

# Return to Play following Shoulder Instability in the Collision Athlete



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# Introduction

- Shoulder instability a common injury in athletes who participate in collision sport
- Non-operative treatment has limited success and surgical treatment frequently required
- Rugby in particular a high-risk collision sport for shoulder injury overall (instability 23% of total shoulder injuries)
  - Tackle recognised as the element of game most conducive to injury
    - peak collision force of approximately 2000N measured during a tackle



# Shoulder Instability

- Instability injuries in the collision athlete are the most severe, have the highest rate of recurrence, result in the most days lost to injury, and have the largest negative effect on career length  
*Brophy et al. Am J Sports Med 2011; 39: 704-709*
- Collision athletes with instability injuries will not be playing at full capacity, have a significant rate of re-injury, and have a high risk of injuring the other shoulder



*Kawasaki et al. JSES 2014; 23: 1624-1630*



# Non-Operative Treatment

- Immediate surgical stabilisation is often not desirable for collision athlete in-season

## However

- No consensus on optimal non-operative treatment of in-season collision athlete with shoulder instability
- Rapid return to sport usually primary concern
- Many factors involved in decision making process - timing of injury, age, specific sport, level of current and future participation, presence of a bony injury, players own future goals, other interested parties



# Return to Play



- Limited data available to guide RTP, with lack of studies assessing pre-injury level and rate of return to sports in athletes of different ages and in different sports  
*Soliaman et al. JISAKOS 2016; 1: 198-201*
- Focus on maximising muscular strength and endurance while improving dynamic stability, proprioception and neuromuscular control  
*Wilk et al. Clin Sports Med 2013; 32: 865–914*
- Typical criteria for RTP include symmetric ROM, adequate strength, and performance of sports-specific activities without pain or apprehension



# Remember

- Although many athletes can return to play within 3 weeks, no guarantee that another instability event will not occur

- Return to sport may be affected by position on field and in particular shoulder dominance

*Sundaram et al. J Sci Med Sport 2011; 14: 111-114*

- Braces recommended for remainder of season, but no evidence for decreased rate of dislocation

*Ward et al. Clin Sports Med 2013; 32: 685–696*

*Shanley et al. JSES 2018; 27: e134-e135*





# Literature

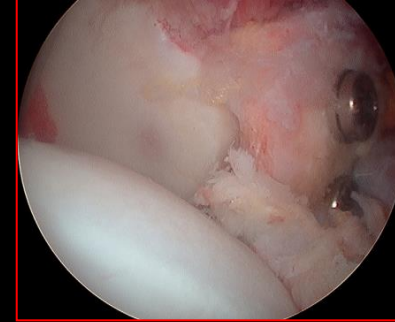
- Prospective cohort study
  - 73% of 45 contact athletes returned to play in-season
  - only 27% completed season without recurrence
  - athletes with subluxations 5x more likely to return to sport, and do so at an earlier time point
  - incidence of recurrent events and ability to complete season similar whether subluxation or dislocation

*Dickens et al. Am J Sports Med 2014; 42: 2842-2850*



# Operative Treatment

- Challenging, especially if a return to collision sport is anticipated
- Remains lack of strong evidence guiding surgeon in recommending one technique over another, with surgical treatment options continuing to evolve



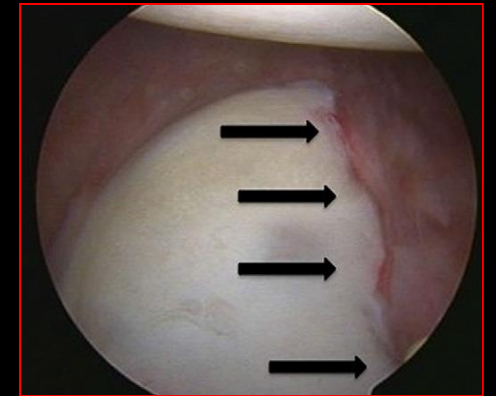
- Much rides on the success of surgery, but risk of reinjury and/or recurrence always present with return to collision sport





# Remember

- Compared to athletes who have had multiple dislocations, early surgical treatment is technically more straight forward, allows an easier rehabilitation, may allow an earlier return to sport, and has a lower rate of failure  
*Stein et al. Am J Sports Med 2011; 39: 2404-2414*
- Early surgical treatment will also reduce the risk of progressive bone loss and damage to other structures that tends to occur with recurrences  
*Milano et al. Am J Sports Med 2011; 39: 1870-1876*  
*Shin et al. JSES 2016; 25: 1756-1763*
  - bone loss associated with associated with age at first dislocation, number of dislocations, male gender, and type of sport



