



HANDBALL GOAL-SHOT ANALYSIS



2010 IHF/EHF Women's Challenge
Trophy

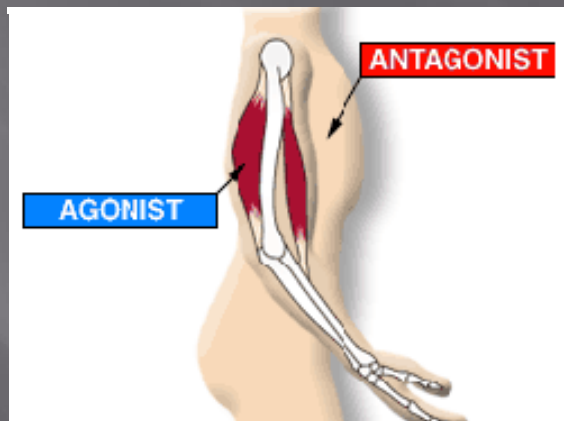


- ▣ We should say that the arm action in a handball shot represents the open kinematic chain concept;
- ▣ for a good executed handball shot is important correct order of recruiting individual parts of the body thus allowing the development of the maximal velocity and control of these parts – from the proximal (central) parts to the distal (distant) parts of the body;
- ▣ the most proximal part (hip) begin the action; it is then followed by the next part and so on till the most distal part – the wrist or the palm.



During individual shoot phase certain muscles or muscles group perform concentric work and at the same time other muscles (opposite) are stretching;

- ▣ regarding the muscle position muscles should be divided in agonists and antagonists:
 - agonists try to execute a movement, antagonists oppose (execute an opposite movement). Therefore their position is on the other side of the extremities. F. e. - m. biceps brachii flekses elbow joint, m. triceps brachii however extend elbow joint.





- ▣ beside this exist between agonists and antagonists reflex relationship – so called disinaptic reciprocal inhibition;
- ▣ during the agonist contraction (f. e. ekstensor) refleks cause the inhibition of antagonist (fleksor), it's additional relaxation thus it's faster regeneration;



handball shot has several phases:

- ▣ the first is the preparatory phase (approach and cocking or wind-up phase - back swing) which allows the athlete to assume a comfortable and balanced body position (stance position) from which to initiate the shot (either a jump shot or ground shot). So the player assumes a position in the last step of their approach with the ball in hand.





- At the end the right shoulder girdle is fully retracted (retroversion) in combination with the abduction and maximum external rotation of the glen-humeral joint to complete this phase. The back swing described is usually made by players during the last step of their approach or even sooner





Another way of performing a back swing is so-called “whip” back swing that involves quickly lifting the shoulder up in abduction without circling and also without rotating the trunk (abduction of the shoulder and flexion of the elbow).





After the preparatory phase the movement phase begins with a forward movement of the arm and continues until the ball is released. The movement phase, sometimes known as the acceleration action, motion or contract phase is the action part of the shot. It is the phase in which the summation of force is generated directly to the ball and is characterized by near-maximal concentric activity in the muscles involved.





- ▣ It's very ballistic (eksplosiv) phase. Velocity of internal shoulder rotation in acceleration reach even $9,000^{\circ}/s$.
- ▣ It's very short phase and last less than 1s. Conclusion is realising of the ball



- The final interval of motion is the follow through phase which begins immediately after the climax of the movement phase, in the order to bring about negative acceleration of the limb or body segment involved. In this phase, often referred to as the deceleration phase, the velocity of the body segment gradually decreases, usually over a wide range of motion.





- ▣ This velocity decrease is usually attributable to the high eccentric activity in the muscles involved. The arm flexes and internally rotates across the chest. Horizontal adduction.



Phase of the shoot	Shoulder motions	Muscles involved	Typ of muscle contraction
wind-up and cocking-phase (back swing)	Abuction/ekstension of overarm, Shoulder blade retraction, external rotation	M. deltoideus M. teres minor M. infraspinatus	Concentric
		M.subscapularis M.pectoralis maior M.latissimus dorsi M. supraspinatus	Ekscentric
movement or acceleration- phase	Elevation of overarm	M. deltoid anterior M. pectoralis maior	Concentric
	Internal rotation	M. subscapularis M. pectoralis maior M. latissimus dorsi	Concentric
follow-through phase – arm and shoulder motion as a consequence of inertia	Internal rotation Horizontal adduction	M. deltoid posterior M. supraspinatus M. infraspinatus M. teres minor M. trapezius M. rhomboideus	Ekscentric



For the praksis:

Strenght

- we have to know the funcional anatomy by the movements in shoulder (ekstenzion, fleksion)
- beside agonist we should strenght also antagonists
- special atention should be dedicated for the strenght of the external and internal of the shoulder

Proprioception

- first exercises should executed in the closed kinetic chain and after that in an open kinetic chain;

Pliometric

- first basic exercises (throws) than specific;
- by the pliometric throws dedicated for the development of the external and internal rotators we should specialy take into account three different positions of overarm:
 - external and internal rotation - overarm beside (at) the body
 - external and internal rotation - overarm 90 degrees abduction
 - external and internal rotation - overarm 90 degrees fleksion



THANK YOU VERY MUCH FOR YOUR
ATENTION!