



MISSISSIPPI MILLION

THE GREAT RIVER ROWED

MEDICAL, NUTRITION,
TRAINING AND EXERCISE
INFORMATION

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The Team

Rob Shave

Rob Shave is Professor in Sport and Exercise Physiology at the Cardiff School of Sport. His research examines the acute and chronic impact of prolonged exercise upon the heart. Previously Rob worked for the British Olympic Association as an applied physiologist. In this role he helped prepare the British Rowing team for competition. Since moving into academe Rob has continued his work in applied sport science through his involvement with the London Marathon Science and Medicine Conference.

Juliette Lloyd

Juliette is a Health Professions Council (HPC) registered, British Psychological Society (BPS) Chartered Sport and Exercise Psychologist with an MSc in Exercise and Sport Psychology. A former British junior international rower, Juliette has almost a decade of experience as a rowing coach at national and international level for the GB junior team. After graduating for the University of Exeter, she spent ten years working at the English Institute of Sport (EIS) supporting elite performers in a wide variety of sports. Juliette combines freelance work as a sport psychologist and coach with bringing up her young family.

Courtney Kipps

Dr. Kipps is a consultant in sport and exercise medicine and principal clinical teaching fellow at the Institute of Sport, Exercise and Health at UCL where he is co-lead on the MSc in Sports Medicine, Exercise and Health. Dr. Kipps is the medical director of the London Triathlon, the Blenheim Triathlon and London's "Run To The Beat" half-marathon. He has worked with Team GB at the European Athletics Championships, Winter Paralympics holding camp and the World University Games.

Paul Thawley

Paul Thawley specialises in Sports physiotherapy with a Masters degree in Sports Medicine and Rehabilitation and a postgraduate diploma in Physical rehabilitation. Paul has 22 years of extensive physiotherapy experience within international sport attending three Olympic Games. He reached the peak of his career when selected as a senior physiotherapist for the Olympic Medical Institute where he treated elite sporting individuals. He is currently a clinical teaching fellow and course organiser on the MSc in Sports Medicine, Exercise & Health at University College London and is actively involved in current research projects

Justin Roberts

Dr. Justin Roberts is a Senior Lecturer and Researcher in Sport, Health and Exercise at the University of Hertfordshire, specializing in Functional and Performance Nutrition. Having previously worked at the British Olympic Medical Centre, Dr. Roberts gained significant experience with high-level performance, and more recently has been recognised for his scientific and practical nutritional applications for endurance athletes, including ultra-endurance and expedition events.

Justin has advised numerous athletes and expeditioners, and supported various nutrition companies.

Martin Suzan

Martin is a water safety consultant at Swim Safety Ltd, who provides water safety management to some of the UK's largest mass participation water based events. He has also worked as water safety advisor on a number high profile fundraising challenge events with Sport Relief such as the David Walliam's Thames Swim & recently Davina McCall's Beyond Breaking Point challenge.

Graeme Mulcahy

Graeme is a senior coach at the Skiff Club and will be helping participants of the Mississippi Million train and prepare for their leg of the challenge. Graeme learnt to row at school, continued while a student at The Polytechnic and then at Worcester College, Oxford. After graduation, his rowing career developed, eventually winning several National Championships and culminating in representing Great Britain at two World Championships. Alongside standard rowing, he took up skiffing and won 6 successive skiff Championships. After competing in addition to his career in teaching he began to coach school rowing. Moving onto senior coaching, he was a member of the GB coaching team for two World Championships. He has also for many years been active in coaching skiffing.

Medical Considerations

The Mississippi Millions Challenge will be a once in a lifetime event. There is no doubt it will be great fun, but it will be a challenge! You will be out in the open on a river flowing through wide open countryside, at times far away from big cities and crowds, but also far away from big hospitals. The Challenge team take your health and safety seriously and are working to ensure the event is as safe as possible. There will be trained first-aiders on the challenge with you.

Before going out, in fact before beginning training seriously, we would like to offer all of you a medical assessment and examination with our sports medicine doctor at one of the training weekends. This will include a full heart, lung, abdominal and skeletal examination which will help to identify any current or potentially looming problems and allow an opportunity to address them before departure!

When you attend for a medical examination, it would be helpful to know:

Do you have any medical, surgical or mental health conditions?

Are you currently seeing your doctor for anything?

Have you previously had any serious or significant medical, surgical or mental health conditions, or any injuries?

Do you take any medicines or any tablets on a regular basis?

Are you allergic to anything?

If you know the answers to any of these questions now, please feel free to let us know sooner rather than later!

Before you go...

You will need to ensure you have sufficient medicines to last you and it is wise to carry a spare supply in case of emergency, particularly if they are prescription medicines. It will also be helpful to carry a list of your prescriptions with you.

Please ensure your travel insurance provider is aware of your participation in the Challenge and make sure your policy includes emergency evacuation as well as emergency medical care should you require it.

Look after yourself in the build up to the challenge. It is a good idea to monitor how you are dealing with the increased training load. To keep an eye on how your body is coping with the additional stress you can keep monitor your resting heart rate and take an interest in the colour of your urine!

Morning heart rate: Get into the habit of taking your morning resting heart rate (RHR). When you wake, and after the shock of the alarm clock has passed, take your RHR. After a week or so you should have a good idea of what your "normal" RHR is. When you know this you can monitor it for any significant change. In our experience if you notice a 10 bpm elevation in RHR it is worth having a day or so of "light" training as opposed to "harder" sessions. An elevation in RHR can often be the first sign of an imminent infection and you do not want to be pushing your body any harder at this point in time. Remember we want you to get to the start of your challenge!

Urine colour: This may sound a little strange, however, the colour of your urine is a great indicator of hydration. The urine colour chart below can be used as a guide. Remember staying well hydrated will help your body adapt and recover from the training that you are doing. Keeping hydrated doesn't mean that you need to start drinking loads of sports drinks, rather just remember to take some fluid on before and after training and keep an eye on your urine colour.



Am I Hydrated? Urine Color Chart



When you're out there...

Common ailments you might encounter:

Blisters: Blisters on hands and fingers is always a possibility, however the more training you have done before the event the less likely they are to ruin your big row.

Insect bites: Midges and mosquitos are less of a problem whilst you are on the move but may be plentiful in the evening around the camp. We would advise taking a small bottle of insect repellent along with you.

Sunburn: As you might expect, there will be no avoiding the sun whilst you are on the river! Please ensure you bring along a large floppy hat and long-sleeved loose-fitting cotton garments to protect you from the sun, as well as sufficient sunscreen for any exposed areas. As well as being uncomfortable sunburnt skin does not allow you to sweat as well and so means you cannot lose heat efficiently (something you will want to be able to do!!!).

Gastroenteritis: Upset stomachs, tummy bugs or gastroenteritis are easily spread if basic hygiene is not taken seriously. Please remember to wash your hands properly after being out on the water, after going to the toilet and before eating. A small bottle of alcohol-based hand gel in your pocket is a convenient and quite effective solution to prevent infection. This is worth thinking about in your training as well as out on the Mississippi.

Coughs and colds: These are usually viral infections and incredibly common after long-haul flights. An immune system laid low by travel, stress and training can leave you exposed and more susceptible than you otherwise might be. The best way to avoid coughs and colds is to look after yourself in the run-up to departure and on the journey. Make sure you get enough sleep, eat appropriately to match your training needs and avoid too much alcohol and caffeine.

Muscle strain: Muscle strains happen when you are not properly warmed up or when you start tiring and become fatigued. Practice a simple stretching and warm-up routine before every training session and make sure you build up your fitness in the boat appropriately: make every training session count.

Ankle sprain: Probably the most common injury on a camping trip and little to do with rowing but twisting your ankle on a stone or root can really scupper your trip. Please be careful walking around campsites and riversides. We do not recommend you wear flip-flops in camp as they are responsible for more ankle injuries than anything else!

During the training weekends we will also be providing additional advice in relation to looking after yourselves out on the challenge itself.

If you have any medical queries or concerns about your training or the trip itself please don't hesitate to get in contact with us.

Good luck with your training and we look forward to meeting everyone at one of the training weekends!

Nutrition Principles- Part 1

“**You are what you eat**” – more specifically, you *are* what you actually metabolise and use. Most of us know what foods are healthy, but often we are governed by other factors such as time commitments, fatigue, stress, training, social needs, work pressures, family commitments and specific nutritional knowledge (ie: “whats actually good for me”). For many, nutrition is not conscious, other than hunger pangs and the need to eat.

