Kinanthropometric Assessment of High performance athletes

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1. Introduction

Calgary-1988 Winter Olympics

　－ Stampede

　－ Facilities of the lab etc.

2. Kinanthropometry

　－ definition of the word

　－ definition of the field － Ross, Carter defined as the application of measurement to the study of human size, shape, proportion, composition, maturation and gross function. Its purpose is to help understand human movement in the context of growth, exercise, performance and maturation. Purpose will be achieved through applications in medicine, education, government and commerce.

includes pursuit of human biology, physical anthropolgy and auxolgy or growth. It incorporates some of the measurement procedures of medicine and physical education basic to the whole enterprise is the compulsion to explain and the challenge to predict various human movement phenomena.

3. Monitoring high performance athletes through kinanthropometry

4. Purpose of monitoring HP athletes

　－ record training induced changes in anthropological characteristics

　－ make application/adjustments in training programs

　－ identify morphological prototypes which may lead to information concerning the identification of potentially successful athletes

5. The influence of morphology upon athletic performance is difficult to isolate － certainly a factor but its proportionate contribution is unknown. The proportion will vary from sport to sport.

Contribution of kinanthropometric assessment in different categories of sport

－ Teams sports no objective criteria to evaluate complexity of performance

　a) monitor anthropometric characteristics of team members to recognize positive and negative changes due to training stress.

　b) monitor anthropometric factors that limit fundamental skills of the game

　c) make comparisons with respect to individuals on a team and perhaps with respect to position played

　d) make comparisons with respect to level of performance

－ Individual sports － objectively rated

　a) monitor anthropometric characteristics

of the athlete to recognize positive and negative changes due to training stress.

b) monitor anthropometric factors that limit fundamental skills of the sport

c) make comparisons with respect to level of performance

- Individual sports — subjectively rated

  a) monitor anthropometric characteristics of the athlete to recognize positive and negative changes due to training stress.

  b) monitor anthropometric factors that limit fundamental skills of the sport

  c) make comparisons with respect to level of performance

  d) monitor aesthetic conformation

6. Anthropological variables are determined by a model of human structure

   — many models have been proposed to represent structure

   — we use a relatively simple geometric model using cones, wedges, spheres and cylinders.

   — in order to construct our model we require

   9 breadth, 14 girth, 16 length measurements as well as body height and mass

   — in addition we are interested in body composition and use a four compartment model first proposed by Matiegka in 1921. We have superimposed the estimation of adiposity proposed by Parikova which requires 15 skinfold,

7. With this information we are able to examine

   — length and breadth proportionality eg.

Negro/white

— body composition components eg

— regional development of active tissues, corrected diameters — geometric model

— proportionality of fat and fat free volumes, segmental masses

8. Case study — female volleyball player — reduce % fat — increasing standing jump.

   — acceleration impulse

9. Case study — 2 female VB players compensate for height. disadvantage

10. WOGAP 88 female speedskaters — team comparison

11. WOGAP 88 female speedskaters — individual comparison

12. Swimming team changes in body mass March 87 to May 88

13. Swimming team compositional changes

14. Swimming team corrected diameter changes

15. Fat free volume changes

    — swimmer A/B

16. Synchro and diver

17. Skinfold reduction sites — swimmer and diver

Summary :

Application of anthropological assessment in coaching

    — monitor training changes

    — establish optimal weight

    — motivate athlete

    — define morphological prototypes

    — assist in talent ID

Half Life of Scientific Knowledge