

Art and Science of Making Weight

A Real World Guide to Weight Cutting



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Alwyn Cosgrove

Nick J. Grantham

“The typical practice in weight category sports is to compete in a division that is substantially lower than normal training weight or the athlete’s ‘natural’ level of body mass and body fat.”

Hawley and Burke (1998) Peak Performance: Training and Nutritional Strategies For Sport

“Most athletes who compete in weight category sports reduce weight quickly over one to several days in order to achieve their weight goal”

JW Rankin in Clinical Sports Nutrition

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Preface

Are you fed up of not making weight first time round? Do you want to take the guesswork out of weight loss program and replace it with a strategy that will allow you to step onto the scales and make the weight – first time, every time? Then you've found the right manual.

The Art and Science of Making Weight is the ultimate guide to making weight and will help you plan your weight loss strategy, allowing you to come in and compete at the correct weight in the best shape of your life.

Why have we written this manual? Simple really – nothing like this exists. Alwyn and I spent our competitive years making weight and believe me; we tried pretty much every strategy that we could think of to come in at the right weight. How we would have loved to have got our hands on a resource that we could have referred to for some guidance. Nothing existed – so we learnt through trial and error.

Hence, The Art and Science Of Making Weight.

For the first time athletes competing in weight category sports can benefit from our struggles with making weight.

Making weight doesn't need to be complicated. The principles outlined in this manual are the culmination of more than a decade of making (or not making) weight! Some of the principles in this manual are personal to myself and Alwyn, others have come from working alongside colleagues, athletes and training partners.

This manual combines the hard earned knowledge gained from actually having to 'make weight' with additional hours of research into the art and science of making weight. The goal is to provide you the reader with all of the information that you need to effectively come in on the money. We invite you to turn the page and find out how to successfully make weight – **FIRST TIME – EVERY TIME.**

The Premise of Cutting Weight

“Most athletes who compete in weight category sports reduce weight quickly over one to several days in order to achieve their weight goal.”

JW Rankin in Clinical Sports Nutrition

In certain sports, the competitors are divided up into weight classes with the goal being to ensure fair and evenly matched competition. Typically these weight classes exist in strength sports and in combat sports. For whatever reasons they don't exist in events like discus or the shot-put and I think that you could make a case for their inclusion. After all – long distance running, mountain biking and some triathlons at the recreational level have introduced the Athena class (for females over 150lbs) and the Clydesdale division (for males over 200lbs).

If you compete in a weight category sport you will inevitably be faced with a dilemma – how can I drop weight to get into my weight division? Some athletes will maintain a low body weight for an extended period of time whereas others will cycle their body weight for each competition. How athletes choose to make weight varies, some of the earliest research investigating different weight loss strategies was conducted with high school wrestlers in the late 1960's (Rankin, 2006). Other studies in the 1990's and more recently in 2004 showed that wrestlers also adopt other strategies such as fasting, laxatives, vomiting, sauna and rubber suits to make weight (Steen & Brownell, 1990 and Alderman et al, 2004). Table 1 provides an overview of the weight loss strategies used by a variety of athletes competing in weight category sports

Table 1: Weight Loss Strategies Used by High School Wrestlers

Weight Loss Strategy	Sport	
	Wrestling	Rowing**
Food restriction	83%	71.4%
Fluid restriction	77%	62.9%
Increased exercise	83%	73%

* Tipton & Tchong (1970)

**Morris and Payne (1996)

The downside of weight classes is that they are completely arbitrary. When we competed in Taekwon-Do with the International Taekwon-Do Federation in the 1990's – the weight classes were -54kg, -63kg, -71kg, -80kg and over 80kg. Contrast that with amateur boxing where there are 11 weight classes or professional boxing where there are at least 17 weight classes and you can see little reasoning behind the selection of different weight classes.

However – the very existence of weight classes creates an inherent problem.

Should a Taekwon-Do fighter who weighs-in in-shape at 75kg ...Gain 4.5kg so that he competes at the top of the under 80kg division (where most of his competitors will be), remain at 75kg and give away 4.5kg or more weight to his opponents, or diet off 4+ kg to compete in the -71kg division?

The answer for the best competitors was usually – **none of the above.**

What most weight class athletes choose to do is to “cut weight” so that they officially enter the division as a -71kg competitor, but reconstitute (regain the weight) prior to the actual event so competing closer to 75kg and enjoying a competitive weight advantage.

Research dating back to 1994 showed that when a group of high school wrestlers were asked who helped them plan their weight loss strategy, ‘nobody’ was the second highest answer (Marquart & Sobal, 1994). Making weight is still a taboo area that is shrouded in myth and mystery. Given the importance placed on making weight, it's amazing that no one has actually come out and written a manual about it.

In the art and science of making weight what we talk about is what actually happens and more importantly the strategies outlined in this manual actually work. Sometimes the advice will seem pretty close to the edge but you need to know this information to ensure that you don't ignore the issues. It is all too easy to simply put your head in the sand and ignore what is actually taking place – to operate in a state of ‘unconscious incompetence’ (denying the relevance or usefulness of a particular strategy).

That is the premise of the Art and Science of Making Weight – to shift you out of the dark and into a position of knowledge. This manual provides you with all of the available options so that you will be in a position of knowledge with the ability to develop appropriate weight loss strategies. This manual will provide you with the ability to reduce bodyweight dramatically for official weigh-ins, yet regain the weight by the time the event begins.

Remember, this is a real world manual – most mainstream books will avoid the ‘real’ issue and often provide little more advice than simply ‘don’t cut weight’. If you choose to follow the strategies outlined in the manual you do so at your own risk. We recommend that you seek appropriate medical and nutritional advice before you implement any of the strategies outlined in this manual and you should always check with your sports governing body’s rules and regulations surrounding weight loss strategies before embarking on your weight loss strategy.

How Not To Make Weight

Before we talk about how to make weight safely and effectively let's take a quick look at how not to do things.

“Try fasting for 24-36 hours.....jump on a stationary bike and complete some high intensity intervals (whilst wearing a fetching plastic garbage bag and waterproof jacket and trousers....then pop into a sauna (whilst still wearing the bin liner and waterproofs and continue with some step ups....once you've finished in the sauna (mainly because you are going a bit light headed) chew on some paper and spit the paper and saliva into a cup (instead of eating a meal) before finally stepping on the scales to breath out in an attempt to make yourself as light as possible! (surely you have breathed in)...then compete in your national championships!”

Now this example probably sounds a little extreme and some of you may even think it is far fetched and has all of the makings of an urban myth!

