



Photo: Andrew Darcey

Rowing SA Coaches Conference 2026 | Saturday 19 September

for Rowers What Coaches Can See, Change & Prevent

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PHYSIOTHERAPY

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Rowing Experience

Rowing Australia:	Network Physiotherapist: 2012 - Present
South Australian Sports Institute (SASI):	Rowing Program 2012 - Present
Rowing World Championships:	2017 (Sarasota, USA); 2019 (Linz, AUT)
Rowing World Cups:	2014 (Lucerne, SUI); 2015 (Varese, ITA); 2016 (Poznan, POL)



Photo: AndrewDarcey

Today's Session

1

Why Injury Prevention Matters

What injuries cost a season, where the load lives in the stroke, and why the ergometer deserves special attention

2

The Injuries That Matter Most

Low back pain and rib stress injury — early warning signs, and the risk factors coaches directly control

3

Managing Load

The four load patterns behind most rowing injuries — what to watch for, why each one matters, and what to do about it

4

Prevention Toolkit

The Rowing Australia prevention framework, boathouse monitoring, and when (and how) to refer

Session duration: 60 minutes | Including Q&A

01

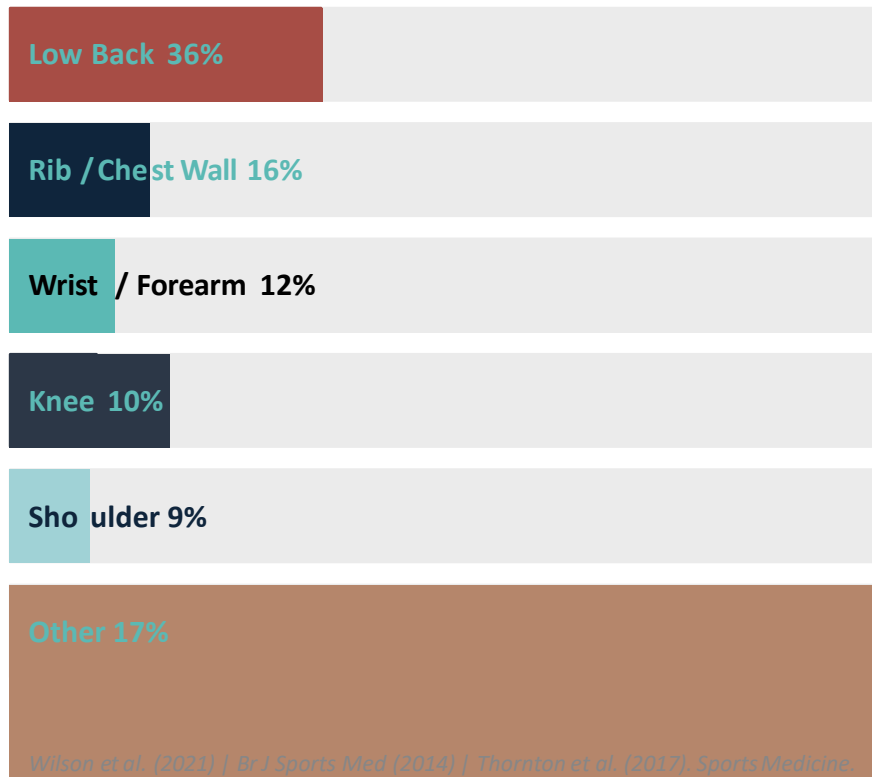
Why Prevention Matters

What injuries cost your crew — and where the load lives



The Rowing Injury Picture — What Are We Dealing With?

Injury Distribution by Body Region



The Rowing Stroke Cycle — Where the Load Lives

Kim Brennan — Olympic Gold Medallist, Rio 2016 | Photos: Andrew Darcey



CATCH

Lower back most flexed & loaded

Peak demand on hip flexibility

Rib stress risk zone

Ask: pain at front of stroke?



