JUNIOR PACE BOWLING WORKLOAD GUIDELINES

CRICKET AUSTRALIA

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OVERVIEW

Pace bowling places high physical demands on a player's body. To develop safely and perform well over time, bowlers need to bowl regularly while also allowing enough time for recovery.

Bowling consistently over weeks and years helps players improve their technique and build the strength their bodies need. When bowling loads are managed well, this helps reduce the risk of injury.

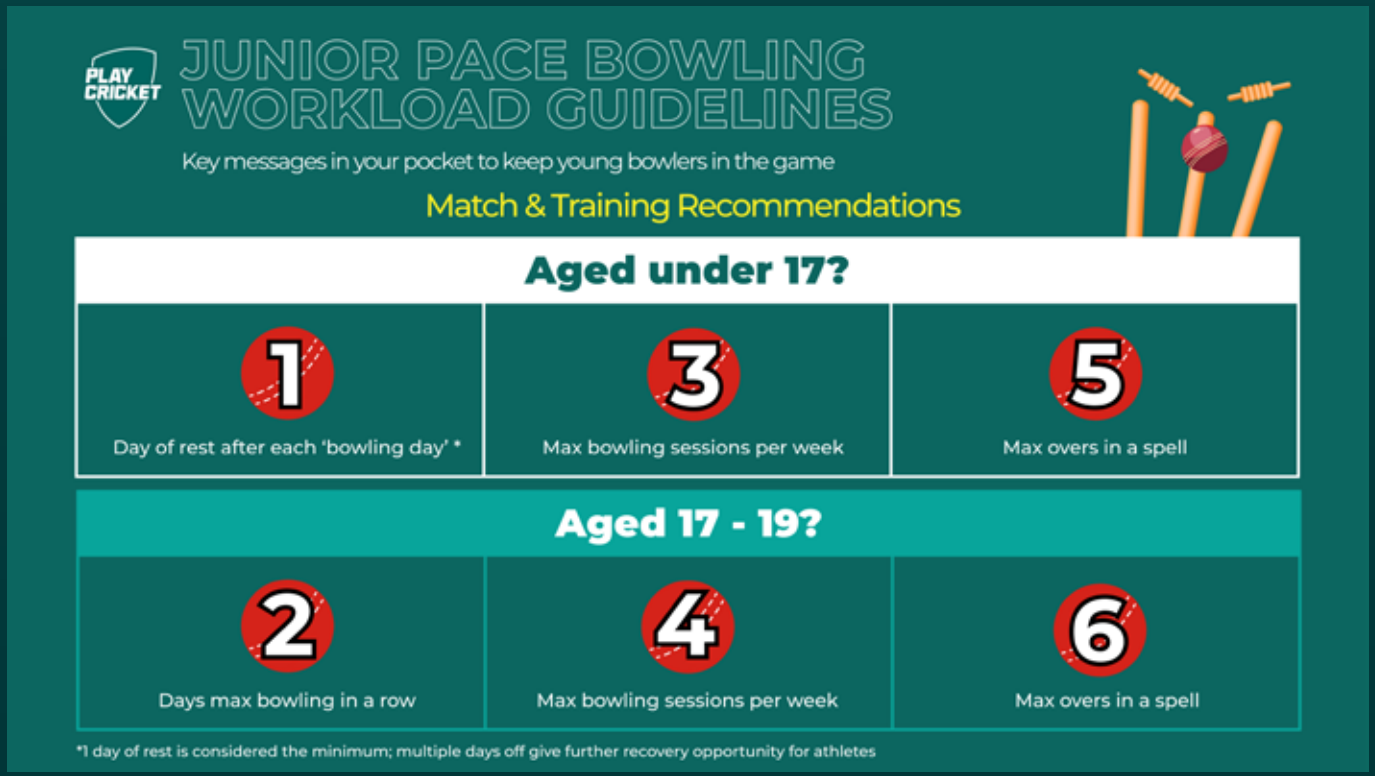
One of the most serious injuries for young pace bowlers is a lumbar bone stress injury (LBSI). This is an injury to the bones in the lower back. LBSI can interrupt a bowler's development and may require long periods away from bowling to recover.

These guidelines are based on the latest research from Australian Cricket and other researchers. They provide core principles for young male and female pace bowlers to support safe skill development and reduce the likelihood of lower back bone stress injuries.

Key Message:

Bowlers aged under 17: Follow the 1, 3, 5 Rule
1 day of bowling before a bowling rest day (avoid back to back bowling days), 3 max bowling sessions per week, 5 max overs in a spell

Bowlers aged 17 – 19: follow the 2, 4, 6 Rule
2 days max bowling in a row, 4 days max per week, 6 max overs in a spell



BACKGROUND

The bones in the lower back are called the lumbar vertebrae. These bones can be damaged by repeated bowling if the body does not have enough time to recover.

Without enough rest, repeated bowling can slowly weaken the lower back bones. This can progress from healthy bone to early bone stress, and eventually to a stress fracture. Bone stress injuries often develop over time and may not cause pain at first. Once the injury occurs, bowlers usually need a long break to allow the bone to heal.

