

ANTHROPOMETRY AND BODY COMPOSITION

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People

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Research interests

In this laboratory imaging tools are utilized to perform anthropometry and body composition analysis in the human with a focus on athletes (handball, basketball, soccer, rugby and volleyball players, and gymnastic and dance performers), obese and disabled subjects. Current protocols involve:

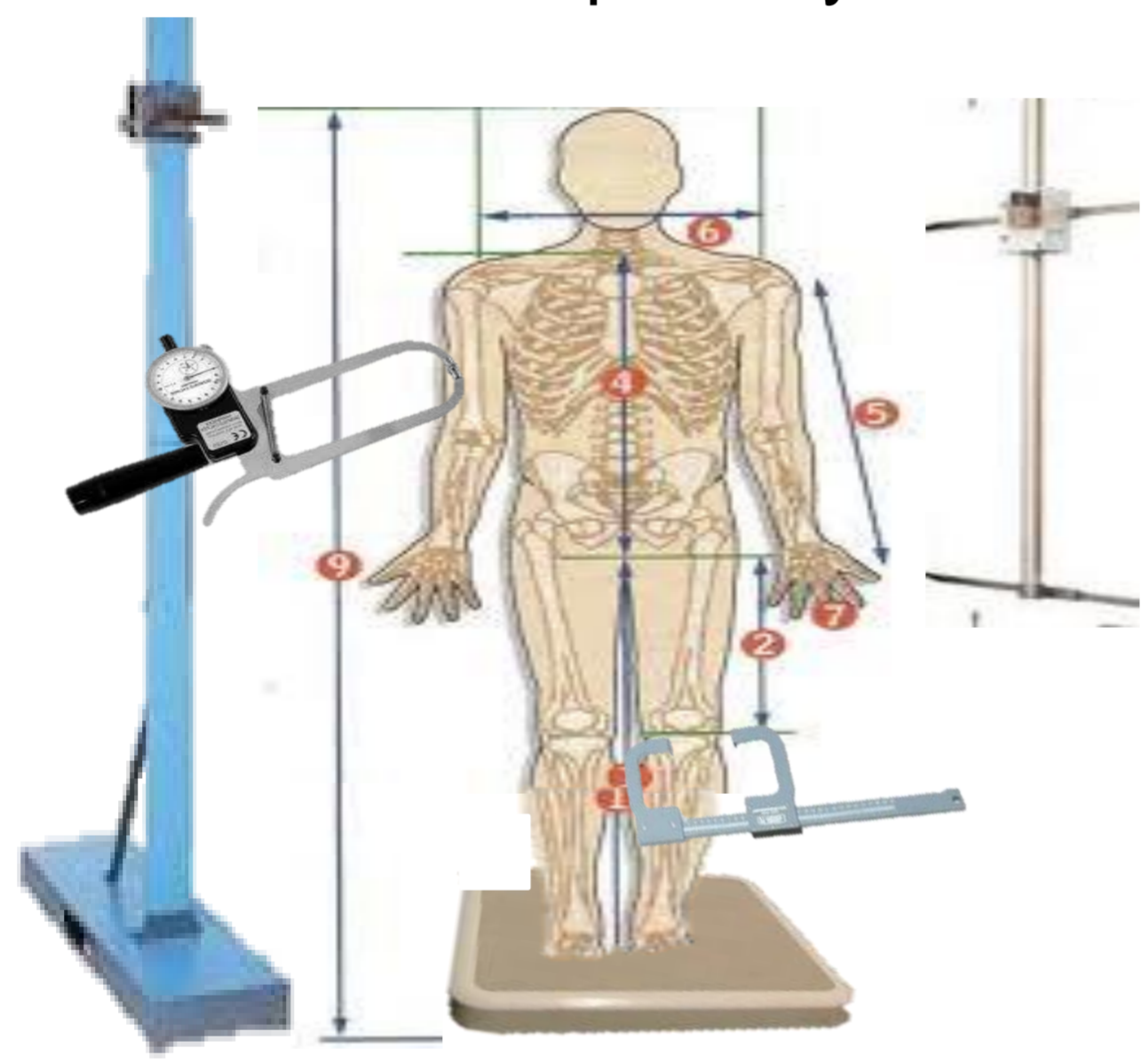
- anthropometry and body composition analysis in young healthy subjects;
- effects of whole-body vibration training in nonobese and obese subjects;
- effects of different impact loading activity in pre-pubertal and pubertal girls;
- effects of different sport codes according to competitive level or the playing position;
- effects of different wheelchair sport codes according to competitive level or the playing position.

Techniques/Methodologies

Dual-energy X-ray absorptiometry
(QDR Explorer W, Hologic, MA)



Traditional, manual
anthropometry



3D Body Scanner
(Breuckmann)



Ultrasound Scanner
(Chinson 600M)



Selection of Main Results

To date, a total of 3063 subjects have been analyzed (Table 1). Some results are itemized below:

•Anthropometry and body composition in young healthy subjects. The body mass index (BMI) should not be used to infer on the motor fitness status of children aged 6-12 years, the amount of subcutaneous fat being more reliable. The correlation between the standing long jump and 30m dash indicates that the two tests assess, at least in part, similar motor abilities; this casts doubts on the usefulness of administering both tests in a battery if independent motor abilities are to be evaluated.

•Whole-body vibration (WBV) training in nonobese or obese subjects. A 8-week WBV training is effective in inducing positive body composition changes as well as increased muscle strength in nonobese women; it could be recommended as an alternative/complementary tool in physical activity or fitness programs as it is well tolerated. WBV exercise is not able to improve bone mineral parameters in young healthy females before the peak bone mass. Moreover WBV is a reliable, effective tool to ameliorate body composition and muscle strength, and to maintain bone mass density in obese women.

•Effects of different impact loading activity in pre-pubertal and pubertal girls. In pre-menarcheal girls higher dose of impact loading activity is more effective in reducing the relative proportion of body fat than accruing lean mass or bone tissue.

•Effects of different sport codes according to competitive level or the playing position. Elite female handball players have significantly lower percentages of fat and higher bone mineral content than sub-elite as well as a clear tendency to accrue more lean mass, especially in upper limbs; players on the wing and goalkeeper positions differed most from one another.

Independent of competitive level (elite/sub-elite) and playing position, anthropometry of female handball players does not change significantly over the competitive season except for some fat redistribution; however, mineral mass increases in the limbs, and lean mass in upper limbs postseason.

Table 1

Field	Number
Soccer	580
Basketball	478
Rugby	88
Volleyball	24
Handball	71
Diabetes	87
Elderly	82
BPCO	153
Wheelchair sports	30
Dance	68
Artistic gymnastic	45
Swimming	13
Golf	30
Weightlifting	16
Triathlon	22
Vibration platform	259
Young healthy subjects	239
Other	778

Future Developments/Collaboration Needs

Collaborations are welcome to expand the above panel of investigated subjects or to identify new categories of subjects for investigation.