

Online resource 5. Meta-analyses and forest plots of risk factors for graft rupture

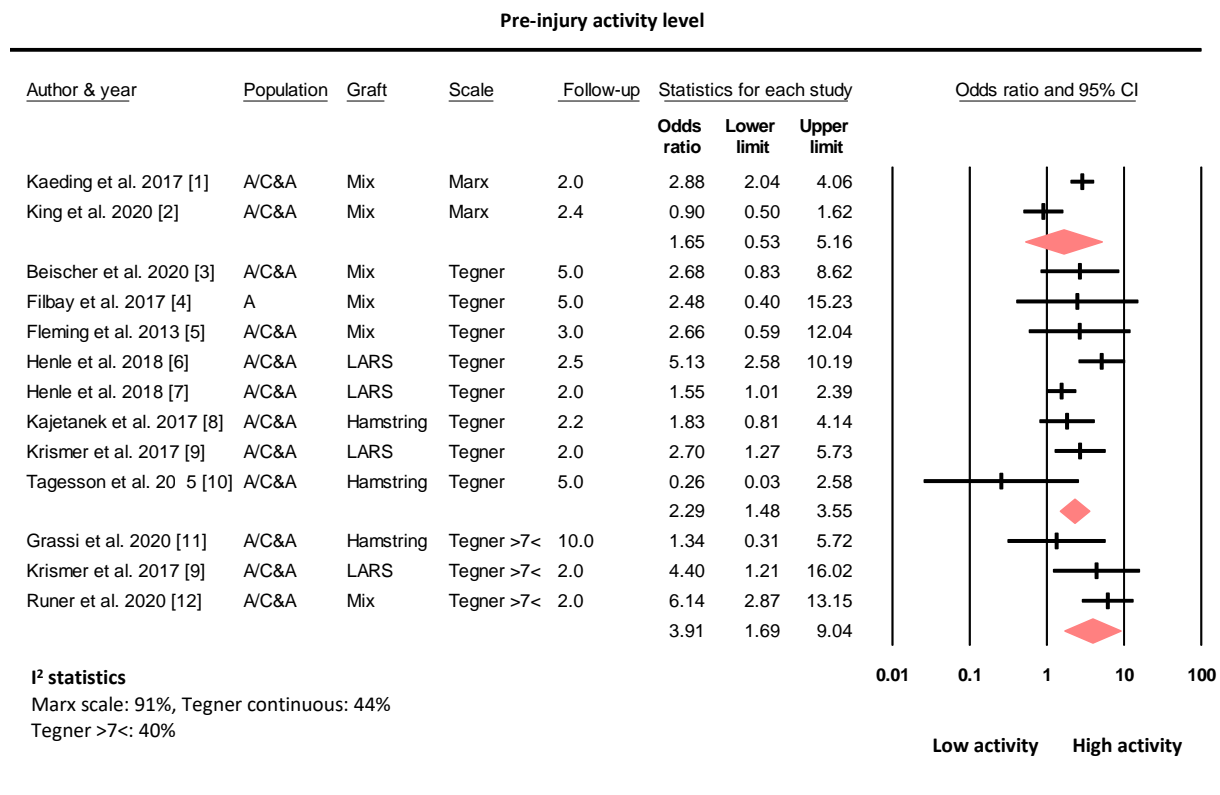
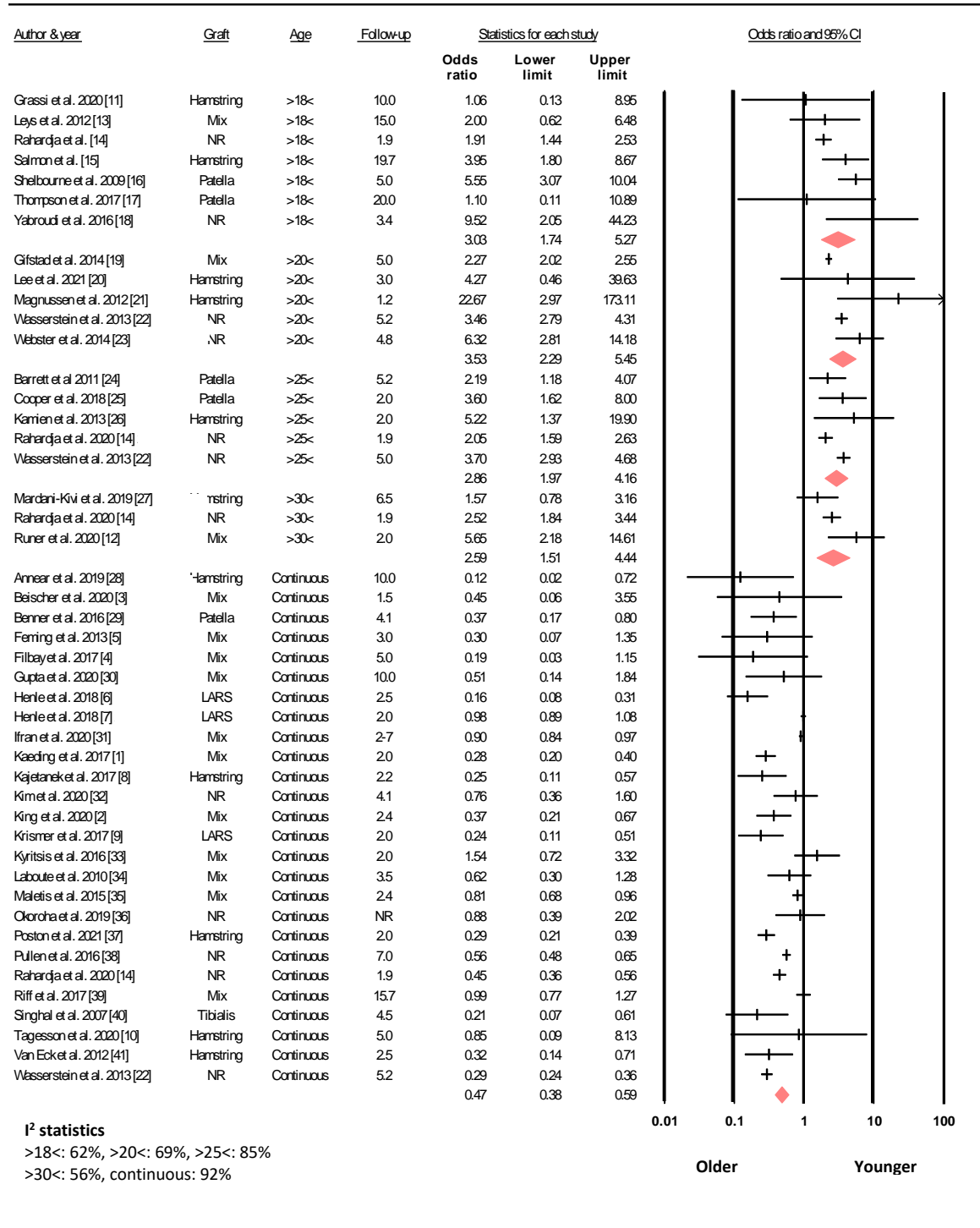


