# Basketball New Zealand Guidelines: Safe return to training for players in preparation for a condensed national basketball league season following covid19 restrictions

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## INTRODUCTION

The outbreak of Coronavirus disease (COVID-19) around the world was declared a global pandemic by the World Health Organisation (WHO) on February 11, 2020.[34] COVID-19 is described as a viral illness that can that can affect not just your lungs and airways but most organs in the body, spreading from person to person with close physical contact, coming into contact with virus-contaminated surfaces, and from respiratory droplets when an infected person coughs, sneezes, or talks.[15,25,34] The viral illness can be asymptomatic, mild or result in hospitalisation, some requiring life support and in a small number of cases multiorgan failure and death. At the time of writing this document there are over 343,562 deaths worldwide.[34]

COVID-19 has resulted in youth, academic and professional sport in New Zealand,[26] and around the world, suspending play and competitive seasons, as well as structured in-season and off-season training for all sports. In particular, the National Basketball Association (NBA) suspended the season on March 11, 2020, after NBA player Rudy Gobert tested positive for COVID-19.[4] Initial reports from NBA Commissioner Adam Silver outlined that the season suspension would last at least 30 days. However, more recent reports suggest that a mid-to-late-June return is likely the best-case scenario.[28] On March 13, the International Basketball Federation (FIBA) announced that all FIBA competitions were suspended.[18] Collectively, these pivotal decisions set off a chain of events that led to the postponement of several high-profile team sport events, including the National Collegiate Athletic Association (NCAA) men's and women's tournaments, the National Hockey League (NHL) season, Major League Baseball (MLB) spring training, the English Premier League season, and the Union of European Football Associations (UEFA) European Championship, to name a few.

This has led to an uncertain future, with National Basketball Leagues (NBL) across the globe, including New Zealand and Australia, facing unprecedented times which require diligent analysis, evaluation, and preparation to cope with the altered schedule, and the potential deconditioning of players.[16,32]

### New Zealand National Basketball League

The New Zealand National Basketball League (NZ NBL) has released plans for a new condensed 56-game competition commencing June 23, with a 1-week finals series to be played July 28 – Aug 1. The league will comprise seven teams (Auckland Huskies, Canterbury Rams, Franklin Bulls, Manawatu Jets, Nelson Giants, Otago Nuggets and Taranaki Mountainairs) that will play up to three games per week over five weeks, with all teams playing 14 regular season games based in Auckland.[1] The NZ NBL finals will feature all seven teams from the start of week six as they work their way through to the last two teams standing for the Grand Final on Saturday 1 August. From an athlete health and wellbeing perspective, two primary concerns have been raised in relation to the condensed schedule, these relate to:

1 Return to competition timeframe:
   - Length of preparation period: From the revised schedule release date, NBL teams will have a 33-day preparation period.
   - What is an acceptable pre-competition preparation timeframe to safely prepare professional players to return to the demands of National League competition after COVID-19 lockdown and training in isolation?
2 Condensed schedule: 14 games in 32 days:
   - Several teams will have intensified game blocks during the scheduled. For example, some teams will be required to play 5 games in 9-days, while others play 6 games in 12-days.
   - Back-to-back games: Five teams will play three back-to-back games, while two team will play two back-to-back games.
     - Taranaki Mountainairs: 5 games in 9-days, two back-to-backs
     - Franklin Bulls: 8 games in 14-days, two back-to-backs
     - Canterbury Rams: 9 games in 18-days, three back-to-backs
     - Manawatu Jets: 8 games in 16-days, three back-to-backs

In light of these concerns, Basketball New Zealand (BBNZ) sought collaboration from leading medical, academic and high-performance personnel in the development of guidelines to assist in the safe return to training for elite players, in response to the COVID-19 pandemic. The concepts of load, overload, and recovery are key considerations for coaches, performance staff and team physicians supporting athletes,[2] and are addressed throughout. Importantly, these guidelines support the Sport New Zealand, Balance is Better National Sport Season Transition Guidelines,[30] in providing training guidelines.

## IMPLICATIONS OF COVID-19 ISOLATION ON PLAYER PHYSICAL READINESS

### Effect of Detraining due to Covid-19 Isolation

The principle of training reversibility states that stopped or markedly reduced training induces a partial or complete reversal of the previous developed adaptations,[21] thus compromising athletic performance. The reversibility principle is also known as detraining.[20] When determining the effect of detraining from a variety of sports,[20,29] NBL

executives, coaches and support staff must take into account the necessary (re)training time ('minimum effective dose') required for players to regain optimal physical conditions and maintain, or at least attenuate, the decay of endurance- and neuromuscular-related performance parameters upon return to training and competition.[8] Coaches and support staff should remain alert for potential risk of injury during the return to training stage for the following three key reasons:

1 Almost 60% of noncontact injuries have been reported during periods in which collegiate athletes transitioned back into training following a period of inactivity (e.g., after vacation).[8]
   a *National Football League (NFL) lockout (2011):* Resulted in a significant increase in Achilles tendon ruptures in the following shortened preseason.[24] Twelve Achilles tendon ruptures occurred in 1-month, with 10 over the first 12-days of the preseason.
   b *National Basketball Association (NBA) lockout (2011):* Experts warned of similar lockout injuries following the 149-day NBA lockout.[3] Games resumed Dec 25, 2011. By Jan 8, 2012, 19 key players across the league had already lost time to injury.
2 Cardiovascular fitness loss may occur as soon as 4 weeks of detraining;[27] with overall ~10% each week of total inactivity can be generally expected;[11] and
3 Loss of lean mass and muscle strength represents an important injury risk factor.[11]

As a simple rule an increase of training load of more than 10% per week more than doubles the injury risk over smaller increments in training load and represents 40% of the entire seasons injury risk.[12]

Moving forward through this immediate period of uncertainty, it is recommended that team administration, coaches, support staff, and athletes, anticipate various plausible scenarios, such as:

a Team practice time constraints upon return to competition;
b Limited accessibility to fitness and rehabilitation equipment,
c Social and physical distancing restrictions.

## Load Monitoring

In light of concerns surrounding the physiological and psychological demands associated with a condensed NZ NBL season, and the potential injury risk during retraining,[24] the concept of *'load monitoring'* is a primary consideration for game and training dose decisions.[32] Determining the prescribed *'external training load'* (i.e. physical 'work'), accompanied by measurement of '*internal training load*' (i.e. physiological or perceptual 'response'), assists coaches in quantifying the global acute training and competition stress placed on the athlete, and provides a means to determine the chronic load applied over time.[13] Reportedly, higher loads are associated with lower injury risk,[17] suggestive of a more robust athlete, so it would be fair to assume that best practice is to progressively build to higher chronic loads. Building to these loads makes it more likely that an athlete will cope with the demands of competition, and be potentially more resistant to injury. That is to say – while athletes may need greater load to potentially be more resistant to injury, this loading should be progressive. Progressive load is the gradual and systematic increases in training load to maintain and/or achieve continued positive training adaptation.[21] The rate of progression is an extremely important consideration, as progressing load too rapidly can result in injury while too little load will delay fitness gains. Finally, recovery strategies should be implemented as a means to promote adaptive responses to internal and external loads.[22] Figure 1 presents various methods to quantify training load, specifically from a basketball context.

## 50/30/20/10 Rule

The *"50/30/20/10 rule"* spanning a 4-week training period may serve as a useful baseline approach to individual and team load progression, as outlined in the Joint Consensus Paper by the National Strength and Conditioning Association (NSCA) and Collegiate Strength and Conditioning Coaches Association (CSCCa).[8] With the reintegration of players into the training environment, it is recommended to reduce the overall conditioning volume by 50% of the uppermost planned conditioning volume in the first week following return to training, with a 1:4 or greater work:rest ratio applied. This is followed by a 30% reduction in uppermost planned volume (week 2), 20% (week 3), and 10% (week 4), which would then see players completing the fully planned load in week 5. Theoretically, such an approach to progressive overload may assist with the lead management of players during reintegration into the training environment. Table 1 provides basketball-specific considerations outlined in an example 5-week return to training and competition plan. Key considerations include the number of sessions per day and per week; the session duration; the reintegration of physical contact and competitive training; and plyometric exercise progressions.[9,10]

## Importance of Recovery

In the 2018 Recovery and Performance in Sport: Consensus Statement, Kellmann and colleagues[22] define recovery as a 'multifaceted (e.g., physiological and psychological) restorative process relative to time'. From the basketball-specific demands of training and competition, recovery should aim to minimise the impact associated with increased mechanical stress related to faster and shorter accelerations and decelerations, explosive changes of direction, repeated jumps and landings, and physical force contact among players.[7] Commonly used recovery strategies aim to hasten regenerative processes, whether through lifestyle (e.g., active recovery, sleep), physiological (e.g., post-exercise cooling, massage, compression), or nutritional and pharmacological interventions (e.g., supplements, anti-inflammatory medications).[14,23,33] Additionally, psychological well-being should not be overlooked in athletes, especially when returning to training and competition


**Figure 1:** Methods of quantifying training load for various training modalities applied to basketball. (Abbreviations: Rate of perceived exertion = RPE; Arbitrary units = AU).

