

Association of Paediatric Anaesthetists of Great Britain and Ireland

Statement on Paediatric Filters and Breathing Systems

There has been controversy and confusion concerning the re-use of paediatric breathing systems. Anaesthesia breathing systems may be re-used where an efficient breathing system filter protects the circuit from possible contamination; however, the circuit itself must be designated as re-useable, by the manufacturer. This is the current situation with adult breathing circuits, which may be re-used for up to a week when used with a new and appropriate adult breathing filter for each patient.¹

There are many paediatric breathing systems which are designated as “single use only” by the manufacturers: this is usually displayed on the packaging. However, there are a few paediatric circuits where re-use is permitted, provided that a new filter with an appropriate specification and performance is employed for each patient.

Last year, the Medicines and Healthcare products Regulatory Agency (MHRA) published the results of tests on over 100 different filters (adult, paediatric and neonatal). These suggested that paediatric filters may have greater penetrance than their adult counterparts when using a test that measured the penetration of sodium chloride particles, at pre-set flows.² It was therefore suggested that paediatric filters, by virtue of their smaller internal volume, may be less efficient than adult filters, with the consequent risk of transmission of infective agents through the device.³

Although this work was conducted in accordance with the European Standard, there has been some criticism of the conditions under which paediatric filters were tested in the above report. Accordingly, Dr Neil Bennett and Dr Robert Bingham, representing the Association of Paediatric Anaesthetists, met recently with representatives of the Association of Anaesthetists of Great Britain and Ireland and the MHRA. The APA pointed out that most of the paediatric filters with higher measured penetration values were designed for use in small infants and neonates only. Although a reduced gas flow was used compared to the adult tests (151/min instead of 301/min), the reduction was by 50% only and would therefore only be valid for filters intended for use in children with weights approximately 50% those of adults. These flow rates would result in an unfair and inappropriate comparison when testing those filters used during anaesthesia in smaller children and particularly infants and neonates.

As a result, the Association of Anaesthetists is in discussion with the manufacturers of both paediatric filters and circuits; furthermore, in an attempt to provide more information it has been proposed that the tests on paediatric and neonatal filters should be repeated using more appropriate gas flow rates. It is hoped that this new information might help in the development of more reliable performance criteria.

In the meantime, there is insufficient new evidence to make any recommendations about current practice. However we must warn that, **in the absence of a written local policy to the contrary, re-use of single-use equipment, even with a filter, remains the responsibility of individual practitioners.** It is therefore essential to have a departmental policy, agreed by the local clinical governance mechanism, concerning the re-use of such items of equipment, when they are used in conjunction with filters. The policy should take into account the size of the patient, the specification of the filter and the existing evidence.

References

1. Checking Anaesthetic Equipment 3. London: The Association of Anaesthetists of Great Britain and Ireland, 2004 (<http://www.aagbi.org>).
2. Wilkes A. Breathing System Filters: an assessment of 104 breathing systems filters. MHRA Evaluation 04005. March 2004 (<http://www.medical-devices.nhs.uk,2004>).
3. Association of Anaesthetists of Great Britain and Ireland. Members News, 15th January 2004 (<http://www.aagbi.org>).

Neil Bennett
Robert Bingham
January 2005