

THE SHOW MUST GO ON GETTING BACK IN THE FIGHT AFTER CONCUSSION: APPLYING A SPORT SPECIFIC RETURN TO PLAY PROTOCOL FOR COMBAT SPORTS



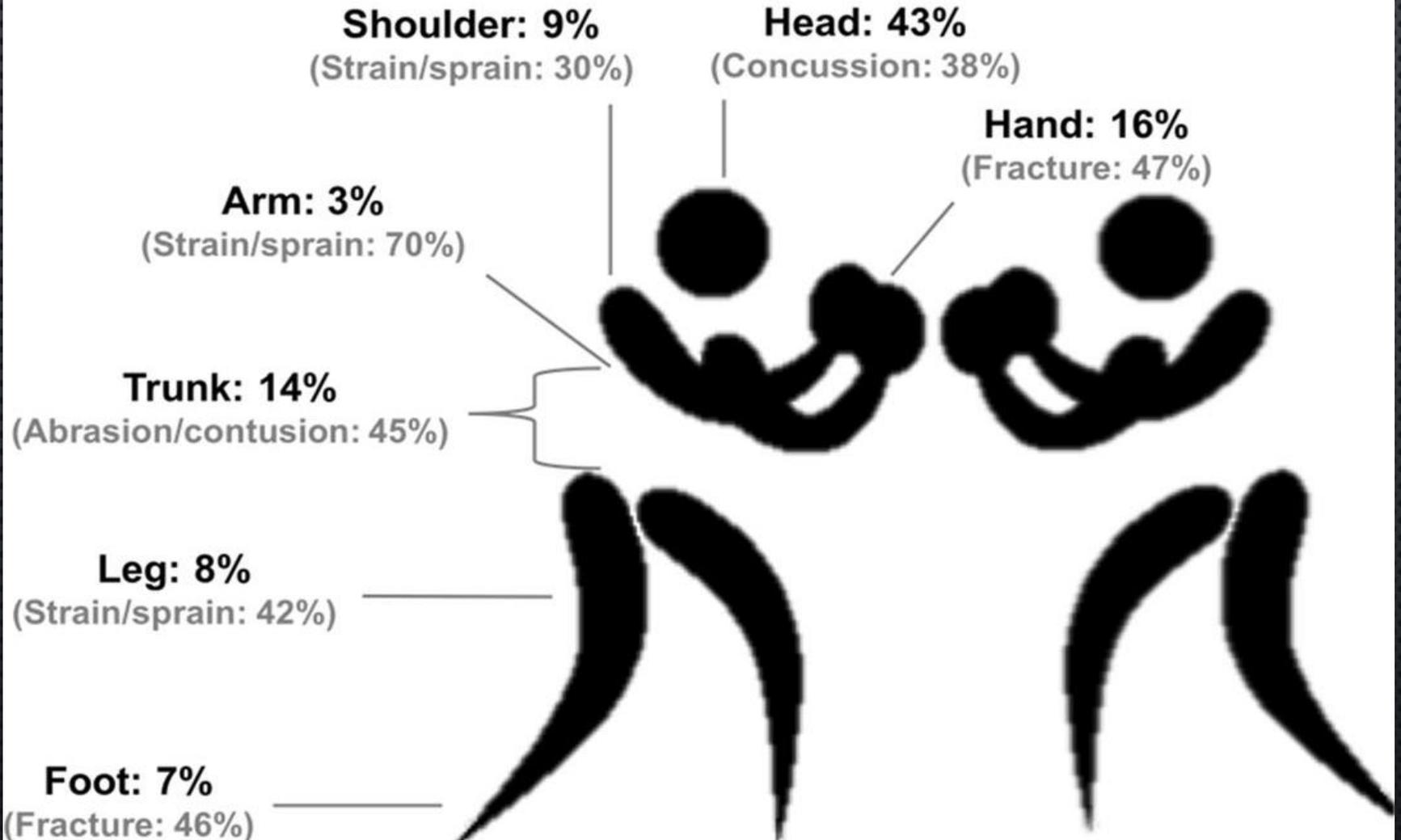
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MMA



