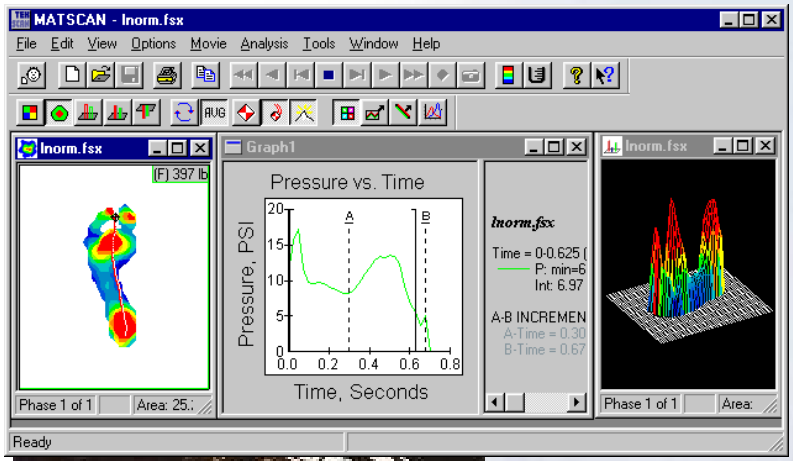
CRYOS TECHNOLOGIES INC.