DRIVE

Legs → trunk → arms

Back muscles working hardest

Peak force output

Sequencing errors = injury risk



FINISH

End of power stroke

Wrist/forearm load

Feathering loads the forearm

Trunk slightly extended



RECOVERY

Return to catch

Trunk control on the slide

Fatigue → posture slumps

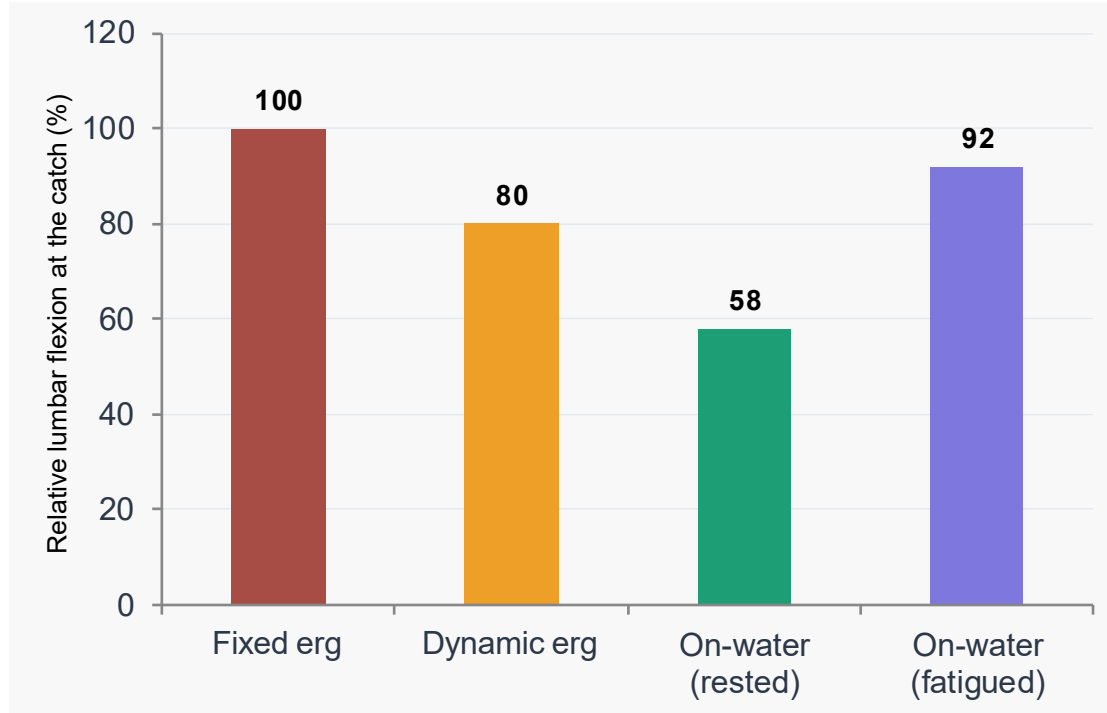
Late-session back pain starts here

'When in the stroke does it hurt?' — the single most valuable question a coach can ask a sore rower

Wilson et al. (2021). Br J Sports Med.

The Ergometer Question — Why Environment Matters

The ergometer loads the lower back more than on-water rowing — and fatigue erases the on-water advantage



*Schematic — relative lumbar flexion at the catch; fixed erg = 100% reference; values illustrative
Nugent et al. (2021) | Wilson et al. (2021) | Wilson, Gissane & McGregor (2014).*

Coaching Implications

#1

Fixed erg = highest back load
Back from injury: short erg tests → water
→ long erg last

#2

Erg sessions >30 min = independent LBP
risk factor
Programme erg volume deliberately —
especially juniors

#3

Fatigue erases the on-water advantage
Coach the last 20 minutes as hard as the
first 20

#4

Modify before you rest
Not 'stop rowing' — 'change the
environment'

02

The Injuries That Matter Most

Low back pain, rib stress and the presentations every coach should recognise



Low Back Pain — How Common Is It Really?

LBP is the single most common rowing injury at every level — your squad almost certainly includes rowers managing it right now

33%

Point Prevalence
(Wilson et al., 2021)

61%

12-Month Prevalence
(high-quality studies)

63%

Lifetime Prevalence —
Athletes (all sports)
(Wilson et al., 2020 — 86 studies, all sports)

96%

Lifetime Prevalence
(Fett et al., 2017 — elite)

Subgroup Comparisons

Elite rowers

55–96% (12-month)

Higher in those with longer careers

College/club

58–68% (12-month)

Clay et al. (2016): 12-month 68% in Div I females

Adolescent/junior

Up to 78–94%

Higher than senior rowers; changing sides = ↑ risk

Masters rowers

Data limited

Management likely differs from elite — needs more research

Wilson et al. (2021) | Fett et al. (2017) | Clay et al. (2016) | Br J Sports Med (2014).

