Introduction To Cycling

Health & Fitness
Triathlon
Bike Fitting
Cross Training

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PEC
PEAK ENDURANCE COACHING

INTRODUCTION TO CYCLING

Safer – faster – for longer

Cycling is a great lifelong activity. It's great for getting away from all the stresses of life into the countryside and close to nature. It's a very healthy non-impact activity.

This booklet is written for beginner cyclists, triathletes and other athletes to help them get the cycling fundamentals right. This will speed their development and save unnecessary difficulties along the way.

The booklets designed to help people to be safe on the roads. To cycle further and faster over time.

Cycling is also used by many club and international athletes to assist in improving fitness levels/ To speed recovery from training. For prevention and rehabilitation from injuries and as part of weight maintenance or reduction regimes.

For the serious athlete, cycling has a major part to play as part of a general fitness programme. It is an excellent mode of training for general aerobic fitness, especially for building the foundations for specific strength, speed and endurance in the legs and hips.

This resource will also assist coaches, medics and physiotherapists who use cycling to enhance fitness in any way, to do so based on sound information, safely and with optimal benefit for the efforts made.

WHY USE CYCLING?

Cycling is an excellent activity for development of

- Aerobic and anaerobic endurance and power
- Strength endurance
- Maximum strength
- Leg speed

It is a low impact exercise, which is very important in relation to recovery from injury and prevention of injury while still producing excellent workouts for all the components of fitness.

Cycling adds variety to training programmes and can be a very enjoyable activity, especially when carried out in a pleasant outdoors environment.

It is an excellent lifelong activity for general fitness for all ages and standards of fitness.

With cycling there is a choice of whether to cycle outdoors, on the road or cross-country mountain trails etc. or indoors, in the gym or at home on an exercise cycle or with a normal bicycle set up on a wind / turbo trainer.

It is easy to graduate and control the intensity of the training

- By the manipulation of gearing
- Pedal cadence
- Control of the Speeds
- By using hilly or flat routes

Benefits: How can a cycling programme be beneficial?

- To improve general fitness and to supplement other training methods, especially during preseason training periods
- For athletes who may have difficulty sustaining large volumes of weight bearing exercises. (Troublesome knees/ hips)
- As a supplement to speed or strength training especially in athletes who are susceptible to knee or hip problems
- As part of a recovery programme from intensive training sessions, competitions and training periods
- To add variety to training programmes

BEFORE YOU BEGIN

Ensure that

1.The bicycle is suitable for the activity intended

2.The position (handlebars, saddle height etc) on the bicycle is correct

3.The bicycle is well maintained

1.Safe routines and practise are followed

4.Wear appropriate clothing

5.Sessions are appropriate and will produce the results you are seeking

6.Maximum benefit is derived for the time and effort expended

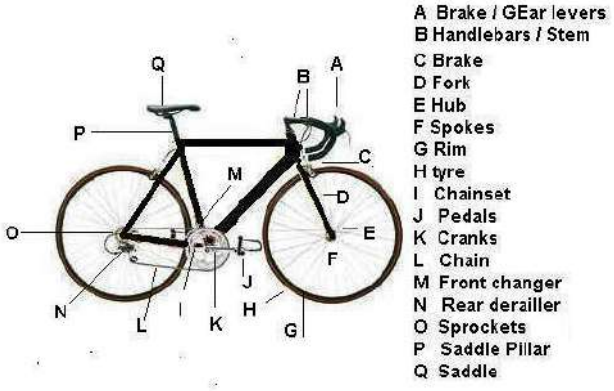
- Injury prevention programme, especially for players susceptible to knee or hip injuries.
- To maintain fitness during layoff because of injury
- As part of a rehabilitation programme
- As part of a weight reduction or weight maintenance programme
- As part of a warm up procedure before some competitions
- To develop co-ordination and balance for young athletes
- To add fun to young athletes training

BUYING A BICYCLE

If you must invest in a new bicycle visit a dedicated bicycle shop with a good variety of bicycles and different brands on sale where you will get a good choice of new and second-hand bicycles.

To begin cycling should not be too expensive and depending on what you intend to use the bicycle for, you can spend from €250 to a few thousand euro for top of the range road or mountain bikes.

BICYCLE COMPONENTS



What you should look for:

Visit a dealer who specialises in the sale and repair of bicycles and who stocks a variety of good bicycle manufacturer's products, good after sales service, and a warranty.

Depending on what and where the bicycle will be used for, you have a choice of road or mountain bike. If the bike is to be used for training only, look for a bike that is built to fit mudguards to, so that you keep yourself dry and clean from wet roads.

Road Bikes

Road bikes are generally lighter, travel faster and are comfortable to ride for extended periods of time. See diagram for parts of the bicycle

Mountain Bikes

If you live near mountain or park trails, a mountain bike can be great fun and while they can vary from heavy to quite light, they usually have very strong wheels and frame to withstand the bumps and rough terrain. It also has a wide range of gears with very low gears for climbing hills. Top of the range mountain bikes may also be fitted with a hydraulic suspension system.

A good mountain bike can also be adapted for road riding by simply changing to road type tyres, and can be quite comfortable for long distance cycling on the road if the position is well set up.

You will require a good level of skill to ride safely on very technical off road terrain.

TIME TRIAL BIKE

MOUNTAIN BIKE

Setting up your Position on the Bike

(Saddle Height, etc)

MEASUREMENTS

The important measurements are:

- Frame size
- Foot position
- Saddle position
- Saddle height
- Height and angle of the handlebars

FRAME SIZE

Buying the correct size frame is very important for comfort and safety.

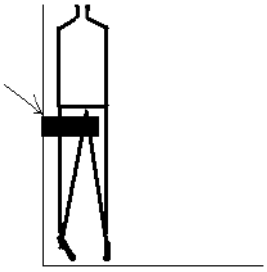
If the frame is too big you will have difficulty getting the handlebars low enough to achieve an optimum position.

If the frame is too small it will be very difficult to raise the handlebar stem to the optimal height as the handlebar stem ***must not*** be raised too high out of the frame or it will be unsafe.

It is worth making the effort to ensure that you get the right size for you. You can do this by following the simple measurements below.

The most suitable frame size can be found, by determining the inside leg measurement to the ground while barefoot. This is then multiplied x 0.66.

INSIDE LEG MEASUREMENT



TOOLS REQUIRED

- Allen keys • Plumb line • Tape measure •Spirit level • Record form/sheet

Measuring the Frame Size

The frame size is measured from

A: the centre of the bottom bracket to

B: the top of the seat tube to give you your correct seat tube length.

Double-check your calculations by riding a bike of that size if possible.

• Always have the measurements that you will require calculated before you visit the shop. Then check the measurements of the frame you intend to purchase before you make the final purchase. Bring a tape measure with you.

• Do not always take the salesperson's word for the frame size or whether the size would suit you or not.

Examples of Frame sizes and saddle height based on the .66 and .855 of inseam, rounded off to the nearest centimetre: NOTE these measurements are only a guide check before you buy a bike based on them.

Inseam	Frame size	Saddle height
70cm	46cm	61cm
75cm	49.5cm	66cm
80cm	53cm	71cm
85cm	56cm	75cm
90cm	59cm	79cm

FOOT POSITION

The optimal foot position in the pedal is usually with the ball of the foot placed directly over the pedal axle.

The lateral position of the cleats depend on your natural feet position. Some people will cycle with heels more out or in towards the cranks

Bearing this in mind if using cleats it is a good idea to set your cleats up and cycle (preferably on a turbo trainer) to check are they correct.

Be sure that the cleats are comfortable as poorly adjusted cleats can create knee problems. Buy cleats that allow some ***lateral movement*** as these allow adjustment of the foot position to suit each individual.

TIP

Time trial or mountain bike frames will usually be smaller by about 10%

Obviously, you should check this out on a bicycle before you purchase a new frame or bicycle

For the first few training sessions with newly adjusted cleats have an Allen key with you to make adjustments if required

SADDLE POSITION

Saddle position: This should be horizontal and can be checked with a spirit level when the bicycle is on a level surface. If it is pointing up it will put pressure on your lower back and possibly cause back pain. If it is pointing down more pressure will be put on to your arms and shoulders. However, research has shown that for cyclists who suffer with lower back pain while cycling that pointing the front of the saddle very slightly down can often eliminate the pain.

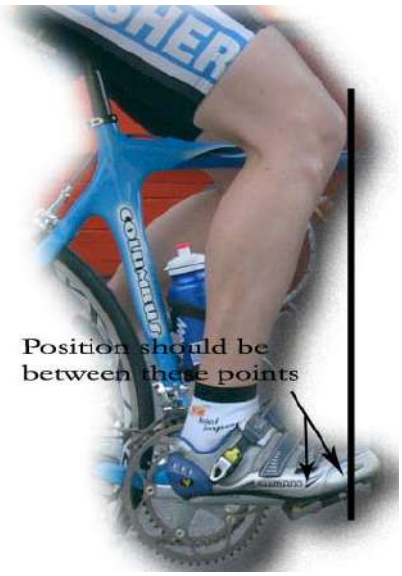
How far forward or back should your saddle be?

The ideal position of the saddle for

maximum pedalling efficiency is believed to be that that when a plumb line is dropped from the kneecap, with the forward crank in the horizontal position the plumb line is just in front of the pedal axle.

