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SPORTS MEDICINE | PHYSIOTHERAPY

WELCOME TO THE SUPER SHOULDER PROGRAM!

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WEEK 1

BELIEFS - Our world appears through the lenses of our beliefs. We filter all information, including physiological sensations such as pain through these beliefs and then create meaning which translates in the expression of our experience.

Write down 3 positive beliefs about your shoulder condition:

1. _____
2. _____
3. _____

Write down 3 negative beliefs you have about your shoulder pain:

1. _____
2. _____
3. _____

GET LEVERAGE > CREATE HEALTHY RITUALS > MANAGE BELIEFS > LIVE A BETTER LIFE

It is our rituals which define us and therefore define our outcome.

- Consider this in the context of:
  - Time management
  - Morning routine
  - Habit shifting - away from bad to good *(consider what are some bad habits which perpetuate your shoulder pain that could be changed through conscious habit shifting)*

OUR EXPECTATIONS OF YOU:

1. Commitment
2. Home exercises
3. Open sharing
4. Questions
5. Home work
6. Feedback

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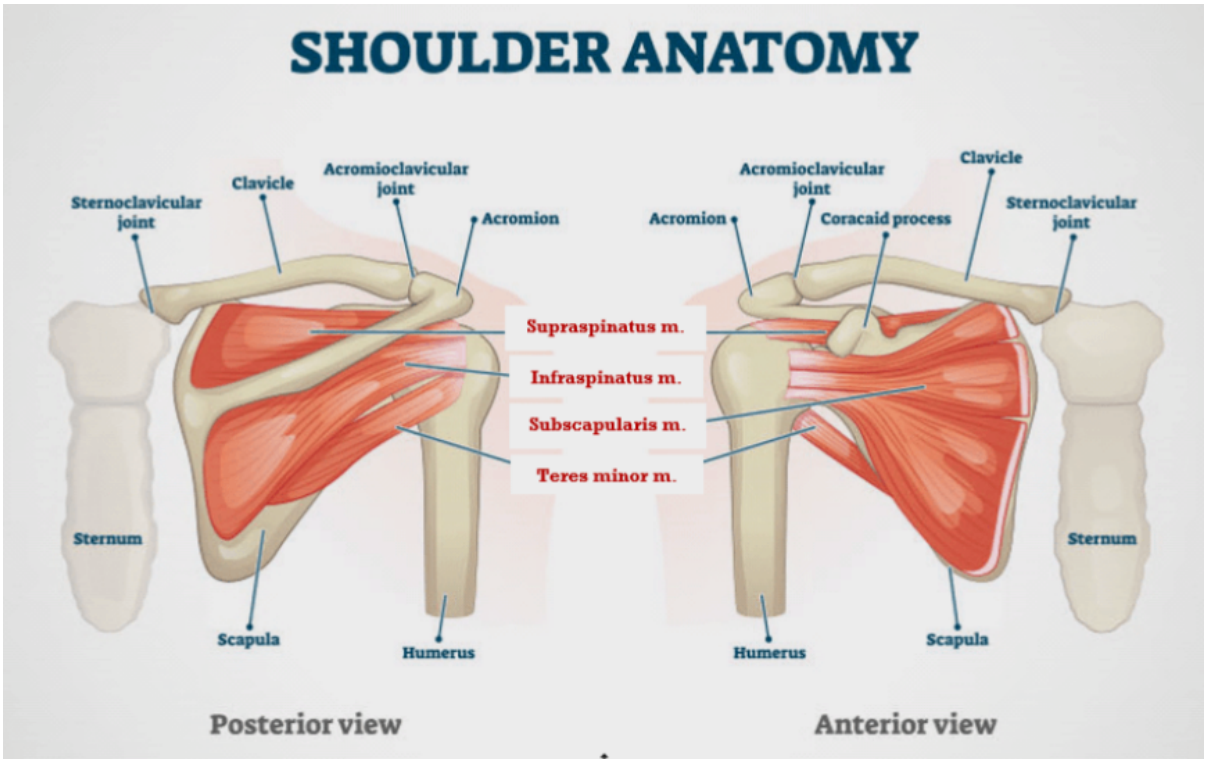
WEEK 2

LET'S GET THE ANATOMY OUT OF THE WAY!