I, Nick Grantham was that Taekwon-Do competitor desperately trying to make weight and if you don't believe me then just ask Alwyn as he was there with me helping me along with my last minute attempts at making the weight. I can assure you that this was in fact pretty much standard practice for me back in the early 90's when I was trying to make weight for competitions.

The process described above was how I prepared for the British Championships in my home town.

I know what you're thinking – “yeah you might have made the weight but you'd be in no shape ot compete”. Not exactly.

Yes - I eventually made the weight and destroyed all of the opposition on my way to final (three fights in a single elimination competition), only to run out of gas in the final round and discover that my legs were no longer linked to the rest of my body - end result a silver medal and a serious groin injury for good measure.

We've not put this example in as a funny anecdote to somehow glamorize this type of weight loss strategy, far from it. We have included this example because this is the reality that many of you will be faced with or have in fact gone through to a greater or lesser extent at some point in your athletic

career. This example should serve as a reminder of how not to do things – a history lesson – a reality check. Now it's time to move on and find out how to safely and effectively make weight.

Making Weight

Making weight is about weight on the scale. It is not related to how good you look. It is not really related to body composition. It is not related to fat loss. It really has nothing to do with fat loss. The idea is to maintain your bodyweight just over the weight class limit between events, “cut” the excess pounds immediately prior to weigh in.

Once the weigh in is completed – the process is only half over – as the reconstitution phase begins and continues right up until the contest begins.

If the reconstitution phase is performed correctly the athlete should in fact ‘rebound’ to a level slightly above (20% or so) where they started – i.e. they cut 5kg but manage to regain 6-7kg.

Who Needs To Make Weight

This manual can be used by any athlete wanting to ‘make weight’ but it is important to recognize that the need to ‘make weight’ is not the sole domain of combat athletes. There are three broad categories of athletes that will need to make weight for their event.

1. Athletes competing in weight category sports who wish to compete in a weight division that is below their current weight (e.g. combat sports, horse racing, weight lifting, rowing etc.). This group of athletes will be our primary focus when discussing effective weight loss strategies.
2. Athletes competing in endurance sports or power sport where low body fat levels and an increased power to weight ratio, is a physical advantage (e.g. gymnastics, distance running, cycling, triathlons etc.). These sports do not have established weight categories but based on my experience working with athletes in these sports it is safe to say that there is often an ‘optimum’ competitive weight that individual athletes will want to achieve in order to compete effectively, a view that is supported by research (McCargar *et al*, 1993).
3. Athletes competing in a sport where leanness and low body fat levels are of aesthetic advantage (e.g. gymnastics, diving, ballet, body building, fitness competitions).

Athletes competing in category one will benefit most from this manual. Categories 2 and 3 should be more concerned with fat loss.

Weight Category Sports

Each weight class sport has its own procedure for making weight. See table 2 for an overview of some of the more popular weight category sports and their weigh in procedures.

Table 2: Summary of Sports and the weight categories and weigh in procedures.

Sport	Weight Categories and Weigh in Procedures
Wrestling	<ul style="list-style-type: none"> • 8 Categories • Weigh in on the evening before competition at 18:00-20:00 • Weigh in period lasts 30 minutes • Expected to weigh in only once at start of competition
Boxing (amateur)	<ul style="list-style-type: none"> • 12 categories • Weigh in on the first day of competition at 08:00-10:00 • Subsequent days only those who are drawn to box shall appear to weigh in between 08:00-10:00 • Boxing shall not commence earlier than 3 hours after the time appointed for the close of weigh in.
Boxing (professional – may vary between countries and associations)	<ul style="list-style-type: none"> • Up to 17 categories • Competitors weight in 24 hours prior to a fight when contesting a fight under one of the 4 world boxing organisations.
Horse Racing	<ul style="list-style-type: none"> • Minimum weight varies between countries (7st 12lbs in UK) • All jockeys weigh in approximately 30 minutes before racing for each race they compete in. Jockey on horses that win prize money (plus the next best finisher) have to weigh in directly after the race)

Table 2 Continued: Summary of Sports and the weight categories and weigh in procedures.

Sport	Weight Categories and Weigh in Procedures
Olympic Weightlifting	<ul style="list-style-type: none"> • 8 categories (male) • 7 categories (female) • Weigh in is 2 hours before the start of competition and lasts for 1 hour
Karate	<ul style="list-style-type: none"> • 6 categories (male) • 3 categories (female)

	<ul style="list-style-type: none"> • Team and individual events –no weight categories in team events • At international level, weigh in is usually conducted the day before competition starts, but this is up to the discretion of the tournament organising committee.
Lightweight Rowing	<p>Male</p> <ul style="list-style-type: none"> • Average weight of crew shall not exceed 70kg • No individual shall weigh more than 72.5kg • A single sculler shall not weigh more than 72.5kg <p>Female</p> <ul style="list-style-type: none"> • Average weight of crew shall not exceed 57kg • No individual shall weigh more than 59kg • A single sculler shall not weigh more than 59kg <p>Coxswain</p> <ul style="list-style-type: none"> • Minimum weight of a coxswain is 55kg for men and 50kg for women and mixed crews (to make this weight a coxswain may carry up to 10kg of dead weight). <p>Weigh in is not less than 1 hour and not more than 2 hours before race start.</p> <p>Competitors are expected to weigh in each day and for each event they are competing in.</p>

Table 2 Continued: Summary of Sports and the weight categories and weigh in procedures.

Sport	Weight Categories and Weigh in Procedures
Judo	<ul style="list-style-type: none"> • 7 (male) • 7 (female) • Competitors can have a trial 1 hour weigh in period followed by an official 1 hour weigh in period • Minimum time between weigh in and start of competition is 2 hours
Taekwon-do	<ul style="list-style-type: none"> • 4 weight divisions at the Olympics • 8 weight divisions at World Championships • Weigh in period is 1 hour on the morning of competition • Usually 1-2 hours between weigh-in and start of competition

Adapted from (Rankin, 2006)

Weighing in

“The intention of weight categories is to provide an ‘even playing field’ for sports where the larger individual will have a clear advantage”

JW Rankin in clinical Sports Nutrition

Athletes with greater muscle mass and reach can generate more power in strength events or more competitive in combat sports than a smaller lighter opponent. Matching athletes should in theory make sports safer and fairer

The reality is that athletes drop weight only to put it back on to gain an advantage on their smaller opponents.