# Literature

- Arthroscopic stabilisation still favoured in recent survey of American Shoulder and Elbow Surgeons, especially in absence of glenoid bone loss or engaging Hill-Sachs lesion, regardless of age or nature of sport

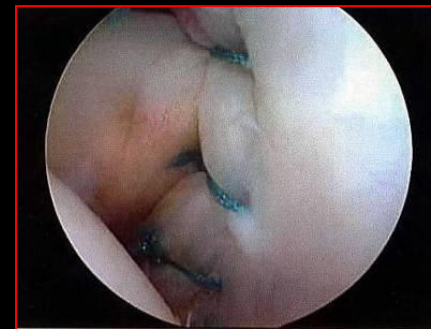
*Garcia et al. Am J Orthop 2016; 45: e91-e97*



- Recent systematic reviews report arthroscopic soft tissue stabilisation provides better rates of return to sport and better subjective perception of the shoulder compared to open stabilisation and open bony procedures

*Blonna et al. Am J Sports Med 2016; 44: 3198-3205*

*Memon et al. JSES 2018; 27: 1342-1347*



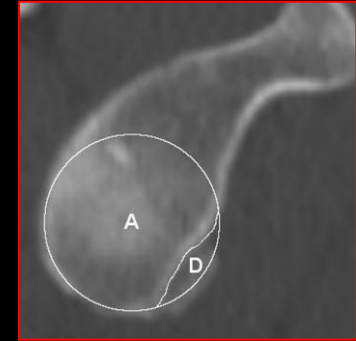
# However

- Whilst most studies report no difference in RTP or PROM's between contact and non-contact athletes following arthroscopic stabilisation, there is a much higher incidence of re-dislocation in the contact athlete

*Yamamoto et al. Orthop Trauma Surg Res 2015; 101: 415-419*

*Alkaduhimi et al. JSES 2016; 25: 1549-1558*

*Milchtein et al. Arthroscopy 2016; 32: 1263-1270*



- Evidence also supports that recurrence rate after arthroscopic stabilisation much higher compared to open bony procedures in the contact athlete, especially in the younger age group (< 22 years)

*Wasserstein et al. Am J Sports Med 2013; 41: 2034-2040*

*Leroux et al. Am J Sports Med 2017; 45: 1218-1225*



# Why is Age Important?



- Virtually every study has identified age as a significant risk factor for recurrence  
*Wasserstein et al. Arthroscopy 2016; 32: 2616-2625*  
*Bonacci et al. J Sci and Med in Sport 2018; 21: 760-764*
- May due to the athletes 'maturity' (less developed co-ordination, proprioception, and muscle strength, inferior techniques during contact events, poorer compliance with post-operative rehabilitation)  
*Milchtein et al. Arthroscopy 2016; 32: 1263-1270*
- Greater likelihood of off-track bipolar shoulder lesions (9.4 x increased risk)  
*Lau et al. Arthroscopy 2017; 33: 1755-1761*
- Recent systematic review on outcomes and RTP following Bankart repair in adolescents reported 31.1% incidence of recurrent instability in contact athletes  
*Kasik et al. JISAKOS 2019; 4: 33-40*

# Rehabilitation



- Initial goal to protect the surgical repair site, minimise pain, and allow for soft tissue healing while gradually restoring glenohumeral passive ROM
- Aim of subsequent rehabilitation is to gradually restore full, pain-free ROM, restore muscular strength and endurance, and then return the patient to all normal activities including their sport

## However

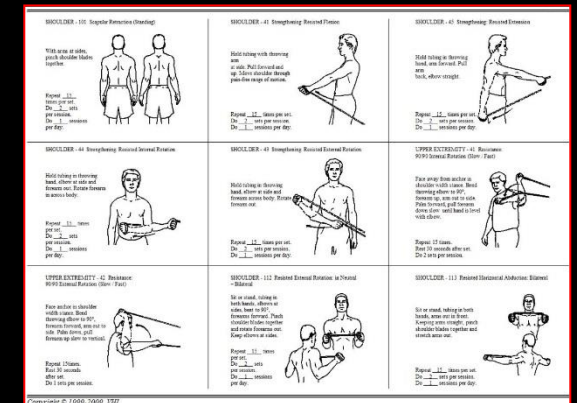
- Specific clinical criteria to determine progression through these stages is lacking





