

Concept2 Indoor Rower

Fact Sheet 4:

Children – Frequency, Duration and Intensity of Exercise, Warm Up and Cool Down

Rowing is a great cardiovascular workout for children and young adults. It uses most of the major muscle groups and is weight supporting. Closely supervised resistance training (rowing) using concentric (shortening) only muscle actions (rowing) with relatively high repetitions (stroke rate) & low resistance (drag) significantly improves muscular strength with no adverse effect on bone, muscle or connective tissue.

However caution is needed when prescribing exercise for children and young adults.

- **Frequency**

Frequency refers to the number of exercise sessions per week.

The maximum number of weekly sessions should be 2 for Year 7 and 8, 2/3 for Year 9 and 3 for Year 10.

- **Duration and Intensity**

Duration refers to the amount of time in minutes for an exercise session. The time spent exercising varies for each Year Group and within each Exercise Zone.

A suggested format to establish safe **Intensities of Exercise** for children and young adults is to use performance over the Year Group race time and base **Intensities of Exercise** on a percentage of the **Watts** equivalent for the average **Pace** achieved.

Five Exercise Zones (**Light, Easy, Medium, Hard** and **Very Hard**) can be identified for use in teaching good technique and as preparation for the Schools League Challenges.

- **Warm up and Cool down**

Warm up and cool down are vital components of exercise. The aim of a warm up is to prepare the body both physically and mentally for exercise.

A warm up should progress gradually and provide sufficient intensity to increase muscle and core temperature without causing fatigue or reduced energy stores (it should make you sweat and slightly breathless).

During cool down maintaining light, continuous exercise allows the body to pump oxygen around the fatigued muscles. This helps to reduce lactate, reduces blood pooling in the muscles, returns heart rate, core temperature and breathing to normal and prevents muscle soreness.

Children – Frequency, Duration and Intensity of Exercise, Warm up and Cool down

This Fact Sheet should not be viewed as an Indoor Rowing training programme but as part of a structured multi-skills physical activity programme for children with the emphasis on safety, fun, basic skills and good indoor rowing technique. Indoor Rowing should be part of a wide and varied programme of activities such as running, jumping, dancing, skipping, balancing and swimming, as well as ball and racket skills catching, kicking, striking and throwing etc. It should be fun and part of a healthy lifestyle including diet, rest and relaxation.

Caution is needed when prescribing exercise for children and young adults. However rowing is a great cardiovascular workout for children and young adults. It uses most of the major muscle groups and is weight supporting. Closely supervised resistance training (rowing) using concentric (shortening) only muscle actions (rowing) with relatively high repetitions (stroke rate) & low resistance (drag) significantly improves muscular strength with no adverse effect on bone, muscle or connective tissue.

Key Points to remember are:

- Children develop at different rates and there are differences between boys and girls. Maximum oxygen uptake (VO₂max) of boys and girls is similar until approximately 12 years old, by 14 it is 25% higher in boys and by 16 50% higher in boys. The difference reflects greater muscle mass in boys and gender differences in daily physical activity.
- The difference closely parallels the greater accumulation of fat in females – extra fat increases the energy cost of exercise.
- As children develop it is important to avoid injury by not excessively loading the musculoskeletal system and to remember that their oxygen consumption is 10-30% higher than an adult for the same level of exercise.
- Children have an inability to generate high levels of blood lactate, HRs are higher, they breathe greater volumes of air and they can suffer greater dehydration.
- Children also show a lower sweating rate and higher core temperature during heat stress. **Intensity of Exercise** should decrease for children exposed to heat stress although children cool faster than adults due to a greater body surface area ratio.
- In addition children generally have a shorter stroke length and therefore a higher stroke rate.
- This makes standard rowing pace more stressful (and performance scores poorer) – this disadvantage exists despite the higher specific aerobic capacity of children.

A suggested format to establish safe **Intensities of Exercise** for children and young adults is to use performance over the Year Group race time and base **Intensities of Exercise** on a percentage of the **Watts** equivalent for the average **Pace** achieved (a **Watts/Pace** conversion is attached as **Table 1** and also see **Fact Sheet 3**). 5 Exercise Zones (**Light, Easy, Medium, Hard** and **Very Hard**) can be identified for use in teaching good technique and as preparation for the Schools League Challenges.

Key Point 1: Children and young adults using the Indoor Rower for exercise only should be limited to the **Light** and **Easy** exercise zones with the emphasis on good technique and basic skills. **Medium, Hard** and **Very Hard** exercise zones should be used sparingly as part of preparation for the Schools League or British Indoor Rowing Championship. In all exercise zones the overriding consideration should be concentration on good technique (see **Fact Sheet 2**).

