria) or negative (mildly unpleasant) side effects that control subjects do not. Such subtle effects would typically go unreported by the subjects and might bias the results and confound standard tests of significance. Med-ic® can detect subtle biasing.

6) Using Med-ic® may in itself improve subject compliance although this has not been demonstrated due to the ethics of monitoring compliance without informing the subject.

Med-ic® is even more important for adaptive trials due to the increased number of decision points and the consequent inflation of the probability of making an erroneous decision (type I error).

In summary, Med-ic® is a powerful tool for monitoring patient medication-taking behavior during a clinical trial and providing data to increase the power of the design. This results in cost savings due to the ability of smaller sample sizes to show statistical significance (drug effectiveness) and earlier regulatory approval with longer time on patent protection. With a well-designed blister package equipped with an electronic compliance monitor and good subject education, patient compliance can be changed from a liability to an asset with enormous return on investment.

Our customers invariably find Med-ic® to be an invaluable tool for their clinical trials, as evidenced by the fact that most of our work is with repeat customers. For details about why Pharma finds value in Med-ic®, please refer to our ROI calculator at http://www.informationmediary.com/roi/roi-calculator