SDC 3 - Table - Characteristics of included studies

First author, year, country.	Participants N (N women) Age Phase: acute or persistent	Intervention, Comparison, frequency, duration	Outcome Measures	Reported results (from the study authors and from the Meta-analysis)
Maerlender et al. 2015 (35) USA	**Total:** N= 28 (20 women) **Intervention group:** N= 13 (8 women) **Control group:** N= 15 (12 women) **Age:** College athletes (no specific age group reported) **Phase:** Acute SRC	**Intervention:** Schwinn Airdyne stationary Bicycle at a perceived exertion level of mild to moderate (0 to 6 on 10-point RPE scale) for 20 minutes or until symptoms became uncomfortable **Comparison:** Rest (no physical or mental exertion) **Frequency:** Daily **Duration:** Daily follow-up until symptoms-free. The maximum duration is unknown.	**Primary:** Time to recovery (days) **Secondary:** Time to recovery (subgroup with 2 weeks cutoff) ImPACT Actigraph Symptoms change after bike ride.	**Time to recovery [median number of days (range)]:** Intervention: [15 (5 – 61)] Control: [13 (6 – 56)] No statistically significant difference between groups **ImPACT:** No statistically significant difference between groups for all measures of the impact test **Other secondary outcome measures:** NR

		Timing: Exercise program began after randomization.		
Thomas et al. 2015 (34) USA	**Total:** N= 99 (16 women) **Intervention group:** N= 50 (18 women) **Control group:** N= 50 (18 women) **Age:** 11-22 years old **Phase:** Acute SRC	**Intervention:** 1-2 days of rest followed by stepwise return to physical and mental activities **Comparison:** Strict rest for 5 days followed by stepwise return to physical and mental activities **Frequency:** Daily (starting after 2 days in the intervention group and 5 days in the Control group) **Duration:** A total of 10 days **Timing:** Initiation of stepwise physical activation was allowed 24h-48h post-injury.	**Primary:** PCSS (19 symptoms version); ImPACT. **Secondary:** BESS; Subjects experiencing symptom resolution	**PCSS at the end of study mean (SD):** Intervention: 8 (13.00) Control: 13 (14.99) No statistically significant difference between groups **Total PCSS scores over the 10 days:** Control: 187.9 Intervention:131.9 Statistically significant difference favoring Intervention group (P<0.03) **Number of symptoms over the 10 days:** Control: 70.4 Intervention: 50.2 Statistically significant difference favoring Intervention group (P<0.03) **BESS** (Mean and 95%CI):

				Intervention: 19 (15.9 – 22.1) Control: 21 (18.4 – 23.6) No statistically significant difference between groups **ImPACT**: No statistically significant difference between groups for all measures of the impact test
Kurowski et al. 2017 (38) USA	**Total:** N= 30 (17 women) **Intervention group:** N= 15 (10 women) **Control group:** N= 15 (7 women) **Age:** 12-17 years old **Phase:** Persistent symptoms after SRC (4 to 6 weeks)	**Intervention:** Sub-symptom exacerbation aerobic training (80% of time) on stationary bike during follow-up visits (mean 4.42) with an intensity target of 11-16 on Borg scale (weekly assessment) for a maximum of 30 minutes. **Comparison:** full body stretching (program rotated every 2 weeks with a follow-up every week). **Frequency:** 5-6 days/week at home **Duration:** A total of 6 weeks (2	**Primary:** PCSI (self-rating) **Secondary:** PCSI (parent-rated) Adherence	**PCSI at the end of study mean** (SD): Intervention: 4.17 (7.36) Control: 15.93 (20.18) Statistically significant difference favoring Intervention group (P<0.044). Largest difference was at 4 weeks (ES: 0.81 (large)) **Number of subjects having symptoms** Intervention: 6/15 Control: 13/15 Statistically significant difference favoring Intervention group

		additional weeks if symptoms persist). **Timing:** Exercise program began one week after randomization.		
Chan et al. 2018 (39) Canada	**Total:** N= 19 (14 women) **Intervention group:** N= 9 (8 women) **Control group:** N= 10 (6 women) **Age:** 12-18 years old **Phase:** Persistent symptoms after SRC (more than 4 weeks)	**Intervention:** active rehab program consisting of: 1.- Sub-Symptoms threshold aerobic training for up to 15 minutes 2.- Coordination ex's 3.- Visualisation/imaging with physio 4.- home ex's program 5.- Symptoms-management and RTP advice, RTS facilitation, physiatry consultation if needed **Comparison:** Symptoms-management and RTP advice, RTS facilitation, physiatry consultation **Frequency:** 2-5 visits (mean 3,4)	**Primary:** PCSS (8 times over 6 weeks) **Secondary:** Recorded adverse events and exacerbation of Symptoms during aerobic training BESS ImPACT BDI PROMIS	**PCSS at the end of study [mean (SD)] :** Intervention: 51.5 (27.8) Control: 40.3 (29.4) Statistically significant difference favoring Intervention group (P<0.047) **BESS [mean (SD)] :** Intervention: 10.3 (3.2) Control: 11.4 (7.4) No statistically significant difference between groups **ImPACT:** No statistically significant difference between groups for all measures of the impact test **BDI:** No statistically significant difference between groups **PROMIS:**