Most legitimate sporting bodies have a built in allowance for cutting weight. Almost all the major sporting federations have a 24 hour weigh in rule. This rule allows an athlete to step on the scales for official weighing 24 hours prior to the official event. Boxing organizations (and specifically the Nevada State Athletic Commission, were instrumental in enforcing this in the professional boxing world) were the first to introduce the 24 hour rule, as previously they had implemented the “same day weigh-in” procedure.

This was eliminated in a bid to improve safety. The fear was that an athlete who was close to the weight class would dehydrate slightly to make weight and then compete in a dangerously unhealthy state. The 24 hour period was originally intended as a “Safety buffer” to allow a fighter to replenish the fluids and compete in a safe condition.

However it backfired.

It did not take long for fighters or coaches to realize that 24 hours was a long time to fully replenish their fluids and glycogen levels. So instead of cutting a few pounds and having to fight in a few hours – athletes could cut a lot of weight, as they had a long time with which to rehydrate and

recover. And thus the art of cutting weight (and a lot of weight) was born. Rather than being a safety buffer – it actually encouraged more aggressive weight cutting.

How it works

Where do you “cut” the weight come from? Due to the short time frame involved there are only a few options.

The key thing to realize is that none of the weight comes from body fat. Fat loss is a long term (weeks to months) process. Cutting weight is a few days at most. When cutting weight – there just isn’t enough time to burn the weight off from fat.

We need to say that again – we are not going to discuss cutting fat – that should have been taken care of well in advance of the final preparations for the weigh in.

The weight lost during cutting, comes primarily from stored water. Everyone knows that the human body is mostly water – approx 70-75%. In a fully hydrated individual it would be the upper limit of that number. So picture a 100kg individual. If we removed all the water from the body – all that would be left would be 25kg. Muscle is mostly water, bone is about 30% water, fat is about 20% water and blood is 57% plasma – which itself is 90% water. So the basic idea of cutting weight is to eliminate excess water for a short period of time (the time it takes to get on the scales and get off again!).

Methods of cutting weight

Fluid Intake Restriction

Hopefully this is obvious: The easiest method to cut excess water is to dehydrate by drastically reducing or eliminating your fluid intake.

The body is actually constantly losing water – through urination, breathing and sweating. All we are doing is choosing not to replace that lost fluid for a short period of time. Normal fluid loss through sweat, breathing and urination can amount to 1-2kg per day. Under normal conditions this fluid is replaced through eating and drinking so it’s not noticeable. Again - all we’re doing in this stage is consciously not replacing that water.

Obviously we can do certain activities or use supplements to enhance the water loss. But at this stage – with absolutely no effort – and merely restricting fluid intake for 36 hours or so before weigh-in usually results in a 2-3% loss in total bodyweight. For a 70kg person, a 2-3% fluid loss equates to 1.4-2.0 kg of bodyweight (Greenleaf et al 1992)

Recovery of fluid lost through dehydration may take up to 24 hours and athletes using dehydration for weight loss are cautioned not to lose more than 2% of body mass as performance and heat tolerance could be compromised (see Table3).

Table 3: Physiological Effects of Dehydration

% Body Weight Lost as Sweat	Physiological Effects
2	Impaired performance (reduced endurance capacity)
4	Capacity for muscular work declines
5	Heat exhaustion
7	Hallucinations
10	Circulatory collapse and heat stroke

Superhydration

One of the fastest and easiest methods to enhance the effect of dehydration is to “superhydrate” for several days prior to ‘upregulate’ the diuretic hormones within the body. Basically a sudden increase in fluid intake causes the body to panic and ‘upregulate’ the hormones that eliminate extra fluid.

The idea is that the body will go into “diuretic overdrive” – you’ll be losing a significant amount of fluid – but then when you cut the fluid abruptly – the body continues to excrete fluid at a maximum level before it adjusts. But this “overshoot” can typically get you another 0.5 -1% of bodyweight reduction. Putting superhydration and fluid restriction together can allow for a 3-5% loss in weight alone and although uncomfortable can be achieved fairly easily.

Clearing the system

Food typically takes 24 hours from when it’s eaten to be processed through the body and be excreted. Understand that weight class sports exist based on total scale weight – so anything that is held in the stomach is counted as bodyweight. It doesn’t help you as an athlete in any way – but it still counts as weight. So it makes sense to weigh in with as little as possible in the stomach and bowels.

How do we do that? Obviously fasting would work – but to completely empty the body could take 3 days or so. Fasting for this long would deplete energy levels too much to be of any value (remember you still have to compete after making weight).

The Australian Institute of Sport has an interesting tactic for making weight that involves eating “low residue foods”. These are basically foods that don’t leave much residue in the body and can actually be cleared out faster.

In the two to three days prior to competition, athletes should avoid excessive salt intake to avoid fluid retention. Adopting a low residue diet for the last 24-48 hours before beginning a depletion phase will help to reduce weight further because it empties the gut of undigested food and fiber.

Table 4 provides an overview of low residue foods that could be used during the final days of your weight loss strategy.

Table 4: Low Residue Foods

Low Residue Foods
<ul style="list-style-type: none">• Low-fiber cereal (corn flakes, rice krispies)• White bread• Jam,• Honey• Juice, low-fat milk, sports drink• Tinned fruit• Jelly• Clear soup (e.g. chicken broth)• White pasta• White rice• Tomato based pasta sauce• Liquid meal (Meal Replacement Shake)

Without actually realizing it this was pretty much the food groups that made up our diet during our competitive career – little did we know that they were in fact low residue foods!

Depending on size and diet, the average person carries about 1 to 2kg of such material in the stomach during the day. Fasting will allow this food to be processed and eliminated, and cause a 'technical' weight loss. However, it will also prevent the athlete from fueling up before the event. A low-residue diet composed of nutritious foods with minimal fiber or waste product will provide nutritional goals while being “light” to eat.

The idea then is to follow a low residue diet for 1 -2 days prior to depleting food and fluid (typically 24-36 hours before weigh in) and then finding a way to clear the gut of anything that left quickly, so as not to deplete energy levels too much.

Laxatives

It is worth noting that if your diet has been solid and your have followed the strategies already outlined in this manual, this should not be a strategy that you need to use. The use of laxatives is not without its risks but it is important to realize that athletes will resort to laxatives in an attempt to completely empty the bowel.

If you are considering using laxatives be aware that some sports and international bodies (WADA – World Anti Doping Agency) have banned the use of laxatives in relation to weight cutting. You

should take the time to find out if your sport has banned the use of laxatives – you don't want to prematurely end your sports career due to a lengthy ban from your governing body.