Relevant Anatomy and Biomechanical Principles

- The shoulder is a ball and socket joint, meaning it has an extensive range of motion
- There are 3 bones that make up the shoulder. The humerus, scapula and clavicle (collarbone)
- At the top of the scapula, the bones splits to make the acromion and the coracoid
- Attached to the bones are various muscles and ligaments
- Around the shoulder are also some sacs of fluid, known as bursa. These help reduce the friction between the bones and the muscles / tendons



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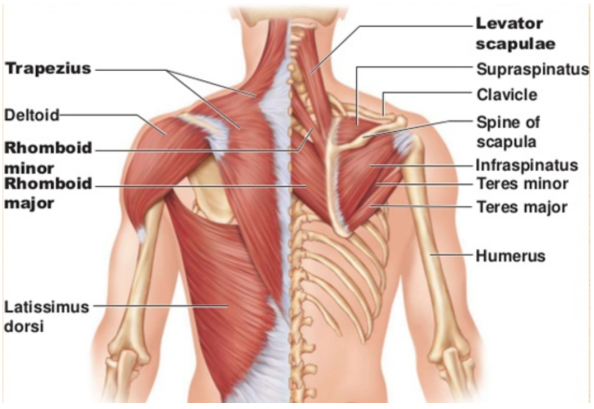
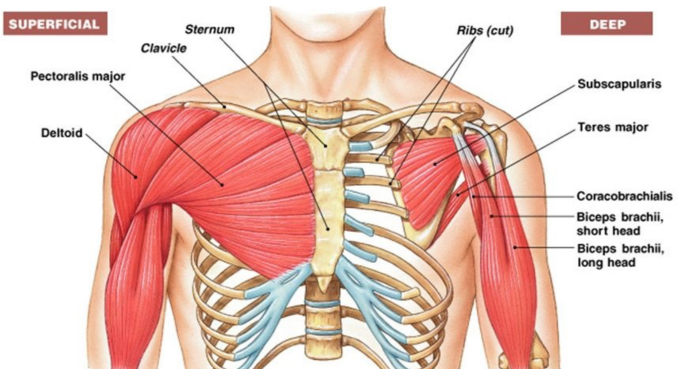
Tendons and Muscles of the Shoulder:

- Tendons attach muscles to bones.
- Muscles provide support and stability to flex, extend and rotate the shoulder.
- Fascia is a strong sheath-like connective tissue that supports the muscles.
- The major muscle groups of the foot are the rotator cuff, biceps, traps, pectorals and rhomboids. There are also individual muscles such as the deltoid, latissimus dorsi and serratus anterior

Muscle Groups

- Rotator Cuff
  - Made up of 4 muscles: supraspinatus, infraspinatus, teres minor and subscapularis
  - Important muscles in stability and rotation of the shoulder
- Biceps
  - Made up of 3 muscles: Bicep short head, bicep long head and coracobrachialis
  - Aid in anterior stability, flexion, adduction and internal rotation of the shoulder
- Trapezius
  - Made up of 3 areas: Upper, middle and lower
  - Important in stability of the scapula
  - Aid in retraction, elevation and depression of the shoulder
- Pectorals
  - Made up of 2 Pectoralis major and minor
  - Important breathing muscles
  - Aid in lifting and rotating the arm in
- Rhomboids
  - Made up of Rhomboid major and minor
  - Important muscle in stability of the shoulder
  - Aid in retraction, elevation and internal rotation of the scapula





