

Figure 1.27a

In football, the communication, decision making, individual technique and football fitness are all connected.



So, the football fitness demands are taken from the game of football itself. Next, the coach will look for answers from a discipline such as physiology, and not vice versa. The same is true for scientific disciplines such as psychology, biomechanics, management and nutrition. The game of football is the central issue and from that starting point, specific questions can be asked in football language to specific areas of expertise.

Figure 1.27b

The four components communication, game insight, technique and football fitness, are not only connected, there is also a clear hierarchy.



### 1.7.3 The four components can be distinguished but not separated

As described earlier in this chapter, the components communication, game insight, individual technique and football fitness are all related. They can be distinguished but not separated from each other as demonstrated in figure 1.27a. Besides the strong relation between these four components, there is also a clear hierarchy as visualized in figure 1.27b. The most fun-

Figure 1.28a

The football philosophy is objective and universal based on the characteristics of the game. There is no room for opinions, past experiences or cultural influences.

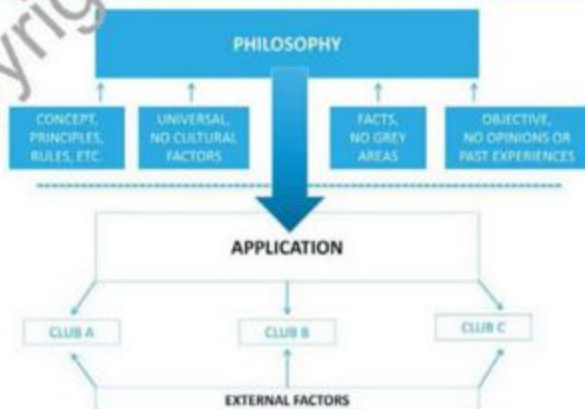
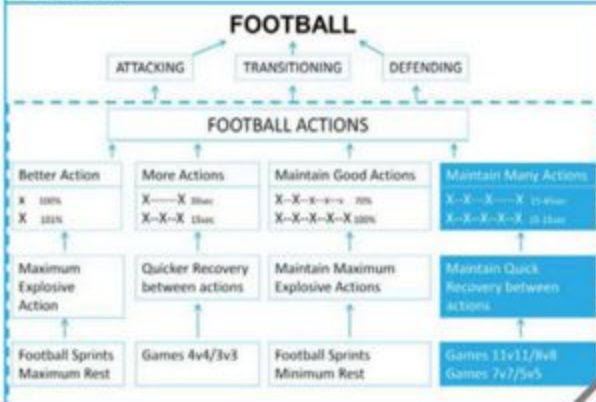


Figure 5.26

The football performance characteristic *Maintain Many Actions per minute*. The football fitness characteristic *Maintain Quick Recovery between actions*. And both the football conditioning exercise Games 11v11/8v8 and 7v7/5v5.



#### Maintain Quick Recovery between actions

To be able to *Maintain Many Actions per minute* in the second half, a player must be able to *Maintain Quick Recovery between actions* (see figure 5.26). Even in the last part of the game, the player must be able to catch his breath quickly between actions. From a physiological perspective, the player has to restore his phosphate system as quickly as possible, including during the last 15 minutes of the game.

#### Oxygen supply to muscles for 90 minutes

The limiting factor in the football fitness characteristic *Maintain Quick Recovery between actions*, is the supply of oxygen to the muscles. During the game, an accumulation of waste products (including heat and lactic acid) takes place, which results in various parts of the body functioning less efficiently. One of the consequences of that, is that the oxygen supply to the muscles will gradually decrease in the second half of the game. A slower transport of oxygen to the muscles, means that the 'burning' of carbohydrates and fats and therefore the subsequent production of ATP, will also slow down. Due to this slower oxygen transport to the muscle, the player will be out of breath longer after a football action, because it takes longer to completely refill the phosphate system. Consequently, the player will make less actions per minute at the end of the game.

When training the ability to *Maintain Quick Recovery between actions*, the objective is to improve the oxygen supply to the muscles, as well as keeping up the restoration speed of the phosphate system between actions. The first part of this chapter explained that oxygen from the outside air moves via the lungs and the blood - which is pumped through the blood vessels by the heart - towards the muscles. To get more oxygen into the muscles, the function of a) the lungs, b) the blood, c) the heart and d) the blood vessels must improve. In addition, the carbohydrate and fat stores in the muscles, and the water balance, also play an important role.

#### Efficient use of lung capacity

When inhaling, air is sucked into the lungs. This outside air contains oxygen. The lungs are full of blood vessels. The blood that flows through these vessels is searching for oxygen. After leaving the lungs, the oxygen-rich blood flows to the muscles. Although the blood flows almost everywhere in the lungs, oxygen is not present in all parts of them. Untrained people in particular only use about 40% of their lung capacity. This means that in 60% of the lungs, there is no oxygen after inhaling. Still, the blood does flow in this 60% of the lungs, and as a result, this blood will leave the lungs without any oxygen

Figure 5.27

Untrained people only use part of their lungs to inhale oxygen. Top players use 80-90% of their lung capacity. So, oxygen enters the most peripheral parts of their lungs.

