Return to Play

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MONTANA ACADEMY OF FAMILY PHYSICIANS

LOGAN HEALTH

Intro

- Training
- Current practice
- Group subspecialties, sports coverage

Key Takeaways

- Resolution of pain
- Absence of swelling
- Normal range of motion
- Strength 85% of contralateral side

- Prevent harm
- Return to baseline
- Consider health status, participation risk, decision modifiers

Key Takeaways

- Nearly 4x higher risk of reinjury (Fuller 2007).
- type of sport, position played, competitive level and ability to protect the injury to lower the risk of re-injury.
- Decision modifiers -- determine the overall acceptable value of risk in making a RTP considering the potential “reward” of participation.

Key Takeaways

- Promote the health and well-being of the athlete
- Conflicts of interest (coach, team administrator)
- Recovery of the athlete outweighs any potential contribution the athlete might make to the team.
- Fully inform parents of potential risks of RTP and document the recommendations, restrictions and instructions

Studies

- Most RTP decisions do not have clinical evidence but rely on experience of the physician

AAOS Consensus Statement 2012

- A guide not a standard of care
- Individual decisions depend on specific facts and circumstances presented to the physician
- For team physicians, establish RTS guidelines in offseason

AAOS Concensus

- Evaluate athlete's health status

(Medical, Psychological, functional tests)

- Evaluate athlete's participation risk

(demands of the sport, role of interventions, risk to others)

- Extrinsic factors

(Parents, coach, team)

- Communicate, document, know the rules

AAOS Concensus

Rehab Rehab Rehab

- Address short and long-term needs
- Sport-specific assessment, treatment, training/conditioning
- Equipment modification
- Psychosocial issues
- Prognosis

Studies

Draovitch, et al . Arthr SM Rehab 2022

- Fundamental goal to advance is to move in a pain-free uncompensated fashion
- Kinetic-linking
- Regional interdependence

- Physician – biologic healing
- PT – functional returns
- Coach – strength and power

Instead look at a continuum of checks and balances

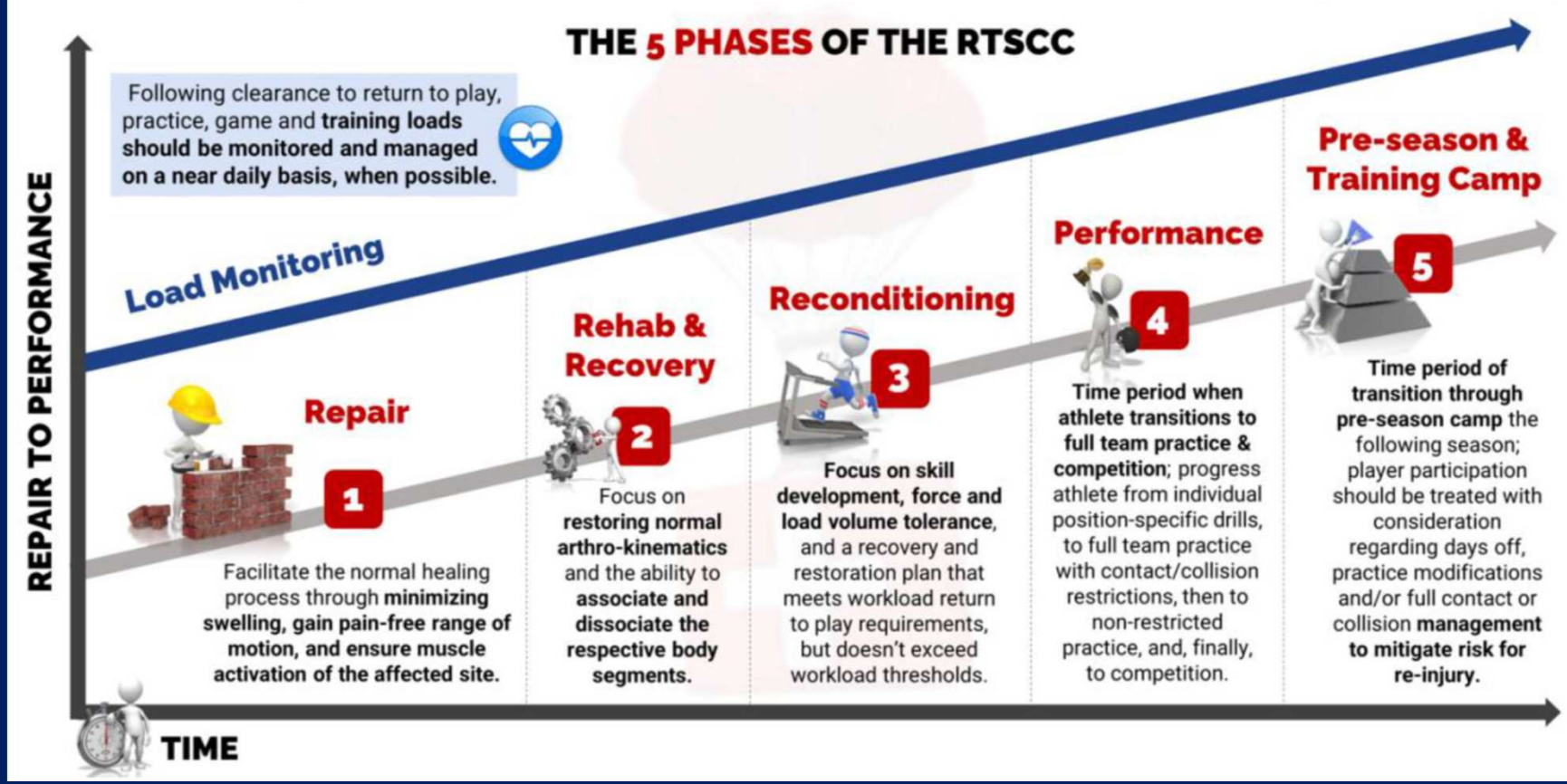
RTS Continuum

- Phase 1: Repair phase
- Phase 2: Rehab and recovery
- Phase 3: Reconditioning
- Phase 4: Performance phase

- **Prolonged recovery should be viewed not as an inconvenient delay but as necessary for RTS success**

STAGED RTS CLUSTERED PERFORMANCE MODEL

THE RETURN TO SPORT CLEARANCE CONTINUUM (RTSCC)



When can I return to sport?

