

Content

Trial Period Extension: Increasing accessibility to the Coach Letter	2
Fatigue and Recovery: How to get more out of training	3
Aerial Skiing Training Loads: In young female aerial skiers	6
Peak Age in Trampolining	8
Fatigue and Supercompensation (infographic)	9
Announcing the athlete support program	10

Trial Period Extension

Increasing accessibility to the Coach Letter

The Coach Letter is really starting to find its feet and gain ground, so to speak. Now that we are finding more about what we want to do with the Coach Letter, we are extending the trial period until May. If you subscribe, you can expect a release of the Coach Letter on the 20th day of every month, with a major release or special edition coming every third month.

The Coach Letter trial period has been extended until May 2019. We want to keep the Coach Letter free, even after May comes around, so we are looking for sponsors.

For now, encourage your fellow coaches, friends, performance managers and even interested athletes to subscribe to the Coach Letter. We are aiming to keep the Coach Letter free, for everyone, forever.

To subscribe, go to our website www.airsportsacademy.com

If you are interested in sponsoring the Coach Letter, send us an email at airsportsacademy@gmail.com

Fatigue and Recovery

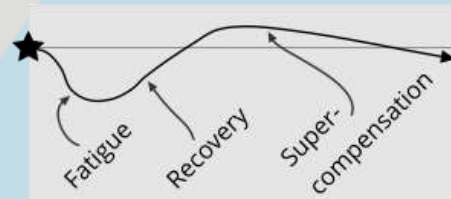
How to get more out of training – by Ryan Hatfield

Aerial sports such as trampolining, diving and aerial skiing involve a high amount of skill. Coaches often get caught up in the technical, mental and skill side of training, forgetting that these sports are physically demanding as well. Just like going for a run or lifting weights, participating in technical training causes fatigue, which takes time to recover from. By timing recovery perfectly, we can maximise the speed at which we make progress.

The theoretical fatigue-recovery curve

In the diagrams below, a training session is indicated by a star. Physical ability (ability to be strong, jump high, etc.) is indicated by the line.

1. Physical ability declines after a training session due to fatigue
2. Physical ability slowly recovers to baseline
3. Physical ability trends above the baseline (supercompensation)



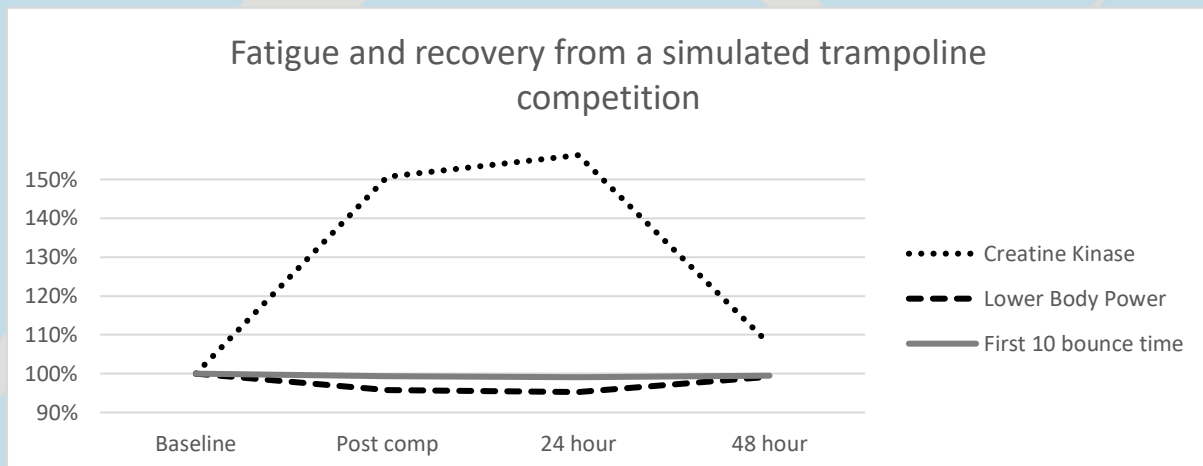
The length of recovery between training sessions can greatly affect how effective our training programs are in the long run. Over time, if we repeatedly plan the next training session to occur during supercompensation, we can expect physical abilities to improve (shown below, left). However, if we train too often, without enough recovery, we can expect physical ability to stay the same, or decline (shown below, right).