Now when we talk about laxatives we are talking about the type of laxatives that can be bought over the counter. Natural laxatives such as Senna are available over the counter and can be used to stimulate bowel movement. This type of laxative is pretty mild and it will take approximately 12 hours to work. You are likely to shed 1-2kg.

Magnesium Citrate is a bottle of fluid available over the counter and is usually taken by patients undergoing surgery or colonoscopies. This type of laxative is far much stronger and much faster acting. Make sure you are close to the toilet as it tends to kick in after just 30 minutes!

Expect to be visiting the toilet regularly within the first 2 hours of taking the first dose of Magnesium citrate. It acts fast and is extremely effective as it essentially causes a complete clearing out of the entire digestive tract. Often explosively....

Diuretics

Now just like laxatives, it is worth noting that if your diet has been solid and you have followed the strategies already outlined in this manual, this is another strategy that you won't need to use.

A diuretic is any drug or substance that elevates the rate of bodily urine excretion. For the purposes of this manual we are only going to discuss the readily available over-the-counter versions.

Dandelion (*Taraxacum*) extracts for example, are renowned for their excellent diuretic action, which have been extensively studied. In fact, some of these studies date back as far as 30 years or more and traditional healers have been prescribing dandelion extract for thousands of years. Dandelion root has also been used to help treat high blood pressure (a risk factor for edema) - its water-eliminating ability reduces the water content in the blood, which helps lower blood pressure.

This is exactly how other prescription-only water tablets work. For example, the commonly prescribed drug bendrofluazide reduces blood pressure by increasing water elimination from the kidneys. Here are some other natural diuretics that will help shift fluid.

Table 5: Natural Diuretics

Diuretic
Nettle Leaf (<i>Urtica dioica</i>)
Vitamin C
Vitamin B6
Uva-Ursi
Caffeine
Fennel
Silica
Buchu Leaf
Potassium
Lemon or lime (non caloric juices) can be added to the water to create a mild diuretic effect.

Caffeine is a powerful diuretic – but be aware that its use is banned in some sporting events at a certain level. For an over the counter complex that contains several of the above diuretics– one of the best on the market is “*Dry Shred*” by Troponin Nutrition that contains a blend of several of the above.

As far as food goes, trying loading your plate up with the following foods in the days prior to competition to give a little ‘boost’.

Table 6: Diuretic Foods

Food	
Asparagus	Mineral content and active amino acid - asparagine
Parsley	Essential oils within the plant
Watermelon	Mineral content within watermelon
Watercress	Mineral content within watercress
Artichoke	Mineral content within artichoke

Thermoregulation

The most common method of cutting weight is sweating – either through exercise or passive means. It's a process that is occurring all the time – often imperceptibly so. The technique of thermoregulation is just using a method by which to accelerate the process.

The body responds to elevated temperature by sweating. So when using heat to induce sweat, a remarkable amount of water can be cut. It has to be carefully monitored though – as the body perceives the cooling mechanism to be more important than hydration – so it will produce significant sweat even in an already dehydrated state.

The old school method of thermoregulation used “sauna suits” or vinyl clothing that seals off the air from the skin (the authors can remember sleeping and training in one!) and stops the evaporation of sweat. Without evaporation the body's system of cooling is disrupted, and the body produces even more sweat. Some even combine wearing the sauna suits, the sweating from exercise and the heat environment at the same time – and exercise in the sauna. Some sporting bodies have attempted to ban the use of thermoregulation – saunas, sweat boxes and sweat baths.

Modern Methods of Thermoregulation

1. Exercise

The first method is just to exercise – any modality, although preferably total body cardiovascular work. Obviously any exercise will work, but strength training will create too much local muscular fatigue to be of benefit this close to competition. In fact – the problem with exercise alone is that by its very nature it creates residual fatigue which can tire the athlete and effect performance. A better idea is to use a passive method of elevating core temperature that isn't so exhausting.

If exercise has to be used – then using a plastic suit with a thick sweatshirt and sweat pants over it is the first step. Then 15-20 mins of low level aerobic work followed by a 15 minute period of resting before changing is normal.

2. Sauna

The second method is arguably the best method. The dry heat of the sauna encourages sweating through both high temperatures and low humidity. Several kilograms can be dropped in a surprisingly short time. Regardless of how much water has been cut – you can almost always cut 2-3kg in a 30-40 minute period of time using the sauna (alternated with cooling periods).

It's important to check weight regularly when using the sauna – there is no need to “overshoot” the weight loss – so we recommend checking after every period of sweating.

We must also understand the prolonged effect that exists in these situations. After finishing exercise, or leaving the sauna – the core temperature remains elevated for quite some time (you only need to look at the faces of people coming out of the sauna – even after showering and changing they are still flushed). So even when the weigh in is close it's probably fine to leave the sauna being 0.25kg overweight.

Should you wear plastic suits in the sauna? To be honest – their effect is greater outside of the sauna when exercising than they are in the sauna. They really don't add too much extra when compared with the intense heat of the sauna, other than making you miserable.

3. Sweat Box

If a dry heat sauna is not available – a steam room or the sweat box method can suffice.

The sweat box method involves wrapping up in several layers of clothing and entering the bathroom area. After laying towels down around the bottom of the door and windows, all the hot taps in the bathroom are turned on to the max and creates a makeshift, although less effective steam room.

4. Sweat Bath

The sweat bath is another option. This involves blocking the vents to the room as before – and then sitting in the bath tub with as hot a temperature of water that can be tolerated. The athlete sits in the tub with the water up over his waist for 3-5 minutes. Then he or she submerges the upper body and face (leaving the nose and mouth out to breathe) and elevates the legs – for 3-5 minutes. Alternate between these positions for 30 mins or so. Hot water

must be added at regular intervals to keep the temperature high. This is usually combined with the sweat box method. Compared to the sauna, you just can't get the temperatures high enough, so this method takes a lot longer.

Adding a pound or two of table salt to the water can increase the effect somewhat.

It's important to note that this process of thermoregulation is draining. It can be physically and psychologically extremely tough. A lot of athletes make the mistake of beginning this phase in a fully hydrated state. Obviously this works – but just makes the initial cut (which could have happened with no discomfort) a little harder.

We recommend fluid restriction and monitoring of weight prior to beginning this portion.