- Recent SR identified time from injury as sole determinant in 50% of studies on ACL (Burgi, Br J Sports Med 2019).
- Biologic healing is important, but shift is to criterion-based approach to RTS
  -strength testing, hop testing, balance/postural control,
  qualitative movement assessment, cognitive decision
  based movement, and patient-reported outcome measures
  -only 13% of studies report objective measures for ACL RTS (Barber, Arthr 2011).
  -several studies show decreased risk of reinjury using obj criteria

When can I return to sport?

Isolated strength deficits

- Poor quadricep strength has been associated with poor performance at 9 months post surgically, and sometimes up to >50% failed to have limb symmetry index (LSI) > 90% at 9 months.

- Professional hockey players with an adductor:abductor strength ratio of <.80 were at a 17x increased risk for sustaining an adductor strain over the course of a season (Tyler et al. Am J Sports Med 2001).

- Single test may overestimate function

When can I return to sport?

- Strength test
- Hop test
- Postural control/dynamic ba
- Qualitative movement

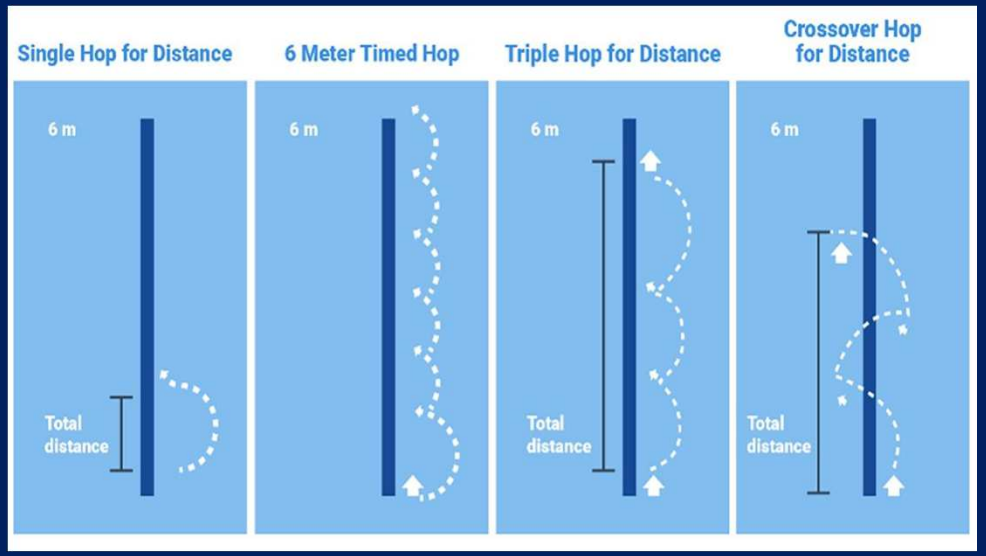
Table 1 Discharge tests and criteria used during the study period

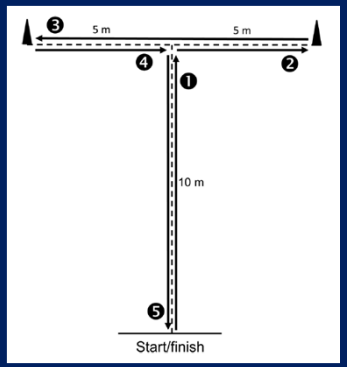
Six-part return to sport tests	Discharge permitted when each of these criteria was met
Isokinetic test at 60, 180 and 300°/s	Quadriceps deficit <10% at 60°/s
Single hop	Limb symmetry index >90%
Triple hop	Limb symmetry index >90%
Triple crossover hop	Limb symmetry index >90%
On-field sports-specific rehabilitation	Fully completed
Running t test	<11 s

Criteria were set according to the literature at the start of the study.

Kyritsis P, *et al*. *Br J Sports Med* 2016;**50**:946–951. doi:10.1136/bjsports-2015-095908

When can I return to sport?





STAGED RTS CLUSTERED PERFORMANCE MODEL

RTSCC TESTING PROGRESSION WITH SAMPLE TESTS

HOW TO USE THE RTSCC

1. Select 1 **Sample Test** from each performance category, or choose your own
2. Conduct test during relative category time period from **Testing Progression**
3. Satisfactory test results allow for progression through continuum

TESTING PROGRESSION

MOVEMENT & CORE → **STRENGTH & ENDURANCE** → **POWER** → **GENERAL & SPORT CONDITIONING** → **RTS LOAD PERFORMANCE** → **SELF REPORTED OUTCOME SCORE**

***LOAD MONITORING & MANAGEMENT**

*Load monitoring should occur daily (weekly, at minimum) throughout the RTSCC to ensure training prescriptions are met

SAMPLE TESTS, BY PERFORMANCE CATEGORY

Movement & Core
- Motion Capture
- FMS/SFMA/QMA
- SEBT/Y-Balance
- McGill
- Bunkey
- Watkins

Strength & Endurance
- Dynamometer
- Force Plate
- Isokinetic
- 1RM (or %1RM)

Power
- Jumps
- VBT
- Hop Test
- Med Ball Toss

General & Sport Conditioning
- VO2max
- Wingate
- 300 Yard Shuttle
- Yoyo Test

RTS Load Performance

Focus of test should be on injured site demands for sport environment.
Example: Vail Sport Test

Self Reported Outcome Score

Re-assess all tested variables on a regular basis, especially during transitions.

