CYCLABILITIES

Before you Start: Things to think about

Cyclabilities, cycling and children with additional needs

According to the Road Safety Trust, the ACT has the highest cycling participation rate in Australia (www.roadsafetytrust.org.au), however, anecdotally we know children with additional needs (and by extension their families) often miss out.

While there is very little published around the cycling participation of children with additional needs in Australia we have found many factors can negatively impact their involvement. One of the most significant is the inability of existing mainstream teaching methods and resources to address the cycling and road safety needs of these children.

Despite these barriers, cycling can provide many benefits for children with additional needs. This can include increased physical activity, improved gross motor skills, balance and coordination. In addition to these tangible skills, participants in the Cyclabilities pilot program have shown increased confidence, independence and social skills, as well as cognitive development and increased visual perception. The ability to cycle independently allows for a new means of transport and a lifelong skill.

Cyclabilites has developed to address this gap, as a *road safety* and *learn to ride* program for children with additional needs. The program draws on a multidisciplinary therapy team to provide a holistic approach to learning. Recognising that each student is different, the program works to provide a personalised, student centred model of learning responsive to the needs in individual participants.

This manual has been developed to help you get started supporting your child's learning to ride journey. It outlines the gear that you may need, some basic bike knowledge, and a few things to consider before you purchase a bicycle. We also look at setting some realistic goals, engaging your child in the whole process and creating the right environment to support your child's learning.

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What to Wear: A few basic bits of gear

While there is a lot available, riding a bike doesn't require much in the way of specialist gear. There are just a couple of things you need to begin your child's learning to ride journey.

Bicycle Helmets

Most important, the helmet. Wearing a helmet is an imperative part of riding a bicycle. Falls are common and a helmet provides the best protection for your child's head. A major international study of bike helmet use around the world recently found helmets reduce the risks of a serious head injury by nearly 70% (Farrell, 2016). It is important to encourage your child to wear a helmet every time they get on their bike.

Most helmets are covered in a strong, puncture-resistant plastic shell which is designed to hold the entire helmet together in the event of an accident and which allows the helmet to slide across the ground in the event of an accident. The lining of the helmet is made of expanded polystyrene which disperses the force of any impact.

There are three main types of helmets on the market: recreational helmets (suitable for recreational use); road bike helmets (generally for competitive cyclists); and mountain bike helmets (generally for mountain biking). All helmets sold in Australia should meet the minimum Australian Safety Standard so this doesn't have to be a big expense. Look for a sticker that reads **AS/NZS 2063:2008 approved** to double check. When choosing a helmet, think about how your child rides their bike, any level of (extra) protection they might need, and their sensory needs.

If your child is involved in an accident, the helmet is likely to be damaged, even if not obviously. The helmet should be replaced after any significant impact or, if incident-free, after five years. Components in the helmet break down over time due to pollution, UV light and weathering.

Getting the right fit

It's important that your child's helmet fits well and is adjusted properly. Below is a checklist to ensure the helmet is fitted correctly.

- **The helmet should be level on the head**. When your child looks up you should just be able to see the rim of the helmet. A good way to remember this is by placing two fingers between the eyebrows and rim of the helmet.
- **The strap should form a V below the ears when buckled**. The chin strap should be tight but comfortable. When the rider opens their mouth very wide the helmet will pull down a little.
- **The rear stabiliser should be snug** (If present on your helmet). This can be adjusted by turning the dial on the back until it feels firm but comfortable.
- **The helmet should be comfortable but firm**. Have the rider shake their head. If the helmet dislodges or moves about a lot then adjust the straps, and stabiliser if present, until the helmet doesn't move.
- **Wearing anything under a helmet stops it from fitting properly**. Sun hats or pony tails lift the helmet higher on the child's head and reduces its protection. Sun protection helmet covers or shaded play areas are preferable.

- **Choose a helmet that is lightweight.** Not too heavy for their heads and necks to carry.
- **Regularly check the fit.** As your child grows, keep checking that the helmet still fits properly. Some helmets come with padded inserts or a 'ring fit' system to allow you to adjust them.