Another saying is “one man’s food, is another man’s poison” – in other words, we are all biochemically individual and to an extent there is no ‘one size fits all’ approach to nutrition intake. This is highly important, as a diet that may work for one person (based on their physiology, needs, current intake, medical status etc) to, say, increase muscle mass, may not necessarily work for another.

KEYPOINT: It’s important to recognise what YOU may need in preparation for this event, and thus plan accordingly, preferably in collaboration with a qualified professional.

Key Principles of Performance Nutrition

Eating healthily is one thing. We all know that its ‘good’ to eat fruits and vegetables, but healthy nutrition is only a small part of performance nutrition. For you to perform to your best ability, nutrition is a key element. Here are several key principles that top performers tend to adhere to:

1. Consistent progression is important

Like with training, progressive overload is a key concept that is the backbone of performance gains. Its the same with nutrition. Often people want quick-fix, sudden gain nutrition. However, if you are training for a Mississippi stage, the training takes time, it takes commitment, it takes consistency. The same for performance nutrition. Don’t beat yourself up if it’s not going well on day 2 of your programme, aim for gradual but consistent improvements. For most people, performance gains occur within a matter of weeks.

Keypoint #1: start your nutrition plan now – not 2 weeks from the event!

2. Nutrition is as important as training

Good performers are aware of the tried and tested principle of nutritional periodization – that is, layering in nutrition around training to support/fuel the volume of training you might undertake, but also support recovery.

Keypoint #2: plan your nutrition programme alongside your training. Skip meals at your peril. Bottom line: you are responsible for YOU; only you can ‘own’ your nutrition.

3. The 80:20 rule

Try to eat world class nutrition 80% of the time, enjoy the other 20%. If you are schedule for a business dinner one evening, or a social event at the weekend, don’t let this stop your ‘consistent progression’. Consider the statement: everything in moderation.

Keypoint #3: plan ahead, have a nutrition schedule – be disciplined 80% of the time; but allow time for the foods you enjoy. They will keep you motivated and on track.

4. Recovery, recovery, recovery

The adaptations to training occur when you physically are recovering. That’s right – quality sleep, and the correct nutrition are as essential to the whole process as the training. Ignore this principle at your peril.

Keypoint #4 – to fuel your training, maximise key nutrients in the recovery phase such as amino acids from protein sources, and wholefood carbohydrates.

5. Always mindful of the ‘right’ nutrition

World class performers are always consciously thinking what their foods are ‘doing’ for them. You wouldn’t put the wrong petrol into a Ferrari would you? Eating clean, eating energy dense foods are an essential part of your progress. Also keep it simple: be mindful of HOW you eat. Take your time, enjoy your meals.

Keypoint #5: before you eat a meal, ask “is this supporting my training goals”. It’s better to look back after months of preparation and KNOW that you gave your best as your prepared for this event, instead of ‘wishing’ you had done more.

6. High quality wholefoods are key

A good friend of mine and a top nutritionist once said to me – if it has more than 3 ingredients then it probably isn't food. I like it, and it's probably true. Mother nature does indeed know better when it comes to wholefoods. These are foods **packed** with nutrients, colourful, full of antioxidants and bursting with energy. If you want energy, eat good quality energy based foods that will sustain you, NOT foods that give you a temporary fix.

Keypoint #6 – a variety of natural wholefoods, vegetables, grains and fruits are key for sustained energy.

7. Metabolic nutrition is central

If you eat quickly, on the go, rushed; if you eat quick fix foods, fast foods, processed or stimulant based foods; if you eat late, if you skip meals, if you eat a high fat, sugar based diet (and many people do!) then you are likely to have associated imbalances, energy issues, digestive complaints and sub-optimal training effects. Eating a high quality protein diet, along with wholefood carbohydrates and healthy fats (the good fats); eating small regular meals throughout the day helps support a more 'functional' metabolism in line with performance gains.

Keypoint #7: eating healthily, and not overloading on calories can lead to improved metabolic function.

8. Like training, eat specific

One of the key principles of training is to train specific to the event to maximise gains. If you are rowing the Mississippi Million, ergo a high percentage of your training should focus on the act of rowing over a sustained period, including the key functional muscles which are engaged (ie: lower back, shoulders, arms, neck). In terms of nutrition, eating specifically in line with training can support recovery and adaptations. Studies have shown that consuming the right proteins and carbohydrates in the hours after training can maximise the adaptive process leading to faster recovery.

Keypoint #8 – be mindful of how nutrition can maximise the training response.

9. The power of superfoods

As we enter a new era of nutrition, we are beginning to understand that many of the foods we eat have bioactive properties. A great example of this is the humble blueberry – we all know it is high in vitamin C, but it also contains powerful antioxidants and anthocyanins, as well as fibre. Whilst the term 'superfoods' is an expression, they are plentiful in our diet eg: almonds, dark cabbages, kale, acai berries, blackberries, ginger, quinoa, almonds, turmeric, and even raw, dark chocolate (not all bad is it) as examples. And we mustn't forget the seeds: pumpkin, chia, flaxseed, sunflower, sesame.

Keypoint #9: Performance nutrition is born out of supernutrients. Be wise in your choices.

10. Variety and spice are the keys to performance

In my experience, keeping to the same old diet, the same one or two meals may not necessarily provide you with all the key nutrients needed for world class health, let alone performance. Being curious about food, increasing variety in the diet from fruits, vegetables, grains, legumes, seeds, nuts, and healthy oils are key. Try new meal ideas instead of relying on the all famous 'chicken and pasta' routine. If variety is key, then adding different herbs, flavours and spices are an essential ingredient. This is just one reason why adding citrus flavours to foods ie: lemon, orange, lime not only improves the taste of foods, but also helps with digestion and absorption of foods.

Keypoint #10 – enjoy a varied diet, full of flavour, colour and nutrition.

Nutrition Preparation - Part 2

Preparation for the Mississippi Million

So now that you have considered (and hopefully started to implement) some of the key principles from Part 1, the next stage is to consider your nutritional planning in preparation for the Mississippi Million.

How you prepare largely depends on:

- i) how important you consider nutrition to be for you;
- ii) how much of the event you are doing.

For those undertaking the full event or multiple stages, then your preparation should really start as early as possible. For those who are undertaking short stages (2-3 days) or single days, then the underlying principles will be useful, but technically you could start later on ie: June for August.

The other thing to individually consider is what YOU would benefit from. Generally performance nutrition aims to support the following areas:

- i) Nutrition to support your health
- ii) Fuelling your training
- iii) Nutrition to lose weight
- iv) Nutrition to increase muscle mass
- v) Nutrition for recovery

For the Mississippi Million – one of the keys will be pacing, especially for those taking part in the whole event. Whilst energy expenditure will be fairly high (estimated at approximately 400-800 kcal per hour – pending exercise intensity and bodyweight), the key will be slow pacing; hence training should focus on increasing your physiological efficiency over a 6-10 hour period ie: slow, low heart rate, easy.

Increasing **your power: weight ratio** may therefore be beneficial. Whilst this does not mean drop total bodyweight dramatically, it could be beneficial for some people to reduce total weight, but maintain a high lean muscle mass ratio. For others, increasing muscle mass and supporting recovery from training may be key. If in doubt, speak to one of the team experts for advice. For others, it may simply be a question of changing the quality or quantity of your diet to support your health and training.

For this reason, I have provided a generalised, progressive overview of a nutrition programme leading up to August 2014 below. This needs to be adapted to your specific needs and commitments:

MONTH	TYPE OF PROGRAMME	GOALS OF PROGRAMME
April 2014	Base 2 progression	Emphasis on macronutrition and caloric intake in line with increased training; use of clinical supplementation as applicable under advice – focus on food quality first.
May 2014	Base 2 progression	Monitoring energy intake in line with repetitive training & multi day training; maximising recovery; continued supplementation programme as applicable; possible use of sports supplementation (12 weeks from event)
June 2014	Specific nutrition phase 1	Focus on maximising recovery; progressive increase in energy intake as applicable; awareness of superfoods; testing products for event use
July 2014	Specific nutrition phase 2	Early practice of products to be used during event (including multi day use); personal event nutrition strategy (snack variety to suit athlete); possible use of ration packs if applicable
August 2014	Event nutrition	Implementation of event strategy – variety key, recovery key; additional packs if needed; awareness of increased calories towards end of event

Obviously the underlying responsibility for implementing your own strategy is YOU. However, to help support you, the following overviews nutrition suggestions and keypoints to begin your programme:

Period 1 (April/May) – focus on improving the **QUALITY** of your dietary intake

- What is YOUR key goal – health/ weight/ muscle/ other?
- Ask what do you need to change to make your programme work for you? What do you need to do?!