Fatigue and recovery in aerial sports

In sports where precision is important, it has been demonstrated that the best chance of success and lowest risk of injury occurs where fatigue is minimised^{1,2}. Aerial sports have little research on fatigue and recovery. Research conducted in 2016 found no scientifically backed training load and fatigue recommendations for aerial skiing³. Research in 2013 by Jensen and colleagues simulated a trampoline competition and analysed markers of fatigue for 48 hours post competition⁴.

Jensen and colleagues had 15 elite level, male trampoline athletes compete in a simulated trampoline competition with three routines. Among other factors, they measured lower body power, trampoline 10 bounce time (from a standing start), and plasma creatine kinase levels (a marker of muscle damage and fatigue). Results are visualised below:



All markers of fatigue demonstrated the same thing: Athletes fatigued during the competition and after 24 hours of recovery, all measures of fatigue were at their worst. By 48 hours of recovery, all measures had effectively returned to baseline. At 48 hours of recovery, there was no sign of supercompensation. Further research needs to be done in this area to examine whether supercompensation may be present after 72 or 96 hours of recovery.

Other research in the strength and conditioning field has produced similar results. Highly trained athletes recover from moderate volume workouts in 48 hours, with minimal signs of supercompensation at this point⁵. Higher volume workouts take longer to recover from, athletes can take 72 hours to recover from high volume strength, jumping and sprinting workouts⁶. Training adaptations may occur when training strenuously every 48 hours, however this frequency may be too high to maximise the benefits of supercompensation⁷.

What to do in the real world

1. In highly trained, elite athletes, it takes at least 2 days to fully recover from a strenuous workout or training session. Consider planning for 48-72 hours of recovery between “high workload” sessions.
2. Recognise that frequent, high training workloads, without adequate recovery will result in a performance decline.
3. Monitor training loads and signs of fatigue and allow for rest and recovery when fatigue is high.
4. Fatigue is not the enemy but ensure that athletes get adequate recovery to allow for supercompensation.
5. Reducing workload to maximise recovery and supercompensation is likely to be very useful when tapering for competitions.
6. Note that most research has been performed on male athletes, and female athletes may respond differently or recover at different rates.

Fatigue and Recovery

How to get more out of training

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Aerial Skiing Training Loads

In young female aerial skiers – by Ryan Hatfield

The following article investigates results from a 2016 study by Keaney and colleagues, titled “The training Load of Aerial Skiing”¹.

The previous article on rest and recovery was predominantly looking into elite level athletes. Developing athletes have different responses to training loads and recovery, so understanding these differences is crucial in the high-risk sport of aerial skiing. There is little research in training loads and fatigue in aerial skiing¹, so many coaches rely on anecdotal evidence and experiences of “what I did when I was an athlete”. This evidence is often highly problematic, as there is nothing to suggest how beneficial or detrimental these practices are.

In the Keaney study, athletes would perform their jump into water and walk up stairs to return to the top of the ramp. Both jumping and stair climbing require physical effort from the athlete and result in a high work:rest ratio of 1.9:1. This work:rest ratio in combination with the high physical demands and high impacts of the training sessions, are identified as a potential risk factor, reducing precision and increasing the risk of injury. Highly fatiguing training sessions are likely to result in decreased precision.

Another area identified by the Keaney study is that aerial skiing athletes experience high training intensities and high impact loads. The recovery time between efforts is likely to be inadequate, particularly if skill accuracy and injury prevention are important factors. While several sports experience high training intensities and impacts, it usually takes years of training to build up to these loads and a lower work:rest ratio is often observed.

Identifying purpose and training methods

In order to achieve desired outcomes, coaches must consider why they are asking athletes to perform certain tasks. While training to improve technique and aesthetic components, athletes need to be fresh and focused, with low levels of fatigue. In this case, a work:rest ratio of 1.9:1 is likely to negatively affect the training outcome. When training to improve technique and aesthetic components, a greater recovery time should be considered.

A work:rest ratio of 1.9:1 may be more applicable when aiming for increased fitness and this is likely to be at the expense of skill precision. When training with high work:rest ratios, reducing the number of high impacts may reduce injury risk. Working with a sports scientist is recommended to identify the outcomes and risks of certain training methods. Training risks and outcomes should be monitored and regularly compared to the training purpose to identify whether training is achieving its targets in the most effective way.