Thermoregulation Schedule

1. 15-20 mins initial exposure to the heat
2. 5 mins out cooling down (do not drink any fluid) – check weight
3. 10 -15 mins back in the heat
4. 5 mins cooling (check weight)
5. 5-10 mins back in the heat
6. 5 mins cooling (check weight)
7. **At this point if more weight needs to be cut, continue with alternating 5 min periods in and out until you are within 1kg of making weight (day before) or less than 0.25kg (morning of).**

Putting it All together.

In this case: Weigh in is Friday at noon for Saturday event and athlete is within 5-10% of the weight class.

Table 7 – Weight Loss Schedule

<i>Day</i>	<i>Weight Loss Strategies</i>
<i>Monday</i>	<ul style="list-style-type: none">– Begin superhydration - 2 gallons of cold water
<i>Tuesday</i>	<ul style="list-style-type: none">– Begin low residue diet– Continue superhydration (2.5 gallon level)
<i>Wednesday</i>	<ul style="list-style-type: none">– Continue low residue diet– Continue superhydration to 3 gallon level– *Begin natural diuretics – one AM dose, one PM dose
<i>Thursday</i>	<ul style="list-style-type: none">– No water from midnight onwards (36 hours) – no exceptions– Continue low residue breakfast– No food from 12 noon (24 hour fast)– Check weight – if less than 2kg over – do nothing– If more than 2kg over – go to thermoregulation procedure– *Consume one bottle of Magnesium Citrate at around 7pm if necessary– *Take natural diuretics if necessary
<i>Friday</i>	<ul style="list-style-type: none">– Check weight upon rising– If more than 1kg over – continue thermoregulation– Make weight– Go to Reconstitution

****seek medical advice before using natural diuretics or laxatives as part of a weight loss strategy***

Reconstitution

OK, so you have made the weight and you're ready to compete.

Wrong.

Dropping the weight is just the first part of your preparation. You are now only at the halfway point. And for some – the next part is the hardest part of the strategy.

Now you need to replace your fluid and energy stores whilst at the same time trying to increase your weight as much as possible. This part of the process is absolutely critical – get this part wrong and all that effort in over the past 5-7 days will have been for nothing because you will enter your event dehydrated, lacking energy and worst of all underweight.

Few studies have looked at the dietary recovery strategies of athletes in weight category sports. Of those studies I'm pretty confident that none of them discussed inhaling one or two chocolate bars and a half gallon of Lucozade Sport (fluid replacement drink) in the time it takes for you to step off the scales and for the next competitor to successfully complete their weigh in (Nick's strategy at the time).

If your appetite is way down (quite common) or you are experiencing GI (gastrointestinal problems – dodgy stomach!) then you will have to look at compact foods and fluids. You need to replenish the fluids and put as many calories and carbohydrates back in as you can.

One of the best products available on the market is Myoswitch. This is the first muscle carnitine loading system which provides a faster recovery and 30% greater muscle glycogen storage compared to other available products. Vitargo and Waxy Maize are also useful at this time.

Fluid Replacement

Recovery of fluids lost through dehydration may take 24-48 hours, longer than is commonly appreciated by athletes (Costill & Sparks, 1973).

Common advice has been to ingest approximately 1 litre of fluid for every kilogram lost due to dehydration. More recent research suggests that increasing this to 150% of the volume of fluid lost due to dehydration is more effective (Shirreffs *et al*, 1996)

Rehydration will occur more rapidly if electrolytes are included in the fluid (Shirreffs *et al*, 1996). Electrolytes such as sodium and potassium stimulates water absorption in the gut and the maintenance of thirst drive.

Food Replacement

You need to maximize effective recovery time by consuming a high carbohydrate meal or snack immediately after the weigh in. You will need to be organized and make sure that you have an adequate supply of sports drinks and meal replacement drinks and bars at the weigh-in site.

The Plan

Immediately upon leaving the scale consume 8oz of carbohydrate drink (e.g. Myoswitch, Vitargo S2, Gatorade, Powerade, Pedialyte) and 8oz of water (16oz of fluid every 15 mins).

Repeat every 15 mins for the first two hours (128oz of fluid)

At hour one – alternate between consuming a medium banana and a higher sodium snack (potato chips, pretzels) every 15 minutes alongside the drink.

At the two hour mark continue drinking only carb drinks (8-12oz every 30 mins or so). Consuming a chocolate bar/energy bar, or a small sandwich every 30-60 mins also until the four hour mark.

At the four hour mark the athlete should continue with the carb drinks and consume a carbohydrate rich meal (such as pasta, rice etc). At this point keep hydration high and follow an energy-rich diet until the competition begins.

Potential Problems

“The most dramatic and unfortunate result of effort to lose weight in wrestling was the death of three collegiate wrestlers in 1997 trying to make weight”

American Medical Association 1998

It would be inappropriate to write a manual on making weight without addressing some of the potential problems associated with rapid weight loss. Remember, this manual has been developed to provide you the reader with a balanced overview of the area so that you can develop your own strategies based on all of the available information.

Short Term Consequences

Rapid weight loss can have some short term effects, which include mental and physical exhaustion:

1. Mood swings (just ask my wife – we started seeing each other whilst I was still competing and I’m pretty sure she would confirm that at times I wasn’t always the nicest person to be around – training 3 times a day and eating bland food whilst all your friends are out partying has a tendency to do that to you!).
2. Lack of energy – no surprises with this one, if you drop weight through dehydration and restricted food intake you are going to start to feel fatigued.
3. Lack of motivation – again, no real surprises with this one, making weight is tough and from time to time you will struggle with motivation. I was lucky enough to have a great training partner in Alwyn – he always found ways to motivate me, usually by telling me that he had just heard that my nearest rival was out training and looking sharp! Needless to say that got me going and I was hitting the pads with a renewed vigour!

Long Term Consequences

Attempting to maintain a low body weight for extended periods of time can have long term implications such as:

1. Disordered eating patterns potentially leading to eating disorders such as anorexia nervosa or bulimia nervosa.
2. Vitamin and mineral deficiencies due to inadequate nutrient intake from a restricted diet.
3. Changes in metabolic function, including a lowering of metabolic rate.

Table 8 provides an overview of potential problems associated with rapid and chronic weight loss.