Figure 1. Meta-analysis on the association between pre-injury activity level and graft rupture (Marx scale; graft ruptures n = 150, controls n = 3310), (Tegner scale continuous; graft ruptures n = 109, controls n = 1379), (Tegner scale >7<; graft ruptures n = 71, controls n = 1162). A = adults, C&A = children/adolescents, Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, Follow-up = years.

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Age



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Figure 2. Meta-analysis on the association between age and graft rupture (>18<; graft ruptures n = 413, controls n = 9318), (>20<; graft ruptures n = 1579, controls n = 57615), (>25<; graft ruptures n = 697, controls n = 21368), (>30<; graft ruptures n = 329, controls n = 8936), (continuous; graft ruptures n = 2450, controls n = 66451). Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, Follow-up = years.

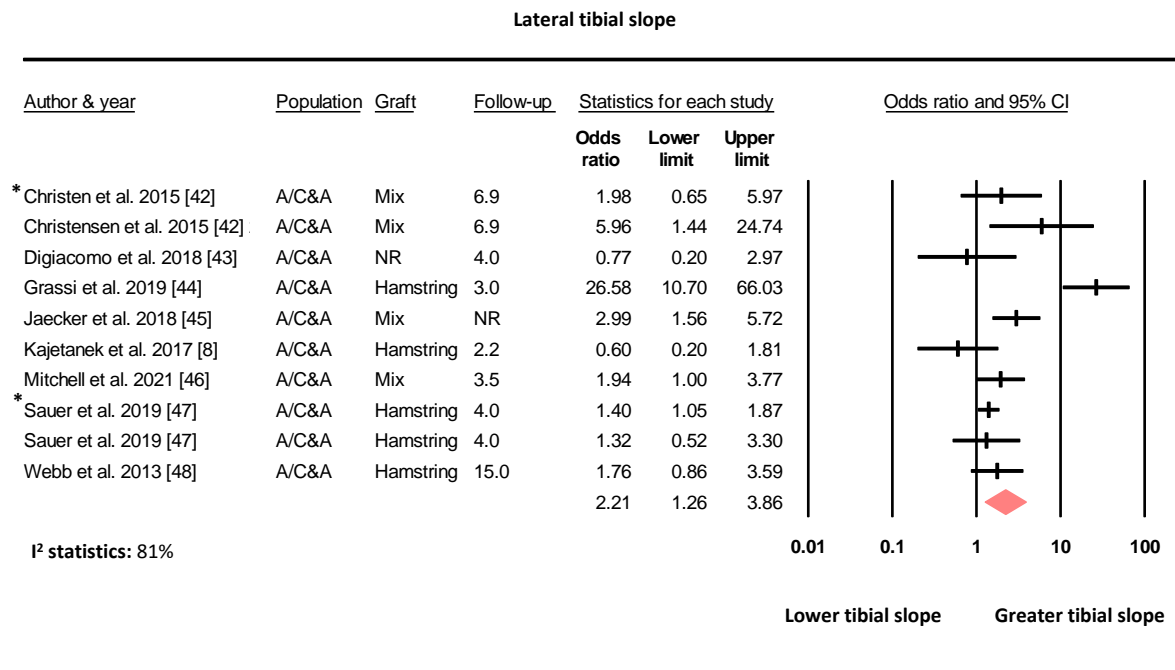


Figure 3. Meta-analysis on the association between lateral tibial slope and graft rupture (graft ruptures n = 311, controls n = 545). A = adults, C&A = children/adolescents, NR = not reported, Mix = mix of different grafts, PTS = posterior tibial slope, Follow-up = years,*Christenssen et al. reported the result for two cohorts (men vs women) and Sauer et al reported the result for two cohorts with two types of graft positioning.

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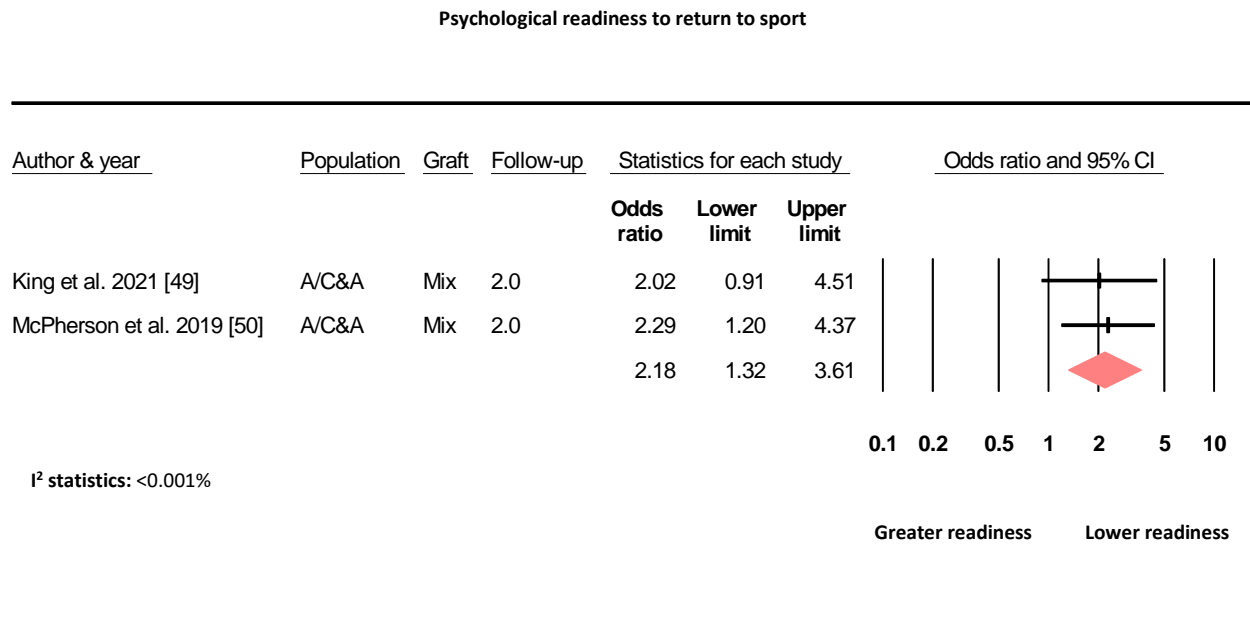


Figure 4. Meta-analysis on the association between psychological readiness to return to sport and graft rupture (graft ruptures n = 65, controls n = 352). A = adults, C&A = children/adolescents, Mix = mix of different grafts, Follow-up = years.