# My Program

- Polysling immobilisation minimum 4 weeks
- Pendulum, active wrist, hand and elbow ROM from day 1
- Passive supine FF and ER from 10 days
- Active waist level ROM and isometrics from 4 weeks
- TheraBand strengthening from 8 to 10 weeks progressing to gym based program from 12 to 16 weeks
- Eccentric strengthening, plyometric exercises and proprioceptive retraining from 16 to 20 weeks
- Sports specific training program initiated from 20 to 24 weeks (progressive contact program)
- Return to collision sport delayed ideally for 26 weeks

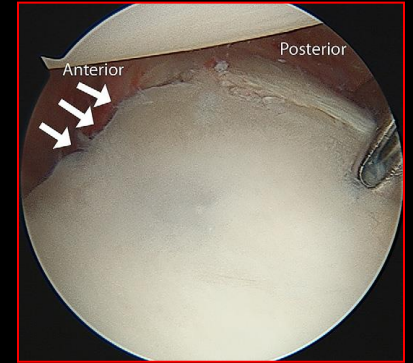




# Return to Play

- Timing of RTP highly dependent on the success of surgery, specific sport involved in, and progress with the post-operative rehabilitation program

*Savin et al. Op Tech Sports Med 2017; 25: 145-153*



- In contrast to ACL reconstruction, there is a paucity of primary studies that address RTP following shoulder stabilisation
- Many issues critical to the post-operative rehabilitation process remain poorly defined
  - healing, ROM recovery, strength recovery, sports specific considerations

*Williams. Arthroscopy 2018; 34: 914-916*



# Return to Play

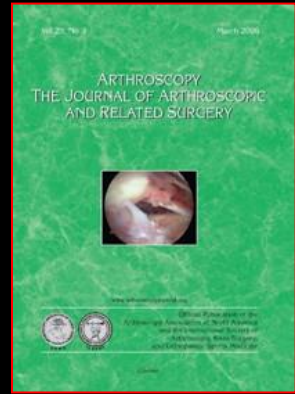


- Standardised physical testing of the shoulder following stabilisation procedures has not been well described
  - most RTP criteria remain something of a gestalt phenomenon
- Surprisingly little literature on labral healing and whether we can modulate this healing process by the type of surgical repair employed
  - no good evidence to suggest how long complete healing takes (? 6 months)
- Current practice in this area largely dictated by previous training, cumulative clinical experience, limited clinical and basic science evidence, and dogma



# Literature

- Recent systematic review reported that time from surgery remains the most common criteria currently used for RTP  
*Ciccotti et al. Arthroscopy 2018; 34: 903-913*
  - average for time from surgery to RTP was 6 months
- Other criterion used in previous studies have included strength, ROM, pain, stability, radiographic evaluation, and/or proprioception
  - none of the studies describe objective means of assessment of these goals
- Selection of soft tissue versus bony stabilisation procedure does not seem to influence the RTP decision



# MOON Study



- Multicentre Orthopaedic Outcomes Network Study
  - at an average of 5.3 months post-op 76% of patients returned to baseline ROM and 98% returned to baseline strength  
*Buckwalter et al. JSES 2018; 27: 1235-1242*
  - increased number of dislocations and generalised joint laxity associated with failure to return to baseline ROM and strength, not surgical factors

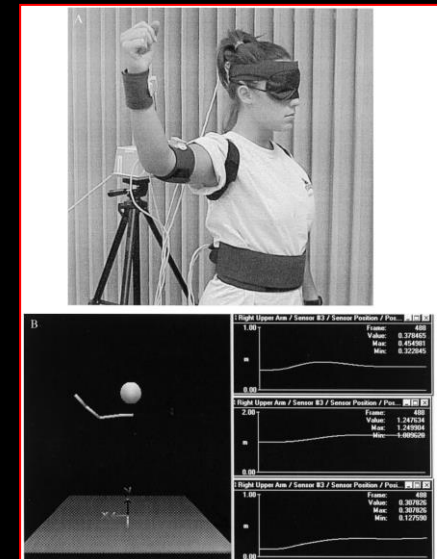
## However

- Collision athletes often do not reach their pre-injury sport specific activity levels (SSAS) until approximately 16 months after surgery
- At 6 months, no athlete has reached their pre-injury level  
*Stein et al. AJSM 2011; 39: 2404-2414*