Wearing a helmet may present a challenge for some children with additional needs, they are meant to be relatively firm fitting and buckled under the chin. If you think your child may struggle, spend some time working on wearing a helmet before you look at bikes at all. Make this comfortable and familiar before introducing any other tasks. If a helmet is too much to start with, work out what it is that troubles your child. Is it the chin strap and being 'locked in'? Is it the disruption to their field of normal vision? Work to find stages to support them to get to the helmet. This might be wearing earmuff (pressure around the head) for a while, or a low brimmed hat to get them use to changes in visual field.

Footwear

When riding, footwear is also important. Shoes should be enclosed, preferably with a stiff, strong sole. This will provide protection for the feet in case of falls and will allow the child to push down properly on the pedals. Good grip is also very important as it helps your child make stronger contact with the pedals. A level of ventilation is also useful to keep feet cool and comfortable. Runners or trainers are ideal.

For the more serious cyclist, cycling shoes are available. Typically, these are paired with a pedal which holds your feet securely on the bicycle. These are not suitable for those still mastering their riding skills. It can be difficult 'un-click' the pairing which may present an additional risk to novice riders.

Other Gear

There is plenty of specialised cycling clothing available. None of this is necessary. It is most important that clothing is unrestrictive, comfortable, easily visible, and appropriate for the weather. However, if you and your child intend to ride regularly, or if your child needs some extra engagement in the 'learning to ride' process other items to be considered may include:

- **Gloves**: If you do happen the fall, the first response is to put your hands out. Gloves may prevent cuts and scratches in the event of a fall and can also provide extra grip and potentially prevent falls.
- **Cycling Shorts:** these may be of the lycra skin-tight variety, or of the 'shy' variety, which look like normal shorts but come with a lycra liner. These are typically padded to provide a little added comfort for your bottom.
- **Cycling Jersey:** a light weight, form fitting top, most often with a zipper at the front to allow for extra ventilation.
- **Extra Padding:** knee or elbow pads are available and may lessen the impact of a fall.
- **Lighting:** If you are riding at night, in bad weather or on by roadways it is essential you have lights fitted. This may include single beams to the front of the bike, and/or flashing red warning lights to the rear of the bike.
- **Cold weather gear:** there are loads of options for managing weather. Long sleeve jerseys, light weight vest or jumpers, and light weight, breathable rain protection are just a few to explore.

It is important to remember that some of these extras will be more suited to the particular needs of some children than others. If your child benefits from pressure to regulate their behaviour tight fitting cycling clothing may help them. They may be sensitive to the feeling of rubber of the handle bar grips and would be more comfortable wearing gloves. If they have high levels of anxiety, they may like to wear pads on their elbows or knees. It really important to keep in mind these sensory needs and consider how best to support them, and what may make them more problematic.

While the options for cycling gear are almost endless it's important to remember, these are just optional extras! To begin with keep it simple (and make is cost effective!).

A Bit of Basic Bike Knowledge

Before getting your child on a bike, its useful for both of you to understand a little about how a bicycle actually works and some really basic maintenance. Working through this basic stuff together can also be a really great way to engage the curious or process driven child in the learning to ride project. It may also be a really useful way of demystifying bike riding if your child suffers from anxiety.

How a bicycle works

There are four main components to a bicycle: the frame; the wheels; the gears; and the brakes.

The Frame

The frame is essentially the big bit! It is the part of the bicycle that distributes the weight of the rider between the front and back wheels. It's usually made of strong, light-weight materials such as hollow steel, metal alloys or carbon-fibre composite tubes, which are positioned into two triangular shapes. The seat of the cycle is located above the rear wheel, while the handlebars are attached to a shaft which attached to the axle on the front wheel.

The Wheels

The wheels are also made of a light weight material and are strengthened by interior spokes, which help to support the weight of the rider. Mounted on the wheels are rubber tyres which house inner tubes filled with pressurised air. The wheel itself revolves around an axle which is attached to the frame.

The Gears

Gears are little sprockets with teeth attached to the back wheel of a cycle and are linked to the pedals by a chain. Bicycles can have anywhere from one to 30 gears, depending on the intended use of the bicycle. The gears are usually changed by moving a shifting lever on the handlebars, and can help a rider to go faster on flat surfaces or alternatively help them to climb a hill.

The Brakes

Brakes use friction to stop a bicycle from moving. Depending on the bike, the brakes can be engaged either by squeezing a lever on the handlebars or pushing backwards on the foot pedal. When engaged, a cable is pulled taut, which closes the brake calliper, pressing rubber pads on to the wheel rim.