Timing of surgery

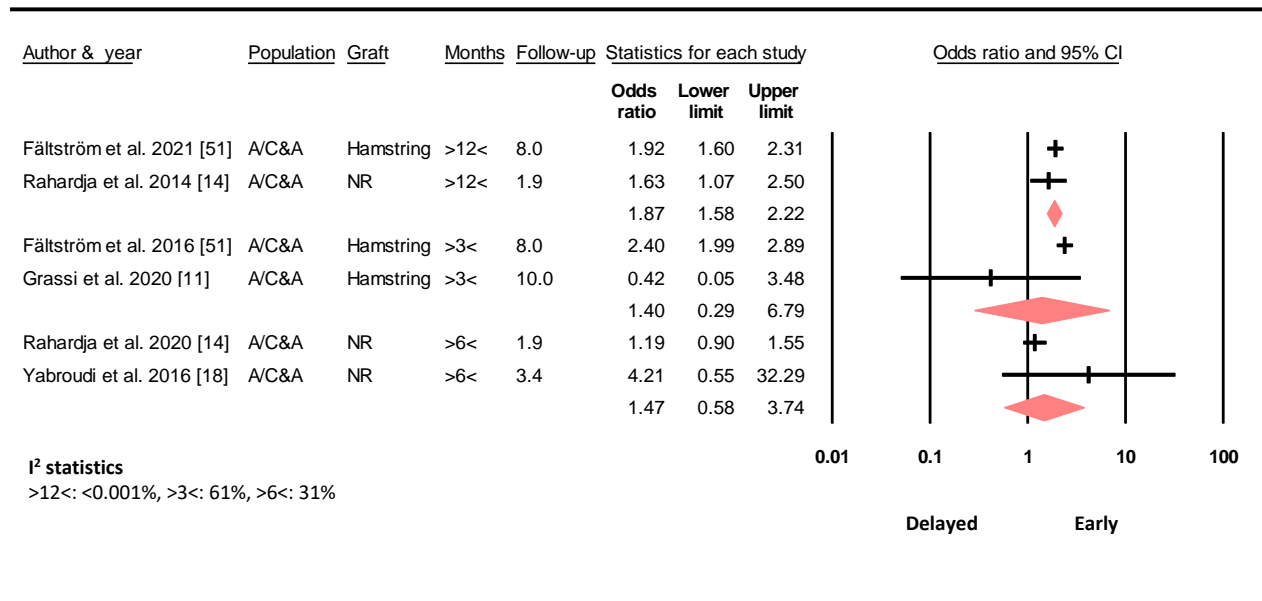


Figure 5. Meta-analysis on the association between timing of surgery and graft rupture (>12 months<; graft ruptures n = 910, controls n = 24091), (>3 months<; graft ruptures n = 661, controls n = 17853), (>6 months<; graft ruptures n = 278, controls n = 7357). NR = not reported, A = adults, C&A = children/adolescents, Follow-up = years.

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Return to pre-injury activity level