# Remember

- Surgically stabilised shoulder joints are never the equivalent of uninjured healthy shoulder joints
- Sensorimotor deficits are decreased after stabilisation, but remain at a significantly inferior proprioceptive level compared with uninjured shoulder  
*Potzl et al. AJSM 2004; 32(2): 425-430*
- Distinct lack of knowledge regarding sensorimotor recovery and specifically optimal focussed rehabilitation protocols to improve this  
*Myers et al. Man Therapy 2006; 11: 197-201*





## In Addition

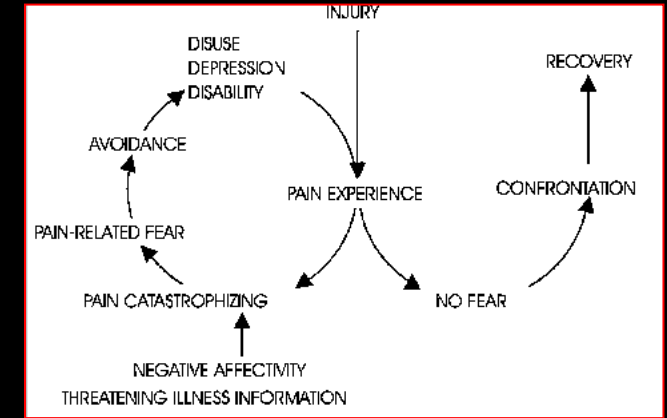
- Some athletes may not return to play despite excellent clinical outcomes due to other factors (psychological and social)

*Tjong et al. Am J Sports Med 2015; 43: 2005-2011*

- competing interests, kinesiophobia (fear of reinjury), psychological motivators (self esteem/anxiety/depression), social support, advancing age
- maladaptive psychological responses and poor motivation detrimental to athletes ability to RTP

*Ardern et al. Br J Sports Med 2013; 47: 1120-1126*

- No uniform outcome measures to assess this
- Lukenchuk et al. Arthroscopy 2017; 33: 447-483*



**PSYCHOLOGICAL READINESS TO RETURN TO SPORT SCALE**

Please rate your confidence to return to your sport on a scale from 0 - 100.  
 0 = no confidence at all  
 50 = moderate confidence  
 100 = complete confidence

1. My overall confidence to play is \_\_\_\_
2. My confidence to play without pain is \_\_\_\_
3. My confidence to give 100% effort is \_\_\_\_
4. My confidence to not concentrate on the injury is \_\_\_\_
5. My confidence in the injured body part to handle to demands of the situation is \_\_\_\_
6. My confidence in my skill level/ability is \_\_\_\_

Total \_\_\_\_  
 Add total and divide by 10 = \_\_\_\_

Scores between 50 and 60 suggest the athlete is psychologically ready to return to sports. Scores below 50 suggest that the athlete may not be ready psychologically to return to sports and needs more time to recover.



# Summary



- Difficult to apply available literature to individual patients as significant variability exists among the different studies with regard to return to sport

## Currently

- Just like it is surgeon's preference in choice of surgical procedure in the collision athlete, it is usually surgeon preference when it comes to RTP
- This can make it challenging, because it is well accepted that a premature return to collision sport carries a substantial risk of reinjury and surgical failure regardless of the type of procedure performed



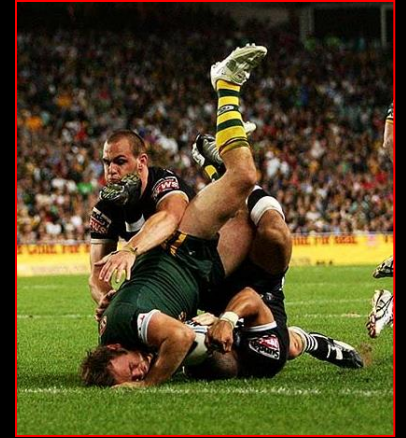


# Summary

- Collision athlete can do well following surgical treatment with a high rate of successful return to play

## However

- Similar to ACL reconstruction, we need to transition from a chronologically based RTP criteria to a checklist of functionally based criteria, including specific thresholds for strength and ROM for sports specific activities
- Limited human and animal model data to support time based RTP criteria
- Ultimately need a validated RTP metric



# Thank You

