

Chung-M10-Toe-Touch-Assessment

The toe-touch assessment (TTA) has been used to assess the low-back, hips, and hamstring extensibility (Rice, Kaliszer, Walsh, Jenkinson, O'Brien, 2004). Decreased hamstring flexibility/extensibility has been associated with (but not limited to) hamstring injuries, low-back pain, patella tendinopathy, changes in lumbopelvic rhythm, greater thoracic kyphosis, spondylolysis, spondylolisthesis, and gait issues (Ayala, Sainz de Baranda, De Ste Croix, & Santonja, 2012a; López-Miñarro & Rodríguez-García, 2010; Mayorga-Vega, Viciano, Cocca, & Merino-Marban, 2014; Muyor, Vaquero-Cristóbal, Alacid, & López-Miñarro, 2014).

Procedure

- Video (http://www.mytpi.com/articles/screening/the_toe_touch_test) (Rose, 2013).
- The client should stand on a level surface, feet together, aligned and pointing forward.
- With minimal cueing, ask the client to bend forward with straight knees and try to touch their toes (Cook, 2010).
- Observe the client's strategy (Cook, 2010; OTP, n.d.).
 - Insufficient posterior weight shift (PWS)
 - Stiff/rigid cervical/thoracic spine/lumbar spine
 - Lack of normal forward spinal flexion (TT with a straight/"deadlift" back)
 - Hips compensations
 - Weight/body shifts/asymmetries
- If the client is unable to perform a bilateral toe-touch (TT), have the client perform a left and right unilateral (grounded leg) TT. "Remove" the contralateral leg by having the client assume a bent-leg, toe-tap position (or place a low step under the contralateral leg) (Rose, 2013).
- If the client is unable to perform the TTA, proceed to the Functional Movement Systems (FMS) active straight-leg raise (ASLR) (Cook, 2010; OTP, n.d.). ASLR at or greater than 80° indicates an issue likely above the waist (conduct further testing). ASLR less than 70° indicates an issue likely below the waist (but does not rule out above the waist, conduct further testing) (OTP, n.d.).
- Always fix the ASLR first; if the ASLR is perfect and the client still cannot TT, then try the TT progressions (Cook, 2003; OTP, n.d.). Video <https://youtu.be/zmvqOdb4XhY> (Finan, 2015).
- For more information:
http://www.functionalmovement.com/exercises/toe_touch_progression (FMS, n.d.)

<https://www.youtube.com/watch?v=n7l4iW5N41M> (Draper & OTP, 2013)

http://www.functionalmovement.com/articles/Podcasts/112/why_i_do_the_toe_touch_progression_on_stage (FMS, 2015)

<http://www.ericcressey.com/mobility-exercise-of-the-week-left-stance-toe-touch> (Cressey, 2013)

Clinical Utility

For testing hamstring extensibility/flexibility, the passive straight leg raise (PSLR) is considered the gold standard for most populations (athletic, non-athletic), but it may not be the most economical (e.g. requiring time and skilled clinician) assessment (Muyor et al., 2014). Muyor et al. (2014) found that PSLR remained the gold standard (as compared to sit-reach, SR, and TT; SR and TT showed low-moderate criterion validity (CV); and TT was slightly better in CV than SR test (Hulsteen et al., 2015; López-Miñarro & Rodríguez-García, 2010). Ayala, Sainz de Baranda, De Ste Croix, and Santonja (2012b) found that PSLR, SR, and TT demonstrated clinically-acceptable test-retest reliability.

Factors that influenced TT included: anthropomorphic characteristics (e.g. posture, spinal adaptations), degree of thoracic kyphosis, lumbar flexion, trunk/hip flexibility, lumbopelvic complex (LPHC)/pelvic tilt, joint flexibility factors (Ayala et al., 2012b; Muyor et al., 2014).

The advantage of SR and TT (over PSLR) is that they are easy to conduct in variable environments with minimal assessor training and especially efficient with large-group settings (López-Miñarro & Rodríguez-García, 2010). While PSLR is preferable, SR and TT provide adequate qualitative information on hamstring flexibility/extensibility; TT may be more economical as a quick "progress" estimation as opposed to a direct measure of hamstring extensibility (Ayala et al., 2012b; Mayorga-Vega et al., 2014).

Description/Evaluation

Because the TTA is a total-body movement pattern (MP), it is not a good direct test of hamstring extensibility. Biomechanically, forward flexion features simultaneous movement of the lumbar spine, LPHC, and plantar flexion of the ankle; extension features simultaneous movement of the lumbar spine, LPHC, and dorsiflexion of the ankle (Rice, Kaliszer, Walsh, Jenkinson, & O'Brien, 2004).

However, TT is an important primitive movement pattern (MP) involving the central nervous system (CNS) and coordinated whole-body-effort that is used in activities of daily living (ADL); TT competency is particularly important in loaded situations (Draper & OTP, 2013; FMS, 2015). While stiffness can be functional, maintaining normal mobility is important; challenging mobility without adequate reinforcement stability work, may cause the body to "protectively" resort to stiffness as a compensation (Draper & OTP, 2013). For example, if a client does not have a natural PWS in TTA due to poor patterning, the hamstrings and low-back may contract (feel "tight") to prevent falling forwards (lack of control, competency, and integrity upon trunk

flexion) (FMS, 2015). The client may be re-patterned via TT progressions that retrain appropriate PWS, coordination, reciprocal inhibition, and using the core (vs. legs) for stabilization (FMS, 2015). Cook noted that in many cases a poor TT was due to inappropriate firing [muscles], poor mobility/stabilization, and a poor CNS pattern as opposed to blaming the hamstrings for an entire faulty MP (FMS, 2015).

The author would use TT to assess MP competency as opposed to hamstring extensibility. A good TT should be a prerequisite to deadlifting and kettlebell work (or other loaded MP).

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