**Table 1:** Example of a 5-week return to training and competition plan: Basketball specific considerations.

| Week | Training Goal | % of Uppermost Planned Training Volume | Basketball-specific considerations |
|---|---|---|---|
| 1 | Reintegration to the training environment | Actual training volume to equal **50% reduction** uppermost planned training volume | 1 2-3 training sessions per week<br>2 1x court-session per day<br>3 Session duration ≤ 60 minutes<br>4 Non-consecutive days on court<br>5 No contact work<br>6 No competitive work<br>7 Plyometric training<br>8 40-60 reps Level 1/2 jump landings |
| 2 | Returning to train | Actual training volume to equal **30% reduction** uppermost planned training volume | 1 3-4 training sessions per week<br>2 1x court-session per day<br>3 Session duration 60-75 mins<br>4 Non-consecutive days on court<br>5 Introduce contact work ≤ 20% of session time<br>6 Introduce competitive work ≤ 20% of session time<br>7 Introduce deceleration drills ≤ 20% of session time<br>8 Plyometric training 60-70 reps Level 2/3 jump landings |
| 3 | Returning to train | Actual training volume to equal **20% reduction** uppermost planned training volume | 1 4-6 training sessions per week<br>2 2 days on / 1 day off<br>3 2x court-sessions per day<br>4 Session duration ≤ 75 mins<br>5 Contact work ≤ 25% of session time<br>6 Competitive work ≤ 25% of session time<br>7 Deceleration drills ≤ 25% of session time<br>8 Plyometric training 70-80 reps Level 3/4 jump landings |
| 4 | Returning to play | Actual training volume to equal **10% reduction** uppermost planned training volume | 1 4-6 training sessions per week<br>2 2 days on / 1 day off<br>3 2x court-sessions per day<br>4 Session duration ≤ 75 mins<br>5 Contact work ≤ 30% of session time<br>6 Competitive work ≤ 30% of session time<br>7 Live play situations ≤ 30% of session time<br>8 Deceleration drills ≤ 30% of session time<br>9 Plyometric training ≤ 100 reps Level 4/5 jump landings |
| 5 | Returning to play | Actual training volume **equal uppermost planned** training volume | 1 Manipulate training components as required to meet player needs |

Plyometric progression guide: Level 1/2 = Jumps in-place; Level 2 = Standing horizontal jumps; Level 3 = Multiple jumps (bilateral hopping/jumping); Level 4 = Box jumps; Level 5 = Bounding.[9,10]

following

**Table 2:** Example of the 24 hour recovery points checklist.

| Recovery Strategies | Description | Recovery Points |
|---|---|---|
| Compression therapy | Compression Garments / Socks<br>• Worn during sleep<br>• Worn during travel<br>Intermittent pneumatic compression | 2 points<br>1 point<br>2 points |
| Cold water immersion<br>Hot water immersion<br>Contrast therapy (hot/cold) | Ice bath (12-15°C): 8-12 mins<br>Spa (~37°C): 8-12 mins<br>Contrast 30 sec cold > 30 sec hot (8 rounds) | 2 points<br>1 point<br>1 point |
| Hydrotherapy<br>• Pool<br>• Beach | Alternate swim strokes, running drills, mobility stretches: 20 mins | 3 points |
| Sleep restoration | Achieved 8+ hours sleep last night<br>Nap during day: 20-30 mins<br>Used sleep aids (eye mask and ear plugs) | 3 points<br>2 points<br>1 point |
| Psychological wellbeing | Listen to Smiling Mind App: 8-12 mins<br>Visualisation: 8-12 mins<br>Future-self Awareness: 8-12 mins | 3 points<br>3 points<br>3 points |
| Substrate<br>• Nutrition<br>• Hydration | High protein snack within 30 mins of training (e.g., milk)<br>Whole foods consumed within 90 mins after training<br>Meet daily hydration target | 1 point<br>1 point<br>1 point |
| Mobility<br>Stretching | Yoga or Pilates: 20 mins<br>Stretching with aids: 20 mins<br>• Resistance bands<br>• Mobility stick<br>• Ankle incline board | 3 points<br><br>2 points |
| Massage | Self-myofascial release (e.g., foam roller): 20 mins<br>Calf massage (Effleurage): 8-12 mins<br>Spiky ball planter release | 2 points<br>1 point<br>1 point |

Adapted from Bird,[6] and Vaile et al.[33]

COVID-19 restrictions. As alluded to by Minnett and Costello,[23] there is no 'one-size-fits-all' approach to recovery, therefore it is important to educate athletes about the importance of individualised, self-initiated, proactive recovery strategies.[14,33] Variations of the weekly recovery checklist6 have been used as successful education tools within the Australian NBL (Perth Wildcats, Illawarra Hawks), as well as internationally with the Indonesian Olympic Team (Beijing 2008 and Rio 2016) and Scotland Basketball at the 2018 Commonwealth Games. Table 2 provides an example of a 24-hour recovery points checklist. The goal is for the athlete to accrue a pre-determined number of recovery points within the 24-hour recovery period, which will be dependent on the sport-specific context.