		Duration: A total of 6 weeks **Timing:** Exercise program began within one week after randomization.		No statistically significant difference between groups for all measures of the PROMIS test
Micay et al. 2018 (40) Canada	**Total:** N= 16 (1 woman) **Intervention group:** N= 8 (0 women) **Control group:** N= 8 (1 woman) **Age:** 14-18 years old **Phase:** Acute SRC (6 days)	**Intervention:** Stationary cycle ergometer at 50% to 70% of age-predicted maximal heart rate (Increasing gradually through the study period); first session duration 10 minutes, all other sessions 20 minutes. **Comparison:** gradual return to activity using the six-stage progression of Berlin 2016 Guidelines **Frequency:** 1 session per day for 2 days in a row followed by 1 day of rest **Duration:** A total of 11 days **Timing:** Exercise program began on day 6 following the injury.	**Primary:** PCSS Time to medical clearance (in days)	**PCSS at the end of study [mean (SD)] :** Intervention: 4.3 (4.1) Control: 10 (6.1) **Time to medical clearance [mean (SD)] :** Intervention: 36.1 (18.5) Control: 29.6 (15.8) No statistically significant difference between groups

Bailey et al. 2019 (37) USA	**Total:** N= 16 (7 woman) **Intervention group:** N= 7 (N women NR) **Control group:** N= 9 (1 woman) **Age:** 14-18 years old **Phase:** Persistent symptoms after SRC (mean 56 days)	**Intervention:** intensive PT treatment consisting of a 20 minutes subthreshold ex's program (HR 80% of Symptoms exacerbation threshold) combined with education session **Comparison:** light exercises (1st 3 weeks:5 daily stretching activity and last 3 weeks: 20 min of daily walking) **Frequency:** 3X20min/week + home based daily **Duration:** A total of 6 weeks **Timing:** Exercise program began immediately after randomization.	**Primary:** PCS-R **Secondary:** BDI BESS ImPACT	**PCS-R at the end of study [mean (SD)] :** Intervention: 18.17 (16.45) Control: 16.38 (19.23) No statistically significant difference between groups **PCS-R at the end of study [Mean and (SD)] when removing influence of depression*:** Intervention: 63.3 (17.4) Control: 56.8 (27.8) Statistically significant difference favoring Intervention group ($P<0.05$), large effect $n^2=0,32$ *Removed outlier who showed no improvement (higher depression Symptoms at baseline) **Other secondary outcome measures:** NR
Leddy et al. 2019 (36) USA	**Total:** N= 113 (48 woman) **Intervention group:** N= 52 (24 women)	**Intervention:** Sub-Symptoms threshold exercises (no stretching): bike or treadmill 80% of HR target. Max 20 min or until exacerbation of 2 points on	**Primary:** Days to recovery since date of injury	**PCSS at the end of study [mean (SD)] :** Intervention: 1.08 (3.91) Control: 5.47 (16.34) Significance not reported

	Control group: N= 51 (24 women) **Age:** 13-18 years old **Phase:** Acute SRC	symptoms score. **Comparison:** rest plus whole body stretching 20 min/daily **Frequency:** Daily **Duration:** maximum of 30 days or until symptoms resolution (whichever came first). **Timing:** Exercise program began 48h post-injury.	**Secondary:** PCSS BCTT	**Time to recovery [median number of days (Interquartile range)]** Intervention: 13 (10 - 18,5) Control: 17 (13 - 23) Statistically significant difference favoring Intervention group (P<0.009) **BCTT at the end of study:** NR

Abbreviations and outcomes: N= number of participants, SRC=Sport-related concussion, NR=Not reported, ImPACT: Immediate post-concussion assessment and cognitive testing, BDI: Beck depression inventory, Actigraph: wearable activity and sleep monitor, PCSS=Post-concussion symptoms scale, PSCI=Post-concussion symptoms inventory, PCS-R=Post-concussive scale-Revised, BESS=Balanced error scoring system, BCTT=Buffalo concussion treadmill test, PROMIS= Patient-Reported Outcomes Measurement Information System, pediatric short forms, SD=Standard deviation, CI=Confidence Interval.