Table 8: Problems Associated With Rapid and Chronic Weight Loss

Problems Associated with Rapid and Chronic Weight Loss	
Plasma Volume loss and susceptibility to heat illness	Dehydration can result in a large drop in plasma volume (Rankin, 2006). Reduced plasma volume results in a decrease in the amount of blood pumped out by the heart – resulting in the heart having to raise its game and work harder in an attempt to maintain the blood supply to the working muscles
Inability to maintain or develop lean tissue	It becomes increasingly difficult to maintain lean tissue with dramatic weight loss (Rankin, 2006).
Reduced metabolic rate	Prolonged weight cycling can reduce metabolic rate making weight loss more difficult. The knock on effect is that further attempts at weight loss will be increasingly difficult since more restriction in energy intake will be required to cause a negative energy balance (Rankin, 2006).
Poor cognitive functioning	Rapid weight loss can have a negative impact on cognitive functioning including increased RPE (rating of perceived exertion) (Rankin, 2006)
Compromised nutritional status	Our bodies can handle brief periods of dieting without a negative impact on nutritional status but prolonged and repeated dieting may cause problems (Rankin, 2006)

Problems Associated with Rapid and Chronic Weight Loss	
Performance deficits	There are potential problems maintaining muscular strength during periods of energy restriction and dehydration. Excessive mineral loss (sodium, potassium and magnesium) can also result in an increased risk of muscle cramps and spasms (Rankin, 2006).
Menstrual and endocrine disturbance	Loss of bodyweight and fat may produce menstrual disturbances, reductions in testosterone and prolactin levels.
Compromised immune function	A lack of balance in the diet may have a negative impact on immunity. I can certainly vouch for this one – Alwyn and I were arguably at the peak of our physical fitness when we were competing but we were very susceptible to colds and coughs etc. – I think that I had a permanently blocked nose between 1992 and 1997!
Disordered eating patterns	Energy restriction may increase the risk of disordered eating patterns. Making weight is tough and the dietary habits required to make the weight are not normal and probably explains why I'm now a fan of all foods that are sweet and Alwyn will devour anything that is savoury. Don't leave me and Al in a room with a table full of sweet and savoury food – it will get eaten and this probably has its foundation in the fact that for years our favourite foods were also the foods that we couldn't eat whilst making weight.

Summary

If you work with athletes competing in weight category sports consider the following when developing a weight loss strategy:

- Develop a long-term plan for weight management
- Consider performance history of your athletes
- Consider the weight control history of athletes – what strategies have worked in the past
- Consider appropriateness of weight category – are they in the right category?
- Set realistic weight goals - body weight should not exceed 10% of desired competition weight
- Monitor weight at regular intervals (minimum of twice a week)

Athletes competing in weight category sports are highly motivated to drop weight rapidly before weigh in. Make sure that:

- Long-term weight loss is achieved through a controlled balanced diet (consult nutritionist).
- Fluid restriction and low residue foods are used for rapid weight reduction.
- Rapid weight loss (just prior to competition) should be achieved primarily by losing water only (via sweating). Dehydration should only be used to achieve temporary weight loss. Avoid losses of 5% of body weight as this level of dehydration will have a negative impact on performance (athletic performance, cognitive function, heat illness).
- Recovery starts as soon as possible following a period of acute weight - recover as quickly as possible using a fluid adequate in sodium and carbohydrate.
- Remember that protein requirements may be higher during periods of prolonged low energy consumption.

Most importantly remember:

- Prolonged and repeated attempts are likely to cause nutritional deficiencies and limit lean tissue growth.
- Do not attempt rapid weight loss if not initially adequately hydrated and nourished. (ie. do not add dehydration to pre-existing dehydration)
- Do not attempt to lose more than 5% body weight in 1 day or 10% total/
- Seek advice if you are considering using diuretics, or laxatives to cut weight.
- Have a strategy – implement it – destroy your competition!

Real World Case Studies

Matt Kroczelezi

What follows is a brief summary of the process I have successfully used to cut up to 30lbs in less than 24 hours (I went from 250 to 219 for the '07 Arnold in 22 hours) and put it all back on in less than a day as well. I do this without any type of diuretics or IVs, just entirely through sweating to lose the weight and drinking/eating to replenish it. This is designed for competitions that have a 24 hour weigh in period prior to the competition.

Now I will not kid you, this process is difficult and requires a great deal of desire, discipline and pain tolerance. It is exhausting, very uncomfortable and certainly not beneficial to your health. However I do feel that it is as safe a method as there is for cutting a substantial amount of weight in a short period of time as it requires no drugs (prescription or over the counter) and uses the body's natural cooling mechanism (sweating) to achieve the weight reduction. I feel a 10% bodyweight reduction can be achieved easily and safely and I have personally used this method to cut up to 15% of my bodyweight in less than 24 hours. I feel going above that amount significantly increases the risk to your health and I do not recommend it. Remember athletes have died from excessive dehydration while trying to make weight so do not take this lightly.

I feel the key to stepping on the platform at maximum strength after cutting weight is to spend as little time as possible with your bodyweight at less than you intend to weigh when you lift so I have designed my method to achieve the desired weight loss to make the weight class limit as fast as possible and to return the bodyweight to precut levels as expeditiously as possible without the use of IV fluids.

Essentially I use a combination of hot baths and a steam sauna to sweat out the desired amount of weight and then immediately replenish the weight by drinking large amounts of gatorade diluted in a 1:1 ratio with water and eating and drinking copious amounts of other food and liquids. I have streamlined my method to get my weight down as quickly as possible while minimizing the health risks. I have also designed this method to be used in a hotel bathroom as that is where most athletes will be staying the night prior to weighing in for a competition. Most hotels have small bathrooms that can quite effectively be turned into steam rooms by closing the door and running the shower with the water turned on as hot as possible.

I prefer to do my sweating in 30 minute cycles. I start by entering a bath with the water as hot as I can get it without scalding myself. I submerge my entire body with the exception of my mouth and nose. I prefer the hot bath because it facilitates raising my body temperature as fast as possible and being submersed in the water is somewhat more comfortable (at least for me) than it is to be sitting in a steam room or especially a dry heat type of sauna. After fifteen minutes I get out of the bath but leave the shower running on pure hot to maintain the steam and heat in the room. I do not know what the precise temperature gets up to but it is typically as hot as any steam sauna I have been in. Then I either sit or stand in the steam for another fifteen minutes. At the 30 minute mark (bath and steam time combined) I exit the bathroom for five minutes. This serves a couple of purposes. It allows me a break both physically and mentally. It also lets the core body temp return to a more normal level and I will feel much better physically. After the five minutes in the cool room I return to the hot bath (I drain and refill the water each cycle to keep the water as hot as possible) and begins the process anew.