Load Monitoring: Accelerometry, GPS, Heart Rate, RPE, Subjective Wellness Questionnaires, Psychological Readiness

rupture: not meeting 6 clinical discharge criteria before return to sports is associated with a 4x greater risk of rupture

- Isokinetic strength at 60, 80, 300 degrees; running t test; single hop; triple hop; triple hop crossover
- Median f/u 646 days (1-2060)
- 158 pro athletes; 26 (16.5%) ACL rupture avg 105 days after RTS
- 2 factors associated with increased risk:
  - Not meeting all 6 criteria prior to RTS, HR 4.1
  - Decreased HS to quad ratio at 60 degrees, HR 10.6 per 10% diff

Common Injuries

Avg time loss from 23,000 injuries in professional football clubs in Europe over a 16 year period

Table 1 Descriptive statistics regarding absence days for the 31 most common *index injuries*. The injuries are arranged according to their median absence

Injury	Frequency (% of total)	Mean (95% CI)	Median (95% CI)	25th;75th percentile	10th;90th percentile	Re-injury rate (%)
Thigh contusion	651 (3.3)	6.4 (5.6 to 7.1)	4.0 (3.0 to 4.0)	2.0;7.0	1.0;12.0	1.4
Foot contusion	537 (2.7)	6.8 (5.9 to 7.6)	4.0 (4.0 to 4.0)	2.0;7.0	1.0;14.0	4.1
Knee contusion	465 (2.3)	6.1 (5.3 to 6.9)	4.0 (4.0 to 4.0)	2.0;7.0	1.0;13.0	2.8
Low back pain	405 (2.0)	8.3 (6.7 to 10.0)	4.0 (4.0 to 5.0)	2.0;8.0	1.0;14.0	18.8
Ankle contusion	385 (1.9)	5.9 (5.1 to 6.7)	4.0 (3.0 to 4.0)	2.0;6.0	1.0;11.0	2.6
Calf contusion	314 (1.6)	6.2 (5.1 to 7.3)	4.0 (3.0 to 4.0)	2.0;6.0	2.0;12.0	1.3
Ankle joint capsular injury	287 (1.4)	8.3 (7.0 to 9.6)	4.0 (4.0 to 5.0)	3.0;10.0	2.0;20.0	10.8
Quadriceps muscle injury (functional)	218 (1.1)	4.9 (4.3 to 5.5)	4.0 (3.0 to 4.0)	2.0;6.0	1.0;9.0	13.8
Calf muscle injury (functional)	215 (1.1)	5.6 (4.9 to 6.3)	4.0 (4.0 to 5.0)	2.0;7.0	1.0;12.0	15.3
Lower leg contusion	200 (1.0)	6.1 (5.0 to 7.1)	4.0 (3.0 to 5.0)	2.0;7.5	1.0;14.0	2.0
Hamstring muscle injury (functional)	709 (3.6)	5.9 (5.5 to 6.2)	5.0 (4.0 to 5.0)	3.0;7.0	2.0;11.0	16.1
Groin pain	256 (1.3)	13.5 (10.2 to 16.8)	5.0 (5.0 to 7.0)	3.0;12.5	1.0;26.0	32.4
Concussion	235 (1.2)	8.7 (6.6 to 10.8)	5.0 (5.0 to 6.0)	4.0;8.0	2.0;14.0	5.5
Ankle joint synovitis	128 (0.6)	10.8 (7.8 to 13.7)	5.0 (5.0 to 7.0)	3.0;11.0	1.0;20.0	38.3
Achilles tendon pain	370 (1.9)	18.4 (14.3 to 22.6)	6.0 (5.0 to 7.0)	3.0;15.0	2.0;42.0	38.4
Knee joint synovitis	279 (1.4)	11.6 (9.7 to 13.6)	6.0 (5.0 to 7.0)	4.0;13.0	2.0;27.0	48.0
Knee joint capsular injury	143 (0.7)	12.8 (9.0 to 16.7)	6.0 (5.0 to 7.0)	3.0;13.0	2.0;24.0	10.5
Knee patellar tendinopathy	231 (1.2)	17.9 (13.5 to 22.3)	7.0 (6.0 to 8.0)	3.0;16.0	2.0;44.0	33.3
Groin other muscle-related or tendon-related pain	216 (1.1)	13.4 (10.2 to 16.5)	7.0 (6.0 to 8.0)	4.0;15.0	2.0;30.0	6.9
Ankle medial ligament injury	196 (1.0)	13.4 (11.2 to 15.7)	7.0 (6.0 to 9.0)	4.0;15.0	3.0;34.0	13.3
Groin adductor pain	1754 (8.8)	13.5 (12.6 to 14.4)	8.0 (8.0 to 9.0)	4.0;15.0	2.0;27.0	17.7
Ankle lateral ligament injury	1260 (6.3)	14.9 (13.7 to 16.0)	8.0 (7.0 to 9.0)	4.0;18.0	2.0;32.0	13.7
Hip flexor pain	264 (1.3)	13.8 (11.6 to 15.9)	8.0 (7.0 to 10.0)	4.0;18.0	2.0;29.0	13.3
Hamstring muscle injury (structural)	2379 (13.8)	18.0 (17.2 to 18.8)	13.0 (12.0 to 14.0)	7.0;22.0	4.0;36.0	17.5
Quadriceps muscle injury (structural)	914 (4.6)	19.5 (18.1 to 20.9)	13.0 (12.0 to 14.0)	7.0;23.0	4.0;41.0	15.6
Calf muscle injury (structural)	818 (4.1)	17.4 (16.3 to 18.6)	13.0 (12.0 to 14.0)	8.0;22.0	4.0;35.0	14.4
Knee LCL injury	146 (0.7)	23.8 (18.9 to 28.7)	13.0 (9.0 to 19.0)	6.0;30.0	4.0;56.0	10.3
Knee MCL injury	760 (3.8)	24.6 (22.6 to 26.6)	16.0 (15.0 to 18.0)	7.0;35.5	3.0;56.0	10.3
Knee cartilage injury	223 (1.1)	48.7 (40.3 to 57.1)	22.0 (15.0 to 30.0)	8.0;62.0	4.0;134.0	36.3
Knee lateral meniscus injury	128 (0.6)	50.1 (41.8 to 58.4)	36.0 (29.0 to 42.0)	18.5.0;65.5	8.0;128.0	23.4
Knee ACL injury	183 (0.9)	210.2 (197.9 to 222.6)	205.0 (198.0 to 218.0)	173.0;238.0	129.0;292.0	6.6

