# Clinical Impact of Home Automated Telemanagement in Asthma

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**Abstract:** There is a great need to provide effective, on-going education and monitoring for the large numbers of asthmatic patients, in particular for those who have a history of aggravating asthma. The complex asthma self management and the busy modern lifestyles makes it unlikely that patients without outside help and support can effectively follow their self-care plans on a regular basis. This study, evaluated the impact of an asthma self-care support system, delivered by telecommunications and computer technology, which has the potential of making a significant contribution in the management of asthma. Analysis of 40 patients using the system showed a significant improvement in the asthma symptoms, lung function test, adherence to action plan and overall decrease in the use of quick relief inhaler.

**Background**: The principal aim of the study is to assess the impact of Home Asthma Telemonitoring (HAT) system[1] on clinical outcomes in adult asthma patients and patients compliance with asthma self care plans. The home based Asthma HAT system[2] collects information on patients self testing compliance, peak expiratory flow (PEF), use of quick relief inhalers, use of prophylactic (controller) medication and the action plan zone of the patient. We performed analysis on 40 patients who used the Asthma HAT system for 12 months. These patients had a HAT home unit which collected information about patient's asthma on a daily basis and provided real time feedback to the patient based on personalized action plan. The mean age of the patients was $48.55 \pm 11.84$ years and the mean education was $11.50 \pm 3.5$ years, 84% were females, 68% were the African Americans, 22% were Caucasians and 10% were the Hispanics.

**Methods:** The patients were asked to perform self-testing on a daily basis which included reporting of their asthma symptoms, adherence with the action plan, peak expiratory flow test. The peak expiratory flow meter was connected to a laptop, and results of the PEF test was directly transmitted to the laptop. The laptop automatically connected to a central server after completion of the test and all reporting was sent immediately to the Asthma center. The HAT server analyzed all information collected at patient homes according to the National Asthma Education and Preventive Program (NAEPP) guidelines. Any change in the patient symptoms, medication adherence, Action Plan use, resulted in generation of an alert which was responded accordingly by a nurse case manager.

**Results:** Analysis was performed on 40 patients to evaluate any significant change in patient self testing compliance, medication adherence, PEF, over 12-month period of follow up.

The average patient self testing compliance at the baseline was $75.78 \pm 13.22\%$ compared to the end of 12-month period that was $79.89 \pm 6.46$. This difference was statistically significant (p=0.035).The average PEF at the baseline was $362 \pm 140.35$ liter/min compared to $369 \pm 116.03$ liter/min at the end of 12 month period and this was statistically significant (p= 0.041). We performed analysis of the total symptoms score over 12 months of follow up. The total symptoms score was a combination of individual symptoms including wheeze, cough, sputum production, chest tightness, shortness of breath, limitation of physical activity, cold and sleep disturbance. The average total symptom score at the baseline was $13 \pm 4.34$ compared to $11.2 \pm 3.36$ at the end of the 12 month period and this difference was statistically significant (p=0.03). The average number of puffs of quick relief inhaler that were used in the last 24 hours at the baseline was $3.51 \pm 3.31$ compared to $2.03 \pm 2.37$ puffs at the end of 12 month period and this difference was statistically significant (p= 0.034) at the alpha level of 0.05

**Conclusion**: We conclude that the ASTHMA HAT system had a positive impact on the patient compliance, lung function, total symptom score and the overall use of quick relief inhaler.

**References:**
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2. Finkelstein J., Cabrera M., Hripcsak G. Internet based Home Asthma Telemonitoring: Can patients handle the technology? Chest 2000;117:148-155