Supplemental Table 1. Critical Appraisal Skills Programme Criteria

The following criteria for each question must be fulfilled to be awarded a point for that question:

Q1. Did the study address a clearly focused issue?
- “Focused” in terms of
  - The population studied
  - The risk factors studied
  - The outcomes considered
- Is it clear whether the study tried to detect a beneficial or harmful effect?

Q2. Were the cases recruited in an acceptable way?
- Precisely defined cases
- Specific inclusion criteria
- Representative of defined population

Q3. Were the controls selected in an acceptable way?
- If the study compared injured and noninjured sides, controls are acceptable
- If the study compared AT and healthy controls:
  - Their participant characteristics must not significantly differ from each other

Q4. Was the exposure accurately measured to minimize bias?
Look for measurement or classification bias:
- Did they use subjective or objective measurements?
- Do the measurements truly reflect what you want them to (have they been validated)?
- Were all the participants classified into exposure groups using the same procedure?

Q5. Was the outcome accurately measured to minimize bias?
Look for measurement or classification bias:
- Did they use subjective or objective measurements?
- Do the measures truly reflect what you want them to (have they been validated)?
- Has a reliable system been established for detecting all the cases (for measuring disease occurrence)?
- Were the measurement methods similar in the different groups?
- Were the participants and/or the outcome assessor blinded to exposure (does this matter)?

Q6. Have the authors taken account of the potential confounding factors in the design and/or in their analysis?
- This depends on each paper (eg, use of same physiotherapist for assessment, assessment protocol outlined, details on practice effects, controlling anything that may affect findings [pain])

Q7. What are the results?
- This is mainly a guidance question; therefore, no point to be awarded for this question.

Q8. How precise are the results?
- Inclusion of
  - Actual values
  - *P* values
  - 95% confidence intervals

Q9. Do you believe the results?
- Methods and design were appropriate
- Confounding factors were addressed

Q10. Can the results be applied to the local population?
- Population correlates with our population of interest
- The measurement tool they used is available to us/widely available

Q11. Do the results of this study fit with other available evidence?
- If there are no available studies with similar measurements, they get no point.

- If there are other available studies with similar measurements, they get a point.

Q12. What are the implications of the study for practice?

- This is mainly a guidance question; therefore, no point to be awarded for this question.

Abbreviation: AT, Achilles tendinopathy.

Supplemental Table 2. Justification for Providing the Score for Each Critical Appraisal Skills Programme Question

Authors and Design	Focused Issue	Appropriate Method	Acceptable Recruitment	Acceptable Controls	Exposure Accurately Measured	Confounding Factors	Results	How Precise Are the Results?	Do You Believe the Results?	Applied to Local Population	Fit With Other Evidence
Alfredson et al[1] (1998)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured sides preoperatively.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Reliability was established in previous papers.	✓ All tests were done at the same time of day to prevent diurnal variation. All tests were measured by the same PT.	Conc PF peak torque at 90°/s and 225°/s and Ecc PF at 90°/s were lower on the injured than uninjured side.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, recreational athletes/ runners). Measurement tool used was available to us.	✓ Findings from this study were consistent with those of other articles.
Alfredson et al[2] (1998)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured sides at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the cases. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Good reliability was stated for some measurements.	✓ All tests were done at the same time of day to prevent diurnal variation. All tests were measured by the same PT.	Conc PF peak torque at 90°/s and 225°/s and Ecc PF at 90°/s were lower on the injured than uninjured side.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, recreational athletes/ runners. Measurement tool used was available to us.	✓Findings from this study were consistent with those of other articles.

Alfredson et al[3] (1998)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured sides (for 2 AT groups) preoperatively and at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Good reliability was stated for some measurements.	✓ All tests were done at the same time of day to prevent diurnal variation. All tests were measured by the same PT. Strength tests were done with the ankle joint positioned to prevent pain from affecting the values.	Surgical group: Conc PF peak torque at 90°/s and 225°/s and Ecc PF at 90°/s were lower on the injured than uninjured side. Ecc training: Conc PF peak torque at 90°/s and 225°/s and Ecc PF at 90°/s were lower on the injured than uninjured side. Ecc training: Conc PF average work at 90°/s and 225°/s was lower on the injured than uninjured side. Ecc PF at 90°/s average work was not different.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, recreational athletes/ runner). Measurement tool used was available to us.	✓ Findings from this study are consistent with those of other articles.
Alfredson et al[4] (1996)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured sides preoperatively.	× The AT group was precisely defined. No inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Good reliability was stated for some measurements.	✓ All tests were done at the same time of day to prevent diurnal variation. All tests were measured by the same PT. Strength tests were done with the ankle joint positioned to prevent pain from affecting the values.	Conc peak torque at 225°/s of PF and 90°/s of DF were lower on the injured than uninjured side. Ecc PF peak torque/total work was not different. Conc PF total work at 90°/s and 225°/s and Conc DF total at 90°/s were lower on the injured than uninjured side.	× 95% CIs were not included.	✓ The design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, recreational athletes/ runners). Measurement tool used was available to us.	✓ The findings from this study were consistent with those of other articles.