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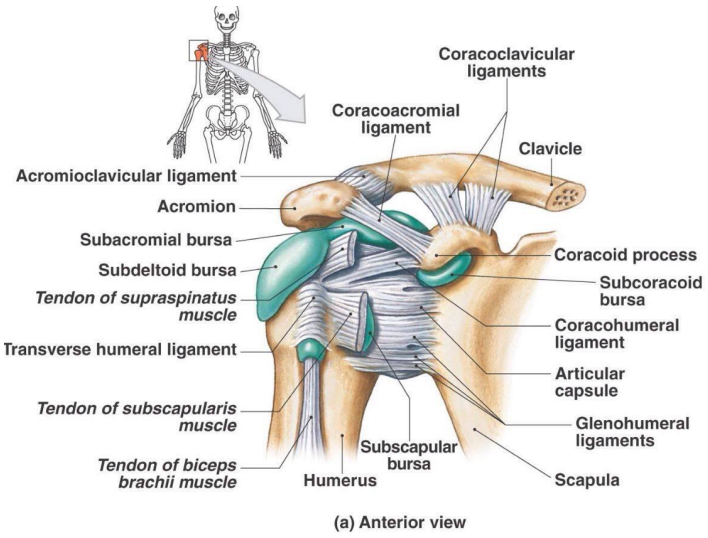
Ligaments of the Shoulder

- Coraco-humeral
  - Connects base of coracoid to the top of the humerus
  - It strengthens the shoulder girdle and prevents dislocation
- Coraco-acromial
  - Connects the coracoid to the acromion
  - Prevents upward dislocation of the shoulder joint
- Coraco-clavicular
  - Connects the coracoid to the clavicle
  - Prevent dislocation of the acromioclavicular joint
- Acromio-clavicular
  - Connects acromion to the clavicle. It strengthens the joint
  -
- Glenohumeral
  - Superior, middle, inferior
  - Ligaments that encapsulate the shoulder girdle to add stability the humerus



(a) Anterior view

Bursae of the Shoulder

Bursae are sacs of fluid that help prevent friction between two body parts, that move against each other:

- Subacromial
  - Prevents friction from the humerus & the bottom of the acromion
- Subdeltoid
  - Prevents friction between the deltoid muscle and the shoulder capsule
- Subscapular
  - Prevents friction between subscapularis tendon & the neck of the scapula
- Infraspinatus
  - Prevents friction between the infraspinatus muscle & the shoulder capsule
- Subcutaneous Acromial
  - Prevents friction between the skin and the acromion

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WEEK 3

Most common sources of shoulder pain

- Subacromial Impingement (SAI)
    - One of the most common causes of shoulder pain. Occurs when the rotator cuff muscles is compressed by superior structures such as the AC joint or Coracoacromial ligament.
    - Common sign is a painful arc. As someone abducts their shoulder they will feel it around 75-80 degrees
    - Common within swimmers due to overuse of the the shoulder
- Subacromial Bursitis
    - Inflammation of the bursa in between the top of the humerus and underneath the acromion.
    - Occurs with direct impact to the area or overuse and soft tissue structures pressing on the bursa and thereby causing inflammation
    - Common sings is tender on palpation and pain with most movements
- Rotator Cuff strain / tear / tendinopathy
    - Strain, is a pulling and irritation of the muscle
        - G1: slight irritation and quick recovery
        - G2: greater irritation and long recovery
    - Tears are as the name suggests and tears in the muscle.
        - Partial tear, is a slight tear in the muscle
        - Full-thickness tear is a tear through the muscle
    - Tendinopathies and irritation and inflammation of the muscle tendon and where it attaches to the bone
        - Most common is supraspinatus tendon
    - RC injuries are common amongst throwing athletes, such as baseballers, cricketers and water polo players
    - Usually will complain of instability and weakness in the shoulder, as well as, pain on resisted rotation
- Frozen Shoulder (Adhesive Capsulitis)
    - Frozen Shoulder is a condition characterised by stiffness and pain in the shoulder. Can occur after a procedure on the shoulder that is forced to be immobile for an extended period of time.
    - Signs and symptoms begin gradually and there is thought to be 3 stages of Frozen Shoulder, each are approximately 6 months.