A high quality diet may include:

Good hydration	BE hydrated – meaning don't worry about fixed values ie: 2L per day – my advice – fill up a 1.5L bottle with 90% water, 10% fresh juice and sip over the day. If you feel you need more, simple, increase it to 2L then 2.5L etc.. Don't wait until you feel dehydrated.
Low glycemic carbohydrates	These are carbs which provide the best slow releasing metabolic fuels – ie: brown rice, sweet potatoes, quinoa, buckwheat, wholemeal bread. In my experience, cutting back on wheat based, starchy carbs and focusing on high quality energy sources such as wholemeal pasta, organic muesli, porridge oats, wild rice, quinoa, oat cakes, all bran, cous cous, steamed vegetables, apples, pears, kiwis, most berries is more likely going to provide quality sustained energy
Lean and mean	Focus on lean choices of protein based foods – ie: lean meats (turkey, chicken), occasional red meats, fresh fish, nuts and seeds. Cutting down on total and saturated fats from animal sources is a good start.
The best fats for you	You've all heard of good and bad fats – simply choose the fats that provide the best health benefits – avocados, pumpkin seeds, salmon, mackerel, tuna, olive oil as examples. If the label is high in total and saturated fats, think differently.
Have you got the minerals	Many athletes often report with low intakes of mineral rich foods – particularly vegetables, try to increase your daily intake of green vegetables, peppers, spinach, leeks, kale, carrots, as well as almonds, walnuts, flaxseed, sesame seeds as example – increasing minerals in the diet is a key part of energy production.
Don't skip, dance	Skipping meals is a sure-fire way of getting poor results – your metabolism can become slower, you can become more sluggish or hungry, leading to over-eating at different points of the day to feeling 'starved' prior to training. Aim to eat small regular meals throughout the day ie: every 3 hours as example. This will help support a balanced metabolism and help fuel performance. Conversely, if you want to 'dance' ie: perform try not to overload (especially carbs) at the end of the day – eat light if needed after 7pm.
Unrefined is best	If lower glycemic sources of carbs are good for you, then reducing the level of refined sugars, hidden sugars and processed foods is part of this. Eating natural, wholefoods provides the best sources of energy – think about the total amount of sugar in your diet – cut back if its over 50% of your total carbs. Try to eat most of your diet as unrefined, natural as possible – think about your cooking practices – steam, grill, vegetable dips, raw food, smoothies, soups are great ways of increasing the nutrient value of your diet.
If you know its not going to help, don't eat it	Think about foods in your diet which you know may taste nice, but aren't really contributing productively to your results or programme – this especially applies to sugar, wheat, dairy, stimulants (especially chocolate – unless dark chocolate) and diuretics such as coffee, and alcohol. Moderation is key here – but top athletes are usually careful with their choices. It may taste nice, but if you are drained the next day this could affect your training and recovery.
Keep a diary	Sounds simple – but most athletes keep training diaries to assess improvements – the same applies with diet. In fact the top athletes tend to keep detailed records of nutrition, training and sleep patterns to help understand their progression and also what works for them. It doesn't need to be a choir, but often tracking progress can pay off.

Period 2 (June) – focus on improving the **QUANTITY** of your dietary intake

Again - what is YOUR key goal – health/ weight/ muscle/ other?

Energy intake – difficult to generalise – but as a starting point this is based on your BASAL metabolic needs plus your daily activity (then add in your goal) – so for example most male athletes weighing 80-90kg may require a basal caloric intake of approximately 1800 kcal per day, and if exercising for an hour per day at moderate intensity their needs may increase to around 2500 kcal per day. If they are aiming to increase muscle, their needs may increase around 20% more than this ie: 3000 kcal per day. If they are looking to lose weight – the starting principle is not to cut back too dramatically ie: don't suddenly drop to 1500 kcal per day but aim to cut back around 10-15% off your daily needs ie: if your daily needs are 2500 kcal then aim to reduce this to about 2100 kcal per day whilst still maintaining your training. Given time, energy expenditure will be greater than intake – hence, progressive weight loss. If you starve your body, you will end up probably regaining the weight later on.

1. How much carbohydrate should I include in my diet?

As your training volume starts to increase, be mindful of your daily carb intake to fuel repeat performance. There is no need to suddenly increase carb levels dramatically as you are unlikely going to be depleting your stores on a daily basis. However, higher carb intakes are related to higher muscle glycogen levels in general which is a vital fuel source for endurance training.

Recommendation: based on 1-2 hours exercise at moderate intensity per day, 4-5 days per week) approximately 4-6 g per kg per day for the average person. For example, a 90kg male may need to consider consuming around 360 – 540 g per day. If you are not used to this, then progressively build up your carbohydrate intake over a 4 week period steadily. The best times to do this are after training and on recovery days. Focus on low glycemic carbohydrates as much as possible.

If you are training considerably less than this then focus on lower intakes ie: 1-3 g per kg – but be mindful that if you are not putting in the training you may struggle during the event!

2. I have been told to eat a lot of protein during training, is this true?

Most people generally do not need to suddenly increase protein levels if they have followed the previous guidelines. For reference though – most endurance athletes in training would probably benefit from consuming around 1.5 g of protein per kg per day ie: for our 90kg male this would be around 135g per day.

Recommendation: Aim to eat around 15-25g of protein with each meal, and aim to eat approx. 4-5 meals per day. The key is consistency ie: making sure that each time you eat something, have you included a substantial dosage of protein with the meal. Try not to overload protein at one or two meals – frequency is the key.

Do I need protein shakes? – simple answer: NO – but practicalities often make it challenging to manage protein intakes – so including a high quality whey protein formula mid morning and/or mid afternoon can help. Also consider simple snacks high in protein eg: an apple with a handful of almonds.

3. How much fat should I eat?

Whilst I have indicated that the polyunsaturated choices of fats are more healthier for you, it is vital that energy needs are met so as not to compromise training and recovery. Hence aiming to match energy needs from fat intake for athletes in training is important. Once you have thought about carb and protein levels for you, make sure your energy needs are met from additional fat intake if needed. Whilst general recommendations are to reduce fat intakes to around 25% of total calories (with approximately 10% from saturated fats), athletes in training may need to increase this in some cases.

For example if an 80kg male needing to eat 2500kcal per day eats 300g of carbohydrate this would equal 1200 kcals. If he eats 110 g of protein, this would equal 440 kcals. Hence he would need to make up approximately 860 kcals from fats – this would be around 95g as example. Remember that some of the protein choices you make contain fat and protein ie: salmon, chicken etc..

4. Should I take a multivitamin?

Supplementation – whilst I am not a massive fan of just including supplements for the sake of thinking they are benefiting you, in many cases there is evidence that people in training probably require higher intakes of key vitamins and minerals than sedentary individuals. It may be prudent in the early stages to consider the use of a daily multivitamin and antioxidant formula – however I would always advocate discussing this with a qualified nutrition practitioner first. Not everyone needs to take supplementation. Having said that, endurance training is likely to increase needs of the B vitamins, zinc, magnesium, vitamin D, calcium and the key antioxidant nutrients.

5. What sports drinks should I take?

Sports supplements – as training starts to increase – aim to focus on fueling needs for the longer sessions. Sports drinks are not necessarily needed for the shorter sessions (less than 60mins) especially if you are aiming to lose weight! For long haul sessions ie: > 2 hours, the use of a combined sugar/maltodextrin formula may be useful to maintain sustained performance.

Recommendation: I would suggest aiming for approximately 30g per hour of total carbohydrates for those who weigh under 70kg; and around 40-60g per hour for those weighing 75-90kg (possibly higher if above 90kg).

The purpose of sports drinks is mainly to maintain sugar levels in your blood from dropping with sustained exercise. You should always be mindful of not over doing it, especially before training as this can lead to 'rebound hypoglycemia' in some people – where your blood sugar falls at the beginning of exercise. Whatever you do- practice it in training, not a week before the event; and ask for advice if you need to.

6. Seriously how important is hydration?

Remember that you are likely to sweat more than you can drink (especially if its hot, humid or you are working hard). Two things – you can always hydrate post training! Secondly, this event is unlikely going to demand a high intensity – it is more likely slow and steady.

