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Title: Self-perceived verses electronic monitoring of adherence to nebulised treatment in children with cystic fibrosis - does the use of telehealth system improve nebulisation adherence?

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Body: Background: Adherence to nebulised treatment among Cystic Fibrosis (CF) patients is variable. Electronic adherence monitoring in outpatient/home setting is available. Aims: (1) To compare self-perceived adherence to data downloaded from adaptive aerosol delivery systems (I-neb) (2) To determine if the feedback from telehealth system (Insight Online) optimises adherence to nebulised treatment in children with CF. Methods: CF patients (on I-neb) were questioned about their adherence to nebulised treatment. Actual adherence (% of doses taken/expected) data was downloaded at clinic visits and compared with self-perceived adherence. Telehealth system was then set up at the homes of consenting patients for self-monitoring. Results: Data was obtained from 15 CF patients (median [range] age: 13.3 [5.5-16] years; 7 males). Six patients were within 10% accuracy between perceived and actual adherence (median [range] of perceived – actual adherence: 2 [0-10] %). Remaining 9 patients perceived their adherence better than the actual adherence (median [range] of perceived – actual adherence: 39 [13-49] %). Following installation of telehealth system, 3 out of 4 children with > 90% actual adherence maintained their adherence level. Six children with adherence <90% improved by median [range] of 22.3% [13.2-178.8%] over 4-week period following self-monitoring at home. Conclusion: Self-perceived treatment adherence can be inaccurate. Telehealth system may benefit by encouraging self-monitoring, informing aspects of treatment that can be improved, and enabling CF team to work with patients/families to promote adherence.