Low Back Pain — The Dominant Rowing Injury

"Pain between lower rib margins and buttock creases, because of or exacerbated by rowing, resulting in a need to modify or stop scheduled activities"

Warning Signs — When to Act

Pain that changes the stroke

Shortened slide, guarded catch, protective rowing — the body is compensating. Take it seriously.

Pain lasting >1 week or worsening

Persistent or progressing pain needs assessment — not another week of 'wait and see'.

Pain spreading into the leg

Leg pain, pins and needles or numbness — refer promptly for assessment.

Young rower, one-sided bony pain

Possible bone stress injury — stop loading and refer. Do not push through.

Night pain, fever, feeling unwell

Anything that does not behave like a rowing injury — urgent medical review.

Why Rowing-LBP is Complex

- Multifactorial — physical load, sleep, stress and growth all matter
- Pain often normalised in rowing culture
 - 'Everyone has back pain' — not acceptable, not normal
- Up to 50% recur within the same season
- Ergometer more provocative than on-water rowing
- Fatigue leads to progressive slumping through the stroke
- Rowers hide pain around seat racing and selection — expect it
- Early reporting = better outcomes — the coach sets that culture

A Rower's Guide to Managing Low Back Pain

A Rower's Guide to Managing Low Back Pain

*"Rowing-related low back pain (LBP) refers to discomfort or pain in the lower back, between the lower ribs and buttocks, that occurs because of or is worsened by rowing or related training" **

Stop What Hurts

If rowing makes your back worse, if the pain is sharp, increases with activity or lasts >30 mins stop on water and erg training

Get Checked

See a RA Preferred Provider Physiotherapist or Doctor*. They will figure out what type of back pain you have and recommend appropriate treatment

Keep Moving and Engage

Stay active. If sitting doesn't hurt, try cycling; if it does, walk and do light activities like stretching or rolling.
Resume rowing or the ergo if possible.
Chat to your Coach and Physio, they can assist you adapting your program to help return to full training.
Engage actively in your rehab

Understand & Plan

Learn about your injury
This will help manage your fears and involve you in making an optimal recovery plan



Report It Early

If you have LBP, tell your Coach, Physio or Doctor right away
Acting early can help you recover faster



Reduce your Pain

Use pain relief like paracetamol or anti-inflammatories as advised by your Doctor
Follow anti-doping rules (<https://www.globaldro.com/AU/search>)
Avoid prolonged positions such as sitting
Physiotherapy, heat and taping may help



What's your Health Status?

Consider your overall physical & mental well-being. Are you sleeping & fuelling enough? Are you stressed or anxious? These will impact your recovery



Work as a Team

Involve your Coach from the start.
You, your Coach (+/- Physio/Doctor/S&C coach) will work together to help optimise your recovery



* click QR code for RA Preferred Provider list



* It might sometimes extend into one or both legs and include other sensations such as tingling or numbness

It is important to distinguish LBP from normal training related muscle soreness or tightness, which typically feels like a dull ache or stiffness that improves with movement and recovery. Get assessed if you're unsure.

LBP Risk Factors — What Coaches Control

The strongest risk factors are programming decisions — most of this list sits in the coach's hands

STRONGER EVIDENCE — MOSTLY IN YOUR HANDS

- Previous history of LBP — the strongest predictor
- Young 'training age' — new rowers, gradual build-up
- Rapid increase in training or racing load
- High training volume and intensity
- Ergometer pieces >30 minutes
- Longer career / years of exposure to the sport
- Fatigue → slumping posture late in sessions
- Changing rowing side mid-season (juniors)