The saddle position should be initially set so that the saddle pillar is at the midpoint of the saddle.

This will ensure that the beginner will not be in any extreme positions. Over time the



saddle position (if necessary) can be adjusted forward or back.

SADDLE HEIGHT:

The correct saddle height is probably the most important adjustment.

BENEFITS

• Maximum power application to the pedals • Comfort

• Easier to achieve aerodynamic position • Road Safety

If the saddle is too high there will be undue pressure on the hamstrings, Achilles tendons, gluteal muscles and lower back. You will also be more likely to get saddle sore from friction as your rear end moves from side to side. If it is set too low there will be undue pressure on the front of the knee.

There are many suggested methods of determining optimum saddle height. However they are all only guides and designed to get the rider very close to the optimum height where the height is then very often gradually adjusted until the rider feels it is correct.

A simple way, which many competitive racing cyclists use successfully, is by pedalling with the heels on the pedals and having the saddle height set so that the leg on the lowest pedal is straight without any rocking of the hips.

When you place your feet on the normal pedal position you should have a slight bend in your knee when the cranks are placed in the 6 o'clock position.

This measurement should bring you to within one or two centimetres or so of the ideal saddle height, allowing for the type of pedals used, shoe size, thickness of the soles of the shoes, flexibility of your thigh muscles, etc

For example, if the rider has large size shoes the saddle might need to be raised,

or lowered for smaller size shoes and this can be refined with ***very slight*** adjustments over the first few weeks until the ideal height is achieved.

Having adjusted these measurements, there should then be a reasonable bend in the knee when the feet are in the pedals (pedalling position) and the pedal is at the lowest point (the crank in line with the seat tube) with the lower foot horizontal.

Changes should consist of a max of five millimetres every week or so to allow your muscles to adapt to the changes.

The final adjustments must be closely monitored until the rider feels perfect on the bicycle.

When a final decision has been made on the optimal saddle height and position this should then be a ***fixed measurement***. If you need to change your reach to the handlebars the handlebar stem may need to be adjusted or changed.

This needs to be set so that the spine and trunk is at a comfortable angle well supported by the contact points of the rider on the handlebars – saddle – and pedals.

Note the angle of the trunks and arms of these riders.....

Bars vary in width so be sure that the bars are the right size. Road racing handlebars come in sizes ranging from about 38-cm to 44-cm wide and if necessary you should buy bars to match the width of your shoulders.

Female cyclists often need to buy narrower bars than are supplied with new bikes to avoid shoulder and arm discomfort.

Depth of Bars

Taller riders usually prefer to use a deeper drop on the bars. Gradually (over a number of weeks / months) adjust the height of the handlebar stem until it is comfortable to ride while holding the bars with your hands in the different positions on the bars.

This is usually from level with the saddle to 3-4 centimetres below the saddle, depending on the height of the rider. They should never be higher than the saddle or there may be undue strain on the rider's lower back, and if they are too low, the rider's back, arms and neck muscles may get sore. Generally the taller the rider is the lower the bars will be set.

Back pain

For a rider with back problems an adjustable handlebar stem is a good option, some handlebar stems can be adjusted in length or height and while they can be quite expensive they could be a very good investment.

If using racing bars, the angle of the drops should be level with your crossbar or very slightly tipped forward.

A straight edge can be used to get the bottom of the brake levers in line with the drops. In this position the brakes can be reached when on the drops or tops of the bars, and is usually found to be a suitable set up. Note the angle of the bars in the photo.

The final position is always determined according to how the position feels to the rider. Any adjustments that need to be made should be very small and tried for at least one week to allow the body to adapt to them before any further changes are made. However, if you feel any of the changes are having a negative effect return to your previous setting and make smaller adjustments if necessary.

RECORD

When changing bicycles, for whatever reason, it is very important to have a record of your position to ensure that you can set up your optimum position immediately. The important measurements to record are:

- **Frame dimensions**
- **Saddle height**
- **Distance of the point of the saddle behind the bottom bracket axle**
- **Angle of handlebar drops**
- **Bar/stem sizes**
- **Distance of the handlebars below the saddle**
- **Crank length**
- **Distance from the point of the saddle to the centre of the handlebar stem**
- **Cleat position on shoes - Dates of check, adjustments made, any other comments**

Safety Reliability Comfort

READY TO TAKE TO THE ROAD

You now have your position set up and are ready for the road. To ensure a safe and trouble free session

Keep the bike in good working order

Regular maintenance of the bicycle will ensure trouble free safe cycling. If you are using an old bicycle, which has not been in use for some time, it is recommended to bring it to a good bicycle dealer repairs shop for a service before using it.

If new equipment is fitted, always try it out on a short local spin before you venture further.

Every 6 months to a year have the bike fully serviced.

Ensure

• That your two brakes are working well.

• That all fittings and attachments (mudguards, bottle cage, pump, etc.) are securely fitted.

• Carry one or two spare tubes, a puncture repair outfit and tyre levers to change the tube in case of punctures and Allen keys.

• Check that the saddle, cranks, chain wheels, etc. are tight to ensure trouble free cycling.

• Inflate tyres to the correct pressure, under inflated means harder work for you and the increased risk of punctures through the tube being pinched between the tyre and rim when you hit bumps in the road.

• Gears should be adjusted so that they change smoothly without the chain jumping on the sprockets.

• The chain and moving parts should be lightly lubricated.

Examples of Regular Checks

- The **SADDLE** should be horizontal or slightly pointed down for people who suffer with back pain while cycling.
- **MUDGUARDS** (if used) should be tight and free from rubbing on tyres etc…
- **TYRES** should be inflated to the correct pressure. Replace if the thread is much worn or the sidewalls are split or damaged in any way.
- The **CHAIN** and **GEARS** should be kept clean and lightly lubricated.
- The **HEADSET** should be adjusted so that it turns freely and there is no rocking when the front brake is applied and no stiff points in the steering when turned.
- The **BOTTOM BRACKET** axle should spin freely while not rocking from being worn or adjusted too loosely.

- **BRAKE/GEAR LEVERS** and **CABLES**: the levers should be secured to the bars in a suitable position where they can be easily reached and applied. Cables should run smoothly and be replaced immediately if worn or frayed.
- **BRAKE BLOCKS**: Keep them adjusted so that the blocks are close to and making full contact with the rim. Replace them before they become too worn.
- **PEDALS** should rotate freely, always check them (and the cranks) after falls or crashes as bent cranks or pedals can cause knee pain and injuries when used.

Safety

Rules of the Road

The rules of the road are there for every ones benefit so use them, however bear in mind that other road users might not follow them, so ride defensively. Look where you are going, always try to anticipate what is happening with traffic etc so that you can react in plenty of time. If you are cycling as part of a group signal to each other about any dangers (Potholes, cars turning etc) that you might be approaching with plenty of time for every one to take evasive action.

OBSTRUCTIONS AND POTHOLES

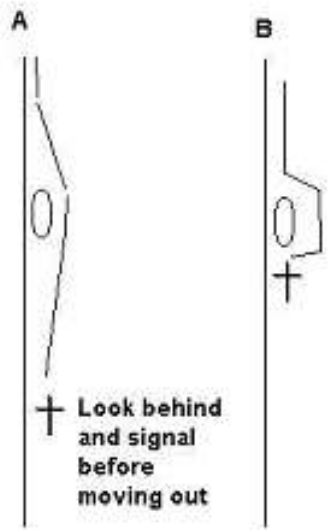
- Anticipating Problems and Signalling

EXAMPLE

When riding in a group anticipation and early evasion is essential to avoid sudden changes in direction which cause accidents. Clear signals and verbal communication with other riders in the group is essential.

A: Good example of anticipation as the rider gradually moves out to avoid the parked car.**B:** Very dangerous manoeuvres as the rider rides too close to the parked car and must turn sharply to pass the car.

DIAGRAMS



Obstructions and potholes etc when riding in a group anticipation and early evasive action is essential to avoid sudden changes in direction which cause accidents.

Clear Signals and verbal communication with other riders in the group is essential.

Examples
A Good example of anticipation as the rider gradually moves out to avoid the parked car

B Very dangerous manouvere as the rider rides too close to the parked car and must turn very sharply to pass the car

Holding the handle bars

Always have a secure but relaxed grip on the bars. The fingers should always form a circle between thumbs and fingers when holding the bars or brakes so that the hands cannot slip from the bars if the bicycle passes over rough roads, bumps potholes, etc.

This is very likely to happen if the hands are just resting on the bars like the rider in the example of how not to hold the bars.

HOW TO HOLD THE HANDLE BARS

HOW NOT TO HOLD THE Handlebars

If you cycle in dark conditions keep your lights in good condition, change batteries as required, wear a high visibility jacket. Check out any strange noises from the bike and make adjustments if required. Loose items on the bike can be a hazard, for example mudguards or a bag, etc. if not properly secured, can become caught in the moving wheels and throw the rider from the bike. Using earphones to listen to music, etc. is not recommended while cycling.

When doing any tests or efforts which involve sprinting or fast riding, ensure that your feet are very secure in the pedals.

