

AUSTRALIAN  
CRICKET

**JUNIOR  
BOWLING  
GUIDELINES**

Season 2023-24



CRICKET  
AUSTRALIA

# AUSTRALIAN CRICKET

## JUNIOR BOWLING GUIDELINES

The junior player pace bowling guidelines are based on available research and aim to reduce the risk of injury. Cricket Australia, and other research demonstrate that between **20%-33%** junior (<19 years of age) pace bowlers develop a lower back (lumbar) bone stress injury (typically a stress fracture) each season. These injuries are hard to detect in the early stages and take between 4-12 months to recover and return to play. Prevention is the best approach.

The most vulnerable periods for bone stress injury (not just in the lower back) are just after puberty. The Cricket Australia research shows the 18 months after peak height velocity (maximum growth spurt period around puberty) present the highest risk of bone stress injury. This is likely to be because of changes in strength (and forces generated) post-puberty, increase in bowling load with transition to older age competitions and a relative weakness in the bone strength (bones grow long before they grow strong).

Recent Cricket Australia research\* (published in 2021) highlight that there are 3 keys risk factors for lumbar bone stress injury in junior pace bowlers:

1. Age – the younger the bowler the greater the risk
2. Height – the taller the bowler the greater the risk
3. Bowling load – the more often they bowl in a week the greater the risk

Whilst we cannot change a player's age and height, we can make changes to their **bowling frequency (number of bowling sessions per week)** to reduce the risk of sustaining a season ending injury.

By adjusting the number of bowling sessions per week, it allows time to reduce fatigue before the next bowling session and for bone (and other tissues such muscles, tendons etc..) to recover.

From time to time – every 6-12 weeks, a longer (5-10 day) break from bowling is recommended to allow for full recovery and for bone to adapt and become stronger.

Preparation (gradual build-up of bowling frequency and intensity) for the cricket season is also important to reduce fatigue and condition bone, muscles and tendons for the season ahead.

**These guidelines apply to female and male players.**

\* Sims K, Saw R, Saw A, Kountouris A, Orchard J. Multiple risk factors associated with lumbar bone stress injury in youth cricket fast bowlers. *Sport & Exercise Science New Zealand*, Vol. 5, Issue 2, 92-100, 2021. <https://sesnz.org.nz/wp-content/uploads/2021/02/Sims-et-al.-2021.pdf>



Age	Match Recommendations
u11	<b>Two</b> overs max each spell** 4 overs max per match day
u13	<b>Four</b> overs max each spell** 8 overs max per match day
u15	<b>Five</b> overs max each spell** 12 overs max per match day
u17	<b>Six</b> overs max each spell** 16 overs max per match day
u19	Six overs max each spell** 18 overs max per match day
Rest between spells should be the same number of overs from the same end as the completed spell	

Age	Pre-season Preparation Recommendations
u13	2 weeks gradual bowling prior to season/tournament
u15	4 weeks gradual bowling prior to season/tournament
u17	6 weeks gradual bowling prior to season/tournament
u19	8 weeks gradual bowling prior to season/tournament

Age	Training Recommendations
u13 – u17	At least <b>1</b> day off between bowling days* A maximum of <b>3</b> bowling days per week (match & training) A maximum of <b>5</b> overs in each bowling spell **
u19	No more than <b>2</b> bowling days in a row A maximum of <b>4</b> bowling days per week (match & training) A maximum of <b>6</b> overs in each bowling spell **

Recovery Guidelines
Allow one easy week (e.g. 1-2 bowling sessions) in every 4 weeks
Schedule a week off bowling after every 10-12 weeks of bowling to allow your body to recover

# COMMUNITY LEVEL JUNIOR RECOMMENDATIONS

\* It is recognized that some matches are scheduled on consecutive days both in tournaments & club cricket. In these instances, players may bowl on consecutive days but should strictly adhere to the other aspects of the recommended targets, namely, to not exceed bowling 3 days per week and 5 over spells .