        - Stage 1 - Freezing: where the shoulder starts to have limited range of motion and movements become painful
        - Stage 2 - Frozen: pain may start to subside but movement is still limited and becomes difficult
        - Stage 3 - Defrosting / Thawing: range starts to improve and pain diminishes.
- Bicep Tendinopathy
    - Irritation in the long head of bicep tendon, the tendon runs along the front of the shoulder capsule and attaches to the top of the scapula
    - Caused through a combination of overuse of the bicep muscle, as well as, consistent internal rotation of the shoulder
- Radicular pain
    - The muscles in the shoulder and arm are all innervated by the nerves that originate from the neck. If nerves are tight or restricted in any way, pain can then be felt in and around the shoulder
- Radiculopathy
    - Nerves that run down the arm can be restricted due to muscle tightness or joint stiffness. This can then result in the nerves passing through a particular area, such as the shoulder, being irritated.
- Acromio-clavicular Joint Sprain (ACJ)
    - Occurs with direct trauma to the area, usually through a fall, either directly on to the AC joint or with a fall on an outstretched arm. The direct trauma separates the clavicle from the acromion.
    - There are 3 grades to the AC joint injury
        - Grade 1: ligaments intact but stretched
        - Grade 2: subluxation of clavicle due to rupture of AC ligament
        - Grade 3: complete dislocation due to rupture of all ligaments

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Symptoms of more serious conditions

- Severe Brachial plexus injury
    - The Brachial plexus is the network of nerves that sends signals from your spinal cord to the shoulder, arm and hand
    - In severe cases, such as vehicle accidents. The brachial plexus nerves can be ruptured and therefore cause severe pain and weakness and little to no movement in shoulder, arm or hand.
- Long Thoracic Nerve Palsy
    - Shoulder injury that affects the long thoracic nerve. This nerve innervates one of the big shoulder muscles (Serratus Anterior).
    - Damage to this nerve can result in pain and lack of movement in the shoulder. The injury can also result in an abnormal protruding of the scapula

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WEEK 4

HOW DID I GET HERE???

GENETICS

- Collagen makeup and its importance
    - Hyper-hypo-mobility (water or land body) - group in to hyper/hypo
- Comorbid issues, e.g other joint pathology like FAI, OA, RA, bloodborne inflam, CNS, sympathetic compression
- Remember that there is a management strategy to aid all of the above and cannot be discounted in a treatment program. Is there a missing link to your recovery?

OTHER INFLUENCES

- Habits - posture, biomechanics, funky habits (cross legs etc)
- Loading - alignment and control
- Prevalence of loading
- Beliefs (influence behaviours and nervous system)
- Nervous system sensitivity
- Emotions

What are the top 3 things described above that you feel are contributing to your pain?

_____

_____

_____

Sitting:

How many hours do you sit for in a day?

Breakfast	
Commute to work	
Morning work	
Lunch	
Afternoon work	
Commute home	
Dinner	

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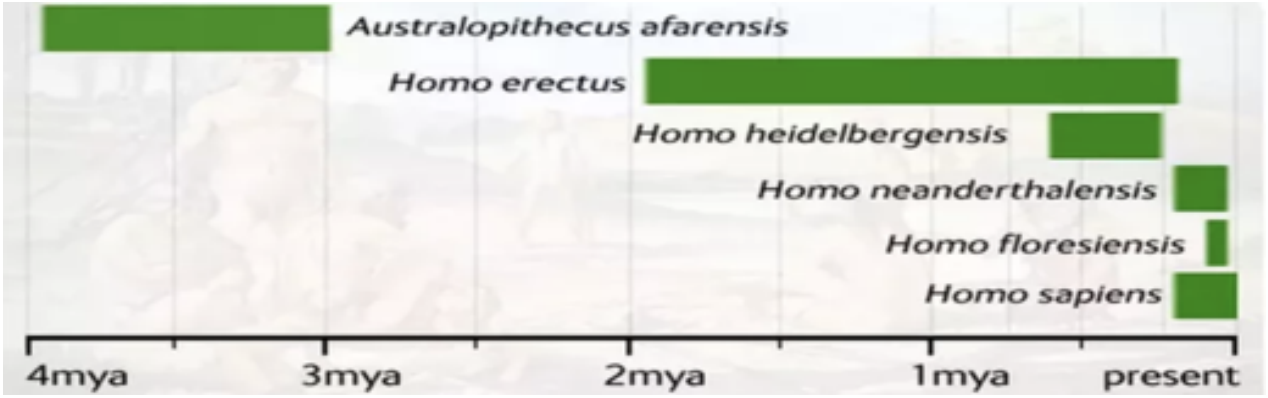
Relaxing	
Total Daily Sitting Time	



Homosapiens have been evolving for 200,000 years and we have evolved to move! Sitting for more than 4 hours per work day (50% of your work day) and 6 hours in total will wreak havoc on your shoulder pain and overall health!