READY TO TAKE TO THE ROAD

Safety • Reliability • Comfort

Dealing with Punctures

Punctures can be a minor or major inconvenience depending on how well prepared you are to deal with them. If you do happen to get a puncture while cycling being properly prepared can minimise the inconvenience and have you back cycling within a few minutes of the puncture.

The best place to fix a punctured tube is at home when you have lots of time rather than out on the road. It is easier to simply replace the tube with a new one.

Preventing punctures

The following simple tips will help to greatly reduce the number of punctures that you get over time.

- Have good tyres suitable for whatever type of cycling that you participate in.
- Keep the tyres at the manufacturer's recommended pressures and they will wear better and puncture less.
- Check the tyres regularly for cuts, wear and pieces of glass, or stones that might be embedded in them.
- Replace the tyres when required

PREPARATION FOR DEALING WITH PUNCTURES

What you need (keep in same place for easy access)

- **Spare tube/s**
- **Tyre levers**
- **Pump**
- **Puncture repair outfit**

1. **Slow down and stop safely. Find a place where you are safe from passing traffic to change the tube.**
2. **Take the spare tube tyre levers and pump and have them ready for use.**
3. **If it is a back wheel puncture, put the chain on to the smallest sprocket to facilitate removal of wheel**
4. **Release the punctured wheels brake quick release so that the wheel can be removed easily.**
5. **Remove wheel.**
6. **Using the tyre levers, remove the tyre from one side of the wheel rim and remove the tube.**
7. **Carefully and gently check for pieces of glass etc on the outside and inside of the tyre and and be sure that all glass etc, is removed.**
8. **Pump a small amount of air into the replacement tube before fitting it, this will help it fit inside the tyre and stop it getting pinched between the tyre and wheel rim as you replace it.**
9. **Insert the tube beginning at the valve and working back to the valve.**
10. **Refit the tyre, beginning at the valve and working either side of the valve, pushing the tyre on by hand. You most likely will need to put the final section of tyre on with the tyre levers.**
11. **Tip: If the tyre is very tight, slightly wet inside the last part of the tyre to be inserted to help complete the tyre fitting**
12. **When the tyre is fitted push the valve upwards into the tyre then pull it back down. This ensures that the tube is completely and safely inserted into the tyre.**
13. **Pump the wheel.**
14. **Insert the wheel. Check that the wheel is centred in the frame and lock the quick release.**
15. **Tighten the brake quick release.**
16. **Check that the wheel is spinning freely and that your brakes are working.**
17. **Gather up your tools /pump and punctured tube and safely resume cycling**
18. **Repair the punctured tube when you go home.**

WHAT TO WEAR

Safety • Reliability • Comfort

Wear clothing suitable for the activity and weather.

For example if you intend to do very short journeys, commuting for example, it is not going to be a very important issue.

Wear comfortable casual clothes suitable to the weather conditions. The clothing should be absorbent to soak up perspiration and not too bulky.

Shoes should have firm soles and give good grip on the pedals. A safety helmet should be worn on all cycles.

However, if you are regularly covering greater distances it is worth considering some specific cycling clothing for comfort and hygiene.

Cycling shorts are essential for regular long cycles as they are designed to protect from friction from the saddle.

Cycling shorts should be worn next to the skin. No underwear should be worn under the shorts or increased friction will be created.

Cycling shoes with cleats, which are designed for utmost efficiency, safety and comfort, are a worthwhile investment.

A cycling jersey with pockets is also very good for long cycles.

Always ensure that the small of the back (lumbar area) is covered by the cycling jersey or a long vest when you are stretched out on the bike.

Carry a light waterproof cycling jacket in case of rain or to protect you from the wind chill if you have to make an unscheduled stop.

A well-fitting safety helmet should always be worn.

THE BASICS:

For the beginner the basics are: - cycling shorts or track bottoms - helmet - cycling jersey or sweat shirt - trainers with firm soles and good grip - windproof jacket.

• If covering long distances regularly invest in some cycling gear for greater comfort. - Cycling shoes with cleats – cycling shorts & cycling tights – cycling jerseys/ jacket & helmet

PRINCIPLES OF TRAINING

Have Fun vary your training for enjoyment

- Train according to your current fitness level and lifestyle (work demands etc)
- Progressively increase training as your fitness improves
- The balance between lifestyle training/ competition and rest is very important
- Fit recovery and rest days into your programme
- Work with a coach if possible, particularly in the early stages of your participation
- Always leave at least 36 hours between strength training sessions
- A well-informed, balanced attitude to nutrition is essential
- Set some goals to work towards
- Training groups should be made up of riders of the same ability
- When cycling for longer than 60 to 90 minutes take food and drink to maintain hydration and energy levels (aim for 30 to 60 grammes of carbohydrate per hour)
  When feeling ill or the onset of a cold, etc. take a few days off training until you are 100%. Better to miss a few days than a few weeks

GEARING & CADENCE

For the experienced cyclist this is not a problem, but for the inexperienced cyclist with 12 to 18 gears, choosing the right gear might not always be easy. The size of the gear is related to the size of chain wheel and sprocket that is used.

Check what size chain rings and sprockets you have on your bike by counting the number of teeth on them. Then consult the gear chart to determine the size of the gear (or Roll out), which is the distance covered by one revolution of the pedals for each chainwheel and sprocket combination.

Also become familiar with what gear ratios these give you, there is often overlap and you should know the best combination to be using at any given time.

- Examples of some gears:
  The distance they travel and the strength required to use them

53 x 12 Distance travelled for one revolution of the pedals **9.43meters**

Force required **very high**

39 x 24 Distance travelled for one revolution of the pedals **3.56meters**

Force required **very low**

GEARING & CADENCE

ROAD BIKES

Usually have 14 to 18 gears that is 7 or 9 sprockets from 13 to 23 teeth on the back

wheel and two chain wheels, which are often 39 and 52 teeth.

Most road racing cyclists use 39 -53 chain wheels with 12 – 21 sprockets which gives them gears for most of the conditions they are likely to meet.

MOUNTAIN BIKES

- have from 18 to 21 gears, that is three Chain rings usually 28 – 36 – 48 teeth, on the front and six to eight sprockets from 12 to 28 teeth on the back wheel.

WHICH GEAR TO CHOOSE

The choice of gear should always be dictated by your fitness, the road conditions and the speed you are traveling at.

A simple rule to follow is, if you speed up because of a tailwind for example, or slow down because of headwind, hills etc. change gears up or down accordingly and maintain a cadence that is suitable for you and the conditions. Always try to make gradual changes as speed and conditions change.

HIGH GEAR = Small sprockets - Big Chain Ring

LOW GEAR = Big Sprockets - Small chain Ring

YOUNG CYCLISTS

Should be encouraged to use low gear ratios to develop high cadence pedaling skills. 90-100+

Practise changing gears regularly. Within a few weeks you should know exactly which gear you are using by the pedaling rhythm. Some of this could be practiced on a turbo trainer if you are a beginner cyclist.

CADENCE

(Pedal revolutions per minute (RPM))

- This is an individual thing and depends on fitness and cycling experience, and each individual must decide what gear best suits the circumstances. Avoid extremes of either spinning too fast or slogging a big gear.

Well trained racing cyclists usually cycle at a cadence of between 90 and 100 RPM on the flat and 70 – 90 RPM on hills. However, there will also be times when they must pedal at 70 RPM (climbing) or 130 RPM tailwind or sprints.

These cadences are only achieved following a reasonable period of cycling training and may be unrealistic for the beginners

It is best for the first few weeks to think in terms of which gear feels most comfortable and which gives you best speed for the effort you must make.

As you’re cycling mileage and cycling fitness increases you will progressively be able to pedal comfortably at higher cadence. A pedalling rate of between 65 - 85 RPM (climbing) to 80 - 100 RPM (on the flat) will probably be most comfortable. Simply counting the number of full revolutions of the pedals for thirty seconds and multiplying by two can check this. Or a cadence meter can be fitted to the bike.

CHAIN ALIGNMENT

Always use the appropriate chain ring and sprocket combination for the conditions and which gives you the best line chain alignment for your chain to work most efficiently.

For example, if the big chain ring and the inside (biggest sprocket) or the small chain ring and outside (smallest sprocket) is used together the chain will be put under a lot of strain because of the severe angle this selection causes. Try this and note the angle of the chain

The small chain ring should be used with the middle to inner sprockets (bigger sprockets) and the outside chain ring with the middle to outside sprockets (smaller sprockets)

• Gear selection is usually made according to the speed you are riding at and the type of training you are doing.

• The larger sprockets should be only ridden with the inside small chain ring for best results. This combination is generally used for climbing or easy to steady basic endurance training (long miles).

• The smaller sprockets should be used with the big chain ring, this combination is usually used for more intensive interval training and racing on descents or with tail winds, etc.

CYCLING SKILLS

Braking • Cornering • Group Cycling • Descending

The skills you need to practise will vary depending on your prior experience of cycling and can be as basic as practising mounting and dismounting the bicycle to cornering and working in groups in competition.

The most important thing in skill development is to assess your skills, define which skills you want to improve and Practise! Practise! Practise!, progressing from practising the very basic skill or part of it, to practising the whole skill under training and competitive conditions.

Skill training can be a specific session or be part of a fitness session. For example you can practise gear changing, drinking, etc during an endurance session.

