Are peak flow meters a potential hazard in the health care setting

Trisha Weller

There is growing concern amongst health professionals regarding the 'single patient use' status of peak flow meters¹. There are concerns that sharing the same peak flow meter between patients is a health hazard, even if different and/or disposable mouthpieces are used. While infection is a concern to all health professionals and minimising risk is essential, there is no published evidence that infection has been acquired through the use of these devices. Ayres reported evidence of fungal contamination in peak flow meters in hospital setting; no evidence of infection was reported in specific patients³. Cleaning instructions are included in the packaging with every new peak flow meter, but do health professionals read the instructions or even direct patients to them?

Peak flow meters are lung function measurement devices that are used in the management and assessment of asthma (and COPD). They measure the maximum rate of air that can be forcibly exhaled over a brief period within the first second of forced expiration, starting from full inhalation. They are used more widely in primary rather than secondary care settings and are simple to use, cheap and readily available. In addition they are a prescribable item (UK NHS) and useful for patients who need to monitor their asthma providing an objective assessment of lung function and a means of monitoring asthma control. In acute asthma, an objective assessment of lung function is essential to assess accurately the severity of the attack, the effectiveness of emergency asthma treatment as well as providing objective assistance in deciding the duration of oral steroid therapy. Use of spirometry, an alternative to using peak flow meters is increasing but many general practitioners and nurses who are performing these tests are not trained adequately in spirometry or in the understanding and interpretation of the results. Whilst spirometry may well be useful in the surgery it is impractical in the emergency setting and for home self-monitoring. Peak flow measurement requires minimal patient instruction and a forced blow is easier to carry out than prolonged exhalation, as in spirometry.

It is questionable whether peak flow meters are indeed a hazard for patients in the health care setting. Given the concerns regarding 'single patient use' it seems health professionals have no option other than to issue a new prescription for a meter each time they consider diagnosing asthma in their patients. Taken to its logical conclusion, single patient use would necessitate large stocks of peak flow meters at the point of patient care, both in and out of hospital. Is this cost effective?

Supporting evidence is important in current health care provision, but there is scant evidence that using

the same peak flow meter between patients poses a significant hazard. European directives limit the use of medical devices to single patient use to reduce the risk of infection and the possibility of disease transmission, such as variant Creutzfeldt-Jakob disease; however a medical device can range from a sphygmomanometer to a walking stick⁴. The Medical Devices Agency have stated that single patient use devices must not be reused under any circumstance⁵ and that re-use of single-patient use devices has legal implications. However, an anomaly exists and peak flow meters that are not prescribed under Drug Tariff specification do not have to be labelled 'single patient use'.

Practical example

Consider the following fictitious, but possible, case history:

Picture the following scenario.

"A patient was seen in a GP surgery suffering from an acute asthma attack. Peak flow readings were not recorded because the peak flow meter had been used by another patient that morning. No replacement meter was available. The patient was soon beginning to feel a bit better having had several doses of short acting bronchodilator. The doctor and nurse agreed to discharge the patient home. Unfortunately, they did not appreciate the severity of the attack because no objective measure of lung function was available.

The patient was found dead later that day as a result of an acute asthma attack"

This sort of scenario is possible and the consequence for patients and health professionals significant.

Where would the medico-legal responsibility rest?

We must of course reduce the risk of infection but we do need an alternative, practical, common sense ruling from the authorities on this matter. Clement Clark (Mini-Wright Peak Flow Meter) has published pragmatic information for the care of devices in health care setting⁶. Could these instructions form the basis of further discussion?

Extending the argument, the potential for infection exists for placebo inhaler devices too; it is considered good practice to check patients' inhaler device technique.

There are significant cost implications to practice and trusts if all asthma patients are supplied with their

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own peak flow meter. However, a case could be made for certain special situations and patients. For example, people with severe asthma, previous hospital admission due to asthma and those requiring frequent courses of oral steroids are amongst those who may benefit from having their own meter. The other group of patients are those in whom a diagnosis of asthma is suspected and a two week home peak flow diary is considered necessary in order to decide whether to initiate long term therapy. For some patients peak flow monitoring can be a tedious chore and symptom monitoring may be more appropriate if additional information is required.

We need to acknowledge EC legislation about medical devices and the importance of reducing infection risks, to ensure patient care is not compromised. However a balanced view considering cost and benefit to the patient and the health service is required, supported by good research evidence. ■

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This is a personal view and may not necessarily reflect the views of other health professionals

Peak flow meter manufacturers comment - single patient use Clement Clarke International Limited

Jon Bel

Clement Clarke has recognised the growing concern from healthcare professionals regarding risk of cross-infection when using these devices.

The "Mini-Wright" was developed in the late 1970s to offer a low-cost, portable alternative to the Original peak flow meter - the Wright meter - which was increasingly being used by healthcare professionals to measure PEF in clinics around the world. To address the need to measure many patients each day, the newly designed "Mini-Wright" incorporated a one way, exhalation-only valve. For over twenty years it has been the only PEF meter that has protection against the patient inhaling through the meter.

In 1987 a petition by Respiratory Consultants for patients to be prescribed their own meter was sent to the Department of Health, followed up with one from the Asthma Society (now the National Asthma Campaign), resulting in the peak flow meter becoming a reimbursable item in October 1990. The requirement was such that meters were to be labelled "For Single Patient Use".

Peak flow meters have continued to be used in clinics for baseline, periodic assessment or for assessing severity during acute asthma attacks, with healthcare professionals taking responsibility for the cleaning of the device, and minimising risk of cross-infection during use. (Full guidance is available on request from Clement Clarke)

Whilst both Standard and Low Range Mini-Wright retain their one-way valves to this day, the requirement for prescription labelling now puts them into conflict with the MDA advice⁶ which states "Do NOT reprocess

devices designated for single-use only"

Clement Clarke has approached various Authorities for discussions, but no consensus exists. Until such time as it does, the following points should be considered

Should the patient be given his or her own personal meter

Wherever possible, yes. For several years asthma guidelines have highlighted the benefits of self management plans, and the new BTS Guideline detail the value of individual patients having their own device.

Whether the device is provided in the Hospital or the Community, the cost to the Health Service is no more than £6.97 for a new meter - a precision medical device that has a three-year lifespan.

At least one UK Hospital has been advised that immediate prescription of "one-per-patient" cannot be authorised on financial grounds, and that it will only be possible from March 2003. In the meantime regular cleaning and disposable mouthpieces have been recommended to ensure Mini-Wrights can still be used in Respiratory Clinics, on the Wards and in A&E departments

To date, no data has been presented that quantifies the costs associated with cleaning peak flow meters

What procedure should be adopted when using Mini-Wright in the Clinic setting

Mini-Wright peak flow meters have one-way valve

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