Azevedo et al[6] (2009)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared GRF between the injured and asymptomatic groups at baseline.	✓ Representative of the defined population.	✓ The control was asymptomatic controls matched to the AT group.	NA	✓ Detailed measurement protocol was provided.	Results were mixed for GRF between the injured and asymptomatic control groups.	× 95% CIs were not included.	✓ Design and methods were appropriate.	✓ Participants were consistent with our population (eg, runners). The Measurement tool used was available to us.	✓ Findings from this study were consistent with those of other articles.
Baur et al[7] (2004)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared GRF between the injured and uninjured sides and asymptomatic group at baseline.	× Adequate details on inclusion and exclusion criteria were not provided.	× Details of control-group's sex were not provided.	NA	✓ Detailed measurement protocol was provided.	No difference existed in vertical GRF between the control and AT groups.	✓ Results included actual values and *P* values. Mean differences and 95% CIs were included.	✓ Design and methods were appropriate.	✓ Participants were consistent with our population (eg, runners).	✓ Findings from this study were consistent with those of other studies.
Becker et al[8] (2017)	✓ Population and measure of interest were clearly specified.	✓ Cross-sectional design was appropriate, as this study compared GRF between the injured and uninjured sides and asymptomatic group at baseline.	× The AT group was precisely defined. No inclusion criteria were given.	✓ Age- and activity-matched control group.	✓ Exposure and measurement tools were clearly defined. Methods were specified.	✓ Detailed measurement protocol was provided.	No difference existed in vertical GRF between the control and AT groups.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, recreational athletes/ runners). Measurement tool used was available to us.	✓ Findings from this study were consistent with those of other articles.

Child et al[9] (2010)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured groups at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control group was defined precisely. The control group was not different from the AT group in age, height, mass, or running distance/wk.	× Exposure and measurement tools were clearly defined. Methods were specified. Reliability was stated. For those with bilateral symptoms in the AT group, the study did not mention which limb was tested.	✓ Patients were instructed not to exercise the day before the specified testing. Only men were chosen, as female hormones would affect the results. The knee and ankle were positioned to minimize ankle-joint rotation and, therefore, measurement error.	✓ No between-group differences existed for maximal isometric PF force	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	× Participants were consistent with our population (eg, recreational runners). Measurement tool they used is not available to us.	× No differences existed for maximal isometric PF force; however, actual values indicated that the AT group had more force than the control group. No other evidence is available to support this finding.
Firth et al[10] (2010)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared hopping distance between the injured and uninjured groups at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	× The control group was a convenience sample and was not matched to the AT group by age or sex.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Good reliability was stated.	✓ Clearly defined successful attempts. To reduce practice effects, the participants were allowed to practice until they were happy.	Hopping distance in the AT group was lower than the healthy group.	× 95% CIs were not included.	× Methods were not appropriate for selecting controls.	✓ Participants were consistent with our population (eg, runners). Measurement tool used was available to us.	✓ This findings from this study are consistent with other studies for hopping distance.