ACL, anterior cruciate ligament; LCL, lateral collateral ligament; MCL, medial collateral ligament

Eckstrand et al. Br J Sp Med

Common Injuries

5 diagnoses had longer time from sport after re-injury than after initial injury:

- Achilles tendon pain
- Calf muscle injury
- Groin adductor pain
- Hamstring injuries
- Quadriceps injuries

Common Injuries

31 injuries were “mild” with time loss of less than a week and many could return back to play immediately.

- Mostly contusions and muscle injury

9 were “moderate” with avg time loss of 8-28 days, comprising 60% of the total injury absence

- Hamstring muscle injury, groin adductor pain, ankle lateral ligament injury, quadriceps muscle injury, calf muscle injury, MCL injury
- Median 13 days absence for calf, quad, HS injury

Severe injury greater than 28 days: ACL, lateral meniscus tear

- Median time out for ACL 205 days (pro soccer); typically 9-12 months for competitive

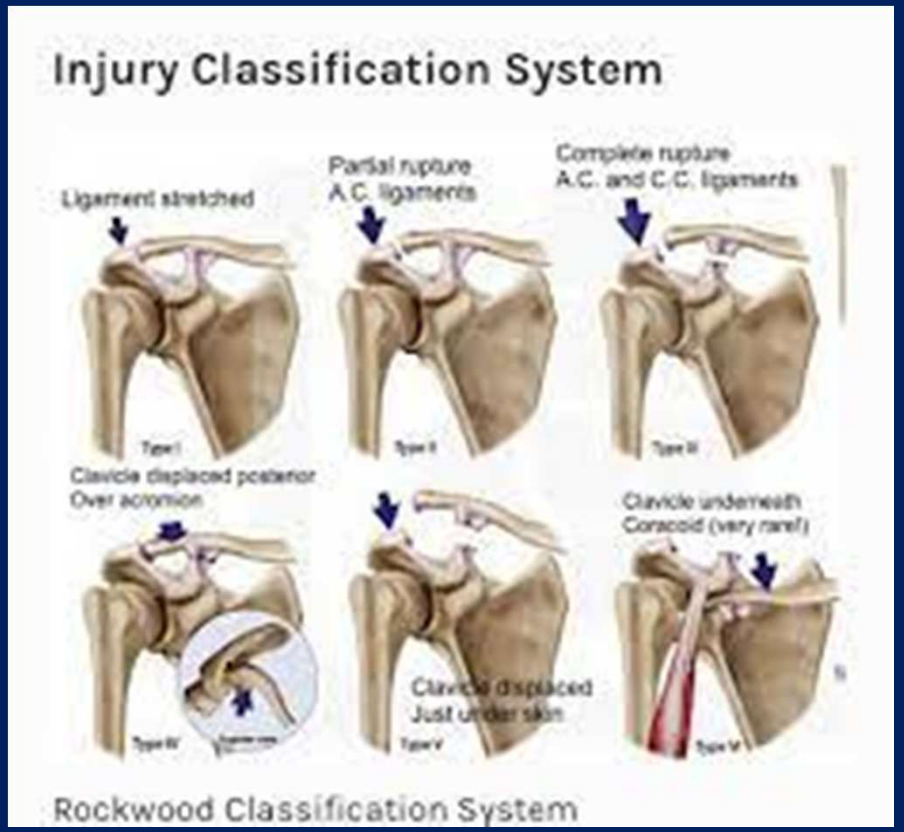
Common Injuries

AC joint separatio

- Fall or impact on the top of the shoulder
- Anterior or superior pain
- Swelling of AC joint
- Prominence of the joint
- Tender to palpation
- Pain w/ cross body adduction or resisted horizontal abduction
- Cuff tests may be positive (loads AC jt)

AC joint sprain

- Rockwood classification
  - Type I – sprain of the AC joint capsule
  - Type 2 – tear of the AC joint capsule, partial CC tear
  - Type 3 – complete tear of CC ligaments, superior
  - Type 4 – posterior displacement
  - Type 5 – 100-300% superior displacement
  - Type 6 – inferior displacement



AC joint sprain

- Types I-II rest, NSAID's, ice, consider injection
- Type III conservative vs surgery
- Types IV-VI surgery

