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## **Force magnitude applied by orthodontists. An inter-and intra-individual study**

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### **ABSTRACT**

The aim of this investigation was to study the magnitude and variation of forces routinely applied by different orthodontists for buccal tipping of premolars and canines in the maxilla, and also to compare these forces with the individually considered ideal force. Nineteen clinically experienced orthodontists were asked to bend and activate sectional arch wires on a plastic model with bands on the first molars. Round 0.016 Australian wires were used on one side and square 0.016 x 0.016 Blue Elgiloy wires on the other. The tests were repeated a second time 3-4 weeks later. The applied mean force magnitude was 48.4 cN (g) for premolars and 40.0 cN for canines, with a considerable intra-individual variation (range 25-75 cN, and 21-62 cN) using the round Australian wire. In general, the activation of the square wire resulted in a higher force, mean difference 29 per cent (11.4 cN) for canines and 23 per cent (11.1 cN) for premolars when compared with the round wire. On each side, the shorter wire for premolars was activated with a higher force when compared with the longer canine wire, mean 16 per cent (8.0 cN) for the square wire and 21 per cent (8. cN) for the round wire. Sex, age and clinical experience had no major influence on the applied force magnitude. On average, the orthodontists considered an ideal force for tipping of canines and premolars to be mean 62.5 cN (range 30-100 cN) and mean 56.1 cN (range 30-100 cN) respectively. They also reported that a strain gauge was not often used in everyday clinical practice. This study showed substantial differences between applied forces and considered ideal forces. It is suggested that regular checks of the force magnitude should be performed in situations where a certain force is considered important.

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