treated the STJ complex lags. This critical review summarises
the literature, providing model to support further investiga-
tions into the role of the STJ complex in CAI. Future
research should focus on identifying the clinical popula-
tion overlap of CAI patients and those with concurrent STJ
complex instability, and the best practices for clinical action when
the intrinsic ankle ligaments are involved.

017 INERTIAL SENSORY DATA PROVIDES DEPTH TO
CLINICAL MEASURES OF DYNAMIC BALANCE

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10.1136/bjsports-2017-anklesymp.17

Study Design Case Study.
Objectives Establish the role a single inertial sensor may play
in the objective quantification of dynamic postural stability fol-
lowing acute ankle injuries.
Background The Y Balance test (YBT) is one of the most
commonly utilised clinical dynamic balance assessments.
Research has demonstrated the utility of the YBT in identify-
ning balance deficits in those with acute ankle injuries and
chronic ankle instability. However, reach distances fail to pro-
vide information relating to the quality of balance strategy
and dynamic stability. Motion capture systems are often
employed to provide micro-level detail pertaining to an indi-
vidual’s postural stability. However, such systems are expen-
sive, lack accessibility, hinder natural movement and require
extensive processing expertise. The addition of inertial sensors
may allow for the inexpensive, accessible quantification of
postural stability in an unconstrained environment.
Case Description Forty-two elite under-20 rugby union players
were recruited as part of a wider study. Two athletes were
identified to have sustained acute ankle injuries two weeks
previously; one lateral ankle sprain and one deltoid ligament
sprain. A single inertial sensor was mounted at the level of
the 4th lumbar vertebra. Participants completed four practice
YBTs bilaterally, prior to completing 3 recorded YBTs. Reach
distance and inertial sensor data were recorded for each reach
excursion.
Outcomes When compared to the group mean, both athletes
demonstrated no clinically meaningful reduction in reach dis-
tances for all three reach directions. However, both athletes
demonstrated a higher 95% ellipsoid volume of sway than the
healthy control group for all three directions of the YBT
when completed on their affected limb.
Conclusions Preliminary analysis suggests that inertial sensor
data may provide information relating to the quality of
dynamic postural stability following an acute ankle injury. Fur-
ther investigation is required to establish the role that such
measures may play in the assessment and management of
ankle injuries.

018 SMARTPHONE TECHNOLOGY FOR ASSESSING THIGH
MOTION DEFICITS IN PARTICIPANTS WITH A HISTORY
OF ANKLE SPRAINS

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10.1136/bjsports-2017-anklesymp.18

Study Design Case-control.
Objectives Our purpose was to identify sagittal thigh angular
motion deficits during a stepping-in-place task between healthy
controls and participants with a history of recurrent ankle
sprains.
Background Ligamentous laxity and self-reported ankle ‘giving
way’ resulting in modified proximal joint movement patterns
have been noted in individuals with recurrent ankle sprains
and instability. However, few clinical evaluation tools are used
to assess potential altered movement patterns. We propose
using smartphone technology to identify sagittal thigh motion
deficiencies.
Methods and Measures Subjects with (22±3 year, 171±10 cm,
76±11 kg; 14 females, 8 males; Cumberland Ankle Instability
Tool=21±5) and without (23±4 year, 168±2 cm, 69±12 kg;
14 females, 8 males; Cumberland Ankle Instability Tool=29
±1) a history of ankle sprains. Participants were outfitted
with a smartphone on each thigh. Healthy participants were
matched to ankle sprain participants and were assigned an
affected and unaffected limb. Three trials of a stepping-in-
place task were performed for 70 s. The angular thigh posi-
tion in the sagittal plane was collected by a customised App
on a smartphone. Two repeated measures ANOVAs
(alpha=0.05) with one between factor (group: sprain, no
sprain) and one within factor (limb: affected, unaffected) ana-
lysed maximum and average sagittal thigh angular motion
(degrees).
Results Significant interactions (maximum: F(1,42)=5.016; p=
0.03; average: F(1,42)=6.17; p=0.02) were found that indi-
cated the unaffected limb of the ankle sprain group (maxi-
 mum=40.73±11.33°; average=13.06±4.01°) had less motion
than its affected limb (maximum=44.26±12.52°; aver-
age=15.02±5.78°) and the unaffected limb of the healthy
group (maximum=46.29±14.78°; average=16.41±6.01°).
Conclusions We established that a smartphone App identifies
thigh motion deficits for a clinical pathology. A history of
ankle sprains may facilitate compensatory thigh movement
strategies when stepping-in-place. This novel finding demon-
strates the need to examine the role that the unaffected prox-
imal extremity might have in recurrent sprains of the
contralateral ankle.

019 CORTICAL ACTIVATION VARIABILITY IS ALTERED IN
INDIVIDUALS WITH CHRONIC ANKLE INSTABILITY
DURING SINGLE LIMB POSTURAL CONTROL

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10.1136/bjsports-2017-anklesymp.19