Grigg et al[10] (2013)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared GRF between the injured and asymptomatic groups at baseline.	✓ Representative of the defined population.	✓ The control group was asymptomatic controls matched to the symptomatic patients.	✓ Exposure and measurement tools were clearly defined. Methods were specified.	✓ Exercise sessions were conducted at a standard time of day. Physical activity beyond activities of daily living was controlled for 24 h before study. Two exercise sessions were separated by washout period of 4–7 d to ensure full recovery.	Results indicated mixed results in relation to GRF between the injured and asymptomatic controls.	× 95% CIs were not included.	✓ Design and methods were appropriate.	✓ Participants were consistent with our population (ie, athletes with AT).	✓ Findings of inconsistent results from this study were consistent with other studies investigating GRF variables.
Haglund-Åkerlind and Eriksson[11] (1993)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured groups at baseline.	× The AT group was not precisely defined. No inclusion criteria were given. No objective criteria indicating their definition of *AT* were given.	× Randomly selected. No differences existed between the AT and control groups in age, height, and mass; however, years trained and distance/ wk were different.	× Exposure and measurement tools were clearly defined. Methods were specified. Tool reliability was not mentioned.	✓ Tests were accepted only when reproducibility was good. Two trials were done at each velocity before the test.	Ecc PF muscle torques at 30°/s, 60°/s, 120°/s, and 180°/s were lower in the AT than healthy group. No differences in Conc PF torques at any velocity between groups.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, runners). Measurement tool used was available to us.	× No other evidence supported the finding; velocities used did not compare with those of other studies.
Maquirriain[12] (2012)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared jump height, contact time, and flight time between the injured and uninjured sides at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Tool was validated.	✓ Participants were allowed to get used to hopping at the preferred frequency. The first limb examined was randomized.	Maximal jump (height, contact time, flight time) was negatively affected on the injured side but was not different.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	× Participants were consistent with our population (eg, active athletes). Measurement tool used was not available to us.	× No other evidence supported the findings.

Masood et al[13] (2014)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured groups at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The controls were defined precisely, as they were anthropo-metrically matched with the AT group.	✗ Exposure and measurement tools were clearly defined. Methods were specified. Tool reliability was not mentioned.	✓ All tests were done on a single day. Participants were familiarized with the equipment.	Maximal PF force was greater in the uninjured than injured group.	✗ 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✗ Participants were consistent with our population (eg, recreational athletes/ runners). Measurement tool used was not available to us.	✗ No other researchers used the same method, so it cannot be compared with other studies.
Mayer et al[14] (2007)	✓ Population and measure of interest were clearly specified.	✓ Randomized controlled trial compared strength measures at baseline and at follow-up between the injured and uninjured sides in participants with AT.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group.	✗ Exposure and measurement tools were clearly defined. Details on isokinetic protocol were lacking.	✗ All tests were done on a single day. Participants were familiarized with the treadmill-running assessment, but no details were provided on familiarization or confounding variables for strength assessment.	Maximal PF force was greater in the uninjured than injured group.	✗ 95% CIs were not included.	✓ Design and methods were appropriate.	✓ Participants were consistent with our population (eg, runners).	✓ Findings were consistent with those of other articles.
McCrory et al[15] (1999)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured groups at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✗ The control group was a healthy population with no injuries. The control group was not different from the AT group in age, height, or mass. Fewer AT group participants than controls were included.	✗ Exposure and measurement tools were clearly defined. ethods were specified. Reliability was not mentioned.	✓ The first limb tested was randomized. To keep testing procedures uniform among participants, no encourage-ment was given.	DF peak torque at 60°/s, DF peak torque to body weight ratio at 60°/s, and PF peak torque at 180°/s were muscular strength discriminators.	✗ 95% CIs were not included.	✗ Design was appropriate. However, the methods were not rigorous, as the study included fewer AT group participants than controls. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, runners). Measurement tool used was available to us.	✗ No other evidence supported all the findings.

Öhberg et al[16] (2001)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured sides at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Methods were specified. Good reliability was stated for some measurements.	✓ All tests were done at the same time of day to prevent diurnal variation. All tests were measured by the same PT.	Conc PF peak torque at 90°/s and 225°/s and Ecc PF at 90°/s were lower in the injured than uninjured side.	× 95% CIs were not included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population (eg, athletes/ runners). Measurement tool used was available to us.	✓ Findings from this study were consistent with those of other articles.
Silbernagel et al[17] (2006)	✓ Population and measure of interest was clearly specified.	✓ Case control was appropriate, as this study compared lower leg function between the injured and uninjured sides at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side; however, some controls were the "least symptomatic leg" and, therefore, representative of healthy controls.	✓ Exposure and measurement tools were clearly defined. Good reliability was stated for some measurements. The methods were specified.	✓ All tests were measured by the same PT. Tests were always performed in the same order, and 1 limb was always tested first to eliminate variations. Standardized instructions and practice trials were included.	Differences were reported between limbs for hopping, drop countermove-ment jump, Conc toe raises at 33 kg, and Ecc-Conc toe raises at 23 and 33 kg.	× 95% CIs were not included.	✓Design and methods were appropriate. Confounding factors were addressed.	× Participants were consistent with our population, as most injured the AT during exercise. Measurement tool used was not available to us.	× No other evidence supported the findings.
Wang et al[18] (2012)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared hopping distance between the injured and uninjured sides at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	× Exposure and measurement tools were clearly defined Methods were specified. Reliability was not mentioned.	✓ The study controlled for age, activity level, history of injury, and tendon injury. Approved trials were defined clearly (3 trials with no successive increases).	Hopping distance was lower on the injured than uninjured side.	✓ The results included actual values and *P* values. Mean differences and 95% CIs were included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population group (eg, runners/ athlete). Measurement tool used was available to us.	✓ Findings were consistent with those of Firth et al[10] for hopping distance.