SUMMARY OF RELIABILITY AND VALIDITY STUDIES

NOVEMBER, 2005

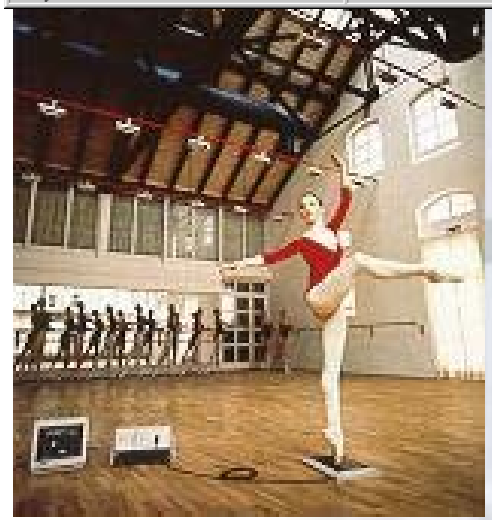
INSTRUMENTATION



Pressure

Force-plate

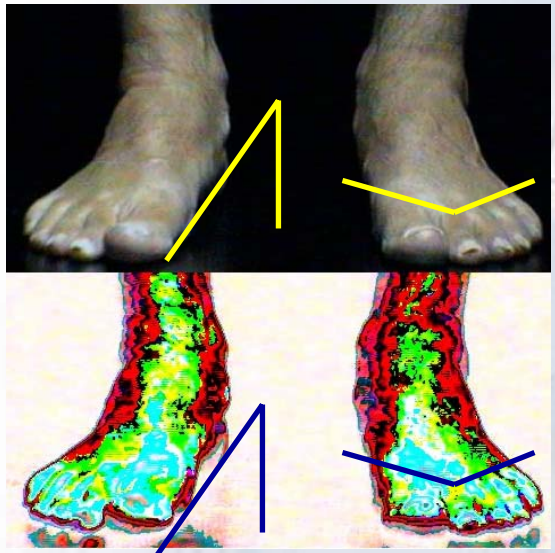
Video

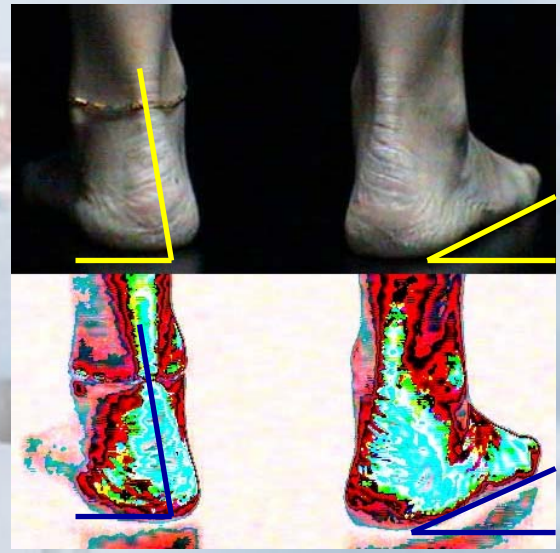


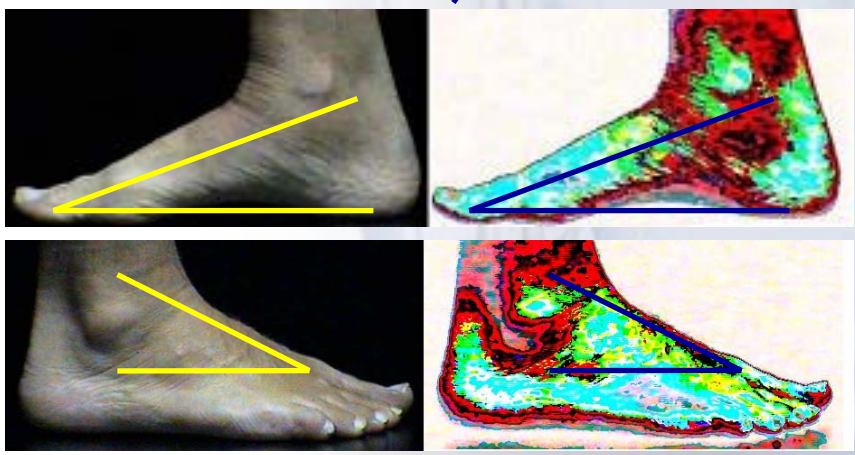
DIAGNOSTIC OF FOOT PROBLEMS

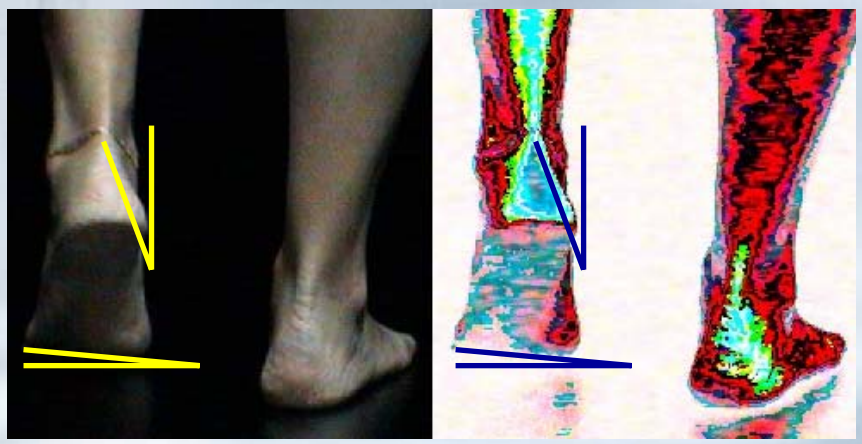
- Qualitative assessment
- Seldom includes a body posture evaluation
- Lower limbs and pelvis compensations
- Need to quantify foot disorders to improve
  - Diagnosis
  - Provide a better prescription of foot orthoses

ANGULAR PARAMETERS









COLOR-CODED VIDEO-BASED SYSTEM

- Morphology immediately recognizable making easy qualitative comparison
- Quick and clinically relevant body posture and foot assessment
- Is the color-coded video-based system reliable?
  - Number of trials (ICC and ANOVAs)
  - Inter-tester reliability (ICC and ANOVAs)
- Are the angular measurements valid?
  - Comparison of angular values (T-tests)
  - Relations with other angular measures (Pearson Product-Moment Correlation)