Recommendation during training: Drink gradually, sip little and often. As a guideline I would recommend about 400ml per hour over the course of a long training session ie: if a 3-5 hour session, aim to drink just 2L of fluid (water with a sports drink formula diluted ie: about 3-4% concentration) – aim to sip when you can every 15-20minutes. The sports drink may give about 20-30g of carbohydrate per hour, if you need more aim to supplement with additional snacks ie: bananas, flapjacks, energy bars, gels, protein bars, bounce protein snacks, honey sandwiches – it doesn't really matter – just make sure you have tried it out first and you like it.

7. Do I need salt tablets?

No not really! Some people do naturally sweat more than others and may require higher electrolyte levels in their diet. Most sports drinks contain some electrolytes – sodium, potassium, magnesium. During training, unless the temperature is excessive ie: > 30 degrees, there is probably no need to dramatically change your fueling strategy other than increasing basic hydration whilst maintaining carbohydrate intake. However, as you approach the summer months, you could try adding a basic salt tablet formula (aim for a lower dose to start with ie: 500mg per hour) and start by introducing this towards the end of a medium length session ie: 4 hours – include the salt tablet with fluid at hour 2 and 3 as example. If you need more specific advice please ask one of the team experts.

8. Whats the fastest way to recover after training?

There is an opportune period in the hours after sustained training where your muscles are more receptive to nutrients which can be beneficial to recovery. Simple rule – if your sessions are less than 60mins just aim to eat normally as you would – chances are the diet will facilitate the nutrients needed. If you are undertaking intensive or strength training, then a carbohydrate / protein formula may be useful – aim for 4:1 formula – that is 4 parts carbohydrate to 1 part protein – this may mean a simple recovery shake with 60 g of carbohydrate to 15g protein. Most sports supplement companies cater for such products. If your sessions are longer ie: endurance training 2-8 hours – I would suggest a lower ratio ie: 3:1 for the first hour, then a 'drip feed' approach over the first 4 hours ie: 1g of carbohydrate per kg per hour to maximise carbohydrate recovery – however this is largely dependant on personal needs – some people like to drink liquid meals (smoothies, shakes, energy drinks), others like to eat solid foods – sandwiches, fruit, energy bars, pasta/rice meals etc. A key point is to eat something when you can as opposed to doing nothing.

9. Should I take creatine to 'boost' my muscles?

Creatine – one of the most popular supplements on the market. Do you need it? Probably not – unless you are having issues with weight gaining or recovery, chances are you don't need it. Having said that, those people with low protein intakes or low muscle creatine levels often benefit from a low dose creatine strategy during training, even endurance training. Including 3-5g per day as part of a recovery drink may support training during this period; again speak to one of the team experts in the first instance.

Ideas for eating plans

Menu ideas – below is an example of a two day plan (which can be rotated or manipulated to suit your needs) for endurance style training. The focus here is on energy, dense wholefoods to support nutrient and caloric needs:

MENU IDEAS FOR ENDURANCE TRAINING

MEAL	DAY 1	DAY 2
BREAKFAST	Natural porridge oats with chopped banana and blueberries. Use skimmed milk, rice or almond milk. For additional protein add 1 serve of mixed nuts or linwoods ground seed range 1 cup of green tea 2 cups of water	Muesli (mixture of grains, with added nuts, seeds, flax) served with natural yoghurt and manuka honey. Dorset cereals make a good range of mueslis 1 cup of lemon and ginger tea 2 cups water
SNACK	1 serve of cottage cheese with rye bread 1 apple 500ml water – diluted with fresh orange	1 serve of whey protein powder with 250ml of skimmed milk or water 1 pear 300-500ml water
LUNCH If training in afternoon – could add additional carbohydrate drink for pre-loading/energy	200g Lean chicken breast with mixed stir-fry vegetables; 50g quinoa 300-500ml water	150g wholewheat pasta with fresh tuna steak, tomatoes and spring onions; small side salad mixed 1 natural fruit yoghurt, 1 banana 300-500ml water – lightly diluted if needed/ electrolyte formula

SNACK	None – can have a small natural greek yoghurt if needed	Small serve of whey protein 30mins before bed with skimmed milk
SNACK	Small serve of porridge/ cereal with manuka honey and mixed nuts – especially if post training 300-500ml water – electrolyte water if post training	1 serve of whey protein powder with 250ml of skimmed milk or water; 1 apple 300- 500ml water especially if training around this point
DINNER	250g lean turkey steak with sweet potato wedges and steamed spinach 300-500ml water – lightly diluted if needed	Mixed bean and vegetable salad with brown rice drizzled with lemon and olive oil 300-500ml water- lightly diluted if needed

Key points to remember for endurance nutrition include:

1. Carbohydrates are essential for longer term repeat performance
2. Eat lighter at the end of the day if trying to maximise weight/fat loss
3. Maintain hydration/electrolytes especially if undertaking longer duration training
4. Include a diet rich in natural wholefoods and antioxidants

Period 3 (July) – event preparation – aim to be organised at least 1 month ahead of the event

- Focus on maximising your use of superfoods and variety in the diet; you may well be doing this, but worth increasing your specific foods choices as part of your intake – here are some examples:

SUPERFOOD CATEGORIES				
FRUITS				
Apples	Pears	Oranges	Grapefruit	Lemons/Limes
Blueberries	Cranberries	Raspberries	Strawberries	Apricots
Cherries	Grapes	Kiwi	Bananas	Melon
Papaya	Mangos	Pineapples	Pomegranates	Dates
Figs	Raisins	Prunes		
VEGETABLES				
Chestnut Mushrooms	Shittake mushrooms	Yellow/Orange peppers		
Tomatoes	Pumpkin	Red onions		
Spinach	Asparagus			
GRAINS & SEEDS				
Barley	Buckwheat	Pumpkin seeds	Oats	
Almonds	Hazlenuts	Walnuts	Flaxseed	
Sunflower Seeds	Millet	Maize	Sesame seeds	

- Start thinking about the event itself. What has worked for you in training up to this point?
- What specific supplementation and snack choices have you liked?
- Start thinking about what you will need to buy in for the event and take with you – never assume it will be available when there. This may include supplementation that you are taking – be mindful of transporting to the US [NOTE: More information about nutrition during the event to follow soon].
- Try a variety of products – I am a big fan of not relying on one product (unless it works very well). People's tastes and needs are different. During this period – if you haven't done so already I would suggest trying 3 or 4 different types of sports/food/snack products to see which you prefer. Also try different snacks for 'on the go' training such as fruit bites, oatcakes, energy bars, trail mixes (nuts/seeds), dried meats (some people prefer savoury to sweet!). One of the key things to remember with sustained exercise is not to overload the stomach with too much food/carbohydrate – use a 'drip feed' approach as require

Training Advice

As a member of the Mississippi Million “Challenge Crew” you will likely loosely fall into one of the following three categories:

- Untrained (do not take part in regular exercise)
- Moderately active (2-3 moderate bouts of exercise per week)
- Trained (>4 training sessions a week and regular weekend exercise events)

No matter your current state of conditioning there is time to adequately prepare. However, dependent upon which group you are in your training will be different, especially at the beginning. This document is not meant to be prescriptive, everyone will be different, and therefore a single training programme would be inappropriate. What follows is some general advice and then some specific comments for the different categories of “challenge crew” identified above. Our advice is based on the following general training principles:

Overload: Your body will adapt to the stress placed upon it, if you do not overload the system (e.g. aerobic endurance, strength, flexibility) you will not adapt. However, remember to take care that you overload slowly with small increments, too much too soon will lead to injury.

Progression: As your body adapts you will need to progressively change (increase the demand). Ultimately, you want to be able to row continuously for ~8hours for two consecutive days, however, that is many months away. Your programme should take you to the point that 2-3 weeks prior to your scheduled river date you are able to achieve 8 hours of continuous rowing for two days.

Specificity: Your body will adapt specifically to the training that you do. There is no point in being able to **run** for 8 hours easily when you actually need to be able to **row** for 8 hours. Cross training has its place, especially at the beginning when you initiate your training and to avoid overuse injuries, but do not kid yourself, you need to be able to row for a long time. Rowing should therefore be a prominent component of your training.

Recovery: Although the training you undertake is incredibly important, providing time for adequate recovery is essential if your body is to adapt well without breaking down.

In relation to progressive overload there are a number of aspects of training that can be manipulated. The *Frequency*, *Intensity* and *Duration* of sessions can all be altered in order to create overload. Furthermore, using different *Types* of training may help maintain interest and motivation, however, always bear in mind the principle of specificity.