Wang et al[19] (2011)	✓ Population and measure of interest were clearly specified.	✓ Case control was appropriate, as this study compared calf-muscle strength between the injured and uninjured sides at baseline.	✓ The AT group was precisely defined. Specific inclusion criteria were given. Representative of the defined population.	✓ The control was the uninjured side, so controls were matched to the AT group. The uninjured side represented healthy controls.	✓ Exposure and measurement tools were clearly defined. Good reliability stated for some measurements. The methods were specified.	✓ Participants were evaluated using the same sequences in subsequent measurements. The foot was fixed on a footplate to minimize variations in findings caused by changes in position or remote muscle activity.	Torque for the maximal voluntary isometric PF/DF torque was not different between limbs.	✓ The results included actual values and *P* values. Mean differences and 95% CIs were included.	✓ Design and methods were appropriate. Confounding factors were addressed.	✓ Participants were consistent with our population group (eg, runners/ athlete). Measurement tool used was available to us.	× Unlike other papers, no difference in maximal voluntary isometric PF/DF torque was found.

Abbreviations: AT, Achilles tendinopathy; PT, physical therapist; PF, plantar flexion; Ecc, eccentric; CIs, confidence intervals; Conc, concentric; DF, dorsiflexion; GRF, ground reaction force.

Supplemental Table 3. Characteristics and Results of Included Studies

Authors and Design	Participant Characteristics	Groups Compared	Strength Variable Investigated	Test	Result		Symptom Duration	Source of Funding or Support
					Study Group	Comparison Group		
Alfredson et al[1] (1998), prospective cohort study	N = 10 (5 Men, 5 women; age = 40.9 ± 10.9 y, height = 172.7 ± 9.7 cm)	Injured vs uninjured side	Maximal strength: isokinetic dynamometry	Conc PF peak torque 90°/s 225°/s Ecc PF peak torque 90°/s	 65.3 ± 17.5 32.3 ± 9.1 140.3 ± 44.2	 80.2 ± 21.6 38.5 ± 12.0 158.2 ± 40.4	30.9 mo	NS
Alfredson et al[2] (1998), prospective cohort study	N = 30 (23 Men, 7 women) Calf-muscle–strengthening group: n = 15 (12 men, 3 women; age = 44.3 ± 7.0 y, height = 176.3 ± 9.4 cm) Surgical group (preoperatively): n = 15 (11 men, 4 women; age = 39.6 ± 7.9 y, height = 175.5 ± 9.4 cm)	Injured vs uninjured side	Maximal strength: isokinetic dynamometry	Calf-muscle–strengthening group Conc PF peak torque 90°/s 225°/s Ecc PF peak torque 90°/s Surgical group (preoperatively) Conc PF peak torque 90°/s 225°/s Ecc PF peak torque 90°/s	 69.1 ± 24.6 30.9 ± 10.4 152.0 ± 57.4 70.8 ± 24.4 34.4 ± 15.3 146.3 ± 56.3	 78.6 ± 20.8 37.7 ± 10.3 171.1 ± 48.6 87.1 ± 21.6 45.1 ± 12.3 169.4 ± 48.0	28.6 mo	Stated
Alfredson et al[3] (1998), prospective cohort study	N = 11 (7 Men, 4 women; age = 40.9 ± 10.1, height = 172.5 ± 9.7 cm)	Injured vs uninjured side	Maximal strength: isokinetic dynamometry	Conc PF peak torque 90°/s 225°/s Ecc PF peak torque 90°/s	 64.7 ± 16.7 32.1 ± 8.7 135.8 ± 95.5	 80.1 ± 20.5 39.2 ± 11.6 157.4 ± 38.4	18.3 mo	NS
Alfredson et al[4] (1996), prospective cohort study	N = 13 (10 Men, 3 women; age = 44.1 ± 8.5 y, height = 175.6 ± 8.8 cm)	Injured vs uninjured side	Maximal strength: isokinetic dynamometry	Conc PF peak torque 90°/s 225°/s Ecc PF peak torque 90°/s	 76.3 ± 27.9 36.2 ± 17.4 155.9 ± 56.4	 86.1 ± 21.4 45.8 ± 14.0 161.7 ± 53.0	18.3 mo	Stated
Azevedo et al[5] (2009), case-control study	N = 42 (32 men, 10 women) AT group: n = 21 (16 men, 5 women; age = 41.8 ± 9.7 y, height = 177.8 ± 7.4 cm) Asymptomatic group: n = 21 (16 men, 5 women; age = 38.9 ± 10.1 y, height = 174.3 ± 8.0 cm)	Injured side vs asymptomatic controls	Explosive strength: GRF via a force plate	Horizontal and vertical forces normalized by BW using a standardized force plate (960 Hz) Horizontal breaking force, BW Horizontal propulsive force, BW Vertical impact force, BW Vertical loading rate, X BW/s Vertical propulsive force, BW	 0.20 ± 0.05 0.16 ± 0.04 1.45 ± 0.23 44.79 ± 11.27 2.18 ± 0.23	 0.21 ± 0.05 0.15 ± 0.02 1.34 ± 0.20 42.87 ± 9.31 2.19 ± 0.15	NR	Stated