RELIABILITY
NUMBER OF TRIALS

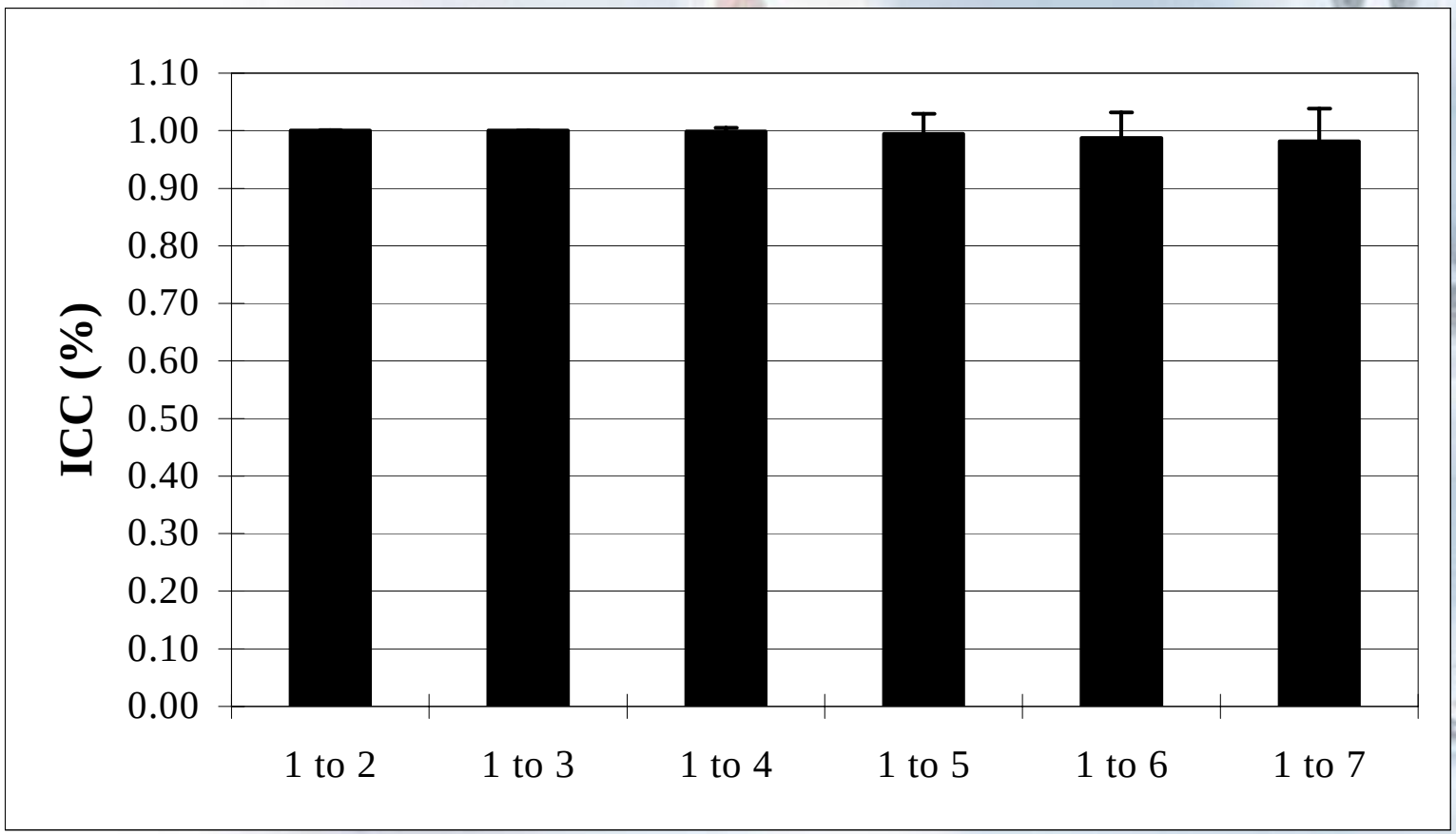
- 20 able-bodied subjects
- 8 images (1 trail) taken from 5 views
- 32 angular parameters (1 tester)
- 7 trials ICC (intra-class correlation)
- ANOVAs ($p < 0.05$) followed by Tukey post tests

RELIABILITY
NUMBER OF TRIALS

- Overall average was 0.98 ± 0.06
- Mean ICC value for each view was 0.90 or above
- Lowest individual ICC value was 0.72
- No significant difference between trials
- Mean ICC:
  - Lower limbs = 0.90 ± 0.09
  - Feet = 0.82 ± 0.10

RELIABILITY BETWEEN TRIALS

(Feet)