Cycling skills for Beginners

- Mounting / Dismounting
- Placing feet into pedals or shoes smoothly
- Changing gears / selection of optimum gearing
- Smooth pedalling at suitable cadence
- Braking
- Cornering
- Cycling in groups
- Descending
- Control of the bike while cycling with one hand on the bars (for eating, drinking, signalling when turning)
- Drinking / eating on the bike

Practise all of the above in a safe environment to begin with, for example in a sports field on grass, an empty car park or on traffic free road. The session can consist of games or competition based on whatever skill you are targeting. These sessions can be great fun.

Some relaxation and visualisation exercises have also been proven to be a very beneficial support to skill development training, either immediately before a session or between sessions to mentally practise and reinforce the correct movements.

THE TRANSITION IN TRIATHLON

For beginner triathletes the transition from the swim to cycling and cycling to the run should be practiced regularly in training, until you have a safe, well-developed technique that you can consistently apply with confidence in competition.

PRACTICE SESSION

A best crank position for start

The start and getting feet into the pedals - The rider begins with one foot on the ground.

1. Aim to get the other foot into the pedal without looking down at the pedal.
2. Importance of angle of crank to get good start
3. Importance of suitable gear selection for a smooth start

Notice in the photo how the cyclists have their leading pedal in the 10 past 8 oclock to 15 minutes past 9 oclock position. As soon as they press on the pedals the bike will move forward

BRAKING

Braking must be practised regularly,

preferably in a traffic free environment (car park, basketball court, etc.) to get used to the different effects that using the front or back brakes have on the bicycle. If you apply the back brake too severely the back wheel will lock and you will skid. If you apply the front brake too severely the front wheel is likely to lock and throw you over the handlebars. You must be able to apply the correct pressure to slow the bike without either skidding the back wheel or locking the front wheel.

Always do the main part of your braking when the bike is travelling in a straight line, rather than when turning as the bike is quite likely to skid if hard braking is applied when the bike is leaning over.

EMERGENCY BRAKING: Use both brakes and push your backside further back on the saddle to create greater stability in the back wheel and to reduce skidding.

Practice braking safely, from different speeds. Pulling the front brake too severely could cause the front wheel to lock and you being thrown over the handlebars

CORNERING

The essentials for cornering are, good balance and confidence. This can be

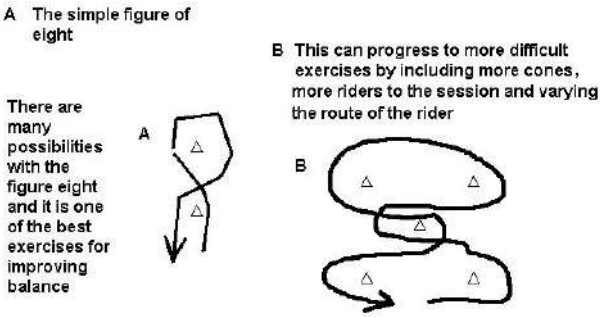
developed in beginners by regular practising of a large variety of movements as part of a skills programme which can be held in a traffic free environment such as a car park or sports field, or on roads with very light traffic volumes.

The simple figure 8 exercise is an excellent exercise for developing all round balance and cornering skills, and also for testing improvements in skill. It can be practiced in a very small space like a sports ground, car park or basketball court. The difficulty of the exercise can be increased or lessened by reducing or increasing the size of the figure eight.

The figure of eight: there are many possibilities with the figure eight and it is one of the best exercises for improving balance

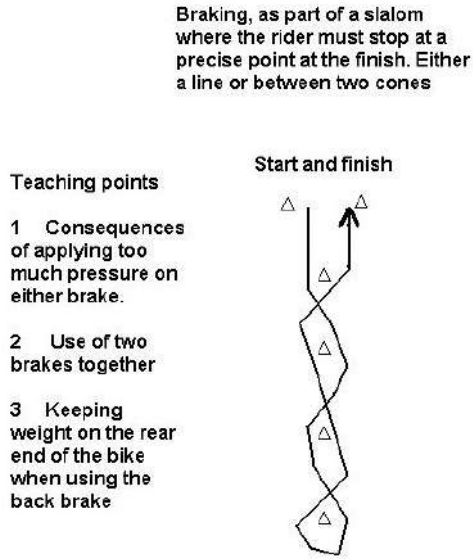
Braking as part of a slalom where the rider must stop at a precise point at the finish.

Teaching Points:



1. Consequences of applying too much pressure on either brake
2. Use of two brakes together
3. Keeping weight on the rear end of the bike when using the back brake.

This can progress to more difficult exercises by including more cones, more riders to the session and varying the route of the rider.



CYCLING SKILLS

PRACTICAL CORNERING SESSION

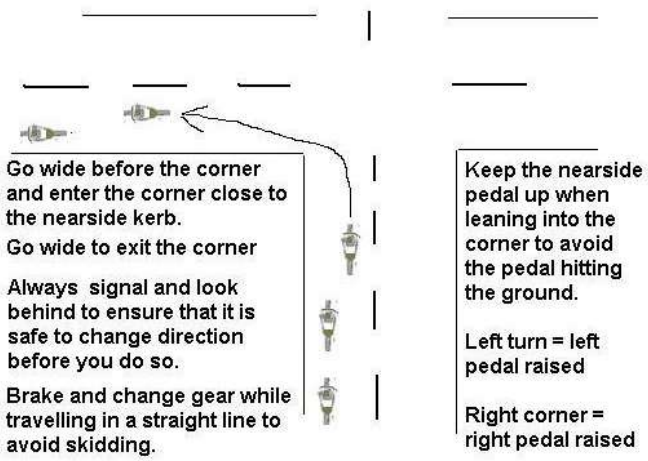
This could be set up in a field, car park, etc. or when riders are experienced enough, on a safe stretch of road with good supervision and safety controls. If practising on the road practise on corners without obstructions (hedges, walls, or houses) where there is a good view of all traffic. Young cyclists should always be supervised by coaches during these exercises. You can use cones, etc. as markers for taking the correct line through the corners during the early stages of this training until the skill becomes automatic.

How?

Left turn = left pedal raised

Right turn = right pedal raised

Diagram A



Unless you are racing on roads that are officially closed to other traffic, when you can then use the full width of the road to corner. Keep to your own side of the road. It is the law and it is for your safety

Unless you are racing on roads that are officially closed to other traffic, keep to your own side of the road. It is the law and it is for your own safety

GROUP CYCLING AND PACING

Cycling at a good pace in a well-organised group is one of the delights of cycling. If the group is well organised, it will generally travel further and faster with less effort than an individual rider.

A substantial part of your cycling training sessions may be in groups so it is important to be able to organise your training groups so that they are safe and that every one involved gets maximum possible benefit.

When you are cycling in the middle of a group or behind another rider, sheltered from the wind resistance, you use up to 40% less energy than if cycling at the front against the resistance of the wind.

This means that riders who are not as fit as other riders in the group can still ride at a comfortable effort by spending more time sheltered in the group than at the front. As fitness improves more time can be spent sharing the pace at the front of the group.

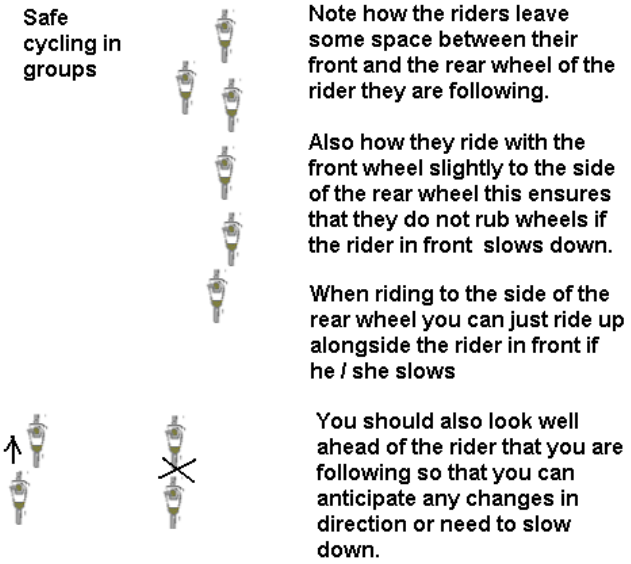
Practice: The best way to learn this is to cycle with experienced cyclists. If every athlete in the group uses roughly the same gear ratios (within a sprocket or two of each other) this will ensure that the cadence and speed of the group will be fairly uniform.

Practice must be non-competitive and disciplined in the early learning stages or the group will disintegrate because of accelerations and speed that's too high for some members of the group.

Begin by practising with two riders and as you become more proficient more riders can be added to the group. Take turns riding at the front for 300 to 500 metres at a comfortable speed.

Note how the riders leave some space between their front and the rear wheel of the rider they are following.

Note also how they rider with the front wheel slightly to the side of the rear wheel.



This ensures that they do not rub wheels if the rider in front slows down.

When riding to the side of the rear wheel you can just ride up alongside the rider in front if he/she slows.

You should also look well ahead of the rider that you are following so that you can anticipate any changes in direction or the need to slow down

Sequence

1. When taking your turn at the front do so smoothly, maintaining the speed of the group. If you accelerate through very fast the group will most likely disintegrate and overall progress of the group will be hindered.