Year groups 11-13 could use the Year 10 Duration and Intensities of Exercise – however these are the age groups where progression to a more developed exercise and training programme can be beneficial – for specific 2000 m training and exercise programmes see:

<http://www.concept2.co.uk/training/interactive.php>

Frequency

Frequency refers to the number of exercise sessions per week. The maximum number of weekly sessions should be 2 for Year 7 and 8, 2/3 for Year 9 and 3 for Year 10. The majority of exercise should be in the **Light** and **Easy** exercise zones mixing in **Medium**, **Hard** and **Very Hard** exercise zones as Schools events approach. An example of 4 weeks structured sessions leading to a Schools League event:

Year 7/8/9 (two sessions)

Week	1	2	3	4
Session 1	Light	Light	Light	Light
Session 2	Easy	Medium	Hard	Very Hard

Year 9/10 (three sessions)

Week	1	2	3	4
Session 1	Light	Light	Light	Light
Session 2	Easy	Medium	Hard	Very Hard
Session 3	Light	Medium	Medium	Light

School Year Group Durations and Intensities of Exercise for each Exercise Zone

Year Group	Race Time	Light = 50% of race time Watts	Easy = 60% of race time Watts	Medium = 70% of race time Watts	Hard = 85% of race time Watts	Very Hard = 100% of race time Watts
Session Time - Stroke Rate						
7	2'	5-10' - 18-22	5' - 22-24	2x1'/1.5' rest - 24-26	2x1'/1.5' rest - 26-30	3/4x30"/1' rest - 30-36
8	3'	15' - 18-22	7.5-10' - 22-24	2/3x2'/2' rest - 24-26	2/3x1.5'/2' rest - 26-30	3/4x45"/1.5' rest - 30-36
9	4'	15-20' 18-22	10-12.5' - 22-24	2/3x3'/3' rest - 24-26	2/3x2'/3' rest - 26-30	3/4x1'/2' rest 30-36
10	5'	20-25' 18-22	12.5-15' - 22-24	3x3.5'/3.5' rest - 24-26	3x2.5'/3.5' rest 26-30	4x1.5'/3' rest - 30-36

Warm Up and Cool Down

Warm up and cool down are vital components of exercise. The aim of a warm up is to prepare the body both physically and mentally for exercise. Warm up increases muscle and core temperature, blood flow and improves the uptake, transport and utilisation of oxygen around the body as well as providing a comfortable way to lead into more vigorous exercise. Warm up also increases alertness and reaction time as the increased body temperature allows nerve impulses to travel more quickly. It also has psychological benefits as it helps mental preparation, focus on the task ahead and settles nerves.

A warm up should progress gradually and provide sufficient intensity to increase muscle and core temperature without causing fatigue or reduced energy stores (it should make you sweat and slightly breathless).

Warm up may need to vary depending on the environmental conditions (hot or cold venue) and should be completed within a few minutes of the start of an exercise or training session.

Warm up stretches the muscle tendons allowing greater length and less tension on exposure to the start of an exercise or training session. Injuring a warmed up muscle requires greater force than the force required to injure a cold muscle. A good warm up produces higher temperature, higher oxygen consumption and lower blood lactate in the first minute of exercise compared to no warm up at all (a considerable benefit for racing - but note the differences in children mentioned earlier in this Fact Sheet).

For those individuals who suffer with exercise induced breathlessness of any description warm up is

paramount as the intermittent intensity of some of the warm ups will assist in generating the necessary stimulus to keep the airways open sometimes without the need for inhalers (however always take medical advice).

Cool down is as important as warm up. During cool down maintaining light, continuous exercise allows the body to pump oxygen around the fatigued muscles. This helps to reduce lactate, reduces blood pooling in the muscles, (which can lead to dizziness) returns heart rate, core temperature and breathing to normal and prevents muscle soreness. A few minutes of gentle rowing can be sufficient to reduce blood lactate levels to near normal (but note the differences in children mentioned earlier in this Fact Sheet).

Warm Up for each Exercise Zone

Year Group	Light Zone	Easy Zone	Medium Zone	Hard Zone	Very Hard Zone
7	2' at slower than Light pace	2'-3' – 1'/1.5' at Light pace and 1'/1.5' slower than Easy pace	3' – 1.5' at Light pace and 1.5' at Easy - incl 2 x 8 strokes at 24-26 SR	3'-4' – 1.5'/2' at Light pace and 1.5'/2' at Easy pace - incl 2 x 8 strokes at 26-28 SR	4' – 2' at Light pace and 2' at Easy - incl 2 x 8 strokes at 30-36 SR
8	3' at slower than Light pace	3'-4' – 1.5'/2' at Light pace and 1.5'/2' slower than Easy pace	4' – 2' at Light pace and 2' at Easy pace - incl 2 x 10 strokes at 24-26 SR	4'-5' – 2'/2.5' at Light pace and 2'/2.5' at Easy pace incl 2 x 10 strokes at 26-28 SR	5' – 2.5' at Light pace and 2.5' at Easy pace incl 2 x 10 strokes at 30-36 SR
9	4' at slower than Light pace	4'-5' – 2'/2.5' at Light pace and 2'/2.5' slower than Easy pace	5' – 2.5' at Light pace and 2.5' at Easy pace - incl 2 x 12 strokes at 24-26 SR	5'-6' – 2.5'/3' at Light pace and 2.5'/3' at Easy pace - incl 2 x 12 strokes at 26-28 SR	6' – 3' at Light pace and 3' at Easy pace - incl 2 x 12 strokes at 30-36 SR
10	5' at slower than Light pace	5'-6' – 2.5'/3' at Light pace and 2.5'/3' slower than Easy pace	6' – 3' at Light pace and 3' at Easy pace - incl 2 x 15 strokes at 24-26 SR	6-8' – 3'/4' at Light pace and 3'/4' at Easy pace - incl 2 x 15 strokes at 26-28 SR	8' – 4' at Light pace and 4' at Easy pace - incl 2 x 15 strokes at 30-36 SR