Eating and drinking prior to and during the weight loss process with the goal being to drop approximately 10% of the athlete's bodyweight (20-25lbs for me) are as follows assuming an 8am weigh in time on the day prior to the competition. At 24 hours out I will have a normal breakfast (usually oatmeal and whey protein) and then an hour or two later I will have a meal replacement type protein shake. At about 20 hours out I am now done drinking and eating anything substantial until after the weigh in and ready to begin the sweating process. The only food I allow myself during the cut is peanut butter on a slice of whole wheat bread. This provides me with carbohydrates, fat and protein and a decent amount of calories without adding any significant weight and additionally is easy to prepare and carry with you to a competition. With this short of a time frame the only thing that matters for the weigh in is how much the food physically weighs and not the calorie content when you consume it. I will allow myself two pieces of the bread with peanut butter usually spaced out evenly during the cut. I would say the first piece is typically consumed about eight hours into the cut (about 10-12 hours out from the weigh in) and the second piece about six hours later. I always feel a renewed energy and sense of well being after these small snacks. I do not allow myself to drink ANYTHING during the cut as this is counter productive to what we are trying to achieve. Any liquid that enters the body during this time period is just that much more that must be sweat out to achieve the desired bodyweight. I will chew on and spit out ice chips during my five minute breaks but that is as close as I come to drinking any type of fluids during the weight loss process.

I am typically able to achieve a weight loss rate of two pounds per hour early in the cut and approximately one pound per hour towards the end of the cut as I become more dehydrated. I use this to gage how far out I am from making weight and how much sleep I allow myself during the cut since I perform this cut throughout the night prior to the weigh in. I try to time the weight loss to reach my goal no more than one hour prior to weigh in and typically as close to the weigh in time as possible erring on the side of getting down a little soon rather than a little after weigh ins begin so as not to decrease the amount of time I have to replenish my body. I do not plan to sleep more than three hours or so during the night as taking more time lengthens the time the body is in a depleted state and we wish to minimize this to counteract any negative effect the cut may have on athletic performance.

Once I make weight the first thing I do (and this is seconds after stepping off of the scale) is to drink a half gallon of Gatorade mixed in a 1:1 ratio with water. I drink this entirely within a few minutes and then continue to drink often finishing the gallon within an hour or so. Then I normally go out to breakfast right away and eat as much as physically possible. I continue to eat every two hours or so throughout the day and try to drink continuously. This is also a difficult process and requires a lot of discipline. At first due to the depleted state you will be in the drinking and eating is pleasant but soon you will feel rather full and that is where the discipline to keep eating and drinking comes in. You must regain all of the weight lost in order to prevent the cut from affecting your performance. I often regain 20lbs of bodyweight in the first 12 hours after weigh in. This essentially means I have consumed a combination of liquids and food that if weighed on a scale would equal that amount. Yes, that is a lot of food but it is absolutely necessary to use this method successfully.

How well does this work and how much will the athlete's strength be affected on competition day? I have used this method exclusively over the last several years dropping a maximum of 30lbs in 22 hours for the '07 Arnold and the fastest rate I cut weight at was losing 22lbs in 15 hours for the '07

Pro Am. I have always felt that I was at 100% when stepping on the platform and I almost always feel better after the replenishment process than I did prior to starting it. The key is to regain all of the lost weight. As long as the athlete does this their strength should not be affected what so ever when they step on the platform. However if the athlete falls short during the replenishment process the greater the difference in their bodyweight pre and post cut the greater the negative affect on their performance. This is both a cutting and replenishing process and both aspects must be completed successfully in order for the athlete to compete successfully.

These are links posted that I wrote regarding the weight loss process I used at last year's Pro Am and the '06 Arnold Classic:

http://www.elitefts.com/documents/cutting_weight_proam.htm

http://www.elitefts.com/documents/cutting_weight.htm

Brian Schwab

-No high glycemic carbs for two to four weeks depending on the necessary weight loss w/approx. 1 gallon water/day.

-1 to 2 grams of protein/lb. of bodyweight per day combined with low glycemic carbs eaten every 2 to 3 hours for 5 to 6 meals a day.

-The last 2 days I switch to 8 oz. of water every 2 hours instead of the gallon.

-No food or water prior to weigh ins for about 18-20 hours (this part sucks).

-Mild diuretic/sauna if necessary (not fun either).

- To gain the weight back post weigh ins I start drinking 8 oz. of penta water alternating with pedialyte every 15 minutes until I'm full, then switch to 8 oz. of gatorade about every hour mixed with 5gms. each of creatine and glutamine every 2. I also eat high sodium foods along with carbs that my stomach will easily handle.

Justin Harris

Final week preparations for making weight:
181lb weight class example
Assuming a starting weight of just under 200lbs

In the final few weeks before the contest, dietary sodium should be increased to a higher level than usual.

Sodium:

until monday before the meet: high sodium

monday: low sodium

tuesday: no added sodium, just Mrs dash for seasoning

wednesday: NO sodium, no salt added to your food (you can season with Mrs Dash), and you will also boil your chicken or steak before you grill or bake it. (that will boil out some of the salt...especially any chicken that may have been stored in a salty broth...like most chicken is)

thursday: same as wednesday

friday: NO sodium until you make weight....then MEGA sodium after you weigh in.

Water intake:

monday: 3 gallons

tuesday: 3 gallons

Wednesday: 1 gallon

thursday: 2oz with each meal

Friday: no water until you make weight. sip on ice chips if needed.

Immediately upon making weight, include as much water, 1/2 strength gatorade, and waxy maize as you can get down. 1 gallon of water is about 8lbs, the more fluid you can get down, the more weight you can put back on.

The higher the amount of fluid retention, the greater the leverage capabilities across the joints.

Dry shred:

monday: 6 caps am and pm

tuesday: 6 caps am and pm

wednesday: 6 caps am and pm

thursday: 6 caps am (stop after the am unless you're still way over weight. You want to give about 24 hours after the dry shred stops before you start trying to put the weight back on)

Carbs:

monday: 100g of carbs total for the day

tuesday: 50g of carbs for the day (25g in meal 1 and 2)

wednesday: NO carbs, just lettuce, brocolli, or asparagus with your protein in each meal

thursday: no carbs. Only protein and lettuce....

Friday: no carbs until you make weight. PIG OUT after weighing in.

You should still have 6 meals each day. Each meal should have about 4-6oz of cooked steak or chicken. Thursday should be only chicken, no steak.

An example of this meal plan would be:

Monday

meal 1: 8 egg whites, 1 cup plain oatmeal
meal 2: 4oz chicken, 1/2 cup plain oatmeal
meal 3: 4oz round steak, 1/2 cup plain oatmeal
meal 4: 4oz round steak, 2 cups lettuce with balsamic vinegar
meal 5: 4oz chicken breast, 2 cups lettuce with balsamic vinegar
meal 6: 40-50g protein drink, 1 cup broccoli

Tuesday:

same protein amounts.