\*\* Minimum of 20 mins between spells



# JUNIOR BOWLING GUIDELINES

## BOWLING RECOMMENDATION- SIMPLE MESSAGE

### UNDER 15 AND UNDER 17

**1 3 5**

*1,3,5 message [1 day off between bowling session, 3 days per week, 5 overs in a spell]*

### Under 19

**2 4 6**

*2,4,6 message [maximum 2 bowling days in a row , 4 days per week, 6 overs in a spell].*

### COMMON SENSE APPROACH

The guidelines are general in nature and every bowler needs to be managed on an individual basis. Some will cope with more or less load as there are other important variables other than age (e.g. physical maturity, technique, bowling speed, fitness, previous injury etc..) that are also important factors.

# JUNIOR BOWLING GUIDELINES

## PREPARATION AND RECOVERY

The emphasis of the guidelines are based on **preparation** and **recovery** as the key pillars

### PREPARATION

A gradual build up in bowling volume leading into a season or tournament so the player is physically ready to cope with the loads. This takes time (usually > 10 weeks) and some planning. In the 3-4 weeks leading into a season / tournament, bowlers should be close to expected match / weekly volumes and intensity.

### RECOVERY

**Recovery** is essential to allow the body (particularly bones, muscles and tendons) to recover, adapt and be ready for the next session (training or match). Recovery between spells (to alleviate short-term fatigue), training & matches (to allow bone to adapt) and after prolonged high load periods, for example mid-season (to allow the physical and mental fatigue to resolve) are important injury prevention strategies and help maximise performance.

***We recommend a week off bowling every 10-12 weeks, and a lighter bowling week every 4 weeks.***

# JUNIOR BOWLING GUIDELINES

**Bowling frequency** = the number of consecutive days, and days per week bowling

## Under 15 & 17

*Aim to have a day off between bowling sessions and a maximum of 3 sessions per week (previously 4-days per week).*

## Under 19

*Aim to limit the number of consecutive days bowling to 2-days in a row & maximum of 4-days bowling per week.*

**Bowling Spell Lengths** = the number overs / deliveries bowled consecutively

It is recommended that pace bowlers u19 years of age should not bowl spells of more than 6 overs. This is in line with Cricket Australia data that shows adult professional bowlers only occasionally bowl spells longer than 6 overs in matches (less than 5% of bowling spells in male first-class cricket is 7 overs or greater and 1% of bowling spells are longer than 7 overs in 50 over one-day matches).

**Bowling volume targets** = how many balls bowled in a given period (e.g. balls per week or month)

## Under 15

*90- 100 balls per week*

## Under 16/17

*110-120 balls per week*

## Under 19

*Approximately 120 balls per week*

Players should gradually build up their bowling volumes in the lead up to the cricket season or tournament.

**At the community level** – if it is not possible to accurately monitor the absolute number of balls bowled, it is appropriate to adhere to the bowling frequency, bowling spell lengths and recovery periods as it will likely result in the desired outcome and manageable bowling volumes.

# INJURY RISK REDUCTION

What do we know? Research has shown an increased risk of injury associated with the following*:	Bowling guidelines to reduce risk
Low career and high 3-month bowling load <sup>1</sup>	Gradual bowling preparation 8-10 weeks leading into season
<120 and >180 balls per week <sup>2,3</sup> Players bowled less balls than the 2018-19 recommended targets (CA internal analysis)	Target balls 100-120 (U17) or 120-140 (U19) per week in month before season/tournament
<2 days between bowling sessions <sup>2,4</sup>	At least 1 day off between bowling sessions (U17); max 2 days in a row (U19)
>2.5 bowling sessions per week <sup>5</sup>	Maximum 3 (U17) or 4 (U19) days per week
High load periods not followed by recovery period <sup>4</sup>	1 easy bowling week every 4 weeks Plan recovery around high load periods (e.g., tournament)
<2 weeks off bowling during the season <sup>4</sup>	1 week off bowling every 10-12 weeks
Younger age, taller and more frequent bowling <sup>6</sup>	Gradual increase in bowling frequency and volume in each junior year to build resilience. Maximum 3 (U17) or 4 (U19) days per week