AC joint sprain

Return to sport once full ROM, minimal tenderness/pain

Same strength with cuff testing

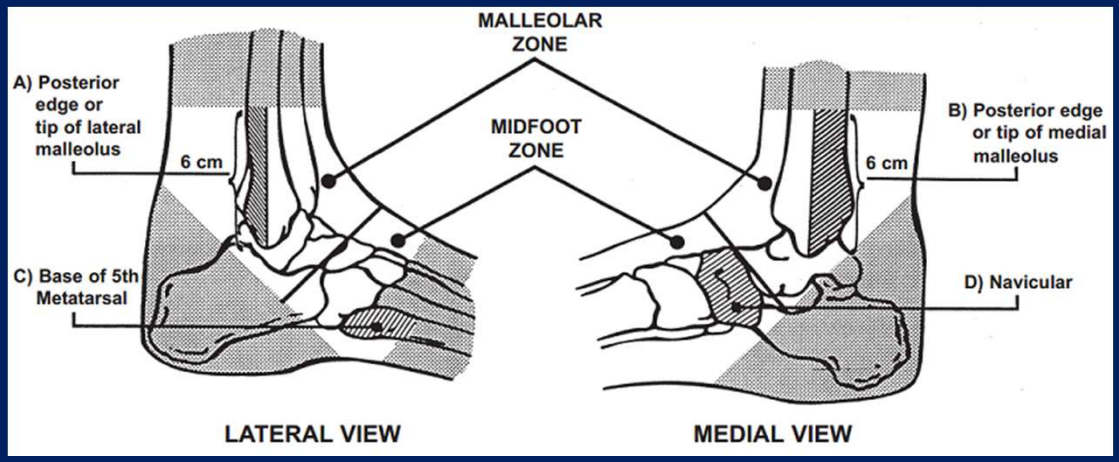
Players must be able to protect shoulder from further injury as low grade sprain may convert to higher grade

Recovery time 1-6 weeks depending on severity

Ankle sprain

- Twisting mechanism
- Painful pop, swelling, med/lat pain
- Ligament tear
- X-ray if bony tenderness (Ottawa rules)

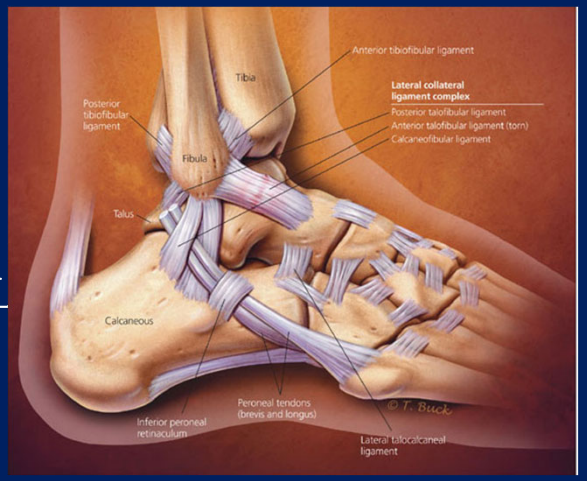
Ottawa rules



- Bony tenderness along the distal 6 cm of posterior fibula or medial malleolus; including tip
- Bony tenderness at base of 5^{th} metatarsal or navicular
- Inability to weightbear

Ankle sprain

- ATFL
- CFL
- PTFL
- High ankle sprain – AITFL/PITFL



Ankle sprain

- High risk of recurrent injury
- Brace or tape upon RTS
- Rehab – ROM, stretching, strength, proprioception
- RICE then start early rehab as ROM and pain improve

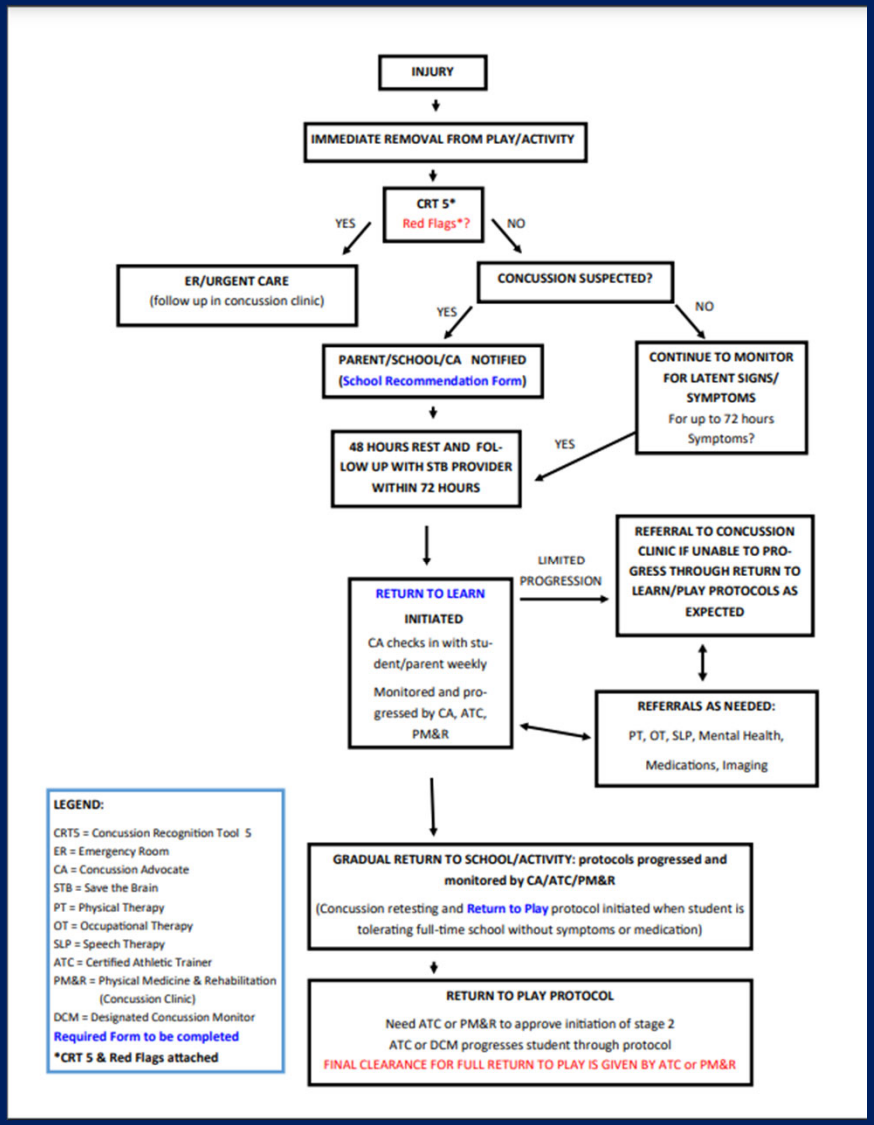
Surgery for recurrent sprains or high ankle w/ mortise widening