2. When finished your stint at the front ease over and let the next rider come to the front as you return to shelter behind the last rider and so the sequence continues, while maintaining a steady speed without accelerations.

3. Return smoothly to the rear of the group following your turn at the front. Maintain enough pressure on the pedals so that you do not slow down so much that you have to sprint as the last riders rear wheel passes you, otherwise you will quickly become exhausted from the repeated sprints. It is a good idea to begin accelerating slightly as you see the last rider's front wheel appearing. This will ensure that you are moving at the same speed as the group. Practice keeping the group close together so that everyone gets maximum shelter if the wind direction changes and the formation of the group (changing to the left or right) is to be changed, be sure to clearly signal this to every rider in the group before the change occurs. Also signal if there are any dangers (potholes, obstacles, etc.) on the road.

4. Always have a quick glance over your shoulder before you change position, to be sure that it is safe to do so.

Braking • Cornering • Group Cycling • Descending

Progression

When the basic skill of working as a group is learned the distance that each rider stays on the front can be altered according to the size of the group and the speed that it's travelling at. If the group is very large and moving very quickly the turns at the front might be as low as 100 to 200 metres as each rider just goes through and over,

this generally only happens in bicycle races when the speed is very high. When travelling at comfortable speeds, for example, endurance training, each rider might be on the front for 300 to 1000 metres.

The best tactic is to cycle in a group of riders of similar ability to your own especially for long distance endurance training.

When there is a larger number of riders in the group two lines will be more effective. The rider gets shelter while moving up and back down the line and is only exposed to the wind for the short time he is at the front of the group.

There are a few DOs and DON'Ts essential to safe group riding which must be strictly observed

DOs

- Always have your front wheel a safe distance behind and slightly to the side of the rear wheel of the rider in front of you, to avoid rubbing wheels if the rider in front slows.
- Observe the rules of the road.
- Always check behind and signal before you change direction or stop.
- Anticipation. Observe what is happening ahead at all times, to allow for braking time, avoiding parked cars, potholes etc.
- Signal to other riders in the group if there are upcoming obstacles.
- Always keep your hands within reach of the brake levers
- Keep your hands on the bars
- Leave bigger gaps between you and other riders when descending to allow for the higher speeds achieved and longer time needed to safely stop the bicycle in emergencies
- Get plenty of practice at progressively higher speeds and in larger groups as you become more proficient.
- When practicing keep the entire group on similar gearing where possible, or within one sprocket either side of a particular gear according to the conditions, so that there is not huge variations in speed which disrupts the progress of the group.

The single line is usually formed when the group is not so large. the leading riders drifts to the back when the turn at the front is completed

The double line is formed when the group is quite large.

Groups can travel very fast for a long distance in the double line as the turns at the front are very short compared to the time spent sheltered behind other riders.

DON'Ts

- Brake without warning.
- Ride with both hands off the bars.
- Make any unnecessary, sudden changes in direction without signalling to other riders in the group.

Practice Game

When some measure of competence is developed, a team time trial with riders of mixed ability in each team can be organised. The team must work together within the strengths of the group. No rider should be dropped, if they arrive at the finish minus a rider / s no time is recorded. This will ensure that the riders learn how to work together in a disciplined way.

Descending

The number one consideration when descending should be safety. Very high speeds can be reached on some descents and when roads are open to other traffic, you can never be sure what you are going to meet around the next corner so you should ride accordingly. Leave big gaps between riders when descending, as it takes longer to slow from the higher speeds, if you are too close your reactions or brakes may not be quick enough to avoid accidents.

Leave plenty of braking time, have an awareness of what's happening further up the road at all time so that you are anticipating and have plenty of time to react.

• ***Introduction to Cycling*** - Cross Training, Leisure & Triathlon

PREPARING FOR A SPORTIVE

Leisure/Cycle Challenge

Cycling challenges and mass participation cycling events are great fun and really popular throughout the world with the number of participants increasing year on year. These events are great fun and challenge for the thousands of people that participate in them. They can also be a motivational tool in achieving fitness and lifestyle goals.

DISTANCE OF THE EVENTS?

Events range from 20 kilometres to 200+ kilometres. Some events cater for all fitness levels. The An Post Cycle Series is a very good example of this where there are family cycles of 20 to 60 kms and very challenging cycles of 150 km plus all run off on the same day and venue.

Stephen Roches Tour De Cure takes place in Midleton, Co Cork catering for families to the more seasoned cyclist, with routes ranging in distance from 15km - 165km.

Some people want to challenge themselves on an extreme physical level and will participate in events such as: the Wicklow 200, which is 200 kms through the Wicklow mountains with great climbs tackled during the event; Around Ireland Cycle; or the Mizen to Malin challenge which is usually completed over a few days. Riding some of these longer events is a great test of: endurance, skill, willpower, pace judgement and nutritional knowledge.

Who should ride what distance events and what does it take to complete the events?

20 - 60 kms

Most people of average fitness levels who don't participate in sports or regular physical training should be capable of

completing the 20 to 60 kms distance with a small amount of consistent training for 4-6 weeks.

If your long-term goal is to ride one of the more challenging events the shorter events can be used as stepping-stones on the way to fitness for the longer events, which require a greater amount of training.

60+ - 100kms

People who maintain fitness levels by playing sport, cycling, walking, jogging and gym training, etc. should be able tackle these longer cycles by switching some of their focus to cycling training for a period of time.

100 - 200+ kms

This requires very focused cycling training and a longer period of training prior to the event. How long would it take for a beginner to move from being fit enough for the 20-60 kms cycles to 100 to 200+ kms? It may be possible in six months or so but a longer term approach might be best for the longer and more difficult events so it could take up to a year or more depending on your level of fitness when beginning, and your time available for training.

You have decided which event/s you wish to participate in so what's next?

Planning

Spend some time assessing what you need to do, and then do it.

Checklist and questions to address:

- Decide what events you will participate in?
- Get an entry form, complete it and send it away
- Is your Bicycle in good order or do you need to have it overhauled?
- Is your bicycle well set up and comfortable to cycle?
- Have you suitable clothes for cycling?
- Plan some suitable and enjoyable training routes, suitable to your fitness level.
- Are there other people in your locality training for these events?
- Are there any cycling clubs/groups to train with in your area? Make contact with them.
- If you are over 35 years of age and have been inactive for a number of years, it is advisable to get a health check from your doctor before embarking on a fitness programme

Check out www.peakendurancecoaching.ie for more information on sportives

Join a Cycling Ireland club

If you are a newcomer to cycling events try to join up with a more experienced local group. The best way to do this is to join your local Cycling Ireland club, which will have cyclists and coaches with the practical experience to pass on to you.

By joining the local Cycling Club you can get a lot of practical advice, which will make life on the bike easier and more enjoyable in a shorter period of time. You will be on a quicker learning curve and

avoid a lot of the mistakes that beginners are inclined to make. You will also get more opportunities to get notice and information on upcoming national and club events. Make some enquiries as to which clubs suit your needs best. Some clubs are mainly racing while others cater for racing and leisure cyclists very well.

Training programmes

Train according to the distance and profile of the event/s that you intend to cycle.

Training routes

In the early stages of the programme use flattish courses and as you get fitter after a few weeks gradually introduce more hilly routes for one or two of the weekly sessions.

Physical Preparation

Depending on your state of fitness, the distance of the event you are training for and the time you have available, begin training with two to four days of activity.

This can be one or two days cycling as well as different aerobic activities on other days. For example, one day jogging one day swimming and one or two days cycling.

As your fitness improves you can increase the number of days of cycling activity. A minimum of three days will have a good training effect and four to five days training per week is sufficient for the longest events.

The best way to increase the distance is by doing the same distances for one week before increasing it by about 10 %.By using this system the body is allowed adapt to each increase and so gets stronger. Try to do the session in groups of similar ability as yourself, especially the longer sessions, as these will improve your skills for cycling in groups.

Example of programme! How to increase your training

Everyone is different, so depending on your fitness level and time available for training , you will do more or less. Begin training from your current fitness level and initially do too little rather than too much then you can progressively increase the distance as your fitness improves. You should finish sessions feeling that you could do some more.

Begin with laps

If you are unsure about your fitness, begin by cycling on a small circuit of five to eight kms near to your home. You can cover a number of laps and head for home when you feel you have done enough. As you get fitter you can increase the number of laps until you are fit and confident enough to head out on a longer spin away from the circuit. This will be far better than going out too far and struggling home.

The longer spins should always be ridden comfortably, using medium gears and effort that feels best for you. After a

ON THE DAY – PACING:

Ride at a comfortable speed, The best tactic is to cycle in a group of riders of similar ability to your own.

Do not try to stay with groups that are moving at a speed that is very uncomfortable for you, (especially in the mountains) or you will be exhausted before the finish. Let them go and you will probably pick some of them up before the finish anyway.

In addition, eating and drinking regularly will see you through to the end of the event.

number of weeks as your fitness progresses you could include some faster efforts using higher gears on one or two days of the week. For example ride faster but still comfortable for a few 2 to 10 kms sections of one or two sessions per week, ride easy in between the fast efforts on a lower gear until you recover before repeating the effort a few times.