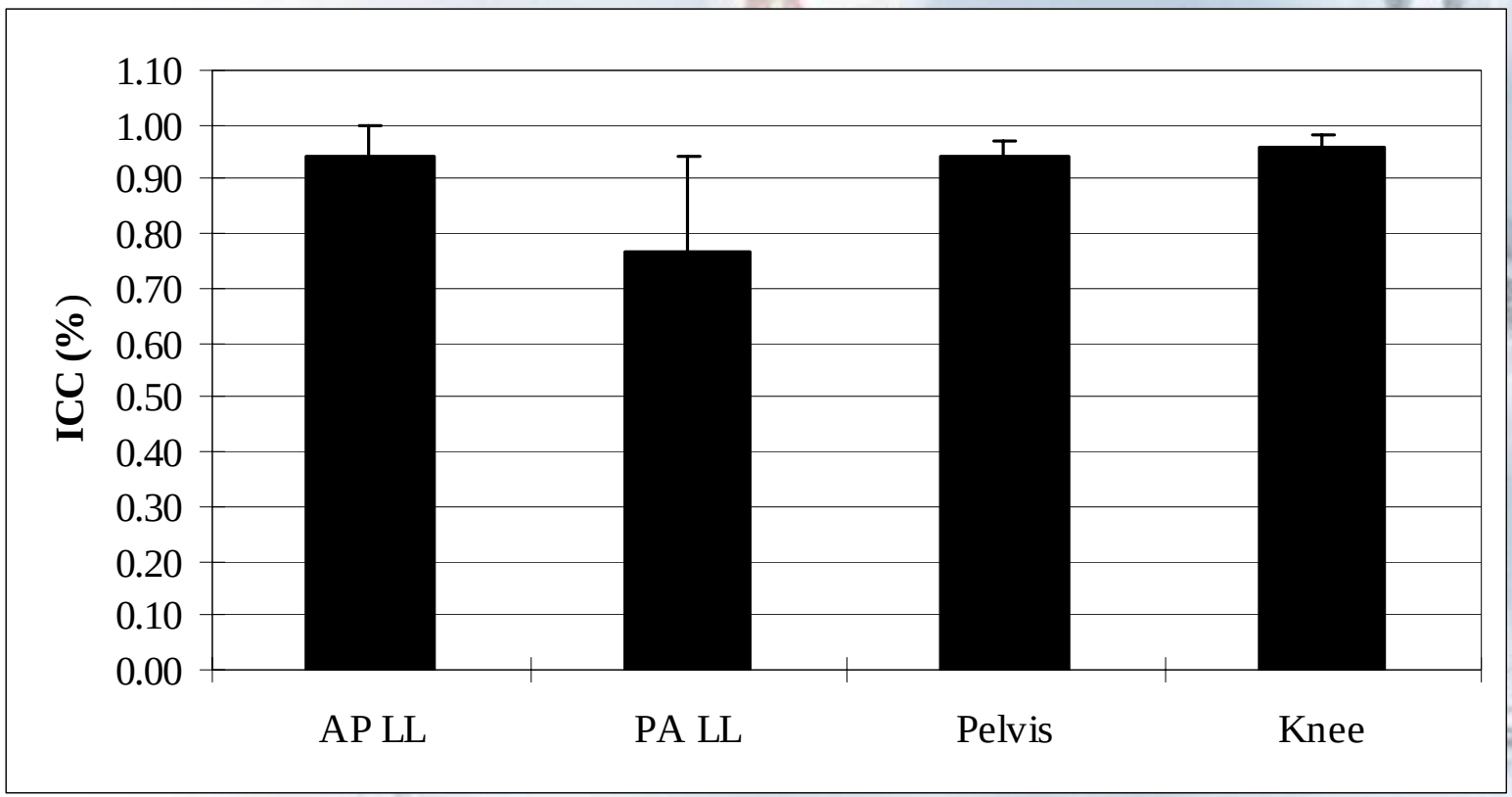


RELIABILITY
LOWER LIMBS AND FEET

n=10	ICC LOWER LIMBS	ICC FEET
Mean	0.90	0.82
S.D.	0.09	0.10
Min.	0.76	0.68
Max.	0.96	0.94

