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## Force generation by orthodontic coil springs

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### ABSTRACT

Nickel titanium (NiTi) coil springs are a new development in orthodontics, designed to produce light continuous forces. This study compares the force delivery by NiTi open and closed coil springs during unloading (de-activation) to that provided by comparable stainless steel (SS) springs.

Open-coil springs (0.010×0.035 inch) were compressed from their initial length of 15 mm to 6 mm and the forces generated with spring recovery recorded. Closed-coil springs (0.009×0.035 inch) were distracted from their initial length of 3 mm to 9 mm and the force recorded as the spring recovered.

The closed-coil NiTi springs produced light continuous forces of 75–90 g over the distraction range of 6 mm while the open-coil springs produced forces of 55–70 g within the 9 mm compression range. SS springs produced heavier forces, ca. 200 g, for an activation of 1 mm and the generated force increased rapidly as the activation was increased. The findings indicate that NiTi coil springs deliver optimal forces for orthodontic tooth movement over a longer activation range than comparable SS springs.

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