These programmes are only an example of how your training might progress. The most important thing is to do the amount and speed that suits you. Try to maintain focus during training and don't be lured into training harder than you planned.

You should recover within a few hours of each session. If you are sore and exhausted for a few days following sessions you are probably doing too much, so ease off for a few days and then begin again from a lower level.

20-60 KM EVENT 6 WEEK TRAINING GUIDE

WEEKS

TYPE OF ROUTES: On flat to undulating roads. Gears: smaller chain wheel or middle chain wheel if the bike is fitted with triple chain wheels, and middle to smaller sprockets on back wheel

Week 1	Complete 3 sessions of easy cycling of 30-40 minutes. Learn to cycle with a group
Week 2	Complete 3 sessions of easy cycling of 40-50 minutes
Week 3	Complete 3 sessions of easy cycling of 50-60 minutes
Week 4	Complete 2 sessions of easy cycling of 70 minutes and 1 easy session of 90 minutes
Week 5	Complete 2 sessions of easy cycling of 90 minutes and 1 session of 70 minutes
Week 6	Complete 2 sessions of easy cycling of 40 to 60 minutes and the event. The reduction in training this week will ensure that you go into the event with plenty of energy

100KMS EVENT 10 WEEKS TRAINING GUIDE:

This is for a person who has already achieved enough fitness to participate in cycles of lower distances.

WEEKS

TYPE OF ROUTES: On flat to undulating roads if the sportive you are training for is hilly include one to two (progressively) hilly sessions per week from the fifth week on. **EFFORT:** Most of the cycling will be carried out at an effort, which is moderate where you can talk with your cycling companions. The faster efforts should be slightly faster at an effort you can maintain for the duration. Your breathing would be deeper but not totally breathless. Gears smaller or middle chain wheel if the bike is fitted with triple chain wheels, and middle to smaller sprockets on back wheel. The faster efforts will generally use slightly higher gears

Week 1 - 2	2 - 4 sessions of 2 to 2.5 hrs per week
Week 3	2 - 4 sessions of 2 to 3 hrs per week
Week 4	1 - 2 sessions of 3 to 3.5 hrs, 1 - 2 sessions of 2 hrs
Week 5	1 - 2 sessions of 3 to 3.5 hrs and 1 - 2 sessions of 2 hrs, introduce hillier routes on one or two days
Week 6 - 7 - 8	Each week aim to complete 1 - 2 easy sessions of 3-3.5 hrs and 2 sessions of 1.5 to 2 hrs with some faster but comfortable efforts of 5 - 10 kms, followed by very easy cycling for 5 -10mins between each effort
Week 9	Complete 2 - 3 sessions of 2.5 hrs and one session of 2 hrs with some faster but comfortable efforts of 5 -10 kms
Week 10	Complete 2 - 3 sessions of 2 hrs easy and the sportive

100 TO 200 KMS EVENT TRAINING GUIDE:

This is for a person who has already achieved enough fitness to participate in the 100 kms events

WEEKS

TYPE OF ROUTES: On flat to hilly roads. **EFFORT:** Easy/Medium; you should be able to have a conversation with a cycling companion. Gears: smaller chain wheels or middle chain wheel if the bike is fitted with triple chain wheels, and middle to smaller sprockets on back wheel to big chain wheel and middle sprockets according to fitness levels.

Weeks 1 - 3	2 - 3 days from 2 hours increasing to 2.5 hrs over the 3 weeks practise feeding on the bike
4 - 6	2 - 3 days from 2.5 hrs increasing to 3.25 hrs by the third week
7	The same as week 1 for recovery
8 - 11	1 day 3.5hrs on flat or undulating route increasing to 4.5hrs by the third week. Introduce hilly routes on two of the weekly sessions and keep these to a maximum of 3hrs. Each week gradually include a bit more climbing to these sessions. Learn to use the best gears and pace to get you up the hills at a pace you can maintain
12	1 day 4-5hrs on undulating route at steady pace in group. 2 days of 2 - 2.5hrs on hilly route. On one of these days include some sections of the hills at a slightly faster pace than usual using a slightly higher gear than usual
13	One day 4 hrs on undulating route at steady pace in group. 1 day 2.5hrs hilly route, 1 day of 2hrs on hilly route which includes some sections of the hills at a slightly faster pace than usual using a slightly higher gear than usual
14	One day 3.5 hrs on undulating route at steady pace in group. 2 days of 2 hrs on hilly route. On one of these days include some sections of the hills at a slightly faster pace than usual
15	See binder for the rest of this regarding cycling Irelands ads etc

COMPONENTS OF FITNESS

Aerobic • Anaerobic • Strength • Power

It is essential to know which component of fitness you wish to train and how to train each component.

SPEED

Speed of movement, sprinting, maximum speed, reaction speed. This is a very important component for team games and short distance events.

SKILL /CO ORDINATION

General bike control including gear changing, cornering and balance. It is essential that riders learn these skills as young riders when potential for developing this component is very high.

If this is neglected until later years it is likely that the athlete will never reach as high a level possible than if it had been trained at a younger age. However, skills can be improved at any stage to some extent, with practise.

There may be crossover from cycling to other sports for example there may be benefits here for athletes who are rehabilitating from injuries that limit their ability to twist and turn when running.

Cycling sessions can train the movement patterns to help maintain a lot of their general movement skills which can be quickly transferred to the sport specific skill when recovered from injury.

FLEXIBILITY

Flexibility is important for all sports to achieve optimal range of movement when required.

The most important thing is to practice correct stretching techniques. Incorrect application of stretching exercises increases the danger of injury.

AEROBIC ENDURANCE

The ability to maintain the effort and/or required pace for the duration of a training session or event.

For example, it could be a 3 minute effort to a 4 hour race or training session. Aerobic endurance is the foundation that other training is built on in most sports, and is extremely important.

ANAEROBIC ENDURANCE

The ability to maintain the effort and/ required pace for maximum efforts, from fifteen seconds to two minutes.

STRENGTH

Strength is the ability to overcome resistance. It is a very important component of all forms of cycling competition and is an area where great gains in performance can be gained with effective training. There are different forms of strength required for different disciplines or types of efforts

MAXIMUMSTRENGTH

Accelerating from a slow or standing start on a high gear in a sprint is an example of maximum strength. Your max strength will determine how much power you can produce. This is of extreme importance for any athlete who aspires to perform well in sprint events especially.

POWER

A combination of max strength and speed, for example the sprint, when accelerating from a rolling start.

STRENGTH ENDURANCE

All endurance events require a high level of strength endurance. Climbing a mountain riding a time trial or breakaway attempt on high gears is an example of strength endurance. This is of major importance for events from two minutes to a number of hour. All **en**durance athletes should maintain a high level of strength endurance throughout the training year.

TRAINING SESSIONS

The following training sessions are a guide only as to how you might organise some of your training. The amount and speed that the efforts are made at, will all depend on the individual rider's ability and training status.

The important thing is to be progressive. Do too little rather than too much when beginning then you can gradually make increases.

If you do too much to begin with, you will probably have to cut back or cease training for a period of time until you make a full recovery, which can be very demoralising and is not very positive in terms of improving your performance levels.

With the more intensive sessions, recovery is extremely important. Be sure to take adequate recovery between efforts and sets to maximise the benefits of the sessions.

STEPS

For the first ten to fourteen days most of the improvements in fitness will be made in your ability to pedal fluently. This period should not be rushed and it is best spent doing short cycles regularly at a comfortable pace, on a gear that is neither too high nor low and that feels just right for you. This could be interspersed with shorter faster efforts according to your level of fitness.

As fitness improves the speed and smoothness of pedalling will improve.

Following two weeks you should be able to gradually extend the duration of the sessions, or, depending on your previous level of fitness, begin a specific training programme which may be more intensive.

If you are beginning from a low training and fitness background the most important sessions for you are the aerobic sessions. This will build up your basic fitness before you move on to the more intensive sessions.

Heart rate monitors can now be bought at very reasonable cost and are well worth investing in especially for controlling aerobic training

HEALTH CHECK

If you are over 35 years of age and have not been exercising for a long time you should get a general health check to determine your suitability for an exercise programme.

- ***Introduction to Cycling*** - Cross Training, Leisure & Triathlon

TRAINING SESSIONS THE INDIVIDUAL SESSION

Every training session should consist of three parts:

1 Warm up
2 Main part
3 Cool down

This sequence is very important if you are to achieve maximum benefit from each session and to begin the recovery process following sessions.

HOW FAST SHOULD I BE CYCLING?

Age	Max Hr (Estimate)	AEROBIC TRAINING ZONE 60-80%	COMPETITION PREPARATION 80-90%
20	200	120-160	160-180
30	190	115-150	150-170
40	180	110-145	145-160
50	170	102-136	136-153
60	160	96-128	128-144
70	150	90-120	

Control of the effort and pacing

There are a number of things that you can do to learn how to control the efforts and pace yourself.

How the effort feels

Ask yourself the question, “can I maintain this effort for the distance of the session or efforts that I am doing?” You will know from how difficult the effort feels, and can reduce or increase the effort accordingly.