Cool Down for Each Exercise Zone (all at SLOWER than Light Zone pace)*

Year	Light Zone	Easy Zone	Medium Zone	Hard Zone	Very Hard Zone
7	2"	2'-3'	3'	3'-4'	4'
8	3'	3'-4'	4'	4'-5'	5'
9	4"	4'-5'	5'	5'-6'	6'
10	5"	5'-6'	6'	6'-8'	8'

EXAMPLE: Year 7 metres rowed over 2 minutes – 426 m = Average **Pace** of 2:21 per 500 m = 125 average **Watts**

Light Zone - Slow technique rowing up to 10 minutes = 50% of 125 **Watts** = 63 **Watts** = **Pace** of 2.57 per 500m @ 18-22 strokes

Easy Zone - Fast technique rowing up to 5 minutes = 60% of 125 **Watts** = 75 **Watts** = **Pace** of 2:47 per 500m @ 22-24 strokes

Medium Zone – Fast technique/long Intervals 2 x 1.5 minutes/1.5 minutes rest = 70% of 125 **Watts** = 88 **Watts** = **Pace** of 2:38 per 500m @ 24-26 strokes

Hard Zone – Medium intervals 2 x 1 minute/1.5minute rest = 85% of 125 **Watts** = 106 **Watts** = **Pace** of 2:29 per 500m @ 26-30 strokes

Very Hard Zone – Short Intervals 3 x 30 seconds/1 minute rest = 100% of 125 **Watts** = 125 **Watts** = **Pace** of 2:21 per 500m @ 30-36 strokes

A Medium Zone session for this example:

Warm up - 3' – 1.5' at 2:57 pace and 1.5' at 2:47 pace - incl 2 x 8strokes at 24-26 SR

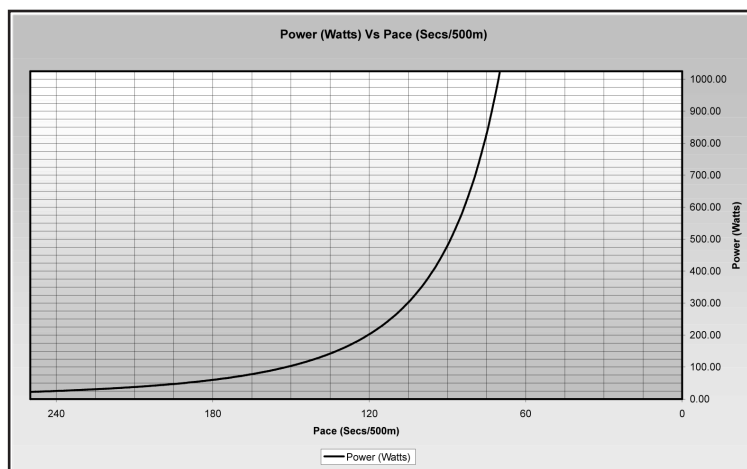
Main session - 2 x 1.5' at 2:38 pace /1.5' rest 24-26 SR

Cool down - 3' at 2:57 pace

Top Tip 1: To get the best result for any rowing session, row at an even Watts/Pace and stroke rate throughout the session – this will use less energy.

Top Tip 2: Concentrate on technique to produce a smooth Force Curve (see Fact Sheet 3).

Watts/Power Conversion



Watts	25	50	75	100	125	150	175	200	225	250
Pace	4:01.0	3:11.0	2:47.1	2:31.8	2:20.9	2:12.5	2:06.0	2:00.5	1:55.9	1:51.9
Watts	275	300	325	350	375	400	425	450	475	500
Pace	1:48.3	1:45.2	1:42.5	1:40.0	1:37.7	1:35.6	1:33.7	1:32.0	1:30.3	1:28.8
Watts	525	550	575	600	625	650	675	700	725	750
Pace	1:27.3	1:26.0	1:24.8	1:23.6	1:22.4	1:21.4	1:20.3	1:19.4	1:18.4	1:17.6
Watts	775	800	725	850	875	900	925	975	1000	
Pace	1:16.7	1:15.9	1:15.2	1:14.4	1:13.7	1:13.0	1:12.3	1:11.1	1:10.5	