Baur et al[6] (2004)	N = 22 (All men; age = 36 ± 9 y AT group: n = 8 Asymptomatic group: n = 14	Injured side vs uninjured side or asymptomatic controls	Explosive strength: GRF using a treadmill on 3-dimensional force transducers	GRF Vertical GRF Vertical impulse, BW% Passive peak, BW% Active peak, BW% Horizontal GRF Braking peak, BW% Pushing peak, BW% Braking impulse, BW% Pushing impulse, BW%	 AT barefoot = 35.12 ± 1.6 AT shoe = 36.12 ± 1.44 AT barefoot = 138.55 ± 18.24 AT shoe = 151.57 ± 13.73 AT barefoot = 240.8 ± 16.19 AT shoe = 240.48 ± 14.74 AT barefoot = −36.98 ± 4.49 AT shoe = −36.07 ± 3.49 AT barefoot = 30.61 ± 2.78 AT shoe = 28.17 ± 2.11 AT barefoot = −2.29 ± 0.27 AT shoe = −2.17 ± 0.21 AT barefoot = 2.19 ± 0.23 AT shoe = 2.09 ± 0.14	 Control barefoot = 34.05 ± 1.47 Control shoe = 36.58 ± 6.26 Control barefoot = 140.67 ± 23.93 Control shoe = 161.57 ± 15.03 Control barefoot = 234.37 ± 21.19 Control shoe = 237.74 ± 19.1 Control barefoot = −34.97 ± 4.08 Control shoe = −34.43 ± 3.47 Control barefoot = 29.96 ± 3.61 Control shoe = 27.01 ± 3.14 Control barefoot = −2.2 ± 0.14 Control shoe = −2.06 ± 0.18 Control barefoot = 2.06 ± 0.19 Control shoe = 1.95 ± 0.21	NR	NS
Becker et al[7] (2017), cross-sectional study	N = 26 (18 Men, 8 women) AT group: n = 13 (9 men, 4 women; age = 37.6 ± 15.9 y) Asymptomatic group: n = 13 (9 men, 4 women; age = 32.6 ± 12.4 y)	Injured side vs asymptomatic controls	Explosive strength: GRF via force-plate technology	Peak propulsive force, BW Propulsive impulse, BW*s Peak vertical force, BW	0.31 ± 0.08 0.21 ± 0.06 2.71 ± 0.22	0.29 ± 0.06 0.22 ± 0.05 2.62 ± 0.3	NR	Stated
Child et al[8] (2010), cross-sectional study	N = 29 (All men) AT group: n = 14 (age = 40 ± 8 y, height = 1.77 ± 0.06 m) Asymptomatic group: n = 15 (age = 35 ± 9 y, height = 1.78 ± 0.05 m)	Injured side vs asymptomatic controls	Maximal strength: isometric via customized calf-raise apparatus with a calibrated load cell	Isometric PF force, N	826.5 ± 246.8	755.6 ± 214.3	27 mo	Stated
Firth et al[9] (2010), cross-sectional study	N = 55 (21 Men, 34 women) AT group: n = 29 (17 men, 12 women; age = 44.5 ± 10.7 y) Asymptomatic group: n = 26 (4 men, 22 women; age = 27.6 ± 5.4)	Injured side vs asymptomatic controls	Reactive strength: single-legged hop test	Single-legged hop: hop distance, cm	87 ± 29	130 ± 29	NR	Stated
Grigg et al[10] (2013), cross-sectional study	N = 20 (All men) AT group: n = 11 (age = 48.2 ± 8.5 y) Asymptomatic group: n = 9 (age = 49.0 ± 10.3 y)	Injured side vs asymptomatic controls	Explosive strength: GRF via force-plate technology	GRF: recorded during an eccentric heel-drop movement using a force plate 7 Hz 8 Hz 10 Hz 11 Hz	 0.032 0.050 0.024 0.006	 0.022 0.035 0.067 0.024	10 mo	Stated