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WEEK 5

Pain science

Pain is an unpleasant experience. In fact, it's bloody horrible. But it is actually an incredibly important experience that keeps you safe, informs you about danger and helps you avoid harm. Without pain, you would all be doing crazy and damaging things to your bodies without realizing it. But your pain systems don't always work perfectly.

Pain and the brain

Once upon a time, scientists believed that pain was a message that was sent from our body to our brains, informing us that damage had occurred. What we have now discovered is that these early scientists had it the wrong way around.

It is now well understood that pain occurs *in* the brain. It may be hard to believe, but pain doesn't actually tell you about how much you have damaged your body; it tells you about how much *danger* your brain *believes* you are in. This may be potential danger or real danger.

Persistent pain

In a normal and healthy pain response, all of the elements that make up your pain experience will reverse and return to normal over time, in line with the healing of the injured tissue. But sometimes, things don't behave as they should, and pain persists. There is no simple answer for why this occurs and there are often a number of different factors, each unique to the individual case.

Regardless of the reasons, the fact of the matter is that your danger alert system has malfunctioned. Whilst in a normal scenario, the level of pain will diminish as the injury heals, with chronic pain the level of pain you experience remains the same or even worsens over time, **even if the injured area is healing normally.**

When pain becomes chronic, the pain you feel is no longer an accurate representation of danger or damage in your body.

Summary:

- Pain is an important protective mechanism
- The level of pain we experience is determined by how much danger our brain *believes* we are in
- It does not tell us about how much damage is in the tissue
- Chronic pain is rarely an accurate assessment of danger to the body
- All of the changes in the body associated with chronic pain are reversible

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WEEK 6

Stress & Mindfulness

Below is a list of some of the physical responses that occur during a stress response and the direct impact on pain.

Fight or Flight Response	**Impact on your back pain**
Rapid & shallow breathing	Rapid and shallow breathing results in less oxygen delivery, which then causes the muscles to start tensing up in order to help with lung expansion in an effort to get more oxygen. This results in tight and painful muscles due to overactivity.
Increased muscle tone	The sympathetic response causes muscle tension to assist with running or fighting, but prolonged muscle tone causes pain and impacts bony alignment.
Reduced immunity	Blood and energy is directed to the muscles instead of the immune system (to assist with escaping immediate danger) and this reduced immune energy impacts healing abilities and injury recovery.
Adrenal fatigue	Prolonged release of stress hormones (e.g. adrenaline) causes exhaustion and adrenal fatigue. This reduces tissue healing and also increases pain perception by impacting mood and emotional regulation.
Poor digestion	Similar to the immune system, blood flow and energy is directed to the muscles instead of the digestive system (to assist with escaping immediate danger). This negatively impacts absorption of nutrients and vitamins that assist with injury recovery.
Inflammation	Prolonged stress causes inflammation in the body, creating pain and poor tissue health. Inflammation occurs through poor gut health (due to digestive issues), cortisol and insulin resistance (hormonal issues) and altered immune system responses.
Hypervigilance	The fight and flight response causes increased mental alertness (to detect danger), which makes us hyper-sensitive to pain.

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Questionnaire;

- How do you feel now compared to when you started the program?

- What have you learnt about your body?

- Do you know what makes you feel uncomfortable or what triggers pain?

- Do you have a strategy to make you feel better? Any particular exercise you have learnt so far?

- Is the pain still taking anything out of your life? Do you think you can change this?

- Has anything changed in your life since you started the program in regards to exercise routine, social life, interaction with friends and family?

