Wheeze Rate – A New Paradigm in Asthma Management

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### What You Should Expect from a Personal WheezoMeter™

Simon. Godfrey, MD, PhD, FRCP, FACP
Chairman, Scientific Advisory Committee, Karmelsonix, Ltd.

The Personal WheezoMeter™ is a handheld device that records breath sounds over 30 seconds, and uses sophisticated algorithms to extract the proportion of that time during which wheeze is present in the recording; the Wheezo Rate, Tw/Ttot %. In order to understand the place of the Personal WheezoMeter in the management of asthma and the interpretation of the data it provides, it is essential to take into account a number of important issues which are the subject of this document.

### Wheeze and depth of breathing.

The Personal WheezoMeter™ was deliberately designed to record breath sounds during normal quiet breathing in order to make the data collection as standardized as possible and avoid artifacts produced during forced expirations. In normal clinical practice the physician listens to the breath sounds during normal breathing but will then often ask the patient to breathe more deeply in order to detect adventitious sounds which were not evident during quiet breathing. In a recent study Sugimura et al. showed that asking young children with cough but no wheeze to blow as a pinwheel enabled the clinician to hear wheeze and apply appropriate treatment. However, forced expiration can produce wheeze even in normal subjects and in any case many young children for whom the Personal WheezoMeter™ is an ideal tool cannot expire forcibly.

This means that the physician using the WheezoMeter™ in the correct fashion should not expect it to detect wheeze which the physician only hears when the patient breathes forcibly.

### Relationship between Wheeze and FEV₁

Where wheeze in asthmatic subjects only occurs when airways are constricted enough to cause flow limitation and under these circumstances conventional tests of lung function such as the measurement of the forced expiratory volume in one second (FEV₁) show an obstructive pattern. What is far from certain is how much the FEV₁ has reliably expired forcibly. The great advantage of the Personal WheezoMeter™ is that it provides immediate real-time information on the severity of wheeze which is displayed for the patient to see and also stored for later review by the physician. The following is a brief outline of a few of the obvious clinical uses of the WheezoMeter™.

#### Clinical uses of the Personal WheezoMeter™ as an ‘asthma thermometer’.

At the present time there are a number of situations in which the Personal WheezoMeter™ can provide useful information for the management of the asthmatic patient. This is most obvious for children who are too young to undertake tests of lung function reliably but it is also appropriate for adults who are unfamiliar with performing lung function tests or unable to perform them reliably. The great advantage of the Personal WheezoMeter™ is that it provides immediate real-time information on the severity of wheeze which is displayed for the patient to see and also stored for later review by the physician. The following is a brief outline of a few of the obvious clinical uses of the WheezoMeter™.

1. The physician is unsure of diagnosis from the account of the carer (or patient) in a child (or adult) with attacks of noisy breathing separated by symptom free intervals. Using the Personal WheezoMeter™ whenever the patient is symptomatic for a week or so provides the physician with an objective measure of the presence and severity of wheeze.

2. The carer (or patient) with known asthma is unsure of the severity of an attack and whether to trial a bronchodilator, call their physician, or go to ER. Measurement of wheeze rate and the way this changes in response to the inhalation of a bronchodilator can greatly improve the decision making process. At the present time the implications of a particular wheeze rate are not yet available and may vary from patient to patient (as does PEF). In general terms: Tw/Ttot <5% trivial; 5-20% moderate; >20% severe. Absence of wheeze with obvious respiratory distress may mean silent chest and implies very severe airways obstruction.

3. Following an unscheduled visit to the ER or an admission to hospital for an acute attack of asthma it is desirable to follow up the pulmonary status of the patient for a week or so to ensure resolution of the attack or to instigate additional treatment at the earliest possible time. In children or adults unable or unwilling to make measurements of lung function in the home, the use of the Personal WheezoMeter™ on a regular basis 3-4 times daily plus as needed measurements when feeling unwell, provides such information.

4. Similarly, in children (or adults) with brittle asthma who have frequent unscheduled visits to a physician or ER, the continuous use of the Personal WheezoMeter™ for 2-4 weeks on a regular basis 3-4 times daily plus as needed measurements when feeling unwell provides an objective data on the pattern of the asthma and the way it responds to treatment.

#### Reference List


For further information and details, contact Karmelsonix on (02) 9634 4876

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