THE INJURY

ROUND 2 OF UFC 197 PRELIMINARY CARD
LEE V ESCUDERO

BACKGROUND

- 30 Y/O MALE
 - 11-YEAR HISTORY AS A PROFESSIONAL MMA FIGHTER
 - WRESTLED AT THE HIGH SCHOOL AND COLLEGIATE LEVEL
- DATE OF INJURY: 4/23/16
 - MULTIPLE BLOWS TO THE LEFT SIDE OF HIS HEAD IN THE SECOND ROUND OF A THREE-ROUND FIGHT
 - FOUGHT TO THE COMPLETION OF THE BOUT
- NO REPORT/DISPLAY OF SIGNS/SYMPTOMS OF MTBI INITIAL POST FIGHT
 - NO LOC, NO AMNESIA
- SYMPTOM ONSET WAS 4 HOURS POST FIGHT
 - SYMPTOMS PERSISTED IN THE DAYS AFTER
- REPORTED CONCUSSION SYMPTOMS TO PROMOTION FIVE DAYS AFTER BOUT. REFERRAL WAS MADE TO MULTI-DISCIPLINARY CONCUSSION CENTER
- PAST MEDICAL HISTORY IS UNREMARKABLE

MEDICAL EXAM 1

10 DAYS POST INJURY

SUBJECTIVE REPORT

- HEADACHES
- DIZZINESS
- LIGHT/NOISE SENSITIVITY
- DROWSINESS
- NAUSEA DUE TO DIZZINESS
- BALANCE PROBLEMS
- IRRITABILITY
- MENTAL FOGGINESS
- BLURRED VISION

PHYSICAL EXAM POSITIVE FINDINGS

- SYMPTOMATIC VESTIBULAR OCULAR REFLEX (VOR) CANCELATION IN VERTICAL AND HORIZONTAL DIRECTIONS
- RHOMBERG
- BILATERAL OCCIPITAL NERVE TENDERNESS

* REFERRED TO VESTIBULAR THERAPY

VESTIBULAR PT INITIAL VISIT 13 DAYS POST INJURY

- POSITIVE RIGHT DIX-HALLPIKE
TEST FOR POSTERIOR CANAL
BENIGN PAROXYSMAL
POSITIONAL VERTIGO (BPPV)
- TREATED WITH REPOSITIONING
MANEUVER
- ATHLETE INSTRUCTED TO
REFRAIN FROM AEROBIC
EXERCISE TRAINING FOR THE
REST OF THE DAY

EFRAIN'S BPPV VIDEO GOES HERE



VESTIBULAR PT VISIT 2: 16 DAYS POST INJURY

- SENSORY ORGANIZATION TEST (SOT): WNL FOR AGE
- ATHLETE SPECIFIC HIGH LEVEL BALANCE TEST REVEALED ACCEPTABLE CONTROL AS MEASURED BY FORCE PLATE AND ERRORS COUNTED BY PT
- GAZE STABILITY TEST (GST)
 - LEFT: ≥ 150 D/SEC
 - RIGHT: 135 D/SEC



MEDICAL EXAM 2: 19 DAYS POST INJURY

SUBJECTIVE REPORT

- SYMPTOM FREE

CONCURRENT THERAPY

- VESTIBULAR PHYSICAL THERAPY

MEDICAL PLAN

- CLEARED TO CONTINUE INCREASING SUB SYMPTOM THRESHOLD EXERTION AS TOLERATED AND PER VESTIBULAR THERAPY PROGRESS.
- CLEARED TO BEGIN CLINIC FIGHT-SPECIFIC RETURN TO PLAY AT DIRECTION OF VESTIBULAR THERAPIST.



RETURN TO FIGHT PROTOCOL

Table 1. Return-to-fighting protocol.

PHASE I: Return to General Fitness		
Step 1	Light aerobic activity	Stationary biking, elliptical, incline walking; gradually escalating heart rate and monitoring through perceived exertion and/or HRM
Step 2	Moderate aerobic activity	Jogging, swimming, weightlifting; escalating heart rate to moderate and high-demand activity; HRM or perceived exertion; assess high-level vestibular functioning
Step 3	Sport-specific activity	Sprinting, mitts, bag/footwork, walk-through grappling, etc.; increasing duration; no partner work
PHASE II: Return-to-Fighting Activities		
Step 1	Bag/mitt work with movement	
Step 2	Shadow boxing/drills	
Step 3	One-sided sparring	
Step 4	Sparring – short duration	
Step 5	Sparring – long duration	
Step 6	Sparring – sport specific	
PHASE III: Return to Full Contact Sport Activity		

HRM: heart rate monitor.