HEART RATE

There is a relationship between the heart rate (HR) and the intensity of efforts. A simple heart rate monitor will give you good feedback of how hard you are working. There are guidelines for heart rate training zones below. The age versus heart rate guideline is 220 beats per minute (BPM) minus your age to determine your maximum heart rate. People’s individual max. Heart rates can actually differ by quite a number of beats per minute so the zones are guidelines based on the max. HR of different age groups.

In the early weeks of a training programme and when completing the longer sessions cyclists will be at the lower to middle end of the zones of the 60-80% zone. When fitness improves, some shorter faster sessions and efforts will be in the higher end of the zone.

The majority of cycling for fitness and sportive training will be in the 60-80% zone. The 80-90% zone is usually only used for competition preparation following suitable periods of training in the 60-80% zone.

Note these are only guidelines and the best way to determine your training zones is by testing in a human Physiology performance lab.

TRAINING SESSIONS

There are four main sessions, that should be included in your training plans.

SESSIONS	METHODS	BENEFITS	DISTANCE/ TIME	WHEN THIS SESSION IS MAINLY USED	CADENCE/ GEARS	HEART RATES/ What the Effort Feels Like
1	Recovery Very easy cycling	Speeds recovery. Helps return your body to a resting state and acts like a massage on your muscles	20 to 40 minutes	For the last part of intensive training sessions (cool down) and on recovery days following races or intensive sessions	75 - 85RPM Small chain-ring and middle sprockets on flat routes	HR Below 60% Very easy
2	Long distance cycling	Improves your ability to cycle further faster and recover from training sessions. Acts as a foundation for all other training	From 30 minutes to 4 or 5 hours according to the cyclist's fitness levels and goals	All year round to maintain basic endurance. Especially in the early parts of training programmes to build a fitness base.	80 - 100RPM Small chain-ring and middle to smaller sprockets)	HR 65-80% Should be able to speak with other people in the group
3	Efforts from 5 to 20 minutes	Improves your ability to ride at higher speeds for extended periods of time	5 to 20 minutes efforts repeated a number of times. With very easy cycling in between the efforts	This is used in the final weeks of preparation for the most important sportive or races events.	85 - 110RPM Big chain-wheel middle to smaller sprockets	HR 80-90% Breathing very deeply to maintain the effort. It's possible to say a few words
4 For competition training only	Efforts from 200m to 2 kilometres	Improves sprint and speed ability. Important for competitions only	200 metres to 1 or 2 kilometres	This is used when building up to peaks for important races. Sportive or leisure riders would not use this session.	100 - 130RPM Big chain-wheel middle to smaller sprockets	HR not applicable These efforts hurt! Breathless at the conclusion of the effort.

LISTEN TO YOUR BODY

Watch out for signs of fatigue or overtraining. Symptoms could include ongoing fatigue, disturbed sleep, and reduced enthusiasm for training. Other symptoms could include, irritability, poor appetite, colds and minor infections.

Periodisation is simply the arrangement of the training plans into a number of training cycles, which are comprised of training sessions of different loads and recovery to produce the best performances in the most important events. Successful coaches and athletes use periodisation of training extensively.

THE REASON FOR PERIODISATION

The goal of training should be to produce the best performance possible in the best events. This requires very good planning of training and recovery periods to develop different components of fitness in a structured way, so that the very best performances are produced in the most important events

MONTHLY TRAINING STRUCTURE

The yearly plan is broken down further into periods of a few weeks. A few weeks increase of training is followed by a period of recovery. This is usually a 2 to 4 week's increase of training followed by 7 to 10 days where training is reduced by 30 - 40 % to allow the body to recover and adapt to the previous training loads

THE WEEKLY TRAINING STRUCTURE

This is very important and will vary according to fitness levels and training experience of athletes. It can vary from one day's training and one-day rest for a beginner to three day's training and one day of recovery for an experienced well-trained athlete.

VARIETY

The weekly training should be planned so that there is variety and that the more intensive training sessions are placed before the less intensive sessions.

WHEN SHOULD YOU INCLUDE CYCLING IN YOUR PROGRAMME

When and how will you get the most benefit from including cycling into your annual training plan?

This depends on your specific sport and discipline and why you are including cycling in your programme. You must also have an outline of the periodisation of your sport, for example, when the competition season begins and ends, when your general specific and pre-competition period occurs.

EXAMPLE

MONDAY:- Rest / recovery

TUESDAY:- Speed

WEDNESDAY:- Strength or power session

THURSDAY:- Aerobic endurance

FRIDAY:- Rest / recovery

This is only one example of many possibilities and will vary according to your goals and the phase of training you are in.

For example in the preparation phase there might be more aerobic training compared to the pre-competition and competition phase when the more intensive sessions might take precedence

TABLE OF YEAR PLAN FOR CYCLING

This is a general guide for endurance cyclists. Mountain bike riders would also do some off-road training, throughout the year. Track riders would also have periods where the emphasis is on track work.

However, this programme would also be a suitable foundation for track endurance events or mountain bike racing.

OCTOBER	NOVEMBER - DECEMBER	JANUARY - FEBRUARY	MARCH - APRIL	MAY - SEPTEMBER
X 1-2 days easy cycling X 1-2 days other (easy relaxing) activity that you enjoy, eg. walking – swimming	X 2 days cycling 1.5 to 2 hrs X 2 days jogging/gym X 1 day optional	X 2 days cycling2 to 4 hrs on road with club groups. X 1 day turbo or spinning class X 1 - 2 days jogging/ gym	X 2-3 days easy/steady training X 1-2 days racespecific efforts of various distances X 1 day race	X 1-2 days race X 2 days easy /steady X 1 day race simulation efforts
This is to recover from the competition season which ends in September.	Preparation for next season begins here, with cross training to improve general fitness levels and small amounts of cycling to retain some cycling fitness.	This is an important period to build up a solid foundation of fitness, which will influence your competition fitnesslater on.	This period sharpens up your race abilty through competition and some intensive training.	At some stage during these months you may feel like a break from racing. A few weeks of easier training and less races usually rejuvenates the body and mind.

TIPS

1 Develop a good training foundation with an adequate amount of fitness and specific training before including very intensive training.

2 Be sure to take adequate recovery time between efforts and intensive training sessions, failure to do so can result in overtraining problems and have negative effects on performance levels.

3 Do your cool down and recovery/ easy sessions really easy so that you can recover from the more difficult sessions. There is no such thing as going 'too easy' when riding a recovery ride or doing a cool down

PROGRAMMES FOR OTHER SPORTS

Sailing				
END OF SEASON TRANSITION	PREPARATION 1 GENERAL TRAINING	PREPARATION 2 SPECIFIC TRAINING	PRECOMPETITION	COMPETITION
Easy cycling in pleasant environment for fun and relaxation	Cycling on hills for strength endurance. Long cycling sessions on flat to undulating roads for basic endurance.	Cycling is now used for recovery between specific sessions.	Recovery cycling between some intensive sport specific sessions.	Cycling as part of the recovery strategy between regattas.
Rowing				
END OF SEASON TRANSITION	PREPARATION 1 GENERAL TRAINING	PREPARATION 2 SPECIFIC TRAINING	PRECOMPETITION	COMPETITION
Easy cycling in pleasant environment for fun and relaxation	Cycling on hills for strength endurance. Long cycling sessions on flat to undulating roads for basic	Cycling is now used for recovery between specific sessions.	Recovery cycling between some intensive sport specific sessions.	Cycling as part of the recovery strategy between regattas.
Rowing				
END OF SEASON TRANSITION	PREPARATION 1 GENERAL TRAINING	PREPARATION 2 SPECIFIC TRAINING	PRECOMPETITION	COMPETITION
Easy cycling in pleasant environment for fun and relaxation	Cycling on hills for strength endurance. Long cycling sessions on flat to undulating roads for basic endurance.	Cycling is now used for recovery between specific sessions.	Recovery cycling between some intensive sport specific sessions.	Cycling as part of the recovery strategy between regattas.

Athletics sprint events				
END OF SEASON TRANSITION	**PREPARATION 1 GENERAL TRAINING**	**PREPARATION 2 SPECIFIC TRAINING**	**PRECOMPETITION**	**COMPETITION**
Easy cycling in pleasant environment for fun and relaxation	Max power efforts and high cadence sessions to develop leg speed. This could be set in to a circuit training session. Cycling on hills for strength endurance. Long cycling sessions for basic endurance.	Max power efforts and high cadence sessions to develop leg speed. Cycling is also used for recovery between specific sessions.	Recovery cycling between intensive sport specific sessions. A small amount of high cadence efforts to maintain leg speed.	Cycling for recovery between races.
Team games				
END OF SEASON TRANSITION	**PREPARATION 1 GENERAL TRAINING**	**PREPARATION 2 SPECIFIC TRAINING**	**PRECOMPETITION**	**COMPETITION**
Easy cycling in pleasant environment for fun and relaxation	Cycling on hills for strength endurance. Long cycling sessions for basic endurance. Short high cadence efforts to develop leg speed.	Max power efforts and high cadence sessions to develop leg speed. This could be set in to a circuit training session. Cycling is also used for recovery between specific sessions.	Recovery cycling between some intensive sport specific sessions.	Cycling for recovery between races and intensive training sessions

A good turbo trainer can be a very useful piece of equipment

BENEFITS OF TURBO TRAINING:

- You can train indoors when the weather is very bad.
- You can do some training indoors in the winter when the evenings are dark.
- Good for fitness testing, the environment is controlled, no wind etc.
- To loosen up at a race venue the evening before a race.
- Warm up before events particularly time trials.
- You can check and refine your position on the bike.