Haglund-Åkerlind and Eriksson[11] (1993), cross-sectional study	N = 20 (All men) AT group: n = 10 (age = 26.9 ± 5.7 y) Asymptomatic group: n = 10 (age = 24.0 ± 6.5 y)	Injured side vs asymptomatic controls	Maximal strength: isokinetic dynamometry	Conc PF muscle torque at 30°/s–60°/s and 120°/s–180°/s 30°/s 60°/s 120°/s 180°/s Ecc PF muscle torque at 30°/s–60°/s and 120°/s–180°/s 30°/s 60°/s 120°/s 180°/s	 92.2 ± 17.9 78.0 ± 12.6 58.1 ± 8.8 43.5 ± 7.0 122.4 ± 20.1 128.4 ± 22.7 118.6 ± 19.1 108.0 ± 16.9	 103.2 ± 8.5 84.2 ± 10.9 66.6 ± 12.8 50.2 ± 9.9 140.0 ± 15.2 149.4 ± 20.7 138.2 ± 18.2 127.7 ± 12.8	NR	Stated
Maquirriain[12] (2012), prospective cohort study	N = 51 (40 Men, 11 women) AT group: n = 51 (age = 39.8 ± 11.8 y)	Injured vs uninjured side	Reactive strength: single-legged hop	Single-legged hop: jump height, cm	11.48 ± 6.3	13.60 ± 6.5	5.7 wk	Stated
Masood et al[13] (2014), cross-sectional study	N = 22 (14 men, 8 women) AT group: n = 11 (7 men, 4 women; age = 28 ± 4 y) Asymptomatic group: n = 11 (7 men, 4 women; age = 28 ± 4 y)	Injured side vs asymptomatic controls	Maximal strength: isometric via an in-house custom-built portable force transducer	MVIC PF force, N 30%MVIC, N	1101 ± 176 325 ± 46	1250 ± 192 369 ± 52	9.8 mo	Stated
Mayer et al[14] (2007), randomized controlled trial	N = 31 (All men) Treatment group: n = 11 (age = 41 ± 5.9 y) Control group: n = 8 (age = 38 ± 4.9 y) Insoles group: n = 9 (age = 35 ± 6.7 y)	Injured vs uninjured side	Maximal strength: isokinetic dynamometry	Conc PF muscle torque at 60°/s Ecc PF muscle torque at 60°/s	88.7 ± 20.2 145.3 ± 34.7	90.20 ± 19.0 148.9 ± 37.4	Treatment group: 17.3 ± 18.7 mo Insoles group: 13.8 ± 6.5 mo Control group: 7.9 ± 6.8 mo	Stated
McCrory et al[15] (1999), prospective cohort study	N = 89 (72 Men, 17 women) AT group: n = 31 (27 men, 4 women; age = 38.4 ± 1.8 y) Asymptomatic group: n = 58 (45 men, 13 women; age = 34.5 ± 1.2 y)	Injured side vs asymptomatic controls	Maximal strength: isokinetic dynamometry	PF peak torque 60°/s 180°/s PF peak torque/BW 60°/s 180°/s Flexion/extension work ratio, % 60°/s 180°/s Vertical GRF First normalized vertical peak force	 87.48 ± 4.6 29.47 ± 2.2 40.86 ± 1.6 13.83 ± 0.9 30.53 ± 1.2 42.26 ± 2.9 1.81 ± 0.08	 90.00 ± 3.3 33.84 ± 1.4 43.11 ± 1.2 16.37 ± 0.7 29.71 ± 0.9 36.99 ± 1.4 1.73 ± 0.04	NR	Stated