Basic Bicycle Maintenance

While major servicing best handled by bike mechanics at your local bike shop there is plenty you can do at home to maintain your bike. Before every ride it is important to do a quick check of the following:

- **Tyres:** are they inflated correctly? Are there any obvious punctures, worn patches or cracked spots?
- **Wheels**: do you need to tighten any loose nuts and bolts? If your wheel wobbles when you spin it, you may need to take it to a bike shop.
- **Positioning**: are your seat and handlebars in the correct position? Do they needed to be tightened?
- **Brakes:** is enough pressure applied to the wheel when you squeeze the brake levers or when you push back on the pedal? Check that the brake pads only hit the rims and not the tyre.
- **Cables and bolts**: check that not none of the cables are frayed and that all nuts, bolts and screws that hold your bike together, are tightened and secure.
- **Chain:** does your chain move freely and does it squeak? If so, you may need to apply some lube or oil.
- **Gears:** run through your gears and make sure you can move between them without any problems.

Choosing a Bike

And of course, the bike! The bike is clearly a vital component of the learning to ride journey. Ensuring the bike is appropriate for the rider is one of the most significant steps to biking success. Whether you purchase your bike new, or second-hand there are a number of things to consider, particularly for children with additional needs. What size bike does your child need? Do your child's needs mean they need a special bike? Training wheel versus balance bike? How much to spend?

Bike Size

Size is important! For both safety and comfort. Your child should be able to get on and off the bicycle easily. Their feet should be flat on the ground when they are seated. They should be able to comfortably reach the handle bars without having to stretch. Their knees should not touch the handle bars and there should be between two to five centimetres between the child's crotch area and the bike's top bar.

Unlike adult bicycles, children's bicycles are labelled according to wheel diameter, not frame size. The following is a general guide, but bear in mind that it depends on the height of your child, not their age:

Child's Height	Rough Age	Bike Size*
65cm – 85cm	2 - 4 years	30cm (12 inches)
85cm– 105cm	4 – 6 years	40cm (16 inches)
105cm – 120cm	6 - 8 years	45cm (18 inches)
120cm – 135cm	8 - 10 years	50cm (20 inches)
135cm – 155cm	10+ years	60cm (24 inches)

**Based on tyre diameter*

When choosing a bike, it is essential to also consider your child's range of motion. They should be able to move the pedals in full rotation without moving from the seat. Handlebars should also be able to be moved to a full turn.

Kids grow. Fast. This of course means your child is likely to outgrow their bike within a year or so, and will need a new bike. It may be tempting to purchase a bike that is larger than required in order to extend the time between purchases. The problem then is that the child may have trouble controlling and balancing a bicycle that is too large or heavy, possibly resulting in frustration and/or injury. If you want this to work, start with the right equipment!

Training Wheels versus Balance Bikes

So, when learning to ride there are two main options to get your child get started. The first is **Training wheels**: small wheels fitted either side of the rear wheel of a standard bike. The rider's uses the pedals to propel the bike and balance is maintained by the training wheels. The alternative option is a **balance bike**: a bike that, either by design or modification, has no pedals or drive train. The bike is propelled by the rider's feet on the ground. Balance is maintained by the rider.

The use of training wheels has been hotly debated, and whether you decide to use them for your child is entirely up to you. The benefits of training wheels are that they can help the child to gain confidence faster and help them to concentrate more on learning other skills such as pedalling. On the other hand, a rider cannot learn the skills of balance and steering if using training wheels. Once the training wheels are removed, the rider has to un-learn what the training wheels taught them, which can make the transition difficult.

At Cyclabilities, in most cases, we are strong advocates for the balance bike option. In our experience, particularly for kids that may struggle with change or face some existing challenges with co-ordination, balance is a fundamental skill. To achieve riding success, our team feel it is important to develop this early on. The good news is, if you choose the balance bike option, it doesn't necessarily have to cost you any more. The pedals can easily be removed from most traditional bikes so they act as a balance bike. Alternatively, there are many specialised balance bikes available to purchase.

