# 3 PHYSICAL CONDITIONING

Good physical conditioning enables players to meet all the physical requirements of their sport, to perform well and to minimise their risk of injury. A significant body of evidence supports the idea that a well conditioned player is at a reduced risk of injury.[1] Following correct training principles will improve players' physical preparation and reduce the risk of injury.

## The Aims and Benefits of Conditioning

Conditioning aims to prepare the body for the rigours of the activity. Each sporting activity places unique physical demands upon its players depending upon factors such as the nature of the sport (endurance, power, contact), environmental conditions (temperature, humidity and playing surface), human variables (age of players, size and ability of opposition, disability factors, amount of available substitutes, level of competition) and time variables (stage of the season, stage of the tournament, stage of the game). Ideally, physical conditioning prepares players to a level where they are capable of withstanding the demands of all likely situations.

## Best Practice for the Conditioning Process

Physical fitness should be gained in the off- and pre-seasons and maintained during the season. A balanced, effective physical conditioning programme will have many components (see table 3) including strength, flexibility, endurance, balance, speed and power.[2] Training should address the specific needs of the players, which will be determined by the actual demands of the sport and the condition of the players before starting the training programme.

## General Conditioning Principles

All physical training needs to adhere to general training principles. Training should be planned, directed and purposeful.

1. **The F.I.T.T.E. Principle** describes the Frequency, Intensity, Time, Type and Enjoyment of training.[3] All these components must be specified when designing a training programme and the variables manipulated to specifically target the players' needs.

| CONDITIONING COMPONENT | APPLICATION TO INJURY PREVENTION |
|---|---|
| Strength | • Stabilises the joints against sudden or large forces. |
| Flexibility | • Allows a greater range of motion without joint or muscle pain. |
| Endurance | • Improves the ability to repeat the same action and allows continuous activity without fatigue – fatigue may contribute to injury. |
| Balance | • Reduces the possibility of tripping, falling or landing in an awkward position. |
| Speed | • Enables players to move quickly to avoid contact situations. |
| Power | • As a combination of speed and strength, power conditioning allows the body to withstand sudden changes in motion, speed and direction. |

**table 3:** HOW CONDITIONING CAN REDUCE THE RISK OF INJURY

# 3. PHYSICAL CONDITIONING cont.

2. **Overload and Progression:** Overload means to train to a higher level than the body is used to. Over time the body's systems adapt to this new (higher) level and physical condition improves. A gradual progression from easy training to intense training is recommended, as injury can occur if the volume or intensity is increased too quickly (the overload level will be too high). A general rule is to increase the training load by no more than 10% per week (some individuals may require a slower increase in training load).
3. **Specificity:** Improvements in physical condition caused by training are specific to the type of training performed.
4. **Individual Differences:** Every player is unique, has different needs and capabilities and will respond differently to training. To address the principle of individuality, and to give maximum benefits, a generic training programme needs to be adapted for each individual in a group of players.
5. **Reversibility and Maintenance:** When players stop training for even as little as one to two weeks, their physical condition begins to deteriorate. It is possible to maintain fitness levels with only one to two carefully administered training sessions per week.
6. **Tapering and Overtraining:** To prevent players from becoming too fatigued and "burning out", the amount of training should be reduced during times of competition (periodisation of training).

## The Conditioning Process

The training process involves five steps (see figure 3):

1. Identify the characteristics a player of the particular sport and position(s) requires to perform well and minimise the risk of injury
2. Determine the player's current physical condition using physical tests and a player history (included in the screening process)
3. Identify the player's specific training needs
4. Design and implement an appropriate training programme to meet these needs
5. Monitor and evaluate the training programme at a later date.

