Poster and platform presentations

device use, was recorded. Six different types of inhalers or related devices were used. A scoring system based on manufacturers' operating instructions was devised.

Results: The majority of staff recognised metered dose inhalers volumetrics and diskhalers. 80% were familiar with haler aids but only 65% and 33% recognised turbuhalers & accuhalers respectively. 28% had already received tuition in inhaler use. The median number of steps towards "ideal" M.D.I. usage recognised by staff were 8/10 & 10/12 for M.D.I. with volumetrics. This fell to 1/8 for diskhalers, 1/7 for turbuhalers & 0/11 for accuhalers.

Conclusion: The staff were competent at administering M.D.I's, haler aids & volumetrics. Experience with other devices was limited. It is important to ensure that health care workers have appropriate training in all devices used for administering inhaled therapy.

DOSE-RESPONSE TO ATROVENT IN ELDERLY STABLE COPD: AN UNBLINDED PILOT STUDY
EC PULFORD and MJ CONNOLLY
Robert Barnes Medical Unit, Manchester Royal Infirmary.

Introduction
Ipratropium bromide (Atrovent) is commonly used in COPD (chronic obstructive pulmonary disease) at 20-40μg qds via metered dose inhaler. COPD is common in over 65s, but the Atrovent data sheet admits the scarcity of dose-response data in this age group. In younger adults, higher doses may increase FEV1 (1 second forced expiratory volume) [Newnham et al, Thorax 1993;48:1151] and maximum exercise performance [Ikedo et al, Thorax 1996;51:48]. We looked at the Atrovent dose-response curve (FEV1) specifically in elderly patients with stable COPD.

Methods
Subjects: Patients aged ≥ 65 years with Hodkinson AMT ≥ 7. Measurements: Spirometry at baseline and after unblinded cumulative nebulised Atrovent (25, 125, 250, 500 and 1000μg at 30 minute intervals).

Results
Change(Δ) in FEV1 was >10% and 100ml in 16 of 24, unchanged in 7, reduced in 1. Both low(<125μg) and high(>250μg) doses produced significant Δ FEV1 over baseline, higher doses giving significant extra Δ FEV1 with no reported side-effects.

Conclusion
Higher inhaled doses of Atrovent may be appropriate for stable elderly COPD patients. The relationships between spirometry, symptoms and exercise tolerance need blinded exploration.

A RANDOMISED COMPARISON OF INHALER TECHNIQUE AMONG ELDERLY PEOPLE USING ONE OF THREE INHALERS FOR THE FIRST TIME
V. JONES, C. FERNANDEZ AND P. DIGGORY
Department of Elderly Care Medicine, Mayday Hospital, Croydon, CR7 7YE

Introduction
We aimed to determine if elderly people can learn to use breath activated (Easibreathe) or dry powder (Turbohaler) inhalers as effectively as pressurised inhaler with spacer (MDI).

Methods
100 cognitively intact inhaler naive patients (mean age 84) were randomly allocated 1 of 3 placebo inhalers (Easibreathe, Turbohaler or MDI) to use. Standardised tuition was done on enrolment and after 6 hour review. Inhaler technique was assessed immediately after initial tuition, at 6 hours and 24 hours. Assessment was by scoring (0=poor, 1=moderate, 2=perfect) 5 aspects of technique giving maximum score of 10.

INSPIRATORY IMPEDANCE AS AN ALTERNATIVE MEASURE OF AIRFLOW OBSTRUCTION IN ELDERLY ASTHMATICS
S.C. ALLEN
Department of Medicine, The Royal Bournemouth Hospital, Dorset

Introduction
Established methods of measuring changes in airflow obstruction, such as forced expiratory volume in 1 s (FEV1) and airways resistance (Raw) require high levels of patient cooperation. They are, therefore, of little use in very ill patients, or those with cognitive impairment. This study tested an alternative measure of airflow resistance which might be applied in the clinical management of such patients during treatment for asthma.

Methods
A hyperoxic open breathing circuit, incorporating a pressure transducer and pneumotachograph, was used to measure the rate of early inspiratory pressure drop (dP/dtmax) and mean inspiratory flow rate (Vt/T1) in 6 normal subjects (mean age 78) and 6 asthmatic subjects (mean age 74), during tidal breathing before and after treatment with 5 mg of nebulised salbutamol. Measurements were also made of FEV1, forced vital capacity (FVC), peak expiratory flow rate (PEFR) Raw and airways conductance (Gaw), using an electronic spirometer and whole body plethysmograph. An index of inspiratory impedance (ImpI) with the units kPa.s1 was derived by dividing dP/dtmax by Vt/T1, which reflected the changes in airways obstruction measured by spirometry and plethysmography.

Results
ImpI fell from a mean (SD) of 5.11 (3.36) kPa.s1 to 2.56 (0.88) (P=0.05) in the asthmatic subjects. The corresponding changes in mean FEV1, FVC, PEFR and Gaw were 0.75 1, 1.06 1, 106 L per min-1, 5.86 Kpa.s-1 and 1.52 Kpa.s-1 respectively (P<0.02 in each case). In the normal subjects ImpI rose slightly from 2.08 (0.71) to 2.23 (0.95) Kpa.s-1 (NS). The corresponding mean changes in the other indices were 0.321, 0.071, 28 L per min-1, 0.76 Kpa.s-1 respectively.

Conclusion
The study shows that a fall in ImpI occurs consistently in astmatic subjects after bronchodilator treatment, and might, therefore, be of use in clinical practice. No normal ranges of ImpI exist, so the index can presently be used only to reflect a change in air flow resistance. There is slight temporal discontinuity in the measurement of dP/dtmax and Vt/T1, and dP/dtmax depends on inspiratory muscle strength; these factors must be allowed for when interpreting the clinical significance of ImpI values.