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## Closed Kinetic Chain Terminal Knee Extension Using a Padded Elastic Band

Neil Curtis, EdD, ATC

Lower extremity closed kinetic chain exercises are commonly performed by athletes during rehabilitation of knee injuries and are often integrated early in the rehabilitation progression.<sup>1,2,4</sup> The standing terminal knee extension using resistance is a closed kinetic chain exercise often used in knee rehabilitation programs.<sup>2-4</sup> Einhorn et al<sup>2</sup> describe this exercise using an elastic band for resistance. Other authors<sup>2,4</sup> describe the exercise using surgical tubing for resistance. When a Theraband (The Hygenic Corporation,

Akron, OH) elastic band is used to perform the terminal knee extension exercise, it often rolls or bunches behind the knee in the popliteal space (Fig 1) causing discomfort. This makes performing the exercise more difficult. I have found that applying a foam pad to the Theraband reduces the bunching behind the knee and allows the athlete to perform the standing terminal knee extension more comfortably. Anecdotal reports from athletes indicate that using the padded elastic band is more comfortable than using the elastic tubing alone when performing this exercise.



Fig 1. Theraband, without foam pad, bunched behind the knee.

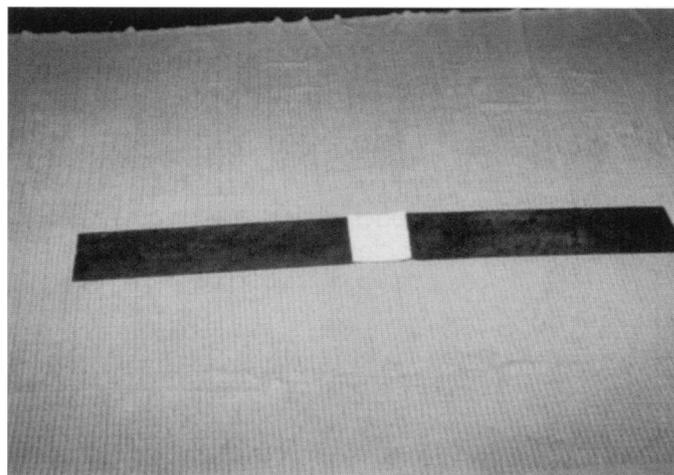


Fig 2. Foam pad attached to the center of a 60-inch black Theraband.

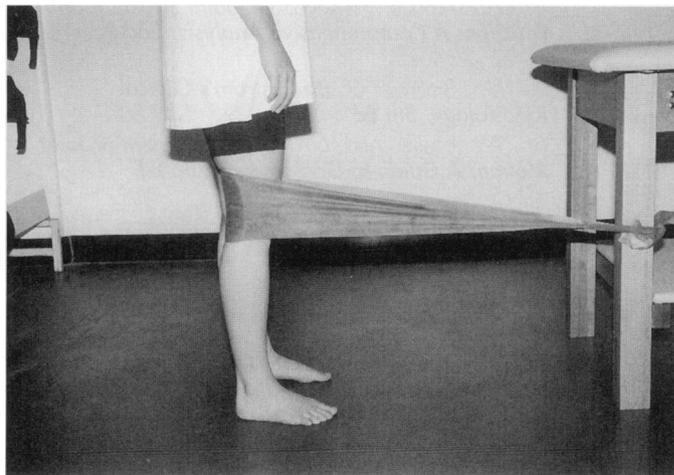


Fig 3. Position 1: pad behind extended knee.

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- Step 1: Select the appropriate resistance (color) Theraband and cut a 60-inch piece.
- Step 2: Cut a 6-inch square piece of 1/8-inch adhesive foam and adhere it to the center of the Theraband (Fig 2).
- Step 3: Tie the band securely to a treatment table leg.
- Step 4: Have the athlete position the foam pad behind the knee and perform the exercise (Figs 3 & 4).

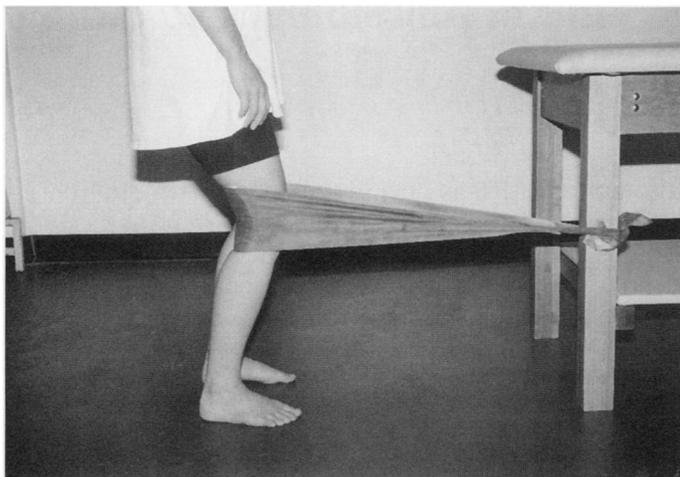


Fig 4. Position 2: flex the knee to about 30°, then return to Position 1 and repeat.

Protocols should be determined according to the athlete's stage of rehabilitation and should be modified as the athlete progresses. The closed kinetic chain terminal knee extension can easily be incorporated into an athlete's home rehabilitation program. To make the exercise more challenging, you can increase the number of repetitions, increase the tension on the elastic band, and/or use a higher resistance Theraband color.

#### ACKNOWLEDGMENTS

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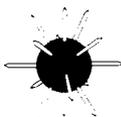
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