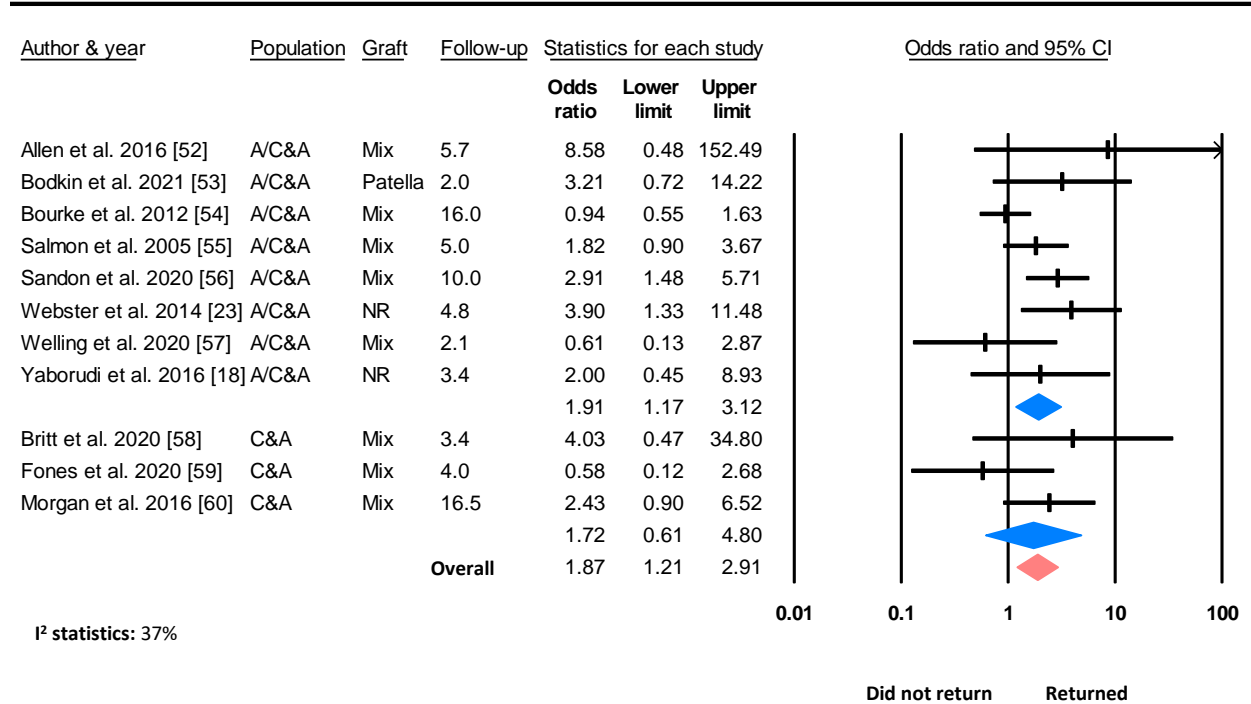


Figure 6. Meta-analysis on the association between return to pre-injury activity level and graft rupture (graft ruptures n = 302, controls n = 3224). NR = not reported, A = adults, C&A = children/adolescents. Blue color = sub group total, pink color = Overall, irrespective of subgroup

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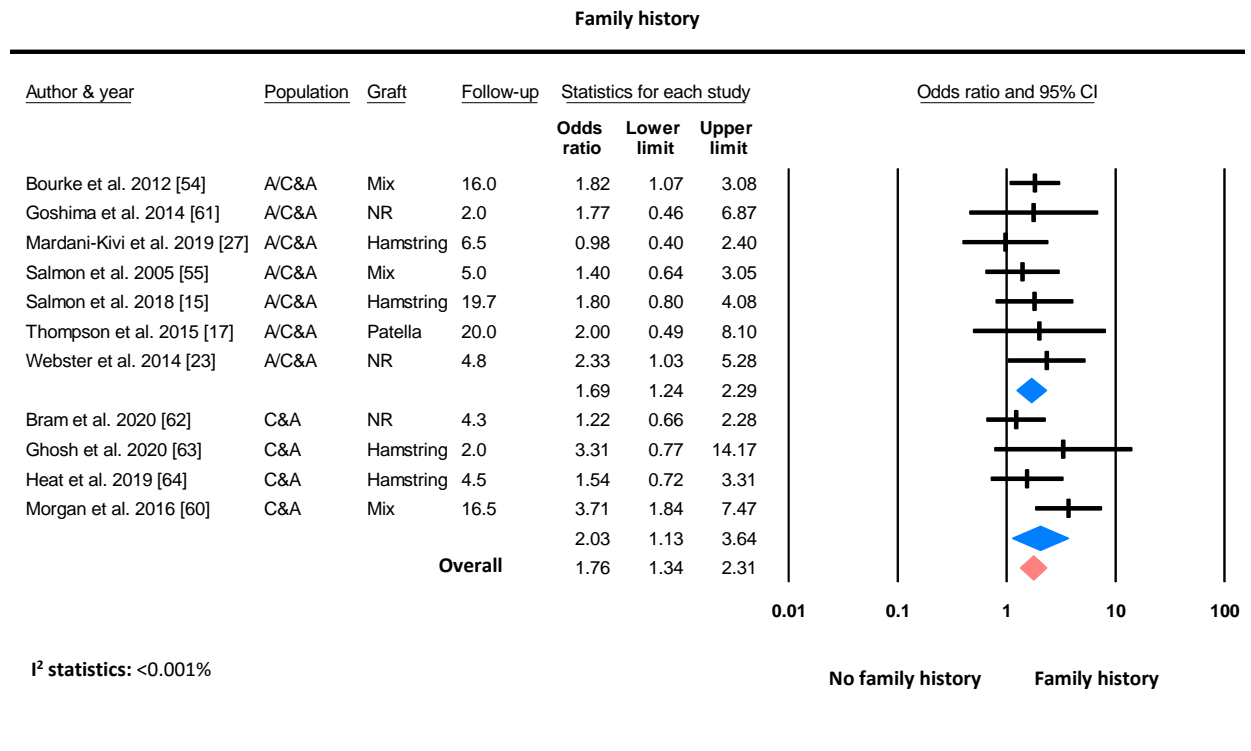