			Explosive strength: GRF via AMTI[a] force platform and runway	Anteroposterior GRF Maximal propulsive force Maximal braking force, BW Mediolateral GRF Maximal medial force Maximal lateral force	 −0.321 ± 0.011 0.428 ± 0.021 0.109 ± 0.010 0.129 ± 0.017	 −0.314 ± 0.006 0.387 ± 0.009 0.110 ± 0.008 0.093 ± 0.005		
Öhberg et al[16] (2001), prospective cohort study	N = 24 (17 men, 7 women) AT group: n = 24 (age = 43.0 y)	Injured vs uninjured side	Maximal strength: isokinetic dynamometry	Conc PF peak torque 90°/s 225°/s Ecc PF peak torque 90°/s	 71.0 ± 25.7 32.5 ± 13.4 141.2 ± 57.2	 83.8 ± 21.0 41.9 ± 13.6 155.9 ± 47.6	NR	NS
Silbernagel et al[17] (2006), prospective cohort study	N = 42 (23 men, 19 women) AT group: n = 42 (age = 46 ± 8 y, height = 178 ± 8.5 cm, mass = 80.7 ± 13.1 kg)	Most symptomatic vs least symptomatic sides	Reactive strength: drop jump (counter-movement jump) followed by a vertical jump on 1 limb Reactive strength: single-legged hop Reactive strength: single-legged hop via lower limb symmetry Maximal strength: isoinertial via concentric toe raises, Ecc-Conc toe raises	Jump height Single-legged hop height, cm % Hopping Plyometric quotient Strength tests, W Conc power at 23 kg Conc power at 33 kg Ecc-Conc power at 23 kg Ecc-Conc power at 33 kg	 11.3 ± 4.8 2.8 ± 1.9 0.4 ± 0.2 213 ± 97 199 ± 122 284 ± 136 301 ± 147	 11.4 ± 4.3 3.4 ± 1.4 0.5% ± 0.14 252 ± 137 275 ± 128 348 ± 141 384 ± 160	37 mo	Stated
Wang et al[18] (2012), cross-sectional study	N = 17 (All men) AT group: n = 17 (age = 27.3 ± 2.0 y, height = 183.2 ± 7.1 cm, mass = 75.9 ± 10.8 kg)	Injured vs uninjured side	Reactive strength: single-legged hop Explosive strength: RFD via MVIC using dynamometry	Single-legged hop: 1-leg, triple-jump hopping distance, cm RFD: Slope of the torque time curve normalized to peak torque of MVIC and determined at normalized force intervals, %MVIC/s Normalized one-fourth RFD Normalized one-half RFD Normalized three-fourths RFD Normalized four-fourths RFD	285.8 ± 59.4 1188.0 ± 523.8 1511.3 ± 525.1 1127.3 ± 394.1 404.2 ± 179.1	436.6 ± 46.1 1414.7 ± 509 1844.2 ± 479.2 1330.8 ± 490.3 507.6 ± 253.0	5.4 mo	NS
Wang et al[19] (2011), cross-sectional study	N = 14 (10 Men, 4 women) AT group: n = 14 (age = 24.2 ± 1.7 y, height = 177.3 ± 8.4 cm, mass = 69.2 ± 9.0 kg)	Injured vs uninjured side	Maximal strength: isometric via customized force plate Explosive strength: RFD via customized force plate	Maximal PF torque Normalized RFD: RFD relative to the maximal torque, %MVIC/s 0–30 ms 0–50 ms 0–100 ms 0–200 ms Absolute RFD: average slope of the torque-time curve over time spans	137.6 ± 16.2 277.0 ± 58.5 294.7 ± 65.1 272.9 ± 44.4 190.9 ± 61.2	145.8 ± 17.1 337.0 ± 47.2 364.3 ± 51.0 337.6 ± 48.5 232.4 ± 54.8	5.9 mo	Stated

				relative to the onset of contraction, Nm/s				
				0–30 ms	319.8 ± 60.0	361.5 ± 69.1		
				0–50 ms	338.8 ± 78.7	393.1 ± 66.1		
				0–100 ms	299.8 ± 45.3	357.9 ± 38.5		
				0–200 ms	215.7 ± 37.7	238.6 ± 26.4		

Abbreviations: Conc, concentric; PF, plantar flexion; Ecc, eccentric; NS, not stated; AT, Achilles tendinopathy; GRF, ground reaction force; BW, body weight; NR, not reported; BW, body weight; BW(%), percentage BW; MVIC, maximal voluntary isometric contraction; RFD, rate of force development.
[a] Advanced Mechanical Technology, Inc (Watertown, MA).
[b] The ratio of the involved limb score and the uninvolved limb score expressed as a percentage (involved/ uninvolved · 100 = limb symmetry index).