WORTH ADDRESSING — WEAKER EVIDENCE

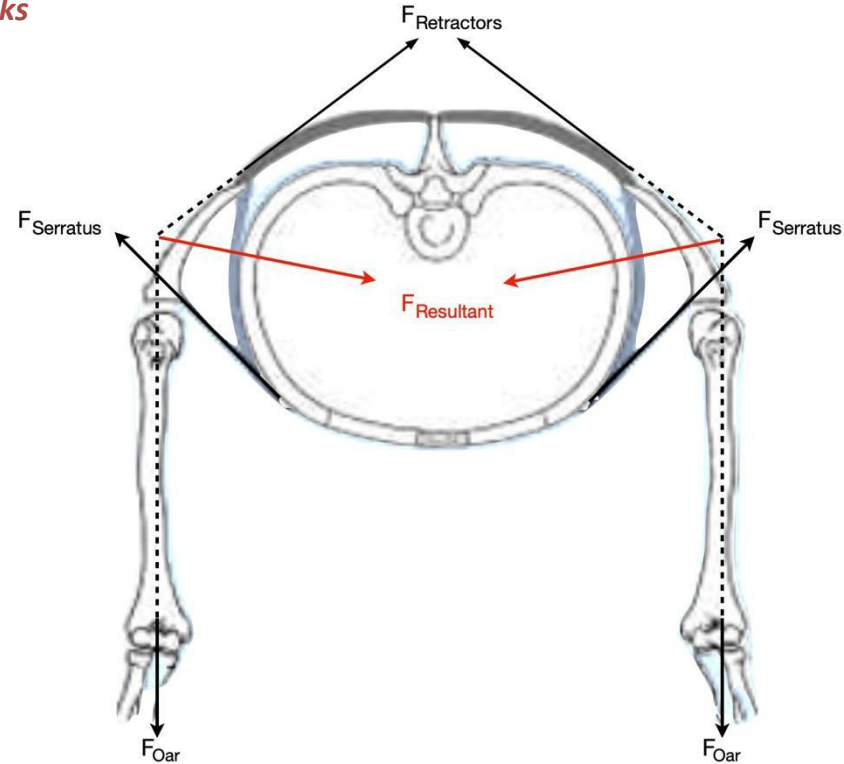
- Rounded lower back through the stroke
 - Coach it anyway — better position, better rowing
- Tight hips and hamstrings
 - Common in sore rowers — addressed by the RA warm-up framework
- Poor trunk and pelvis control
 - Shows up as slumping on the erg late in sessions
- Poor back endurance
 - 90-second back extension hold is the RA benchmark

Rib Stress Injury — Early Recognition Matters

Missed early it can end a season — caught early, it may only be weeks

What Coaches Will See & Hear

- Pain on the side of the chest wall — often pointed to with one finger
- Affects 6–12% of competitive rowers per season — women more than men
- The single biggest cause of lost on-water training time
- Creeps on gradually — often blamed on ‘a knot’ or ‘a strain’
- Pain aggravated by:
 - Rowing load — especially the catch
 - Deep breathing, coughing, sneezing
 - Hurts to breathe or at night = stop & refer



Rowing Australia (2015) Chest Wall Pain Protocol | Wilson et al. (2021) | Vinther (2014). Br J Sports Med.

Rib Stress Injury — Risk Factors Coaches Influence

Bone health, load and technique each play a role — and the whole right-hand column is programming

THE ATHLETE (FOR YOU TO KNOW & FLAG)

- **Bone health factors**

- Under-fuelling for the training load (RED-S)
- Calcium / Vitamin D
- Menstrual changes — a warning sign, ask or refer

- **Scapular control**

- Reduced scapular retraction strength
- Overactive upper trapezius

- **Thoracic mobility**

- Stiff upper back → more load through the ribs

- **Previous rib stress injury**

THE PROGRAMME (COACH CONTROLS)

- **Training load spikes**

- Sudden increases in volume (km's) — camps are classic
- Intensity / stroke rate
- Ergometer blocks (highest rib loading)
- Upper body weight training

- **Technique**

- Breaking at the catch
- Lateral trunk flexion at catch
- Legs not driving first — arms and trunk overloading

- **Equipment changes**

- Oar length, blade size, rigging changes
- Boat position / foot-stretcher changes

Intersection Syndrome — The Squeaky Wrist

The most recognisable wrist injury in rowing — often you can hear it before you see it

WHAT COACHES WILL NOTICE

Where: back of the forearm, a few cm above the wrist — where two muscle groups cross over each other

Presentation

- Swelling on the back of the forearm above the wrist
- Creaking or squeaking with wrist movement — the giveaway sign
- Pain gripping the handle and feathering the blade
- The rower may report the arm feeling weak
- Comes on fast — typically after a load spike or camp

Typical triggers — all coach-controllable

- Sudden increase in volume or grip demands
- New handle, altered pitch, rough water
- Excessive wrist movement when feathering
- Heavy square-blade work

What to do: reduce grip load, undo the change that triggered it, and refer. Responds well when caught early.