Lower back bone stress injuries can affect any cricket player. However, adolescent pace bowlers are at the highest risk, with around one in three experiencing this type of injury. This higher risk is due to the physical forces involved in pace bowling and changes that occur in the body during adolescence.

During adolescence, bones grow in length before they become strong. The lower back is particularly vulnerable in the two to three years after a player's main growth spurt. This period often occurs at the same time that players begin bowling faster and more frequently, which increases injury risk.

Lower back bone stress injuries often develop before pain is felt. If a junior bowler experiences lower back pain while bowling, CA strongly recommends that they stop bowling and see a sports doctor or physiotherapist with experience managing these injuries before continuing to bowl.

MANAGEMENT OF BOWLING LOAD FOR COMMUNITY CRICKET

Bowling load is one key risk factor which when well managed can assist in reducing the risk of LBSI.

Preparing bowlers adequately and managing bowling load appropriately during training sessions and matches across an entire season allows time for adequate bony and soft tissue recovery and adaptation prior to the next bowling session.

PRE-SEASON PREPARATION RECOMMENDATIONS

A gradual build-up of bowling frequency and intensity leading into a season or tournament is important to reduce fatigue and condition bone, muscles and tendons. This takes time (usually > 10 weeks) and some planning. In the weeks leading into a season or tournament, bowlers should be close to expected match / weekly volumes and intensity.

Age	Pre-season preparation Recommendations
Under 13	2 weeks gradual bowling prior to season/tournament
13 – 15	4 weeks gradual bowling prior to season/tournament
15 – 17	6 weeks gradual bowling prior to season/tournament
17 – 19	8 weeks gradual bowling prior to season/tournament

TRAINING RECOMMENDATIONS

Training loads should support planned, progressive increases in bowling workload, with the opportunity to monitor intensity, technique, and fatigue in a controlled environment. Research shows that sudden increases in training frequency or volume - especially after periods of rest or rapid growth - are a risk factor for LBSI in juniors.

These training guidelines are designed to provide a framework for junior bowlers to gradually develop resilience to the demands of pace bowling by providing important windows for recovery both within a session and across a week.

Age	Training Recommendations
Under 17 yrs	Aim for at least 1 day off bowling after a bowling day* A maximum of 3 bowling days per week (includes matches or training)** A maximum of 5 overs in each bowling spell *** (includes matches or training)
17 – 19 yrs	No more than 2 bowling days in a row A maximum of 4 bowling days per week (includes matches & training) A maximum of 6 overs in each bowling spell **

* It is recognised 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, aim to not exceed bowling 3 days per week and 5 over spells.

** A recommended strategy is to remove training session/s from your week if you are reaching your recommended bowling days with matches for the week.

***Recommend a minimum of 20 mins between spells at training

MATCH RECOMMENDATIONS

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These training guidelines are designed to provide a framework for junior bowlers to gradually develop resilience to the demands of pace bowling by providing important windows for recovery both within a session and across a week.

Age	In Match Recommendations
Under 11	Two overs max each spell** 4 overs max per match day
11 – 13	Four overs max each spell** 8 overs max per match day
13 – 15	Five overs max each spell** 12 overs max per match day
15 – 17	Five overs max each spell** 16 overs max per match day
17 – 19	Six overs max each spell** 18 overs max per match day

**In a match, rest between spells should ensure that the same number of overs are completed from the same end as athlete's completed spell before returning.

Eg. if you are 14yrs old and have completed a 5 over spell, then a minimum of 5 overs should be bowled from the same end (10 overs of the match) before you begin a new spell. This is likely to equate to a minimum of 30 mins.

RECOVERY

Recovery is essential to allow the entire body to recover from bowling related bone loading and fatigue in order to be ready for the next bowling session. Optimal bone recovery in a bowler requires a player's recovery to managed well.

OPTIMISING BOWLING RECOVERY		
WHEN	**HOW**	**WHY**
Within a Session	1. Training - Minimum 20 mins between age appropriate spell length. 2. Match - Minimum break time after bowling spell that equates to same number of overs bowled from same end. Eg if spell was 4 overs, then 8 overs should be bowled in the match (4 from same end) before returning to bowl.	Acute neuromuscular and energy system fatigue recovery to maintain technique and power.
Across a Week	1. Avoid bowling on consecutive days where possible. 2. Stick to age guidelines for total number of bowling sessions in a week. (i.e., adhere to non-bowling days)	Repair of acute tissue damage from bowling sessions and allow for physiological system recovery.
Across a Season	1. Plan one light bowling week every 4-6 weeks (e.g. remove a bowling session/s from your week to create a 5 day deload period) 2. Schedule a minimum of full week off bowling (7-10 days) every 10-12 weeks of bowling. 3. Have a more extended period off bowling (around 3 months) at the end of a season before gradually reintroducing bowling during the preseason period as per age guidelines.	Allows space for critical adaptations to occur that support long term bone health and resilience. Psychological recovery to restore motivation.