## RETURN TO TRAINING AND COMPETITION PLAN – RECOMMENDATIONS

It is recommended that teams competing in the NZ NBL address the steps outlined in the Reintegration, Planning, Returning process, which take into consideration the recommendations from leading governing bodies.[8,19,30]

1 **REINTEGRATION** to the training environment
   - a COVID-19 Checklist
     - i COVID-19 Symptom checker
     - ii COVID-19 Hygiene protocols
   - b Player musculoskeletal screening
     - i Performed by: Medical staff (Physiotherapist)
     - ii Aim: Determine if the athlete is currently injury free and ready to return to training
   - c Player physical and sport-related testing
     - i Performed by: Performance staff (Strength and conditioning coach)
     - ii Aim: Determine athletes current physical performance capacity and readiness to return to training
   - d Plan recovery modalities from recovery checklist
     - o Refer to Table 2
       - Neural
       - Muscular
       - Psychological
       - Nutrition
   - e Player Health and Wellness Status Weekly Report
     - i Send to NBL
   - f Basketball-specific training considerations
     - o Refer to Table 1

2 **PLANNING** to train/play/compete
   a Team training
      i Training load quantification
      ii Athlete monitoring and daily wellness reporting
   b Plan recovery modalities from recovery checklist
      o Refer to Table 2
         • Neural
         • Muscular
         • Psychological
         • Nutrition
   c Strength and conditioning
      i Individualised player approach
      ii Identified strength deficits
      iii Micro-dosing principle
         • Maximal strength
         • Change of direction
         • Jump training
         • Specific Endurance
         • Contact Training
   d Physiotherapy
      i Individualised player approach
      ii Identified athlete current injury status
      iii Injury prevention programming
         • International Olympic Committee 'Get Set – Train Smarter' app
         • Basketball prehab programme
   e Player Health and Wellness Status Weekly Report
      i Send to NBL
   f Basketball-specific training considerations
      o Refer to Table 1.
3 **RETURN** to training/play/competition
   a Team training
      i Introduce competitive elements
      ii Training load quantification
      iii Athlete monitoring and daily wellness reporting
   b Plan recovery modalities from recovery checklist
      o Refer to Table 2
         • Neural
         • Muscular
         • Psychological
         • Nutrition
   c Player Health and Wellness Status Weekly Report
      i Send to NBL
   d Basketball-specific training considerations
      o Refer to Table 1.

## GENERAL CONSIDERATIONS FOR SAFE RETURN TO SPORT

The safe return to sport of elite athletes in a COVID-19 environment will be a complex process. General considerations outlined in the Australian Institute of Sport Framework5 and the Return to basketball FIBA COVID-19 restart guidelines[19] provide minimum baseline of standards for 'how' high performance/professional sport activities can be reintroduced based on the best available evidence to ensure the safety of athletes/other personnel and the wider community. Four key areas include, (1) Preparation for sports resumption; (2) Proposed criteria for resumption of sporting activities; (3) Athlete assessment conducted by performance and medical staff prior to the resumption of formal training; and (4) Ongoing monitoring and management of athletes and other personnel. Parliamentary and/or Local Public Health Authorities must be closely consulted in decisions regarding the resumption ('when') of high performance and/or professional sport activities. All individuals and sport organisations must follow directions of the appropriate Health Authorities. Additionally, it recommended that athletes and/or support staff must not join the training environment if in the last 14 days they have been unwell or had contact with a known or suspected case of COVID-19. Sport organisations must be proactive and ensure all athletes/staff have been medically cleared prior to return to the training environment.[5]

## CONCLUSION

The primary focus of the Basketball New Zealand guidelines is the safe return to training for players in preparation for competition. At the forefront of these guidelines is player health and wellbeing. This deals with both the physical and psychological preparation of players to compete in a condensed National League, and prevention of viral spread through common COVID-19 hygiene measures. We acknowledge the logistical constraints, and the difficulty to implement sport-specific training strategies under previous New Zealand Alert Levels,[26] making it difficult to provide training solutions comparable to those adopted under normal circumstances.

Fundamental objective assessments and ongoing subjective athlete monitoring is likely the best avenue to determine players readiness following reintegration to the training environment and during the returning to training/play phase.[32] This provides an opportunity to individualise, recommend, implement, and modify daily training loads. Recovery strategies addressing muscular, neural, psychological, substrate recovery such as sleep hygiene, best nutrition practice, and psychological wellbeing have potential to improve athlete health and performance.[6,14,33] Training strategies such as micro-dose loading and prehabilitation focused on high risk areas may improve physical and psychological readiness of players.[32] While the proposed guidelines provide a framework for injury risk minimisation and safe return to training and competition, further to this, sports administrators and medical providers must remain aware of common COVID-19 symptoms and testing protocols as indicated by local resources, in the event of a positive case, to minimise spread among teams.[31]

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