ANATOMY



Other Common Rowing Presentations

Knee Pain

- Front-of-knee pain — deep catch, high erg volume
- Outer-knee (ITB) pain — common on the erg
- Check footplate height/angle and shoe position
- Usually settles with load modification + strength

Hip & Groin

- Hip flexor strain — from the deep catch
- Hip pinching / restriction — flag in juniors
- Adolescence is when hip shape is still forming
- Persistent groin/hip pain in juniors — refer

Shoulder & Upper Back

- Shoulder pain — especially sweep (outside arm)
- Upper-back pain — especially at the finish
- Watch overhead loading in the gym programme
- Upper-back mobility protects the ribs — worth programming

Beach Sprints — New Presentations

- Knee injuries most common (2022 World Champs)
- Ankle — sand sprint on an unstable surface
- Concussion possible — falls, oar strikes, boarding
- Balance & running prep matters for beach sprint crews

03

Managing Load

Four load patterns — what to watch for, and why



Managing Load — What to Watch For, and Why

1

Sudden jumps in load

Camps, pre-season, back from illness or holidays.

WHY: tissue adapts slowly — a load spike outruns this adaptation.

DO: build in steps; first week back at half volume, etc

2

Long continuous erg pieces

WHY: the fixed erg is the highest back and rib load, and >30 min is an independent LBP risk factor.

DO: cap at 30 min, split pieces, put extra aerobic work on the bike.

3

Fatigue late in the session

WHY: posture slumps and the on-water advantage disappears — back load climbs to near erg level.

DO: coach the last 20 minutes; shorten the piece when technique goes.

4

Change — of anything

Side, rig, handle, gym block, a new sport.

WHY: every change shifts where force lands — side change → back, new handle → wrist, heavy gym → ribs.

DO: one change at a time; watch for two weeks.

Rule of thumb: build in steps, change one thing at a time, and programme for the end of the session — not just the start

04

Your Prevention Toolkit

Monitoring, the RA framework and when to refer



Boathouse Monitoring — The Sit & Reach Traffic Light

A cheap, simple tool any club can put in the shed — rowers self-check back risk before they get on the water

The Concept

- Rowers heading into back pain often lose flexibility first
- A drop in reach can be an early warning — the body guarding itself
- Set each rower's normal range, then check daily against it
- Always measure after the warm-up
- Cheap, fast — fits any club or school shed

Traffic Light System

GREEN
(within normal range)

Good to train —
proceed as planned

AMBER
(slightly outside normal)

Do the mobility work. Back
to green → train. Still
amber → get it checked.

RED
(greatly outside normal)

Hold off and get it
checked — likely in a
vulnerable position.

Four Simple Checks Any Coach Can Run

Test 1

Back Endurance Hold

Target ≥90 seconds. Poor back endurance = higher LBP risk.
(Shipsides, 2019)

Test 2

Full-Range Single-Leg Squat

Full depth, no support. Mirrors the leg demand at the catch.
(Shipsides, 2019)

Test 3

Hip Flexibility

Knee to chest. Tight hips → the back compensates at the catch.
(Wilson et al., 2021)

Test 4

Sit & Reach — Baseline + Daily Check

Set a baseline after warm-up, then use the traffic light daily.
(Wilkie, 2024)

The Prevention Framework — Four Areas That Work

These four areas have the biggest impact on reducing LBP risk — and the earlier you start, the better (Shipsides, 2019)

1

Hip & Pelvis Flexibility

Greater hip flexibility → better spinal position at catch → reduced lumbar load. Also improves force transmission from footplate to handle.

Method: Dynamic warm-up (15–20 min) before EVERY session.
Gluteal stretch 2 min x1/day for structural change.