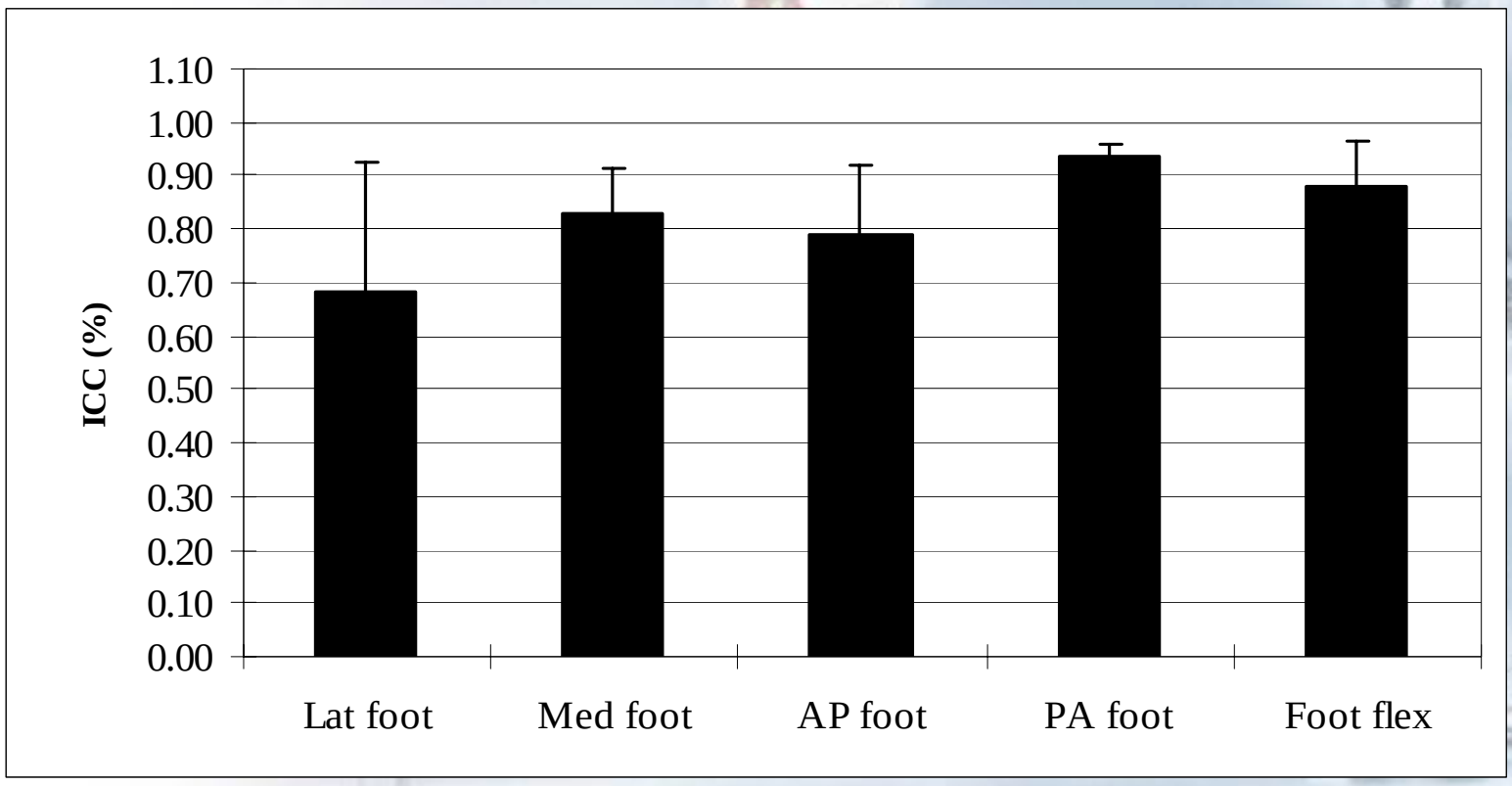
RELIABILITY LOWER LIMBS

n=10



RELIABILITY FEET

n=10



RELIABILITY BETWEEN TESTERS

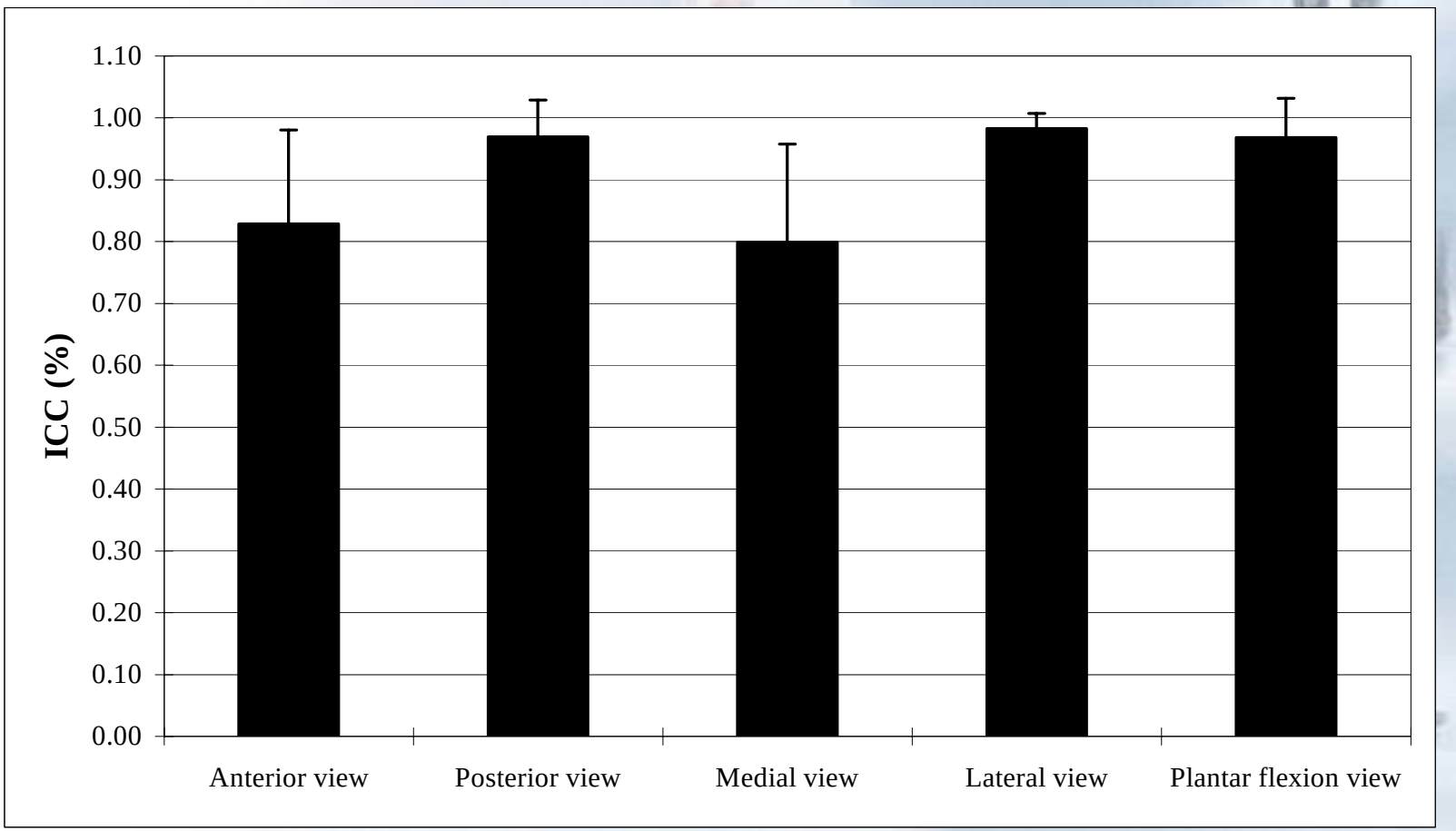
- 10 able-bodied subjects
- 32 angular foot parameters (first trial)
- 5 testers
- ICC for each of the five views
- ANOVAs ($p < 0.05$) followed by Tukey post tests

RELIABILITY BETWEEN TESTER

- Mean inter-tester reliability was 0.90 ± 0.14 for both feet
- Medial view had the lowest ICC at 0.79
- No statistical difference between the means of the different views

RELIABILITY BETWEEN TESTER

(Feet)



RELIABILITY

Foot angles (n=20)	**Number trials** (1 to 7)	**Inter-tester** (5 testers)
ICC Mean ± S.D.	**0.98 ± 0.06**	**0.90 ± 0.14**
ICC Minimum	**0.72**	**0.79**
ANOVAs ($p \leq 0.05$)	**N.S.**	**N.S.**

CONCLUSIONS RELIABILITY

- ✓ Single set of images
- ✓ Between trial and Intertester reliability

  (very good to excellent)
- ✓ Color-coded video-based system

  Quick and clinically relevant for body posture and foot evaluations

VALIDITY RADIOLOGY

- Comparisons of angular values between radiology and Biovizion
- 12 subjects
- T-tests for dependent samples:

  6 of the 8 tested parameters show significant differences between means (p=0.05)
- Pearson Product-Moment Correlation:

  AP: 0.90 ± 0.11

  ML: 0.94 ± 0.03

VALIDITY
VIDEO AND GONIOMETER

- Comparisons of angular values between 3D kinematic system, goniometer and Biovizion
- T-tests for dependent samples (n=4)
- No statistical difference was observed between the different means
- Inaccuracies in surface markers and goniometer positioning are about the same magnitude as those associated with the Biovizion system

VALIDITY

Foot angles	**Radiology** (n=12)	**3D video** (n=4)	**Goniometer** (n=4)
R Pearson Product-Moment Correlation	AP: 0.90 ± 0.11 ML: 0.94 ± 0.03	____	____
T-tests Dependent samples ($p \leq 0.05$)	6 of 8 parameters	N.S.	N.S.

CONCLUSIONS VALIDITY

- ✓ Differences in means of angular values between radiology and Biovizion
- ✓ Significant relations between angular values from radiology and Biovizion
- ✓ No statistical difference between angular values from 3D kinematic system, goniometer and Biovizion