Nalepa et al (2017)

Table 2 Return to fighting protocol

Phase 1: return to general fitness		
Step 1	Light aerobic activity	Stationary biking and elliptical, incline walking; gradually escalating heart rate and monitoring through perceived exertion and/or HRM.
Step 2	Moderate aerobic activity	Jogging, swimming; escalating heart rate to moderate and high-demand activity through HRM or perceived exertion; assess high-level vestibular functioning.
Step 3	Sport-specific activity	Sprinting, mitts, bag/footwork, walk-through grappling and so on; increasing duration; no partner work. Begin resistance training.
Phase 2: return to non-contact fighting activities		
Step 1	Bag/mitt work with movement	Tests fighter ability to punch and/or kick in multiple planes while testing vestibular and visual systems.
Step 2	Shadow boxing/drills	Reintroduces fighter to sport environment and re-establishes footwork in ring parameter and surface.
Step 3	One-sided sparring and grappling	Fighter begins to spar without the concern of contact. Reacts to opponent's movements and begins to get timing back for punches, kicks and body position.
Phase 3: return to contact/sparring fighting activities		
May only advance to this phase when concussion symptoms have completely resolved		
Step 1	Sparring: short duration	First step of live sparring. Rounds of short duration with long breaks. Number of rounds is small to begin with and then can increase as tolerated.
Step 2	Sparring: longer duration	Rounds at this step begin to lengthen in duration while breaks between rounds shortens. Number of rounds can also increase as fatigue allows.
Step 3	Sparring: normal parameters	Full return to normal training. Return to normal rounds and time limits based on sport and next potential bout. Fighter should be able to tolerate normal parameters of training/sparring and is training as normal without a return of symptoms.

An initial period of 1 week should occur prior to beginning phase 1.

*Adapted from Nalepa et al.³²

Neidecker et al (2018)

VESTIBULAR PT VISIT #3

21 DAYS POST INJURY

SERIAL GST

- FIGHTER CHOOSES A SPEED TO RUN ON A TREADMILL FOR 5 MINUTES AND REPEAT FOR UP TO 5 ROUNDS
- SPEED SHOULD BE FAST ENOUGH TO EVOKE A FEELING OF FATIGUE SIMILAR TO THE END OF A CORRESPONDING BOUT OF A FIGHT

	LEFT (DEG/SEC)	RIGHT (DEG/SEC)
Test	275	235
Retest	285	245
After First Run	280	270
2nd Run	230	175
3rd Run	240	240
4th run	185	200
5th run	235	170

ONSITE SPARRING RESULTS 28 DAYS POST INJURY

GST	LEFT	RIGHT (D/SEC)
AFTER 1 ROUND	275	235
AFTER 2 ROUNDS	255	265

BALANCE TEST WAS DONE BEFORE SPARRING WITH NO SIGNIFICANT DIFFERENCE FROM TEST COMPLETED IN CLINIC



DID THE SHOW GO ON???

**YES!!!! FIGHTER COMPETED AGAIN IN
SEPT 2016 AND WON ON DECISION**

TAKEAWAYS

- CONCUSSION IS A MANAGEABLE INJURY WITH TREATABLE SYMPTOMS
- VESTIBULAR REHABILITATION MAY LEAD TO IMPROVED PERFORMANCE
- STEPHENSON AND ROSSHEIM (2018) REPORTED THAT 43% OF INJURIES EVALUATED IN MMA WERE RELATED TO HEAD TRAUMA
- REPORTING IS STILL THE CHALLENGE WITH THIS POPULATION – CONTINUE TO EDUCATE ATHLETES THAT CONCUSSIONS SHOULD BE MANAGED NOT ENDURED WITHOUT TREATMENT
- IN OUR CASE – ATHLETE WAS NEVER FULLY CLEARED – SINCE IT WAS NOT REPORTED OR FOUND AT RINGSIDE, THERE WERE NO FORMAL CLEARANCES NEEDED FOR ATHLETE TO RETURN TO COMPETITION
- CONTINUE TO REFINE MEDICAL SUSPENSIONS-- DETERMINATION AND POTENTIAL ENFORCEMENT BEYOND RINGSIDE EVALUATION
- STUDY THE INCIDENCE OF CONCUSSION IN TRAINING – NOT JUST COMPETITION
 - OUR FIGHTER'S SPARRING PARTNER FOR THE ONSITE VISIT WAS CONCUSSED DURING THAT TRAINING AND PRESENTED TO OUR CLINIC A FEW MONTHS LATER FOR TREATMENT
- CONTINUE PUSH FOR BASELINE TESTING – COGNITIVE, BALANCE AND VISION

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QUESTIONS??



THANK YOU!!!



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