

## Non-adherence, Non-compliance or Non-concordance in Asthma: Patients not Following the Medical Regimen

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Improved adherence to a treatment regimen for asthma in general and to inhaled corticosteroids in particular is recognized as an important factor in asthmatic patients' reduced mortality [1], morbidity, and utilization of healthcare resources [2,3]. Despite its obvious importance, however, the actualization of this compliance is a daunting task for the caregiver.

According to a World Health Organization report, 50% of patients from developed countries with chronic diseases do not use their medications as recommended [4]. In asthma, adherence rates are particularly problematic, generally ranging from 30% to 70% [5]. Many factors are mentioned as reasons for non-compliance. These include a lack of knowledge [6] and the high cost of medications [7]. In a study comparing the adherence in several chronic conditions, asthmatic patients appeared to be less adherent and the "necessity-concerns difference" scores were found to be powerful predictors [8]. In addition, in more recent studies, patients' depression and anxiety were linked to non-compliance [9,10].

Irrespective of the reason, however, every experienced asthma specialist, family practitioner or pediatrician is familiar with the frustration of failing to motivate his or her patient to follow treatment instructions. The result is that reduced compliance is considered the most important factor in non-stable or brittle asthma. The first step in attempting to understand the epidemic of non-adherence is to establish an objective method by which it can be measured. Secondly, one has to then determine the reasons for the non-adherence in a given population or a given patient. These tasks are actually quite challenging. Many methods have been developed to measure compliance in asthma. These include observation of the meter dose inhaler technique, clinical judgment by the healthcare provider, self-reporting and asthma diaries. All these methods are considered to be very subjective and have many obvious weaknesses. More objective measures include biochemical measures, like theophylline assay, medication measurements, and monitors. These methods also have obvious limitations and are not readily available [11].

In the current issue of *IMAJ*, the study by Starobin et al. [12] addresses the issue of compliance in a hospital-based clinic. They report that in that setting the level of compliance was remarkably low. The most important merit of the study was that they were the first to address this issue in Israel. They used a patient report, one of the poorest methods for monitoring, especially if

it is not accompanied by a patient diary [13-15]. Particularly, this method tends to overestimate the adherence report when compared to electronic monitoring [16]. Recently, the Doser Clinical Trial was introduced to overcome the reliability of the self-report problem [17]. However, given that self-report was the source for information in the study by Starobin et al. [12], it is reasonable to conclude that the actual adherence was even worse than reported. Furthermore, in their study, the patients were treated by asthma specialists. Patients whose care is administered by asthma specialists should have a higher rate of adherence as compared to primary care physicians [18,19]. Thus, the low level of adherence found in this study is even more worrisome. Taken together, one can assume that the actual situation is worse than reflected in this study. How can one account then for the good asthma outcome in Israel? We were the first to report the decrease in morbidity and mortality to asthma in Israel and its association with the increased use of inhaled corticosteroids [20]. Thus, even though the adherence may be poor, it is possible to assume that many of these patients received rather high doses of inhaled corticosteroids alone or with long-acting beta-agonist. There was no detailed description of the medication dosages prescribed to the patients in this study.

One additional point is the terminology. The term compliance has mostly been superseded by the term adherence, a similar concept but one that has fewer negative connotations regarding the physician-patient relationship [21]. In the United Kingdom, the term concordance has gained popularity, expressing the role of the patient in the treatment decision. These terminology changes may actually be more important than mere semantics. It may well be that better adherence to a treatment regimen could be achieved through open-ended physician-patient communication, incorporating the beliefs and preferences of the patient in the decision-making process.

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*In the absence of touching and being touched, people of all ages can sicken and grow touch-starved*

Diane Ackerman (1948-), U.S. author, poet and naturalist known best for her work *A Natural History of the Senses*

*Let us face a pluralistic world in which there are no universal churches, no single remedy for all diseases, no one way to teach or write or sing, no magic diet, no world poets, and no chosen races, but only the wretched and wonderfully diversified human race.*

Jacques Barzun (1907- ), French-born American historian of ideas and culture

## Capsule

### New heart muscle from embryonic stem cells

Researchers from the Technion-Israel Institute of Technology have created new heart muscle with a built-in blood supply by using human embryonic stem cells. It is the first three-dimensional tissue with blood vessels. This breakthrough now enables the replacement of tissue damaged in heart attacks. Published online in *Circulation Research*, this study promises new applications for studies of cardiac development, function and tissue replacement therapy. The new heart tissue is threaded throughout with a network of tiny blood vessels that would improve the tissue's survival after being transplanted in a human heart. Lead researchers,

Professors Shulamit Levenberg and Lior Gepstein, say they created the heart muscle "by seeding a sponge-like three-dimensional plastic scaffold with heart muscle cells and blood vessel cells produced by human embryonic stem cells, along with cells called embryonic fibroblasts." The next step is to transplant the tissue into living hearts in animals to study how well the heart muscle adapts to its new surroundings. The team is hopeful that the technique might also prove useful in engineering tissues for other organs such as the liver.

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