Aerial Skiing Training Loads

In young female aerial skiers

References

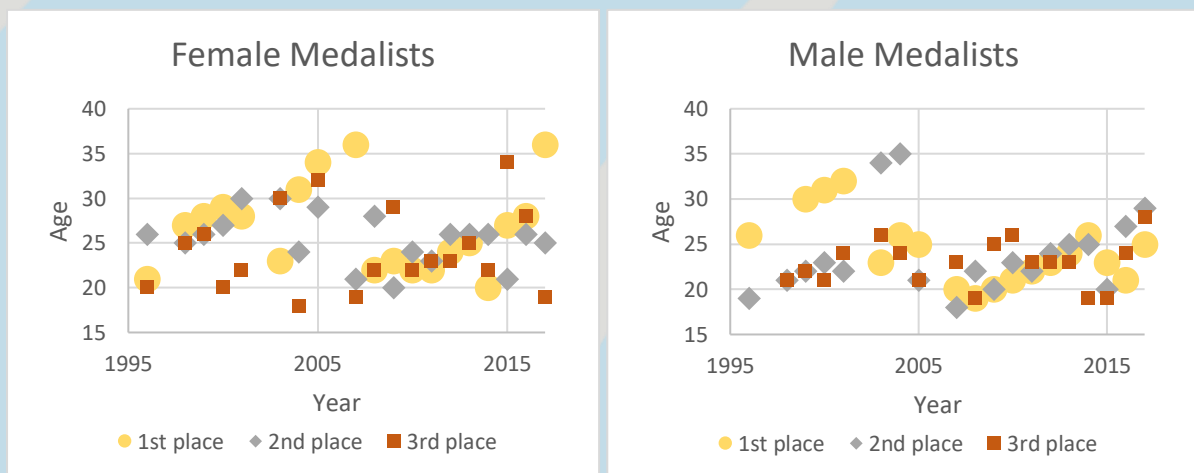
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Peak Age in Trampolining

By Ryan Hatfield

Knowing the age at which an athlete is most likely to be in their prime is a key factor in long term athlete development and in athletic career planning. This article investigates the results from all Senior Trampoline World Championship and Olympic Games competitions between (and including) the years of 1996 and 2017.

There were 19 senior championship competitions in the years analysed, allowing for 57 medals to be awarded to female athletes and 57 to male athletes. Age data was found for all except two medal recipients, giving 57 female and 55 male data points to analyse.



The average age of female medallists is 25 years old and the average age of male medallists is 24 years old. Most successful athletes are achieving medals in their twenties. However, some athletes continue their success into their thirties, with 9 medals won by 4 different women in their thirties and 5 medals won the same man in his thirties. Some athletes also win medals aged 19 or younger, with 3 medals won by 3 different women in their teens and 6 medals won by 5 different men in their teens.

All athletes who won medals in their teens, continued winning their twenties, indicating that they did not peak in their teens. Athletes who are successful in their early twenties often maintain their success into their late twenties and sometimes into their thirties. Occasionally, some athletes win their first medal in their late twenties or thirties.

Take-home points in the real world

1. Plan an athlete's career around reaching their peak performance goals at their peak performance age: approximately 25 years old for females and 24 years old for males
2. Athletes can hold on to a peak into their late twenties and early thirties.

Fatigue and Supercompensation



With enough recovery time, performance trends above the baseline value, allowing us to improve over time