- Do you feel like you are more in control of your body?

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WEEK 7

Chronic pain and Recurrence

- Chronic pain means pain for longer than 3 months, which means pain that persists after the tissue healing time frame – central sensitization.
- Once the nervous system is sensitized the source of pain is most likely to be at the spinal cord and brain instead of tissue, but any increased load over the previously injured tissue will increase brain alert – pain (recurrency).
- 66% of people with chronic pain will have recurrency.

The most important things to remember if you have a flare up;

- The pain is not necessarily from damaged tissues, but most likely from very a sensitized nervous system. Stay strong and avoid negative thoughts about your body and your life.
- Keep moving to restore muscle coordination and maintain the deep stabilisers working well.
- Think of the exercises we have done together and pick the ones that make you feel the best to use as a 'painkiller'.
- Keep moving and doing things you enjoy as much as possible
- At this point you should be able to identify what causes the flare ups and what normally loads your back.

Exercise progression/regression

- The more you load the more resilient the body becomes
- Neutral spinal before movement
- Supported before non- supported
- Standing – double before single legged
- Drivers and their specific loads
- Range
- Speed

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WEEK 8

History behind Pilates Method

- Created by Joseph Pilates who was born in 1880 in Germany.
- The inspiration for his method came to him during World War One to help with military training, He developed his method for four years, working on his fellow internees.
- He suffered from asthma and rheumatic fever. He managed to overcome his physical limitations by developing his own program of exercise.
- It was initially named ‘contrology’

Principles:

- Breathing: Full consistent inhalation and exhalation helps the circulatory system nourish all tissues while carrying away impurities and metabolic waste.
- Axial elongation and core control.
- Spine articulation.
- Organization of head, neck and shoulders.
- Weight bearing and alignment of the extremities.
- Movement integration

Main goals of Pilates for chronic shoulder pain:

- Better flow of communication between body – brain and vice versa
- Increase tissue tolerance and resilience.
- Unload tissues and relieve pain.
- Maintain mobility.
- Increase variability – use the same core activation in different positions without sensitizing the nervous system.
- Consolidate posture, movement, function – EVERY REP NEEDS TO BE PRODUCTIVE (precision).

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WEEK 9

SLEEP

Sleep: failing to get 8 hours of good quality sleep every night increases your pain sensitivity, creates inflammation in the body and makes it harder for an injury to heal.

Here are some tips for getting a good night sleep:

1. **Lighting**: You now understand the impact of artificial lighting on your circadian rhythm, so as the sun sets you should dim any bright lights, turn on soft lamps and light candles. Replace any white globes with warm, low intensity globes. This will tell your brain that night time is here and begin melatonin release at the right time, meaning you'll get off to sleep easier. You should also remove any artificial lights from your bedroom such as alarm clocks, and block outside lights with black-out curtains (if you don't have any external street lights then it can be nice to leave curtains open so sunlight enters in the morning).

2. **Reduce screen-time**: If you're really serious about optimising your sleep then you should ideally cut out all computer, smart-phone, tablet and television use at night in order to minimise blue light exposure. If that is unrealistic, apply "night-shift" filters to your devices to minimise blue light exposure. There are also great options for glasses that filter out blue light.

3. **Read a book before bed:** Reading is a very relaxing and therapeutic pre-sleep activity as it can distract your mind from focusing on the stresses in your own life. *How* you read is very important though. One study looked at the impact of 2-hours of reading on a tablet before bed, versus 2-hours of reading a paper book. The results were dramatically different: reading with a tablet instead of a paper book resulted in a 50% reduction in melatonin release, as well as a 3-hour delay in melatonin release and peak. It also took tablet users longer to fall asleep, they had reduced REM sleep, were more tired the next day, and they had an ongoing lag in rising melatonin levels for several days after tablet use ceased (digital hangover).

4. **Temperature**: The optimal room temperature for sleeping is 18 degrees celsius, so if you sleep with air-conditioning then set it to this. You need your core body temperature to cool by 1 degree to initiate sleep, so a helpful trick is to have a *hot* shower or bath just before bed. The body will create an internal cooling response

due to the hot water, drawing blood to the surface of your skin which cools the core body temperature. Having a hot shower or bath before bed makes you fall asleep faster and can give you 10-15% more nREM sleep.