Concussion

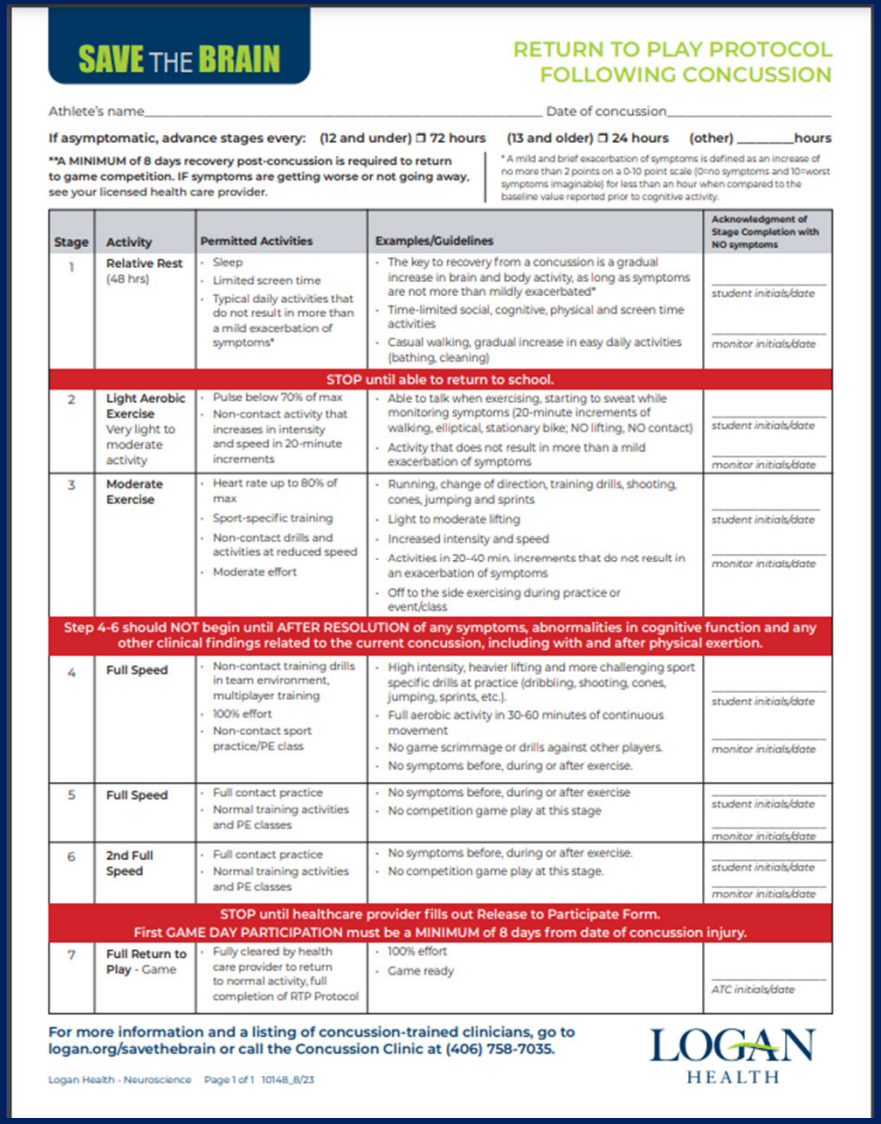
- Traumatic brain injury
- Symptoms include HA, blurry vision, confusion, dizziness, fatigue, irritability, mood changes, difficulty with concentration/memory
- Red flags – LOC, neck pain, increasing confusion, vision changes, vomiting, seizure, severe HA, weakness

Concussion

- Do not return to sport until complete resolution of symptoms
- Increased risk of damage if second concussion with concurrent symptoms
- Can take days to weeks to months
- Mental rest
- Avoid screens (TV/phone for 48hrs)
- Avoid loud sounds, bright lights, any activities that increase symptoms
- Slow progression of physical/mental activity under



https://www.logan.org/fitness/performance-center/youth-development/save-the-brain



SAVE THE BRAIN

RETURN TO PLAY PROTOCOL FOLLOWING CONCUSSION

Athlete's name_____ Date of concussion_____

If asymptomatic, advance stages every: (12 and under) ❒ 72 hours (13 and older) ❒ 24 hours (other) _____hours

****A MINIMUM of 8 days recovery post-concussion is required to return to game competition. IF symptoms are getting worse or not going away, see your licensed health care provider.**

* A mild and brief exacerbation of symptoms is defined as an increase of no more than 2 points on a 0-10 point scale (0=no symptoms and 10=worst symptoms imaginable) for less than an hour when compared to the baseline value reported prior to cognitive activity.