However, if you do decide to use training wheels, make sure that they can be adjusted higher off the ground as your child improves. Another option is to lower your child's seat which will help lower the medium height for balance and allow your child to easily touch the ground, helping them to feel more secure. Never push a child to remove their training wheels – it is much better to do once they are feeling confident.

Modified and Modifying Bikes

Many kids with additional needs find trying to coordinate steering, pedalling and balance together extremely difficult. In some cases, some extra assistance from an occupational therapist or an exercise physiologist, as well as lots of practice can help overcome these issues but for others a modified bike may be a better option. Depending on your child's needs this could be a long-term solution or it may be a short terms step to provide some extra scaffolding and support for skill development.

There is a range of modified bike options including hand cycles, three and four-wheeled cycles, tandems, and the DUET (a combined wheelchair and cycle). Cost can vary considerably based on the complexity of the bike. If this may be an option for your child, it's worth looking at funding options, NDIS coverage and any grants available.

Alternatively, some modifications can be made to existing traditional bikes, include utilising different handlebars or seats. We have found loop handlebars can be useful for children who have limited range of motion in their arms. Comfi-grip or half loop handlebars are often suitable for children who have a different range of movement in each arm. Looking at the shape of the seat may also be useful, as larger broader seats may offer more comfort and stability. Small changes may help your child considerably.

Other things to consider

As with so many things, there are often extra considerations for kids with additional needs. Depending on the specific physical and sensory needs of your child there are some other things you may want to think about when choosing a bike.

Braking method

As mentioned above, brakes can either be on to the handle bars or pedals. Depending on the skills and needs of your child the type of brakes you choose may be important. For example, for those that struggle with coordination hand brakes can prove difficult, and pedal brakes may be more appropriate.

Purpose of the bicycle

The type pf bike you chose will be influenced by how you expect your child to use it. Will your child be riding on footpaths, the road or bike paths? Will they eventually be looking to ride off-road, in grass and gravel? The type of terrain the bike will be used, combined with the needs of your child will influence the type of tyres on the bike, whether or not the bike has gears and numerous other bits and pieces. When making these decisions, talk to your occupational therapist or the staff in your local bike shop.

Price

Bikes can range hugely in price so it is important to consider what the most important aspects of the bike are for you and your child and to shop around. The price will be affected by the size of the bike, the quality of the materials used to make it and whether it needs to be modified. Keep an eye out for second hand bikes either being sold cheaply or given away for free but make sure that you check all the features such as brakes and the bike frame to ensure that the bike is safe.

Look and Feel

As we have mentioned before, one of the most important aspects of supporting you child to learn to ride is getting them involved. Where possible, get your child on board in choosing the best bike for them. Discuss the things you think are important and find out what is important to them. Often, this will include the look and feel of the bike. The colour, the theme, characters depicted on the body of the bike, a particular type of helmet, extra accessories like a bell or lights, beads for the bike spokes, streamers on the handlebars. While this may seem unimportant to us as the adult, these can be the most important things to our children, and can be key to getting them on board.

Setting the Scene

One of the most important things you can do you can do to support your child's learning to ride journey is to *engage them in the process*. At Cyclabilites we feel the way you prepare your child and support their introduction to riding will significantly impact their success. We have identified a few strategies to ease the way.

Prepare your child

It's important to begin to prepare your child well before you start teaching them to ride. Start with the basics. Work out whether or not they're interested in learning to ride at all. If they are keen, find out what it is about riding that they are most interested in. These are really basic questions but they work on a couple of different levels. First, they start your child thinking about learning how to ride and begin the (often slow) process of getting them ready to start. Second, it will allow you to identify any of the particular challenges your child may face in learning to ride, and give you some clues about how to approach teaching your child. Emphasis the things they are interested in. Try to tackle potential issues and concerns that may hold them back before getting on the bike. As much as possible make it a safe and exciting challenge for them.

Set some goals

Setting goals is important for both of you. As the parent of a child with additional needs, you know your child may not achieve the same level of competence as a developmentally typical child, and if they are able to do so, the development of their skills may take longer, and they may need your support for much longer. While the end point is learning to ride a bike, it is helpful to develop some progressive goals along the way.

