The ‘swoosh’ test—an evaluation of a modified ‘whoosh’ test in children

Editor—We were interested to read the paper by Orme and Berg regarding the use of the ‘swoosh’ test during placement of caudal block in children. However, we feel that they failed to state clearly the important clinical conclusions that should be drawn from the results of their testing.

They rightly claim an impressive specificity of 100% for their swoosh test with no false-positive results, giving a positive predictive value of 100%. However, while they mention the sensitivity as 90.7%, they do not identify the negative predictive value, which was only 33%. This large difference is due to the high success rate of the block (the pre-test probability), and is why predictive values should be quoted in such papers as they lead to easier clinical interpretation. For this test, the predictive value identifies that for every three cases with a negative test, two of them will have correctly sited caudal blocks.

When assessing a clinical test, the relative importance of false positives and false negatives should be considered. Having no false-positive rate may not be ‘a highly desirable characteristic for a diagnostic test’ as the authors suggest, if it is at the expense of a potentially dangerous false-negative rate. A false positive for this test might lead to a failed block requiring supplementary intra- and postoperative analgesia. In terms of patient safety, however, this test’s poor performance for a negative result is more important, as a false negative might lead the unwary clinician to provide a second intra-caudal dose of local anaesthetic, or, less seriously, to needlessly reposition the cannula if saline was used.

The results of clinical judgement, which they report were unaffected by reducing this test to the presence of loss of resistance on piercing the sacrococcygeal membrane, would appear to perform much better, with a sensitivity and negative predictive value of 100%. The positive predictive value is still excellent at 99.1%, and hence we would suggest that their results would support the value of clinical assessment for caudal placement in children.

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Editor—We thank Drs Esler and Randhawa for their comments regarding the use of the ‘swoosh’ test as an aid to caudal extradural analgesia in children.

They are, of course, correct in stating that the negative predictive value of the swoosh test was only 33%. This is a consequence of the high success rate for caudal analgesia that is well established in this group of patients. However, we disagree that a false-negative result for this test is potentially dangerous.
since this would only arise if an anaesthetist was prepared to exceed the maximum recommended dose of local anaesthetic solution.

Since the accuracy of the swoosh test is comparable to clinical assessment, our recommendation is that this test should not replace clinical judgement but provide additional corroborative evidence to guide clinical placement. As originally stated, we feel that the test is particularly useful as a teaching aid and for the technically difficult caudal when clinical assessment has been equivocal—a positive result in the case of the latter would provide strong reassurance of a correctly placed cannula. We also feel that the saline modification of this test requires further investigation, since the ability to safely inject saline at a faster rate than local anaesthetic may improve the negative predictive value of the swoosh test.

There is now a short audiovisual clip available on our departmental website (http://www.nda.ox.ac.uk), detailing and illustrating this technique.

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