Stage	Activity	Permitted Activities	Examples/Guidelines	Acknowledgment of Stage Completion with NO symptoms
1	**Relative Rest** (48 hrs)	· Sleep · Limited screen time · Typical daily activities that do not result in more than a mild exacerbation of symptoms*	· The key to recovery from a concussion is a gradual increase in brain and body activity, as long as symptoms are not more than mildly exacerbated* · Time-limited social, cognitive, physical and screen time activities · Casual walking, gradual increase in easy daily activities (bathing, cleaning)	_____ *student initials/date* _____ *monitor initials/date*
STOP until able to return to school.				
2	**Light Aerobic Exercise** Very light to moderate activity	· Pulse below 70% of max · Non-contact activity that increases in intensity and speed in 20-minute increments	· Able to talk when exercising, starting to sweat while monitoring symptoms (20-minute increments of walking, elliptical, stationary bike; NO lifting, NO contact) · Activity that does not result in more than a mild exacerbation of symptoms	_____ *student initials/date* _____ *monitor initials/date*
3	**Moderate Exercise**	· Heart rate up to 80% of max · Sport-specific training · Non-contact drills and activities at reduced speed · Moderate effort	· Running, change of direction, training drills, shooting, cones, jumping and sprints · Light to moderate lifting · Increased intensity and speed · Activities in 20-40 min. increments that do not result in an exacerbation of symptoms · Off to the side exercising during practice or event/class	_____ *student initials/date* _____ *monitor initials/date*
Step 4-6 should NOT begin until AFTER RESOLUTION of any symptoms, abnormalities in cognitive function and any other clinical findings related to the current concussion, including with and after physical exertion.				
4	**Full Speed**	· Non-contact training drills in team environment, multiplayer training · 100% effort · Non-contact sport practice/PE class	· High intensity, heavier lifting and more challenging sport specific drills at practice (dribbling, shooting, cones, jumping, sprints, etc.). · Full aerobic activity in 30-60 minutes of continuous movement · No game scrimmage or drills against other players. · No symptoms before, during or after exercise.	_____ *student initials/date* _____ *monitor initials/date*
5	**Full Speed**	· Full contact practice · Normal training activities and PE classes	· No symptoms before, during or after exercise · No competition game play at this stage	_____ *student initials/date* _____ *monitor initials/date*
6	**2nd Full Speed**	· Full contact practice · Normal training activities and PE classes	· No symptoms before, during or after exercise. · No competition game play at this stage.	_____ *student initials/date* _____ *monitor initials/date*
STOP until healthcare provider fills out Release to Participate Form. First GAME DAY PARTICIPATION must be a MINIMUM of 8 days from date of concussion injury.				
7	**Full Return to Play** - Game	· Fully cleared by health care provider to return to normal activity, full completion of RTP Protocol	· 100% effort · Game ready	_____ *ATC initials/date*

For more information and a listing of concussion-trained clinicians, go to logan.org/savethebrain or call the Concussion Clinic at (406) 758-7035.

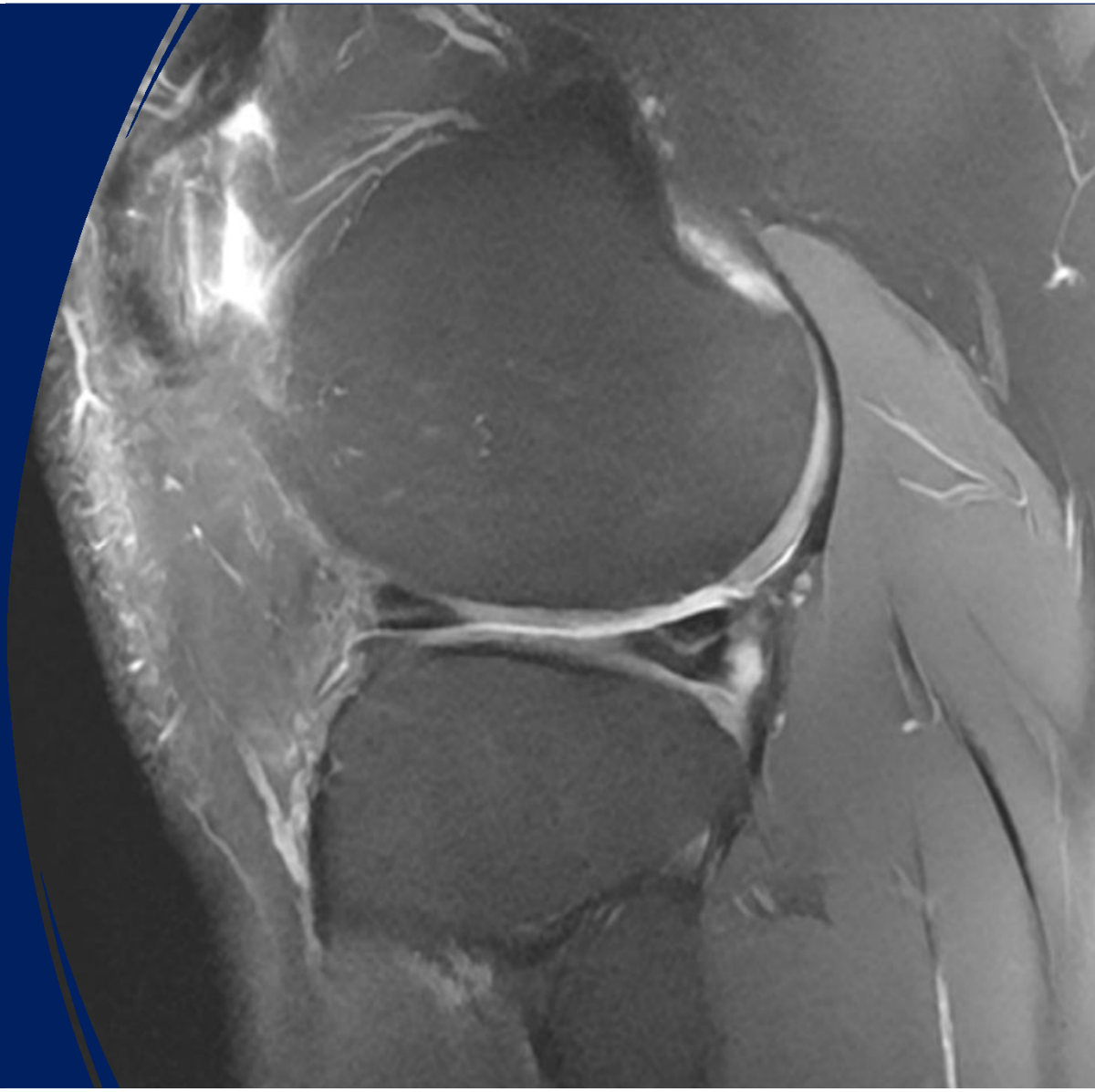
LOGAN HEALTH

Contusion

- Impact to soft tissue or bone (bruise)
- May discolor, become raised, tender
- Immediate ice and compression
- May return to sport immediately if function not compromised
- Temporary muscle weakness may require longer rest and rehab
- Custom padding for protection/prevention