As mentioned above the type and volume of training that you undertake will be dependent upon your current physical condition. It is likely however that you will need to engage in a programme that involves 4-6 training sessions a week, and that will become increasingly demanding as it progresses. As the demand increases the importance of rest and recovery and good nutrition becomes increasingly important and you should schedule these aspects into your overall programme as well as the training itself. From a simplistic approach there are four key areas that need to be addressed.

Aerobic Endurance: This is all about your heart, lungs and muscles. Can your body take in, deliver and effectively use oxygen to fuel the metabolic demand associated with exercise. Training sessions to build this are typically long in duration, but the intensity is relatively moderate, as a guide you should just be able to maintain a conversation with someone during these sessions. It is likely that this pace will ultimately be the pace you adopt on the Mississippi. A good idea is to make a plan of prolonged training sessions leading up to your date with the river. Maybe each weekend you undertake a “long” session, and over the weeks/months these are extended so that 2-3 weeks prior to your river date you are capable of a continuous 6-8h row. We also recommend that you trial back-to-back sessions on consecutive days (e.g. two 4-5 hour sessions on consecutive days). This will give you some idea of what the challenge itself will entail.

As well as the long session once a week 2-3 “tempo” sessions per week would also be a good idea. These are still tailored to improving your *Aerobic Endurance* but are undertaken at a slightly higher intensity. If you were training for the Olympics then specific advice regarding heart rate training zones would be prescribed, however, you’re not heading to Rio 2016 and so simply understanding the characteristics of tempo sessions is all you need to know. These sessions are completed at a hard but controlled intensity, you will be breathing deeply, your heart rate will be relatively high and you will be hot and therefore sweating. At the beginning you might want to introduce “tempo” sessions progressively with a number of shorter efforts interspersed with periods of lighter effort. Obviously, according to the principles outlined above, as you become fitter you will need to increase the overload (e.g. intensity/duration). These sessions may start as quite short sessions (e.g. 30-40 minutes), but then build progressively to 60-80 minutes with a warm-up and cool-down.

Strength: Strength training will be really important, the stronger you are the less demand will be placed on your body, and the better chance you will have of completing your training and challenge injury free. However, strength is incredibly specific and so the training you undertake should very much be focused around those muscles important for rowing (postural as well as locomotive). Strength training, similar to *Aerobic Endurance* should be started slowly and progressively built. It is very easy to cause an injury if you overload too quickly, or if you use poor technique. If you are not experienced in using weight training equipment it is a good idea to take professional advice from a qualified practitioner. This should be available at many local gyms; a couple of individual Personal Trainer sessions at the start of your training would be a very good investment. A good resource related to weight training for rowing is available from the [Concept 2 website](#). We have included a link to this document so that you might see the *Type* of exercises that are recommended for rowing. However, remember that rowing in the Skiff will be very different to a standard rowing boat and so *specificity* is again something you should think about.

Flexibility: Some of you will be very familiar with the concept of stretching, whilst others will be inexperienced, we have provided a basic guide to flexibility for rowing. Appropriate flexibility is an essential component of rowing. An Individual's ability to achieve the correct positions during the stroke cycle is closely related to joint and muscle flexibility in certain key areas. The exercises outlined, if performed regularly, will help to improve your flexibility. Furthermore, you will likely find them beneficial following long training sessions and also during your time on the mighty Mississippi after a long day in the skiff.

When and how to stretch:

Flexibility can be gained in many different ways other than standard static stretching programmes such as the one we have outlined. However, static stretching is a good starting point for Individuals with differing levels of flexibility and fitness. Static stretching is best done after exercise when the body is still warm. Ideally it should be done after rowing or ergo work (Due to its specificity).

Warming up for rowing is best done using a dynamic warm up, following at least 10 minutes of progressive activity.

- Take each exercise to the point of mild to moderate stretch
- Stretching should not cause excessive discomfort
- Hold the stretch for 20-30 seconds
- Repeat 3 times each side

The following are important areas to focus on:

Gluteals (buttocks)

Hip flexors

Hamstrings

Calf and Ankles

Spine

Rowing specific combination stretches

Technique: As mentioned above good technique related to strength training is critical in avoiding injury. The same is true of technique related to rowing.

An introduction to Skiffing

Objective; To learn to move a skiff efficiently and economically.

To be able to skiff for up to 30 miles a day during the Mississippi Million it is desirable to be as technically proficient as practice time allows. Here is some explanation of key technical objectives that we will try to teach, including terminology that coaches will use. Some terms refer to parts of the skiff as illustrated overleaf.

The whole stroke is a cycle; efficiency in one part generates efficiency in the rest of the cycle.

1. **Hold the sculls correctly;** the scull should be held mainly by the fingers, thumbs on the ends to maintain a slight outward pressure. Since most of the power of the stroke comes from the legs and back, a loose grip enables this power to be transmitted to the sculls. With a loose grip, the sculls will **square** and **feather** with minimum effort. As the sculls overlap during the drive and recovery, a loose grip helps the hands cross over with minimum interference with each other – left hand being slightly above and in front of the right. A loose grip will also minimize the development of blisters!
2. **Square;** rotate the sculls so that the spoons are perpendicular to the water.
3. **Catch;** the action of placing the sculls in the water, coordinated with applying pressure to them by pushing with the legs on the stretcher. The aim is to be square just before the catch, and only the spoons of the sculls to be in the water after the catch. It is important to reach forward as far as the tholes allow as this creates a long stroke.
4. **Drive;** maintenance of pressure on the sculls by pushing with the legs, to which the back and arms will add themselves, so that the boat accelerates all the way through this phase.
5. **Finish;** extraction of the sculls from the water as soon as soon as drive can no longer be maintained.
6. **Feather;** rotate the sculls so that the spoons are parallel to the water.
7. **Recovery;** in which the hands are pushed away from the body, the body is swung forward and the legs are slightly bent. This should take about twice as long as the drive, enabling the boat to **run**, and creating a rhythm, the maintenance of which makes sculling long distances much easier.
8. **Timing;** allied to the rhythm, it is important that all phases of the stroke are coordinated between the two members of a crew. The stroke therefore sets the rhythm, and bow follows. The most obvious errors in timing occur at the catch and finish, but it is important to feel that the drive is also coordinated.
9. **Commands;** To start, the coxswain/coach should say “forward – ready – paddle/go”; to stop, the coxswain says “easy all”.

Navigation; No doubt the Mississippi will have its own problems which we will learn in due course. Meanwhile, the Thames is a very busy river, particularly at weekends and in the evenings. There are other rowing boats, kayaks, sailing boats, river passenger boats, cabin cruisers. It soon becomes obvious that some are better than others at following navigation rules. It is safer therefore if we are punctilious about following such rules. The major rule is KEEP RIGHT (when facing the direction of travel). Our practice is to keep close to the bank when going upstream and to the right hand side of the centre when going downstream.

Clothing: "Shorts/tracksuit should be fairly tight fitting so that they remain in place as you move on the seat. Underwear should be thin and have minimal seams as this will rub and cause sores; Speedo 'budgie smugglers' are close to ideal; if shorts are tight enough some may choose to do without underwear. Particularly over long distances, a sheepskin pad is very comfortable.

In very hot weather, T-shirts should be in fabrics that allow sweat to escape and do not retain a lot of moisture. For those who are unable to spend enough time on the water to harden the hands, cycling or similar gloves will prevent blistering, which, at best, is very uncomfortable and, at worst, can become infected.

When on the Mississippi we will be spending long periods in the sun, so hats will be necessary, particularly shading the neck (most exposed as we are heading predominantly south)"

Example Training Programme

Structured for a currently “Untrained” member of the Challenge Crew. Following a programme such as this and applying the basic principles of training discussed above should place you in a good position to complete and enjoy your time on the river.