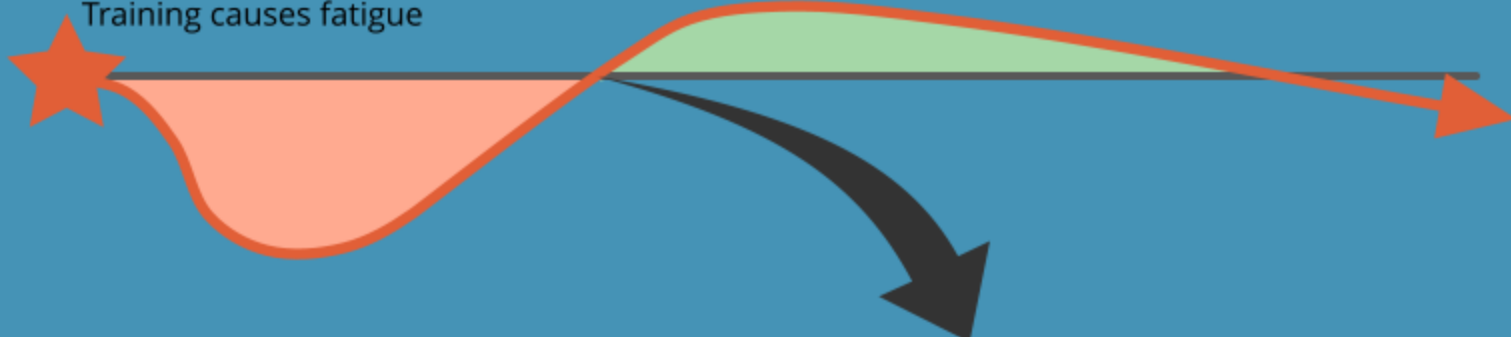


Improvements to strength and power can be observed to last several days



In the quadriceps, supercompensation has been observed 2 days post workout, lasting for more than 4 days.

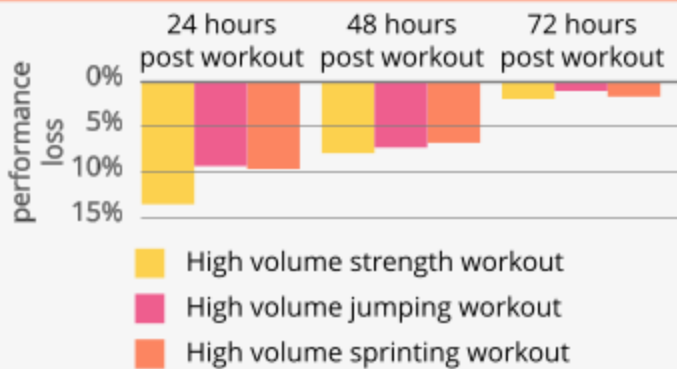
Training causes fatigue



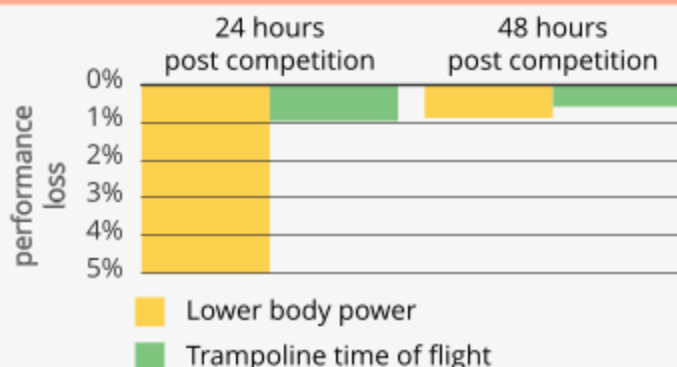
Fatigue impairs performance for several days depending on the type of workout

Time taken to return to baseline performance level for different training sessions

Fatigue after different workouts



Fatigue after a trampoline competition



24 hours recovery



Strength can recover after strength training, but other markers of fatigue are still present

72 hours recovery



High volume strength, sprinting or jumping workouts

48 hours recovery



Trampoline competitions and strength or power based workouts

The Athlete Support Program

Aerial Sports Academy is proud to announce the athlete support program.

We know that athletes have their own goals, their own needs and their own circumstances. Our program is designed to give athletes everything they need in order to achieve their athletic goals.

Our job is to ensure that all the people supporting the athlete are working as a team and working towards the same goals.

We are connected to physiotherapists, sports scientists and other support staff. We can arrange strength and conditioning for the athlete, discounts to services such as massage and physiotherapy, injury risk assessments, and financial support.

This program is designed with the athlete in mind. We know the challenges that athletes face, and we know that a sports coach, cannot also be expected to have the knowledge of an entire team of staff. With cooperative support from a physiotherapist, strength and conditioning expert, sports scientist, sponsors, the athlete and their coach, we can give athletes every chance to excel at their goals.

Currently this program is only open to Australian athletes.

To enquire, contact us at airsportsacademy@gmail.com