RECOMMENDATIONS FOR VULNERABLE BOWLERS

Bowlers that can be considered more vulnerable to LBSI have increased recovery demands to their peers. Bowlers who may be considered more vulnerable to LBSI are:

- Bowlers with a known history of LBSI
- Bowlers who have recently gone through rapid period of growth
- Bowlers who are taller and/or bowl faster than their peers

This cohort are likely to benefit from further modification from their age specific bowling guidelines (spell length, frequency, recovery periods). We recommend consulting with a medical professional with experience in managing LBSI to inform the vulnerable bowler's program.

FREQUENTLY ASKED QUESTIONS

I (or my child) love cricket and want to be a pace bowler for Australia, won't restricting bowling limit progress?

Athlete development is a long-term journey. We encourage players to think about their next 10 years playing cricket, not just the next game.

These guidelines are designed to give players the best chance to stay injury-free and enjoy consistent training and playing opportunities over time. Players who bowl above the guidelines increase their likelihood of LBSI, which when diagnosed take up to 6-12 months to recover from.

We also know that a bowler who has had a LBSI is more likely to have another LBSI, so best risk reduction strategy is to avoid the first injury.

Can a bowler aged under 17 bowl 2-days in a row if they're playing 'up'?

As an occasional occurrence, yes, particularly when key matches are scheduled on consecutive days. If this occurs, bowlers should still consider the number of bowling sessions across their week. The extra match may be balanced with a training session without any bowling early in the week to come back into line with recommended weekly bowling sessions. Ideally, this age group should avoid back-to-back days where possible to allow their body to recover.

Do girls have the same injuries as boys?

Generally, the answer is yes however more research is required in the next few years. We know that junior girls do develop lumbar bone stress injuries at similar rates to boys and so currently the junior bowling guidelines apply to boys and girls.

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). That said, this occurrence should be infrequent and not be part of an adolescent bowler's regular plan as it still increases their exposure to back-to-back bowling days

On the non-bowling days – can the bowler do other training?

Yes – batting, fielding, fitness & strength training, are all examples of what is possible on non-bowling days. Work with your coach or support personnel to create a holistic training plan.

Is bowling intensity important?

Yes – bowling at or near maximum (match) intensity, generally results in high stress on the body so appropriate planned recovery periods after bouts of high intensity bowling is critical. More lower intensity bowling should be factored into training plans and requires shorter recovery periods.

FREQUENTLY ASKED QUESTIONS

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 and through the body. These higher intensity sessions (match or training) are more likely to create the forces that can increase the risk of injury if adequate recovery is not also scheduled.

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 4-5 overs, have a break or do some other training & have another bowling spell. The break between spells allows recovery to perform for the next spell.

What does a training session look like when not bowling?

These sessions provide great opportunity for players to focus on developing other key skills like their batting and fielding. To minimise injury risk, coaches should remain flexible and consider the total bowling workload players have across all of their cricket commitments (e.g. multiple teams).

How should I monitor bowling workload?

Use an electronic or paper calendar to mark what days you are bowling. Step up the monitoring by adding the duration of your bowling sessions.

For training, as a general rule of thumb aim to bowl for no more than 30 minutes at a time before taking a break of equal length.

What if there are multiple matches in a week?

Use the age guidelines around frequency and recovery to create informed recovery periods. A good start is to remove bowling session(s) at training that week and maximise the recovery between bowling match days. Sometimes, a young pace bowler may need to miss a game to make sure their body can cope with the upcoming competition schedule.

I have exceeded these guidelines, what do I do now?

Sometimes the match schedule and player availability may mean you exceed these guidelines. If this happens, the best approach from here is to increase your recovery before your next bowling session. This may be a good opportunity to take one of the 5 day breaks (every 4-6 weeks) or 10 day breaks (every 10-12 weeks) from bowling that are recommended across the season.

CHECKLIST FOR COACHES AND PARENTS

Use this checklist each season and throughout the year to help keep junior bowlers safe and healthy.

1. Know Your Bowler's Risk Profile

- [ ] Is the bowler taller and/or bowling faster than peers?
- [ ] Is the bowler in the 2–3 year period after their peak height velocity (PHV)? (consider using the NSW Office of Sport Maturity Status Calculator as a guide)
- [ ] Has the bowler had a previous LBSI or back injury?

2. Monitor and Manage Workload

- [ ] Are you tracking the number of bowling days, overs per spell, and overs per week?
- [ ] Are you avoiding more than 2 consecutive bowling days? especially for those aged 12-18?
- [ ] Are you gradually rebuilding bowling volume and intensity after any break (e.g., season break, holidays)?
- [ ] Are you planning for lighter weeks every 4 weeks and a full week off every 10–12 weeks?
- [ ] If possible, are you planning time off bowling after periods of higher workload (e.g., carnivals, tournaments)?

3. Recognise and Respond to Symptoms

- [ ] Are you educating bowlers to report any lower back pain or stiffness?
- [ ] Do you have a plan for early assessment and referral if symptoms develop (e.g., sports doctor or physiotherapist experienced with LBSI)?

4. Communication

- [ ] Are you communicating regularly with bowlers, parents, coaches, and other team personnel about adherence to these bowling guidelines?

REMEMBER

- Prevention is best - most LBSI can be avoided with careful management and planning
- Early reporting and conservative management are key to long-term participation and enjoyment in cricket.

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