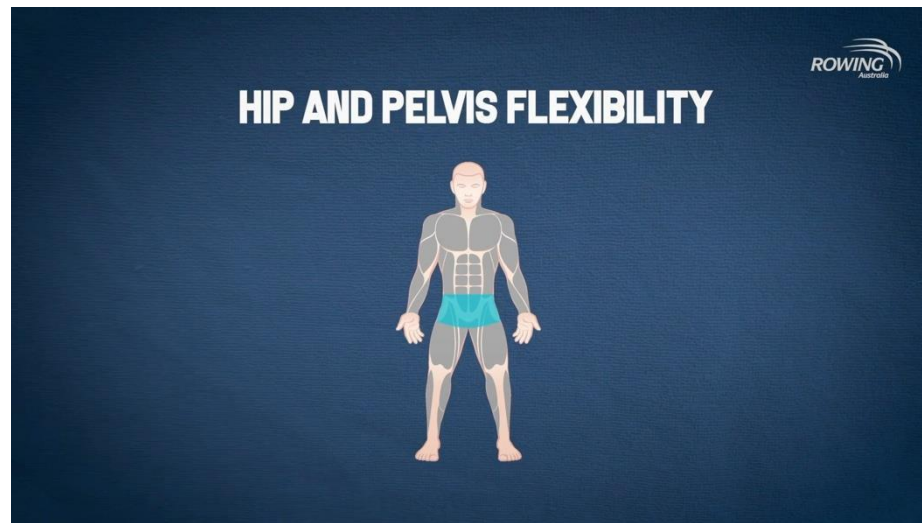
2

Leg & Back Strength + Endurance

Need: strength AND endurance through rowing-specific ranges.

Benchmark: Full single-leg squat (underaged athletes). Back extension hold ≥90 seconds.

Method: Supervised resistance training, full range, excellent technique first.



The Prevention Framework — Four Areas That Work

These four areas have the biggest impact on reducing LBP risk — and the earlier you start, the better (Shipsides, 2019)

3

Spinal Posture

Neutral lumbar (not flexed, not over-arched). Relaxed/slightly curved thoracic spine. Rounded lower back = significantly higher LBP risk.

Physio bridges coach-athlete communication on posture.

4

Dynamic Core Stability

Moving away from static bracing → dynamic, multi-directional, endurance-based.

Include: forward/back, side-to-side, rotation, unstable surfaces (BOSU, gym ball). Pilates useful for movement awareness.

Progress: Kettlebells, weight plates, wobble boards.



When & How to Refer — The Coach's Decision Guide

You don't need to diagnose — you need to know when to stop loading and get help

REFER NOW — DON'T WAIT

- Rib/Chest Wall pain, worse with breathing — unload 4 days, get assessed
- Pain spreading into the leg, pins & needles or numbness
- One-sided bony back pain in a young rower
- Night pain, fever, feeling unwell
- A 'squeaky', swollen, creaking wrist
- Back pain that is sharp, worse with activity or lasts >30 min
- When in doubt — refer

MODIFY & MONITOR — REFER IF NOT SETTling

- Niggle that eases with warm-up
 - Reduce load, watch it — refer if not settling within a week
- General stiffness / DOMS after a hard block
 - Normal training response — manage recovery and fuelling
- Recurring pain that keeps coming back
 - Needs assessment — the pattern is the problem, not the episode
- Build a relationship with a physio before you need one
 - Early, low-drama referral beats a season-ending delay

Key Take-Home Messages

- 01 Injuries are load problems. ~75% are overuse and preventable. The single most powerful lever you have is managing how fast training load rises — no sudden spikes, keep an eye on erg loads, consider the load applied on camps.
- 02 Low back pain is the biggest injury profile— the most common injury at every level. Cap long erg pieces, coach the last 20 minutes as hard as the first, and know which of your rowers has a history of it.
- 03 Learn the two big warning signs. Rib/chest pain that hurts to breathe, and back pain spreading into the leg — both mean stop loading and refer. Caught early, they cost weeks; missed, they cost a season.
- 04 Fatigue is when injuries happen. The last 20 minutes of a session and the last day of a camp are where posture slumps and the load lands on the back. Programme and coach for the end, not just the start.
- 05 Build a prevention culture. A cheap sit & reach in the shed, a group warm-up done every session, safe reporting of pain, and a physio you already know — small habits that keep rowers on the water.

Resources & References

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Thank You

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Questions & Discussion