The common problem that riders speak about with turbo training is that it can be boring. This can be overcome by limiting the time spent turbo training to 60 –90 minutes, by using very interesting and varied training sessions and using music or television as a distraction. You could also organise group training sessions.

TYPES OF TURBO TRAINERS

They range from very basic to top of the range which gives you power output (watts). The important things to look for when buying a turbo trainer is that it is smooth, quiet, reliable and easily stored. There are quite a few models on the market so look up the internet to see what's available and talk to local cyclists to see what best suits your needs.

Calibration: This is very important if you intend using the turbo trainer for performance testing Always use the same back wheel, the same tyre pressure and use the same gear and pedal revs to get to a certain speed, then freewheel. The tension should be adjusted for every test

so that the wheel comes to a stop after the same amount of time spent freewheeling.

SETTING UP THE TRAINING AREA

You need a cool well-ventilated area with a good space around the turbo so that it is safe and nothing will catch in the spinning wheel etc. A mat under the turbo will be helpful in cutting down on noise and vibrations.

Ventilation: A good fan and a well-ventilated room will keep you cool.

THE BIKE

It is preferable to use an older training bike (with identical position as your racing bike) rather than a top of the range racer for your turbo trainer. The reason for this is that there are quite a few strains on the frame etc when you are riding hard with the bike locked into the trainer.

There is also the possibility of corrosion from sweat, you might need to put a towel across your handlebars to collect the sweat and avoid your equipment being damaged.

HYDRATION

Have a bottle or bottles on the bike and drink regularly as well as beginning the session well hydrated. You should also check that the bike is level by checking the cross bar with a spirit level, in most cases you will have to raise the front wheel by securely placing a piece of wood, book etc under it to ensure that it's level.

Preventing saddle soreness

Due to the hot environment and the high intensity that is normally part of turbo training saddle soreness is a possibility if you do not take some simple precautions.

Use good shorts with some chamois cream or Vaseline. Relax between hard efforts and ride out of the saddle for a while every 5 minutes or so. Vary your cycling position between holding the drops and the tops of the bars.

WHEN TO USE

- To warm up for some events
- Cool down and recovery
- after competition or training
- Dark winter evenings
- When the weather is too bad to go out on the road
- For specific sessions
- Performance tests

SESSIONS

See the specific session's pages, and select sessions according to whatever component of fitness you wish to develop.

VARIETY

You can use lots of variety when using turbo training. It can be part of a circuit training routine, where the turbo becomes a station of the circuit.

Combined with jogging it is an excellent way of getting a good endurance workout. For example, use 30 mins of jogging to warm the body up then go straight on to the turbo trainer. Five minutes or so of cycling will then prepare you for the specific cycling session.

PERFORMANCE TESTS

By having a speedometer (worked from the back wheel) and/or a cadence meter fitted to the bike simple tests can be carried out on a turbo trainer to determine the

effectiveness of the programme or the improvement in efficiency of injured limbs. If you have a power-measuring device built in to the turbo or the bike the results will be easier to determine, as you will get a reading of watts produced.

The tests can be carried out while cycling with both legs for general fitness testing, or, in the case of recovery from injury, by cycling with one leg to isolate the injured muscles for testing purposes. All of the tests are carried out while sitting in the saddle and using gears according to your fitness levels. Record the gears used, perceived level of exertion as well as the test results for future comparisons. As your fitness improves you may need to increase the gear size for subsequent tests

Each test routine should be as similar as possible.

Calibration:

Setting the resistance between the turbo roller and the tyre can do this so that when you cycle at a certain speed and then stop pedalling the wheel takes the same amount of time to come to a standstill each time. Use the same rear wheel and tyre type with the tyre pumped to the same pressure each time. You should also have only recovery or very easy training in the previous one or two days to the test and good nutrition and hydration.

If you have colds or are unwell cancel the test until you are fully fit.

TESTS

Sprint test:

From a rolling start until max speed/power is achieved on a medium to low gear (52 x 18-17 or (equivalent). Hold the max speed for 1-2 seconds and recover. Take five minutes recovery between each sprint. The result will be the average maximum speed of the three sprints.

Max strength test:

Acceleration on a high gear from zero speed (53 x 15 to12) according to your fitness level. Accelerate using maximum effort for a maximum time of 6 seconds. Recover for 3 minutes between efforts. The result will be the average of max speed / power of three accelerations).

Cadence test:

On a low gear (42 x 19 –18 or equivalent) accelerate until maximum cadence is achieved, recover for five minutes and repeat the test. The result will be the average of max of two accelerations.

Strength endurance test:

Method: Select a gear that will give you a cadence of 60 rpm at 80 % of your max heart rate and cycle for five minutes at this effort.

Record the gear that you use – the distance that you travel – perceived level of effort – heart rates.

With improvements you will see an increase in the gear used and the distance that you travel.

Aerobic endurance test:

Ride at the highest effort that you can maintain for 12 minutes.

Record distance covered – average speed – gears used. Heart rate recovery, at 1 and 2 minutes after the test.

SAFETY: Turbo and bike should be very securely positioned

NUTRITION

Pre – post during training and events

The general guidelines for healthy eating should be followed in your everyday diet. Have variety in your diet with the emphasis on high carbohydrate, medium protein and low fat. Ensure that your diet is rich in carbohydrates; rice, pasta, potatoes, bread, fruit, etc. as well as a balanced intake of vegetables, meat, fish and dairy products.

Carbohydrate is an important element of nutrition as it is the main fuel for the working muscles during exercise. The stores are limited and must be replenished during and after endurance exercise.

When cycling long distances the body needs to be well stocked with energy before the event and needs regular refuelling and hydration during the event to keep it working at a high level. If you fail to do this you run the risk of virtually coming to a standstill through dehydration or depleted energy stores. This is not a pleasant experience, so to avoid it you must plan ahead.

It is very important to ensure that you are consuming enough calories / carbohydrate to balance energy output with intake.

EATING BEFORE THE EVENT

It is usual to have the pre event/ training meal two to three hours before the event.

A substantial pre event meal is advised for very long events. This meal will be based on carbohydrate with a small amount of protein included

Examples of **pre** event meals:

- Porridge or pasta
- Toast and eggs, cheese or ham
- Toast and marmalade
- Fruit
- Yoghurt
- Tea/Coffee

EATING AND DRINKING DURING EVENTS AND TRAINING

If you intend to exercise for more than 60-90 minutes it is strongly recommended that you snack and drink to maintain energy stores and hydration.

SNACKING DURING EXERCISE

Aim to consume twenty to forty grammes of carbohydrate for every thirty minutes of the cycle. Some of this will be in solid foods and some through your bottles, which should have energy in one of them at least.

For a two-hour cycle in average weather two bottles should be fine, include snacks of your choice: cereal, bars, banana, dried fruit, light sandwiches like bread and honey or jam, fruit cake, cereal bar, energy sports bars.

AFTER THE EVENT OR TRAINING

Your muscles will replace more energy than usual in the first few hours following exercise so have a plan and suitable snacks and drinks available for after the event and training sessions.

In warm weather the priority should be to rehydrate as soon as possible so drinks with sugars and electrolytes/salts should be consumed as soon as possible. Some of the commercial sports drinks are suitable.

Suitable snacks **post**-exercise:

Before exercise

- Soup with Bread
- Cereals
- Pasta
- Sandwiches
- Cereal Bars
- Fruit
- Yoghurt
- Protein Shakes
- Sports Drinks

In warm weather consume about 500 mls of fluid in the hour or so before you begin exercising to boost fluid stores.

Fluid during exercise

Your aim should be to remain adequately hydrated. There is a differences in the amount of fluids that people lose while exercising. So try to identify how much fluids that you lose when. Taking Too much fluids can be as much a problem as too little fluids.

Study sports drinks, note how there is different percentages of carbohydrate in different drinks. Usually ranging from 2 to 8% or more. For very hot conditions a low percentage of carbohydrate helps the body to replace fluid more rapidly. For cooler conditions the percentage carbohydrate can be 8% plus.

Fluid post- exercise

The amount of fluid lost can be calculated by weighing yourself before and after exercise. For every 1Kg (2.2lbs) lost in weight, you need to replace 1 Litre of fluid.

Elite racing cyclists usually take one bottle with energy drink and one bottle with water.

If you have diet or nutrition issues they are best addressed by an accredited ***sports nutritionist*** who are the qualified recognised professionals in Ireland.

You can source one through Irish Nutrition and Dietetics Institute ***www.indi.ie/index.p***

TIPS

Reduce your activity for the two days before the event to boost energy stores.

Practise eating and drinking while cycling during training sessions.

Begin to eat early in the cycle and continue to graze small amounts of food and drink at regular intervals.

Bring food and drinks that you are used to. The day of an event is not the place to try out new drinks or foods as this could cause stomach upsets.

Check the labels of the cereal bars, etc. to determine how much you need to consume to reach twenty to forty grammes every thirty minutes.