Carbs:

meal 1: 1/2 cup oatmeal

meal 2: 1/2 cup oatmeal

rest of meals only vegetables.

Wednesday and Thursday:

same protein amount in each meal.

No carbs, each meal can contain lettuce or asparagus, up to 2 cups per meal

After weigh ins:

Immediately after you make weight, slam a tablespoon of salt (yes, it's gross), and a Waxy maize shake with 200g of carbs, and at least 36oz of water. Drink it as fast as you can without throwing up.

Try to sip 1/2 strength gatorade all day.

2-3 gallons of 1/2 strength gatorade should be the goal.

Have at least 5 WM drinks with at least 2 scoops WM. Add a TON of water, and sprinkle salt into the mixture. Just a little salt, don't make it too hard to drink. but the more sodium the better...

Try to eat at least 4 whole food meals....with HIGH sodium.

Some good high sodium carbs are actually RAMEN noodles.....2 packs of those are over 100g carbs, and a ton of sodium.

Protein isn't super important, but try to get some in each meal. Even if it is a protein drink.

POUND the sodium though. You should try to add salt to everything you eat.

Try to have 2 WM drinks throughout the night. If you get up to pee, slam a WM shake with water and a bit of salt, and maybe a handful of salt and vinegar chips, or something else with a ton of sodium.

If you can, take in 20g of creatine on Friday....do it in SMALL increments though. You can add 2-3g to each WM shake. Creatine can decrease appetite so don't take too much at once.

If the competitor isn't taking beta-alanine, this can be added in at 4-6g per day in two doses of 2-3g, about 2-3 weeks beforehand.

L-tyrosine will aid in water retention too. Creatine and L-tyrosine are in Anatrof....you can add a tablespoon of that to each WM meal. (if you don't have Anatrof, just take the creatine)

You should get 2 gallons of 1/2 strength gatorade, at least another gallon in the WM shakes, and then a little more fluid through the night. The more you drink, the more water you can hold.

The more sodium you eat, the more water you can hold.

The more carbs you eat, the more water you can hold.

The more water you can hold....the stronger you will be.

So, basically, here is how Friday should look:

Before weigh ins: no food, no water

After weigh in:

HUGE waxy maize shake with 200g of carbs, tablespoon of salt, some creatine, and at least 36oz of water.

Have a gallon jug filled with 1/2 gatorade, and 1/2 water. Finish at least 2 of those on Friday.

You should alternate high sodium meals with waxy maize meals, and sip the gatorade all day.

So, as soon as you can stomach food after the first WM shake after weigh ins, have 2 packs of ramen noodles.

Add salt plus the seasoning that goes with it, and try to get 36oz of the 1/2 strength gatorade down with it.

Just alternate meals like that....the WM shakes should be about 100g of carbs each, but the first one will be 200g.

any time you can stomach it, throw a teaspoon or small handful of salt down your mouth, and wash it down with a big swig of gatorade.

Your guts will feel like they're dying....like they're stretched to their limit....that is what it should feel like. You will feel like SHIT on friday, but you'll be fine by the time you wake up in the morning.

Check your weight on friday morning. If you're over, sauna before the drive. If you're still more than 2lbs over before the drive, you can hotbox your car....high heat, windows rolled up. Just don't pass out.

www.troponinnutrition.com

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About the Authors

Alwyn Cosgrove



Alwyn Cosgrove is one of the most in-demand and exciting coaches, writers and speakers in the fitness industry today. He currently spends his time lecturing, teaching, training and writing and as the owner of Results Fitness in Santa Clarita, CA

For the past nineteen years Alwyn Cosgrove has been committed to achieving excellence in the field of fitness training and athletic preparation. Specializing in performance enhancement, Alwyn has helped countless individuals and athletes reach their goals through sound scientific training.

In July 2004 Alwyn was diagnosed with Stage IV Cancer. After a long battle, and intensive chemotherapy, Alwyn was pronounced in full clinical remission as of March 2005.

Unfortunately the cancer returned in March 2006 and Alwyn again was treated with very aggressive chemotherapy and this time underwent an autologous stem cell transplant.

Alwyn is currently living in Stevenson Ranch, California with his wife Rachel.



Nick Grantham is committed to helping athletes optimize their potential through the provision of individualized, athlete centered strength and conditioning programs. Specializing in the area of fitness training and athletic preparation Nick has helped numerous athletes achieve their goals through his unique understanding of sport science and athletic preparation.

Nick has an honours degree in Sport Science and a master's degree in Exercise and Nutrition Science from the University of Liverpool. As well as being accredited as a Sport and Exercise Physiologist (Support) with the British Association of Sport and Exercise Sciences he is a certified Strength and Conditioning Coach with the National Strength and Conditioning Association. Nick is recognised by the British Weight Lifters Association and is a founder member of the UK Strength and Conditioning Association.

Nick began his coaching career at the Lilleshall Sports Injury and Human Performance Centre where he worked for the British Gymnastics Team. Following that Nick took the position of Strength and Conditioning Coach with the England Netball team, before moving to the English Institute of Sport where he has headed up the Strength and Conditioning team in the West Midlands for the past four years. Since then he has continued to work as a strength and conditioning coach, successfully implementing his innovative training strategies as Director of Strength and Conditioning at GENR8 Fitness.

Nick has trained many of the countries elite athletes including Olympic and Paralympic finalists, World, European and Commonwealth Games medallists and professionals in a multitude of sports including Netball, Cricket, Hockey, Skiing, Professional Football, Rugby League, Rally Driving, Boxing and Ultra-Endurance Running.

Nick continues to develop his knowledge of advanced training concepts and strength and conditioning systems and has had the unique opportunity to observe world's best practice at some of the leading training establishments in the World, including the Australian Institute of Sport, US Olympic Training Centre, Chinese National Football Centre and Cirque du Soleil. A sought after 'expert' Nick has presented seminars and practical demonstrations on strength and conditioning for the Football Association, the National Sports Medicine Institute, the British Olympic Association and the UK Strength and Conditioning Association. Nick has articles published in leading sports publications including Men's Health, Men's Fitness, Maxim and Peak Performance, as well as writing a monthly column in Sports Injury Bulletin.

Nick has become recognised as a specialist in athletic preparation and has helped athletes of all levels achieve their personal goals and ambitions.