Developing some goals and clearly identifying the strategies and steps you will use to achieve them provides you with a plan. You have some clear direction about how to tackle this task with your child. It also allows you to adaptive and strategic. When things are going well you have direction as to what to do next. If things aren't going well, you can review your goals and think about different strategies and step that may be more effective. It will also provide a means of measuring your child's progress. While they may not be able to ride off to school by themselves just jet, they may be engaged in learning, they may have developed better balance and coordination in the time that you have been working on these skills.

It is important to write these goals down and keep a record of how your child is going. We have identified some tips to help you develop effective goals for your child:

- **Make them realistic**. Consider your child's needs, quirks, strengths and the areas that need more development.
- **Engage your child**. If possible try to engage your child in developing goals. This may allow you to identify the achievements that are important to them, and to discuss the steps they need to take to get there. Consider introducing some rewards or incentives for their progress or effort. Ask them what would motivate them. This will reinforce their engagement in the process.
- **Break it down.** Break you goals down into manageable steps and strategies to support the achievement of the goal. Think of each progressive goal as a step toward riding, and these identified strategies the pathway to get there, the tools you can use.

Below are some examples of what a couple of your initial goals might look like.

Goal 1:	**Get Tim excited about starting to ride**
Steps:	1. Talk to Tim about learning to ride and what type of bike he would like. 2. Select a few bikes that would suit and take him to choose one he likes. 3. Look though some magazines with Tim to find some bike riding pictures. 4. Borrow some books about riding form the library to look through together.

Goal 2:	**Get Tim walking/sitting on a balance bike**
Steps:	1. Take Tim to the school oval. 2. Get him familiar with the bike, talk about the parts and how it works. Let him touch and adjust and play around. 3. Get him to sit on the seat and stand still. 4. Get him to stand up and walk around over the bike. 5. When he is comfortable get him to sit on the bike and walk around.

Creating the right space and getting started

A really important step before getting started is creating an effective space for your child to learn in. There are several considerations here, all of which will depend on the particular needs of your child. These are also likely to change over time so it is a good idea to revisit this idea of a good learning space as your child's skills and confidence improves.

- **Surface**. Think about the surface when choosing your location. It should be relatively flat and open, with plenty of room for your child to manoeuvre and move around. It should be smooth (free from debris, rocks, glass, potholes). Hard or soft? What would your child feel most comfortable starting out on?

- **Noise and other sensory inputs**. While particularly important for children with sensory issues, for all children it is important to think about the noise level and other sensory inputs in the space that you choose. Find somewhere relatively quiet, avoid street noise, other people and try to select somewhere with as few visual and auditory inputs as you can manage. In addition to reducing the load for children that struggle with sensory issues, this will help all children focus more effectively on the riding.

- **Distractions**. It's important to try to find somewhere as free of distractions as you can. This is particularly relevant for children that struggle with attention and behavioural regulation, but will aid all children with maintaining their focus on riding. If distractions become an issue perhaps begin the session by allowing your child some time to engage with whatever it is that's distracting them (a play equipment, looking at the ducks, people watching, whatever it is) and negotiate time after the session to do the same. A visual schedule may be useful to support this.

- **Safety.** This one is an obvious one. Think about how the space you are choosing is used. What risks are around? How can you minimise these? How much space is available around your child? Traffic, other riders and pedestrians are all important considerations.

When you're getting started we would recommend somewhere like a school netball or basketball court during a quiet time. Many schools will also have cushioned play surfaces that may also be ideal. These spaces allow you to address most of the concerns raised above and are relatively accessible. We also suggest that you avoid bike paths initially if possible, instead selecting somewhere that will provide your child with lots of space in all directions and present as few safety concerns as possible.

For many children with additional needs you will also need to be flexible (you know this! You parent them all the time). Pick a time when their mood is conducive to learning. This may be in the morning or after they have eaten. If their mood changes and they become agitated let yourself pull the pin and try again another time. If you find after some time things aren't working out quite as you hoped then perhaps consider making some changes to the riding space so that it better meets the needs of your child.

Conclusion

This manual has touched on some of the preliminary thinking it's helpful to do before getting your child started on their learning to ride journey. It has outlined some of the gear that you may need, some basic bike knowledge, and a few things to consider before you purchase a bicycle. It has also looked at preparing your child to begin by setting some realistic goals, engaging your child in this process and creating the right environment to support your child's learning to ride journey. We hope you have found it useful! Good luck!