	Training Theme	Comments
January	Foundation	<ol style="list-style-type: none"> 1. Identify where and how you are going to train. 2. Start with a couple of aerobic endurance slow and steady sessions a week. 3. Take advice on good weight training technique. 4. Introduce a couple of “technique” focused weight sessions. 5. Regular stretching
February	Foundation	<ol style="list-style-type: none"> 1. Extend the aerobic sessions slightly 2. Add in occasional “tempo” session 3. Two weight sessions a week, maintaining technique and increasing repetitions. 4. Regular stretching
March	Volume	<ol style="list-style-type: none"> 1. Introduce “long” weekend sessions 2. Regular “tempo” sessions 3. Two/three weight sessions a week increasing weight. 4. Regular Stretching
April	Volume	<ol style="list-style-type: none"> 1. Extend “long” weekend sessions 2. Regular “tempo” sessions 3. Two/three weight sessions a week increasing weight. 4. Regular Stretching
May	Volume	<ol style="list-style-type: none"> 1. Extend “long” weekend sessions 2. Regular “tempo” sessions 3. Two/three weight sessions a week increasing weight. 4. Regular Stretching
June	Mississippi Focus	<ol style="list-style-type: none"> 1. Trial back-to-back long sessions (e.g. once in the month complete two 3h rows on sat/sun) 2. If doing back-to-back sessions reduce tempo volume slightly in that week and introduce easy recovery row on the following day. 3. Two/three weight sessions a week focus on repetitions not extra weight. 4. Regular Stretching
July	Mississippi Focus	<ol style="list-style-type: none"> 1. Trial back-to-back long sessions (e.g. once in the month complete two 5h rows on sat/sun) 2. If doing back-to-back sessions reduce tempo volume slightly in that week and introduce easy recovery row on the following day. 3. Two/three weight sessions a week focus on repetitions not extra weight. 4. Regular Stretching
August	River Preparation	<ol style="list-style-type: none"> 1. If all has gone to plan with training then this month is very much about maintenance, and preparing for the river. 2. Complete final long row (6-8 h) two/three weeks prior to departure. 3. In the two weeks prior to your departure the volume of training should reduce, maintain the quality of the tempo sessions but reduce overall load (e.g number and volume of sessions). 4. Weight sessions should be reduced and focus on maintenance 5. Week before departure focus on recovery 1-2 short sessions only.

If you have a later river date (e.g. September/October) simply extend the “*volume*” and “*Mississippi Focus*”. Recovery is important, make sure you build in adequate rest days, especially after particularly long sessions. Stretching is highlighted above, this could take the form of structured stretching after your regular training or you may wish to consider yoga/pilates type classes.

Untrained Challenge Crew Advice: “Slow and steady” characterizes the training that is required. Yes, in several months time you are going to row continuously for ~8hours for two consecutive days, however, that is many months away. The key thing as you start is that you build the foundations correctly, this way you will avoid injury and place yourself in the best possible position to enjoy your time on the river and contribute effectively to the progress of the team. Below a guide is provided, do not feel obliged to follow, however, the general principles outlined will help you prepare appropriately.

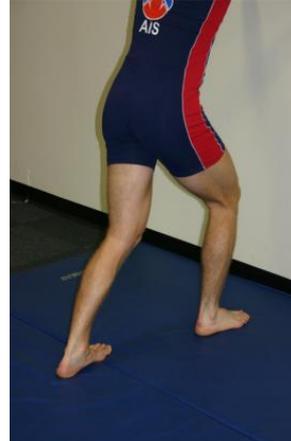
Moderately Active Challenge Crew Advice: Although you currently engage in some exercise do not overestimate your current fitness, similarly do not underestimate the challenge ahead. Your ability to contribute to the team will significantly impact the success of the challenge. You will likely be able to bypass some of the “Foundation” activity identified in the programme above, however, if you are new to weight training then make sure you take good advice on technique and do not overload too much at first.

Trained Challenge Crew Advice: If you are used to high volumes of training and endurance participation then this challenge should not be overly demanding for you. However, remember that you will want to start the challenge as fresh as possible and so make sure that you allow appropriate recovery before departing for the Mississippi. Additionally, if you are well trained but not specifically for rowing do not underestimate the issues you will have transferring from one exercise modality to another. Accordingly, if you are new to rowing remember that you, like the untrained, challenge crew members need to progress slowly with rowing specific training. Make sure that your rowing technique is good before you start undertaking your routine volume/intensity of training.

Flexibility Exercises

Calf and Ankle

- Make sure the back foot is facing straight to the front
- Keep your heel on the floor and your knee straight
- Lean forward so that your knee moves forward relative to your ankle
- The stretch should be felt in the upper calf
- To stretch the lower part of your calf, repeat the stretch with your knee bent



Hamstrings

- Hold your thigh in vertical position with both hands
- Keep your ankle and foot relaxed
- Straighten your knee until you feel a stretch in the back of the thigh
- If you can fully straighten the knee with the thigh vertical, repeat the stretch while the thigh is closer to your chest



Alternate Hamstrings

- Place your foot on a low bench or stool
- Lean forward with a flat lower back, bending from the hips
- Grasp around your thigh Hold your thigh as you move your body weight away from the bench
- This will cause your knee to straighten and generate a stretch in your hamstrings



Long Hold Hamstrings

- This is an option if the standard hamstring stretches don't give much benefit
- Lie in a doorway, with one leg through the door and the other straight against the edge of the door
- Position your hips a distance away from the door so that you feel a mild hamstring stretch
- Hold this for up to 3 mins per leg
- If your leg gets sore, or goes numb, break up the 3 mins into smaller blocks



Quadriceps

- Grasp your ankle and pull your heel towards your bottom
- Tighten your stomach and keep your low back flat by tucking your bottom under / tilting your pelvis back
- Pull your knee back so that it is in line with your thigh
- The stretch should be felt in the front of the thigh



Gluteals

- Hold your right knee with your right hand, and your right ankle with your left hand
Rotate the leg by drawing the right ankle around
Hold the rotation while pulling your knee to your chest Make sure your knee is directed towards the centre of your chest
- The stretch should be felt in the back of your hip



These two stretches are a good progression from the previous gluteal stretch

Position your lower leg across the bed or floor underneath you

Keep your knee in line with your trunk

Lean forward while keeping your pelvis square to the ground

Occasionally the third stretch can cause knee pain. If this occurs use either of the first two stretches



Hip Flexors

- Position your front foot level with your hands
- Support your upper body weight on your hands and front foot
- Your back leg may be bent or straight, or with weight on your knee, depending on what produces the best stretch
- Move the front of your hip towards the floor
- The stretch should be felt in the front of the hip



Alternate Hip Flexors

- Kneeling with the front shin vertical
- Tighten your stomach to keep your lower back flat
- Tuck your bottom under to tilt your pelvis backwards
- Lunge forwards so that you feel a stretch in the front of the hip



A variation that can help stretch the outside of the hip and side of your trunk is to add a side bend, with arm over head. The stretch should move to being a bit higher and lateral to the previous stretch.



Quadratus Lumborum

- Sitting with the left leg straight and right heel tucked into your groin, place your left hand on your right knee, and use this to pull your trunk into rotation
- Your shoulders should align with your straight leg. Place your right arm over your head and bend towards your left knee
- The stretch should be felt in your right lower back



Lumbar Rotation

- Lying flat on your back, rotate your right leg across your body so that you generate a rotation in your low back
- Keep your shoulders flat on the ground
- The stretch should be felt in the right buttock and low back
- Repeat both sides



Slump

- Sitting on a bench, tuck your chin to chest and drop your shoulders towards your hips so that your spine is as flexed as it can be
- Pull up your toes and foot.
- Straighten your knee to the point where you feel tightness in your leg, buttocks or low back.
- At the point of tightness, lift your head up as you continue to straighten your knee.
- Repeat 20 times each leg, x 3



Combined rowing specific stretch

The goal is to achieve a position that involves:

- Heels on the ground
- Knees straight
- Hips flexed with flat spine
- Arms and head in line with trunk
- Start with the feet and hands wide apart and gradually move them closer together
- A measurement between the toes and hands can be made to measure progress and improve motivation



Common over use sports Injuries

Listed below are a few common rowing / sports injuries, their causes and management. It is impossible to create a definitive list of injuries and their management. Instead, what we have tried to achieve is to provide you with an idea of how to approach some of the most common injuries. However, prevention is a better strategy than managing an injury, and so we have also included some strengthening exercises, which may help prevent each injury in the first place.

Paul Thawley is happy for you to email him directly for advice on preparation and prevention. With respect to any old injuries etc., we should in the near future be meeting at one of the preparation sessions where we could discuss specific problems and their management.

Rowing has both strength and high aerobic demands, and rowing is a repetitive motion, which is non-impact. Thus, rowers are more likely to incur overuse injuries rather than sudden, unexpected ones. These injuries are usually the result of training error in either volume or technique, or inappropriately sized or configured equipment.

It is paramount you are familiar with your equipment and that you prepare and identify issues before they develop into a chronic problem which would be difficult to resolve.

You are probably aware of the generic injury guidelines; **PRICE**, if not we have listed them below

For an acute injury follow the **PRICE** approach.

P - PROTECTION: Protect the injured area from further damage. For leg injuries you may need crutches to enable you to walk normally.