5. **Go to bed and wake up at the same time daily**: Research has shown that this is one of the most important aspects of high-quality sleep. If life permits (e.g. work, kids, commitments), try and match your sleep times to your chronotype (i.e. morning lark, night owl, in-betweener). If you are a night owl, perhaps you can negotiate with your employer about starting and finishing work later, or have a discussion with your spouse about your preference for doing school pick-up rather than drop-off. If you are travelling, taking melatonin supplements as the sun is setting in your new location can assist with jetlag and resetting your circadian rhythm.

6. **Stress management**: Your own mind can be one of your biggest barriers to sleep. Before bed, write down a to-do list for the following day so that you can clear your head for the night. You should then spend 5-10-minutes doing a mindfulness activity like following your breath or doing a relaxing body scan.

7. **Exercise**: There are many benefits to your sleep from regular exercise, such as an increase in deep nREM sleep, improved sleep quality and duration, and reduced time to fall asleep. Sleep also has a big influence on exercise capacity, with poor strength and fitness outcomes after poor night sleep. Sleep and exercise feed each other, with regular exercise leading to better sleep, but good quality sleep also increasing your likelihood of regular exercise due to having more energy. One important tip: don't exercise right before bed as your core temperature will be too high. You should finish training 2-3 hours before bed.

8. **Caffeine**: The half-life of caffeine is 6 hours, meaning half of the drug quantity is still in your system 6-hours after you ingest it (and can take up to 12-hours to completely remove). Given this, you should limit caffeine to before midday, if at all. Try switching to herbal tea or soda water with fresh lemon as an alternative.

9. **Alcohol**: As you now know, alcohol prevents you from entering REM sleep. You should always aim to go to sleep with a blood alcohol concentration (BAC) of zero. It takes approximately 1-hour for your liver to process one standard drink, so if you are having a drink at night, ensure you give your body enough time to clear it from your system before hitting the hay. An even better solution is to swap your wine or beer for a non-alcoholic alternative, at least on the majority of nights.

10. **Diet**: Avoid going to bed too full or too hungry as this can impact sleep quality. A lower carbohydrate diet has been shown to result in better sleep, so reduce your carbohydrate and increase fiber intake at dinner. Getting up to urinate multiple times per night is a common cause of sleep disturbance, so reduce your liquid intake before bed. There are a number of natural herbal supplements that can assist in sleep quality, without the negative side-effects of sleeping pills.

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WEEK 10

FINAL NOTES

Congratulations on committing to the program and playing full out. There has been so much information covered over the past 10 weeks. You now have all the resources to:

- Functionally improve your tissue strength - making the injury site more robust
- Activate appropriate stability muscles to support your shoulder
- Understand the biomechanical driving forces which contribute to your pain and pathology
- Understand pain - knowing that pain does not equal tissue injury state
- Create a flow of exercises suited to your shoulder
- Understand pain relapse and how to work your way back to a functional shoulder

We have prepared some video resources of individual exercises, as well as flow sets which we think will help you to practice appropriate strategies and find your perfect path with optimal progressions so that you can continue to improve over the coming months.

Please remember that you need to listen to your body and work at a level that is appropriate for you at that time.

ADVANZ EXERCISE LIBRARY:

https://www.ahsmp.com/ahsmp-exercise-library/

Below is a list of our recommended exercises. Please feel free to look through all exercises for an overall GREAT functioning body:

- Prone core and shoulder series L1&2
- Reformer Plank series L1&2
- Prone Kneeling series
- Side plank series
- Supine core series

https://vimeo.com/428967553 (easy to moderate)
https://vimeo.com/423045586/4d6befd5f8 (moderate)
https://vimeo.com/419698057 (moderate to difficult)
https://vimeo.com/416641700/90722b42f3 (moderate to difficult)
https://vimeo.com/410956526/59ee63fb66 (moderate + meditation)