REFERENCES

1. Alfredson H, Pietilä T, Jonsson P, Lorentzon R. Heavy-load eccentric calf muscle training for the treatment of chronic Achilles tendinosis. *Am J Sports Med.* 1998;26(3):360–366.
2. Alfredson H, Nordström P, Lorentzon R. Prolonged progressive calcaneal bone loss despite early weightbearing rehabilitation in patients surgically treated for Achilles tendinosis. *Calcif Tissue Int.* 1998;62(2):166–171.
3. Alfredson H, Pietilä T, Ohberg L, Lorentzon R. Achilles tendinosis and calf muscle strength: the effect of short-term immobilization after surgical treatment. *Am J Sports Med.* 1998;26(2):166–171.
4. Alfredson H, Pietilä T, Lorentzon R. Chronic Achilles tendinitis and calf muscle strength. *Am J Sports Med.* 1996;24(6):829–833.
5. Azevedo LB, Lambert MI, Vaughan CL, O'Connor CM, Schwellnus MP. Biomechanical variables associated with Achilles tendinopathy in runners. *Br J Sports Med.* 2009;43(4):288–292.
6. Baur H, Divert C, Hirschmüller A, Müller S, Belli A, Mayer F. Analysis of gait differences in healthy runners and runners with chronic Achilles tendon complaints. *Isokinet Exerc Sci.* 2004;12(2):111–116.
7. Becker J, James S, Wayner R, Osternig L, Chou LS. Biomechanical factors associated with Achilles tendinopathy and medial tibial stress syndrome in runners. *Am J Sports Med.* 2017;45(11):2614–2621.
8. Child S, Bryant AL, Clark RA, Crossley KM. Mechanical properties of the Achilles tendon aponeurosis are altered in athletes with Achilles tendinopathy. *Am J Sports Med.* 2010;38(9):1885–1893.
9. Firth BL, Dingley P, Davies ER, Lewis JS, Alexander CM. The effect of kinesiotape on function, pain, and motoneuronal excitability in healthy people and people with Achilles tendinopathy. *Clin J Sport Med.* 2010;20(6):416–421.
10. Grigg NL, Wearing SC, O'Toole JM, Smeathers JE. Achilles tendinopathy modulates force frequency characteristics of eccentric exercise. *Med Sci Sports Exerc.* 2013;45(3):520–526.
11. Haglund-Åkerlind PY, Eriksson E. Range of motion, muscle torque and training habits in runners with and without Achilles tendon problems. *Knee Surg Sports Traumatol Arthrosc.* 1993;1(3–4):195–199.
12. Maquirriain J. Leg stiffness changes in athletes with Achilles tendinopathy. *Int J Sports Med.* 2012;33(7):567–571.
13. Masood T, Kalliokoski K, Bojsen-Møller J, Magnusson SP, Finni T. Plantarflexor muscle function in healthy and chronic Achilles tendon pain subjects evaluated by the use of EMG and PET imaging. *Clin Biomech (Bristol, Avon).* 2014;29(5):564–570.
14. Mayer F, Hirschmüller A, Müller S, Schuberth M, Baur H. Effects of short-term treatment strategies over 4 weeks in Achilles tendinopathy. *Br J Sports Med.* 2007;41(7):e6.
15. McCrory JL, Martin DF, Lowery RB, et al. Etiologic factors associated with Achilles tendinitis in runners. *Med Sci Sports Exerc.* 1999;31(10):1374–1381.
16. Öhberg L, Lorentzon R, Alfredson H. Good clinical results but persisting side-to-side differences in calf muscle strength after surgical treatment of chronic Achilles tendinosis: a 5-year follow-up. *Scand J Med Sci Sports.* 2001;11(4):207–212.
17. Silbernagel KG, Gustavsson A, Thomee R, Karlsson J. Evaluation of lower leg function in patients with Achilles tendinopathy. *Knee Surg Sports Traumatol Arthrosc.* 2006;14(11):1207–1217.
18. Wang HK, Lin KH, Su SC, Shih TF, Huang YC. Effects of tendon viscoelasticity in Achilles tendinosis on explosive performance and clinical severity in athletes. *Scand J Med Sci Sports.* 2012;22(6):e147–e155.
19. Wang HK, Lin KH, Wu YK, Chi SC, Shih TTF, Huang YC. Evoked spinal reflexes and force development in elite athletes with middle-portion Achilles tendinopathy. *J Orthop Sports Phys Ther.* 2011;41(10):785–794.