R - REST: Rest the injured area for 48 hours and then start to move it within pain limits. Rest should be relative, avoiding excessive movement, stress and activities that may cause further damage however gentle active movement is encouraged within pain free limits.

I - ICE: Ice the injured area for 20 minutes at a time using ice wrapped in a damp towel. Never apply ice directly to the skin or over an open wound. Check the sensation of your skin to ensure that you can feel the cold from the ice to ensure you avoid ice burns.

C - COMPRESSION: Apply compression to the injured area to prevent swelling using an elastic bandage. You should remove this during elevation and at nighttime or if the compression is feeling too tight or causing pain.

E - ELEVATION: Elevate the injured part where possible for the first 48 hours. You should aim to elevate the limb higher than the level of your heart

There is a growing body of evidence that supports not using Non-steroidal anti-inflammatory drugs such as Iprobrufen within the first 48 hours following injury as your body releases important mediators that are beneficial to healing.

Wrist and Hand

The most common wrist injury is tendonitis over the back of the wrist this can be caused by;



- Repetitive feathering
- Sweep to sculling
- Large handle size
- “Too-tight” grip

The athlete often describes a “creaking” and swelling over the tendons over the back of the wrist and hand. It can be extremely painful with loss of grip power. One of the features of this problem is that the wrist becomes stiff following exercise.

Treatment

It is important to change the mechanics to alter the loading, stress and micro trauma; this can be done by;

- Smaller Oar girth
- Thumb on top (during ergo training)
- Rest and ice massage
- Anti-inflammatory medication (after 48 hours)
- Seek Physiotherapy / Physical therapy advice if it persists longer than 5 days

Forearm Pain

Athletes often suffer Inflammation over the forearm muscles. This may be due to a tight muscle compartment which can be caused by;

- Over gripping
- Feathering
- Poor technique
- Over tight restricted forearm muscles

Treatment

- Rest and Ice massage
- Take technical advice
- Seek soft tissue treatment

Forearm stretching and strengthen exercises

Wrist Extensor Stretch

Keeping your elbow straight, bend your wrist down using your other hand until you feel a mild to moderate stretch pain-free. Hold for 15 seconds and repeat 4 times.



Wrist Flexor Stretch

Keeping your elbow straight, take your wrist backwards using your other hand until you feel a mild to moderate stretch pain-free (see below). Hold for 15 seconds and repeat 4 times.



Wrist Strengthening

The following intermediate wrist strengthening exercises should generally be performed 1 - 3 times per week provided they do not cause or increase pain. Ideally they should not be performed on consecutive days, in order to allow muscle recovery. As your wrist strength improves, the exercises can be progressed by gradually increasing the repetitions, number of sets or resistance, provided they do not cause or increase pain.

Resistance Band Wrist Flexion

Begin this exercise with a resistance band around your fingers, your palm facing up. Your elbow should be at your side and bent to 90 degrees, your forearm supported by your other hand. Slowly curl your wrist and fingers up against the resistance band tightening your hand and forearm muscles. Perform 3 sets of 10 repetitions as far as possible and comfortable without pain.



Resistance Band Wrist Extension

Begin this exercise with a resistance band around your fingers, your palm facing down. Your elbow should be at your side and bent to 90 degrees, your forearm supported by your other hand. Slowly curl your wrist and fingers up against the resistance band tightening your forearm muscles. Perform 3 sets of 10 repetitions as far as possible and comfortable without pain.



Resistance Band Radial Deviation

Begin this exercise with a resistance band around your fingers, your thumb facing up. Your elbow should be at your side and bent to 90 degrees, your forearm supported by your other hand. Slowly curl your wrist up against the resistance band tightening your forearm muscles. Perform 3 sets of 10 repetitions as far as possible and comfortable without pain.



Elbow pain (Tennis Elbow)

Tennis elbow is inflammation of the insertion of the muscles that originate on the back of your forearm and pain is felt over the outside of the elbow, conversely golfers elbow is inflammation of the insertion of the muscle from the front of your forearm and pain is felt over the outside of your elbow.

Symptoms

- Pain increases with feathering
- At catch and release
- Increased with premature elbow bending during the catch phase

Prevention and treatment

- Strengthening of forearm muscles
- Avoid excessive fatigue (difficult during the Mississippi Challenge!!!)
- Use a light grip
- Ice after exercise
- Tennis elbow strap during rowing
-

Simple Forearm flexibility and strength exercises

Elbow stretching exercises

Elbow Extension

Place your elbow on the edge of a bench or table. Straighten your elbow using your other hand as far as you can go without pain and provided you feel no more than a mild to moderate stretch. Repeat 10 - 20 times provided the exercise is pain free.



Elbow Flexion

Place your elbow on a bench or table (see below) . Bend your elbow using your other hand as far as you can go without pain and provided you feel no more than a mild to moderate stretch. Repeat 10 - 20 times provided the exercise is pain free.

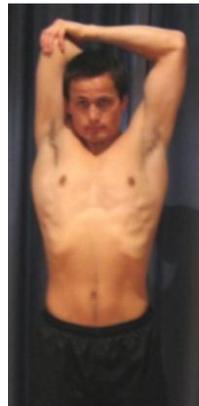
Biceps Stretch

Begin with your back and neck straight and your arm supported behind you on a bench or table. Gently lower your body, allowing your arm to move further behind you until you feel a mild to moderate stretch pain-free. Hold for 15 seconds and repeat 4 times.



Triceps Stretch

Begin standing tall with your back and neck straight. Place one hand behind your lower neck and your other hand on your elbow. Gently push your elbow backwards so your hand moves further down your spine until you feel a mild to moderate stretch pain-free. Hold for 15 seconds and repeat 4 times.

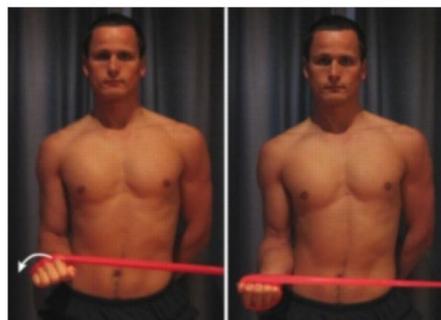


Elbow strengthening exercises

The following intermediate elbow strengthening exercises should generally be performed 1 - 3 times per week provided they do not cause or increase pain. Ideally they should not be performed on consecutive days, to allow muscle recovery. As your elbow strength improves, the exercises can be progressed by gradually increasing the repetitions, number of sets or resistance provided they do not cause or increase pain.

Resistance Band Supination

Begin this exercise with a resistance band around your hand your elbow should be at your side and bent to 90 degrees. Slowly rotate your forearm against the resistance band so your palm faces up. Perform 3 sets of 10 repetitions as far as possible and comfortable without pain.



Resistance Band Pronation

Begin this exercise with a resistance band around your hand your elbow should be at your side and bent to 90 degrees. Slowly rotate your forearm against the resistance band so your palm faces down. Perform 3 sets of 10 repetitions as far as possible and comfortable without pain.



Shoulder impingement

Shoulder impingement is characterised by pain over the outside of the shoulder which can radiate into the outside of the arm, pain is increased with lifting your arm to the side or rotating your arm inwards and often sleeping on the affected side is difficult, it may be caused by the following;

- Acute trauma
- Mechanical injury
- Repetitive overload
- Poor scapular mechanics / Shoulder control)
- Poor core control / stability leading to overuse of the muscles around the shoulder
- Over-reaching at catch

Treatment

- NSAID / anti i anti-inflammatory drugs such as ibuprofen
- Relative rest i.e. non-aggravating fitness
- Physiotherapy
- Rotator cuff strengthening
- Scapular strengthening
- Core stability work
- In Rare cases a cortisone injection

Prevention

In the Boat;

- Sound mechanics on erg and in boat
- Avoid overreaching at the catch
- Stable upright posture at the catch, early drive, and finish

There are some good strengthening exercises below, which can help prevent this problem by strengthen the upper back muscles and getting good control of what are called your rotator cuff muscles. Impingement is very common but by doing simple exercises evidence as shown that it can be avoided.