It is important to recognise that a child's immature skeleton has a diminished capacity to absorb repetitive physical stress. Frequent, excessive demands on young players can lead to injury. This needs to be considered when planning a physical conditioning programme for young players.[4] Guidelines on training for children can be found in *The Young Athlete: Children and Physical Activity.*[5]

The issue of pregnancy and sport is a complex matter that must be considered case by case. In general, women who are used to exercise can continue their chosen sport well into their pregnancy provided they have confirmed their intentions with a medical practitioner. Continuing to play contact sports such as rugby, however, is inadvisable. Regular aerobic activities such as swimming, cycling and

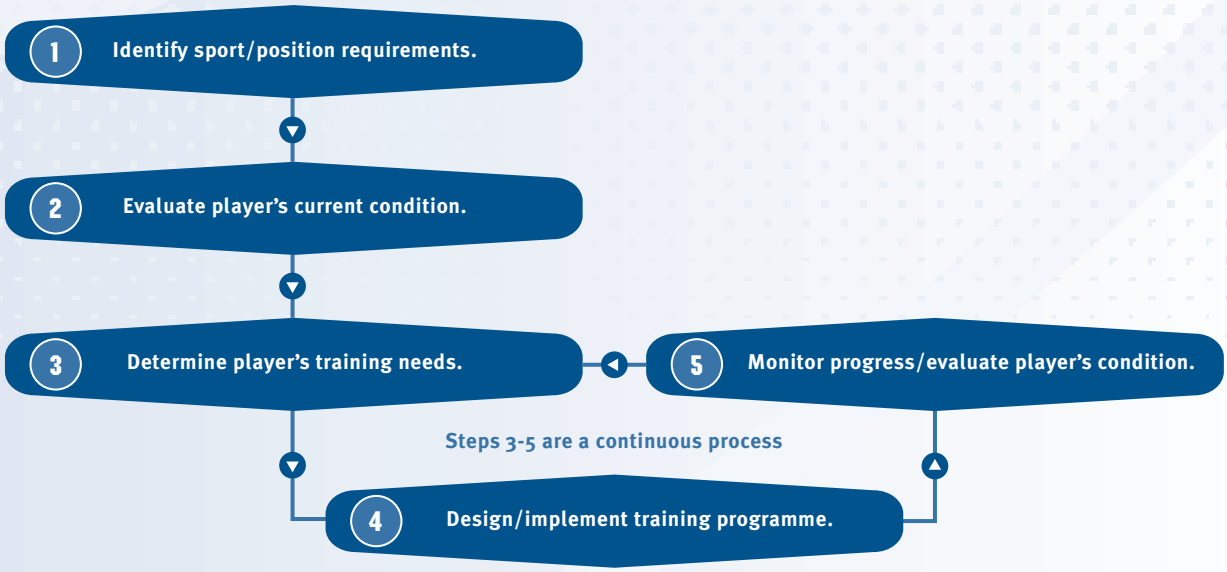


figure 3: THE CONDITIONING PROCESS

jogging are well within the capabilities of healthy women whose pregnancies are uncomplicated. More specific guidelines are available by contacting Sports Medicine New Zealand or by visiting www.sportsmedicine.co.nz.

Other groups which need special consideration are adult and older adult players, and players with a disability. SPARC (Sport and Recreation New Zealand) has further information relevant to these groups.

Practical guidelines on physical conditioning can be found in the "Physical Conditioning" section of the *ACC SportSmart Coaches' Kit*.

**References**


1. **Taimela, S., Kujala, U.M. and Osterman, K. Intrinsic risk factors and injuries. *Sports Medicine*, 1990, 9(4): 205-215.**
2. **Wilson, N.C. and Hume, P.A. *Netball – Your Body: Your Choice! An Injury Prevention Kit*. Netball New Zealand: Auckland, 1993.**
3. **Williams and Wilkins (Ed.) *ACSM Resource Manual for Guidelines for Exercise Testing and Prescription*. 3rd edition. 1998.**
4. **Gerrard, D. The dilemma of the young athlete. *New Ethicals Journal*, February 2000, 11-15.**
5. **Gerrard, D. *The Young Athlete: Children and Physical Activity*. Sports Medicine New Zealand: Dunedin, 1999.**


**Further Reading**


- **Baechle, T.R. (Ed.) *Essentials of Strength Training and Conditioning*. Human Kinetics: Champaign, Illinois, 1994.**
- **Fleck, S.J. and Kraemer, W.J. *Designing Resistance Training Programs*. Human Kinetics: Champaign, Illinois, 1987.**
- **Skinner, J.S. (Ed.) *Exercise Testing and Exercise Prescription for Special Cases*. Lea and Febiger: Philadelphia, 1993.**