1. Orchard JW, Blanch P, Paoloni J, et al. Cricket fast bowling workload patterns as risk factors for tendon, muscle, bone and joint injuries. *Br J Sports Med.* 2015; 49(16):1064-1068. [elite adult male]
2. Dennis R, Farhart R, Goumas C, Orchard J. Bowling workload and the risk of injury in elite cricket fast bowlers. *J Sci Med Sport.* 2003; 6(3):359-367. [elite adult male]
3. Hulin BT, Gabbett TJ, Blanch P, Chapman P, Bailey D, Orchard JW. Spikes in acute workload are associated with increased injury risk in elite cricket fast bowlers. *Br J Sports Med.* 2014; 48(8):708-712. [elite adult male]
4. Kountouris A, Sims K, Beakley D, et al. MRI bone marrow oedema precedes lumbar bone stress injury diagnosis in junior elite cricket fast bowlers. *Br J Sports Med.* 2018; Published Online First: 13 November 2018. [pathway male]
5. Dennis RJ, Finch CF, Farhart PJ. Is bowling workload a risk factor for injury to Australian junior cricket fast bowlers? *Br J Sports Med.* 2005; 39(11):843-846. [club/district junior male]
6. Sims K, Saw R, Saw A, Kountouris A, Orchard J. Multiple risk factors associated with lumbar bone stress injury in youth cricket fast bowlers. *Sport & Exercise Science New Zealand*, Vol. 5, Issue 2, 92-100, 2021

\* Note all research is in males, varied ages and levels as indicated in square brackets after each reference.



# JUNIOR BOWLING GUIDELINES

## FREQUENTLY ASKED QUESTIONS

We anticipate that common sense will be used in interpreting the guidelines. These are some of the frequently asked questions.

### **1. Can an u16 or u17 bowler bowl 2-days in a row?**

As an occasional occurrence, yes, particularly when matches are scheduled on consecutive days. If this occurs bowlers should adhere to other aspects of the guidelines, particularly on the number of bowling sessions per week and the number of overs in a spell (and break between them). But ideally, this age group should avoid back-to-back days to allow their body to adapt.

### **2. If someone bowls a small number of overs, such as 2-3 overs at a training / match, does this qualify as a bowling session?**

Common sense would suggest that there are very low loads that can be considered as low volume & managed appropriately. If the bowler feels okay, is well prepared & recovered well, they can bowl again soon afterwards. (e.g next day)

### **3. On the non-bowling days – can the bowler do other training?**

Yes – fitness & strength training, batting, fielding are all examples of what is possible on non-bowling days.

### **4. Is bowling intensity important?**

Yes – bowling at or near maximum (match) intensity, generally results in high stress on the body so appropriate recovery periods are required. More lower intensity bowling can be factored into training plans and requires shorter recovery periods.

### **5. How can bowling intensity be measured?**

A fairly simple way to measure bowling intensity is for the player to rate the intensity out of 100%, with 100% being match intensity. Anything above 80% is considered high intensity bowling. Anything below 50% is low intensity bowling. In general, increased bowling intensity results in increased forces being generated through the bowling crease. This may, in some players, increase the risk of injury.

### **6. How can a bowler increase their bowling volumes safely through training?**

Like matches, if bowling at training is planned in multiple spells, then this will allow for some higher volume days. E.g. bowl 5 overs, have a break or do some other training & have another bowling spell. The break between spells allows your body to recover for the next spell.

### **7. What if there are multiple matches in a week?**

*Use the age group guidelines for frequency and recovery to create recovery periods. A good start is to remove bowling session(s) at training that week and maximise the recovery between bowling days. Sometimes, a young pace bowler needs to miss a game to make sure their body can cope.*

### **8. Do girls have the same injuries as boys?**

*Generally, the answer is yes. Girls do develop lumbar bone stress injuries and so the bowling guidelines apply to boys and girls.*