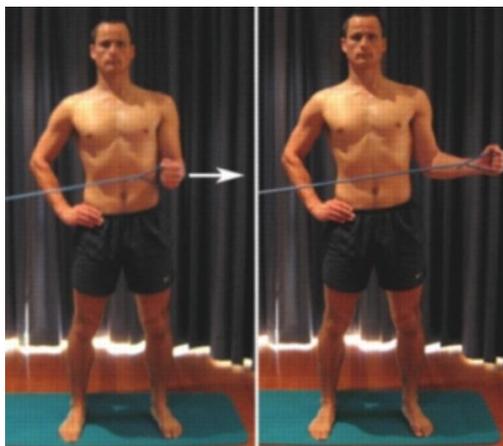
In the Gym / at home:

- Bench pulls
- Seated row
- Plank
- Cable work with shoulder control
- Swiss ball rollouts

The pictures below show some simple band exercises that can be done anywhere and will only take 5 – 10 minutes per day

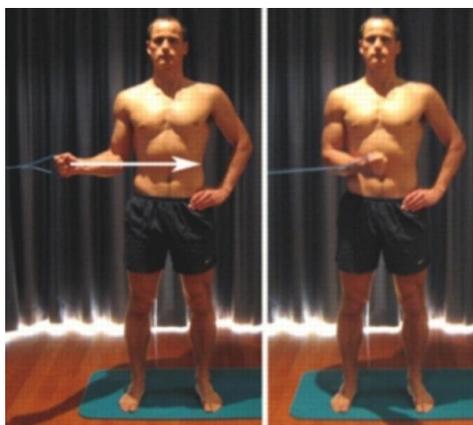
Resistance Band External Rotation

Begin this exercise standing with your back straight, shoulder blades back slightly and holding a resistance band. Keeping your elbow at your side and bent to 90 degrees, slowly move your hand away from your body keeping your shoulder blade still. Perform 3 sets of 10 repetitions as far as possible provided it is pain free on each side.



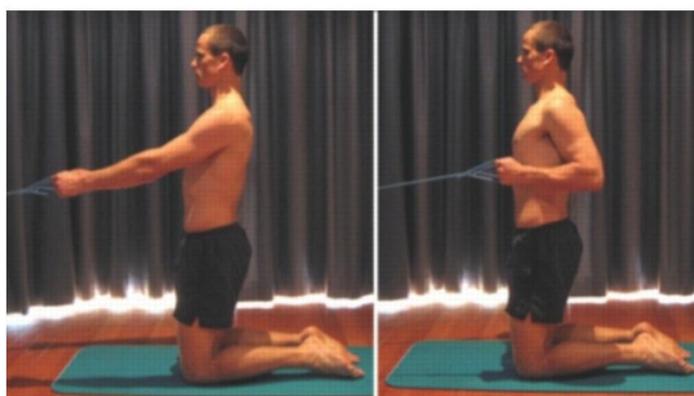
Resistance Band Internal Rotation

Begin this exercise standing with your back straight, shoulder blades back slightly and holding a resistance. Keeping your elbow at your side and bent to 90 degrees, slowly move your hand towards your body keeping your shoulder blade still. Perform 3 sets of 10 repetitions as far as possible provided it is pain free on each side.



Resistance Band Pull Backs

Begin this exercise in standing or kneeling with your back straight and holding a resistance band. Slowly pull your arms backwards, squeezing your shoulder blades together. Hold for 2 seconds and return to the start position. Perform 3 sets of 10 repetitions provided the exercise is pain free.



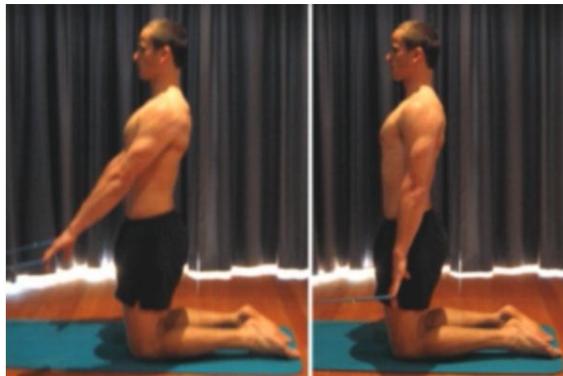
Shoulder Blades Forwards Against Wall

Begin this exercise standing with your back and neck straight and your hands against the wall. Your shoulder blades should be squeezed together fully in this position, your elbows straight and you should be leaning into the wall slightly. Keeping your back straight, slowly bring your shoulder blades forward allowing your arms to lengthen. Hold for 5 seconds and then slowly return to the starting position. Repeat 10 times provided the exercise is pain free.



Pull Downs

Begin this exercise in standing or kneeling with your back straight and holding a resistance band keeping your back and elbows straight, slowly pull the band to your hips as demonstrated. Perform 3 sets of 10 repetitions provided it is pain free.



Low back pain (LBP)

This area is a real nightmare, there are a plethora of possible causes of pain from disc pathology to muscle and joint problems and if you are unsure please seek advice from a professional.

“Red flags” to look out for when you must seek an urgent opinion can include,

- Bladder disturbances
- Pins and needles
- Numbness
- Loss of power
- Persistent pain, which refers away from the spine

That said most LBP is muscular in nature and is localised to the low back, however rowers can develop pain over the mid back (thoracic spine).

Possible causes of spinal pain include:

- Poor flexibility
- Poor core stability
- Deconditioning
- Poorly prepared for the physical task

In this section I want to outline some simple strengthening exercises to use as a prevention strategy. You can also see flexibility exercises within the stretching section of your pack. For specific problems seek the advice of a good sports Physiotherapist and / or a sports medicine consultant.

Low spine strengthening exercises

Opposite Arm Leg Raises

Begin this exercise lying on your stomach with your arms above your head. Keeping your knee and elbow straight, slowly lift your opposite arm and leg tightening your lower back and bottom muscles. Hold for 2 seconds and then return to the starting position. Repeat this process with the other arm and leg. Perform 10 times on each side provided it is pain free.



The following intermediate lower back strengthening exercises should generally be performed 1 - 3 times per week provided they do not cause or increase pain. Ideally they should not be performed on consecutive days, to allow muscle recovery. As your lower back strength improves, the exercises can be progressed by gradually increasing the repetitions, number of sets or duration of the exercises provided they do not cause or increase pain.

Prone Hold

Begin this exercise propped up on your elbows and toes with your back straight as demonstrated (see below). Hold this position for as long as possible provided it is pain free and you are maintaining good posture. Repeat 3 times.



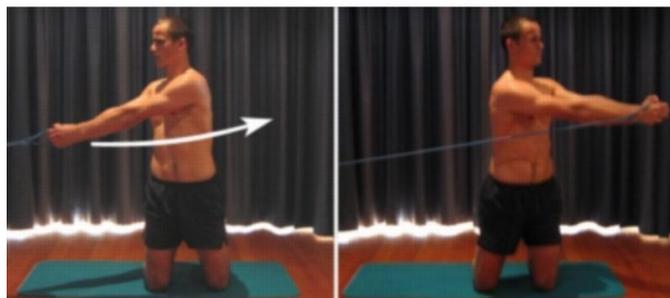
Side Holds

Begin this exercise propped up on one elbow and foot with your back straight as demonstrated (see below). Hold this position for as long as possible provided it is pain free and you are maintaining good posture. Repeat 3 times on each side.



Resistance Band Rotation

Begin this exercise kneeling or standing with your back straight, holding a resistance band as demonstrated (see below). Slowly rotate your body keeping your arms and back straight. Perform 3 sets of 10 repetitions as far as possible provided it is pain free.



Thoracic spine strengthening

The following intermediate upper back strengthening exercises should generally be performed 1 - 3 times per week provided they do not cause or increase pain. Ideally they should not be performed on consecutive days, to allow muscle recovery. As your upper back strength improves, the exercises can be progressed by gradually increasing the repetitions, number of sets or duration of the exercises provided they do not cause or increase pain.

Darts

Begin this exercise lying on your stomach with your arms by your side. Squeeze your shoulder blades together and slowly lift your arms and chest off the ground, keeping your neck straight (see below). Hold for 2 seconds at the top of the movement then slowly return to the starting position. Perform 3 sets of 10 repetitions provided it is pain free. This exercise may be performed with palms facing up or down.



Arms Above Head in Lying

Begin this exercise lying on your stomach with your shoulder blades squeezed together and arms by your side in the position demonstrated (see below). Slowly move your arms above your head, keeping your arms above the ground at all times and then return to the starting position. Perform 3 sets of 10 repetitions provided it is pain free.



Resistance Band Pull Backs

Begin this exercise in standing or kneeling with your back straight and holding a resistance band as demonstrated (see below). Slowly pull your arms backwards, squeezing your shoulder blades together as demonstrated. Hold for 2 seconds, then slowly return to the starting position. Perform 3 sets of 10 repetitions provided the exercise is pain free.