Meniscus tear

- Fibrous cartilage shock absorber, distributes weight, assists w/ stability and movement of the knee
- Sudden twisting, pivoting, cutting for acute tear
- May have pop then pain, swelling, difficulty WB
- Instability or mechanical symptoms may be more severe tear
- X-ray if difficult to WB or impact injury

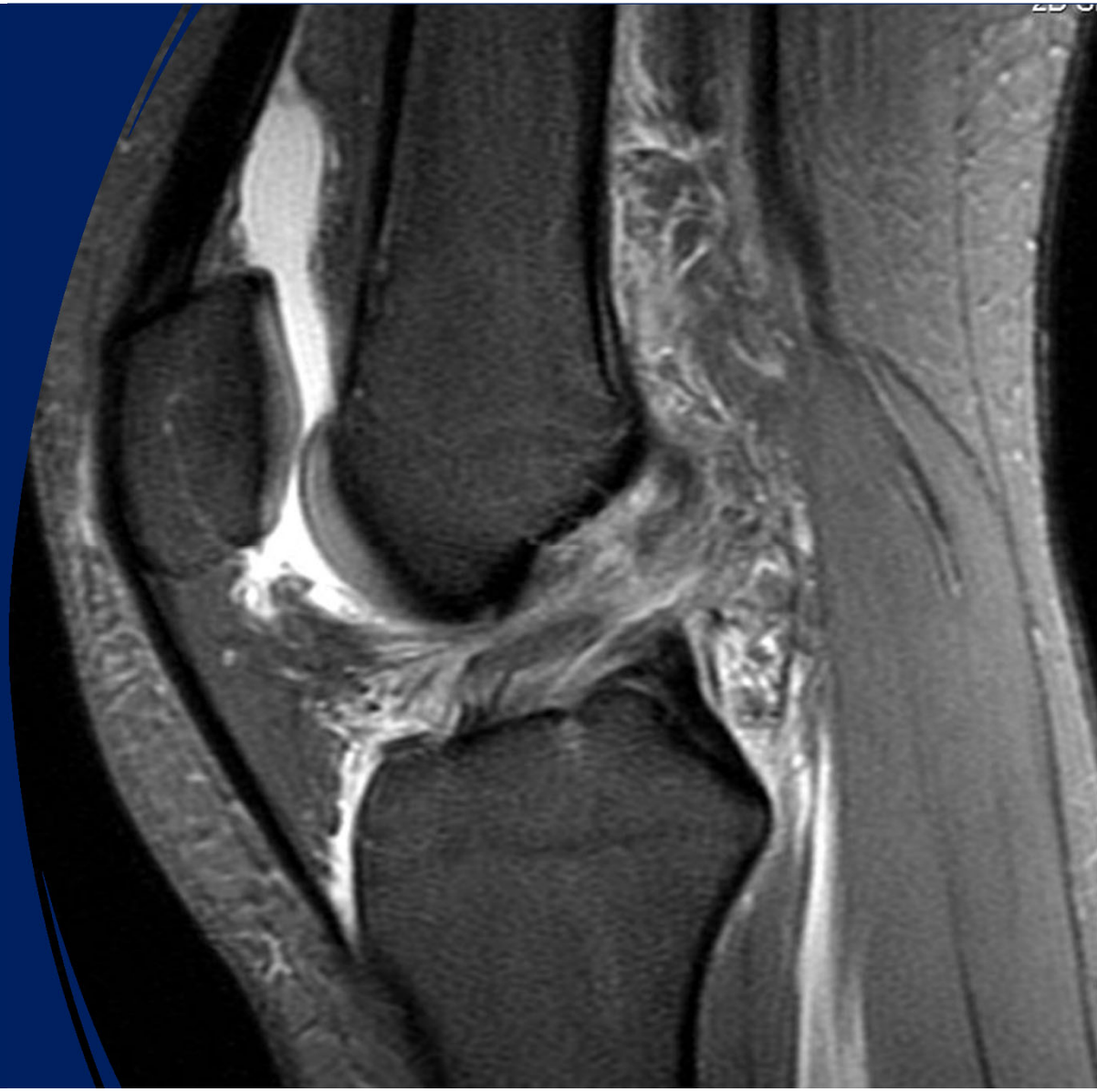


Meniscus tear

- RICE, then rehab
- Return to sport when able to perform sport-specific skills without pain, painless ROM, resolution of swelling, full strength
- Surgical if large tear, ongoing symptoms or failure to progress

Knee ligament tear

- Cruciate
- Collateral
- Strain/sprain



Ligament sprain

- RICE, then rehab
- Brace
- Return to sport when able to perform sport-specific skills without pain, painless ROM, resolution of swelling, full strength
- Surgical if instability or failure to progress

Shoulder dislocation

- First time vs recurrent
- Apprehension
- Brace
- Longer recovery 1st time

Fractures

- Splint then cast vs brace
- If able to protect w/ brace, may be able to return without surgery or postoperatively

Clinical examples

Questions?

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