Figure 7. Meta-analysis on the association between family history and graft rupture (graft ruptures n = 357, controls n = 3837). ACL = anterior cruciate ligament, NR = not reported, Mix = mix of different grafts, A = adults, C&A = children/adolescents. Blue color = sub group total, pink color = overall, irrespective of subgroup

KOOS

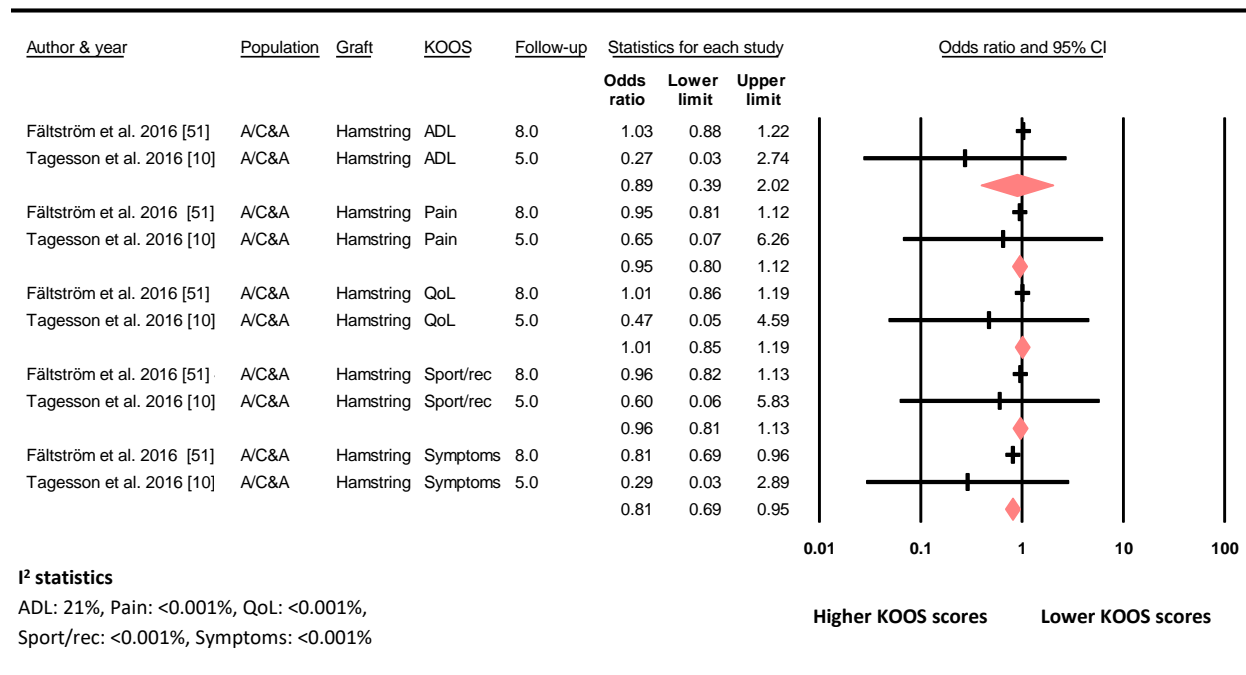


Figure 8. Meta-analysis on the association between Knee injury and Osteoarthritis Outcome Scores (KOOS) and graft rupture (graft ruptures n = 486, controls n = 13207). ADL=Activity of Daily Living, QoL=Quality of Life, A = adults, C&A = Children/adolescents, Follow-up = years

Concomitant cartilage injury

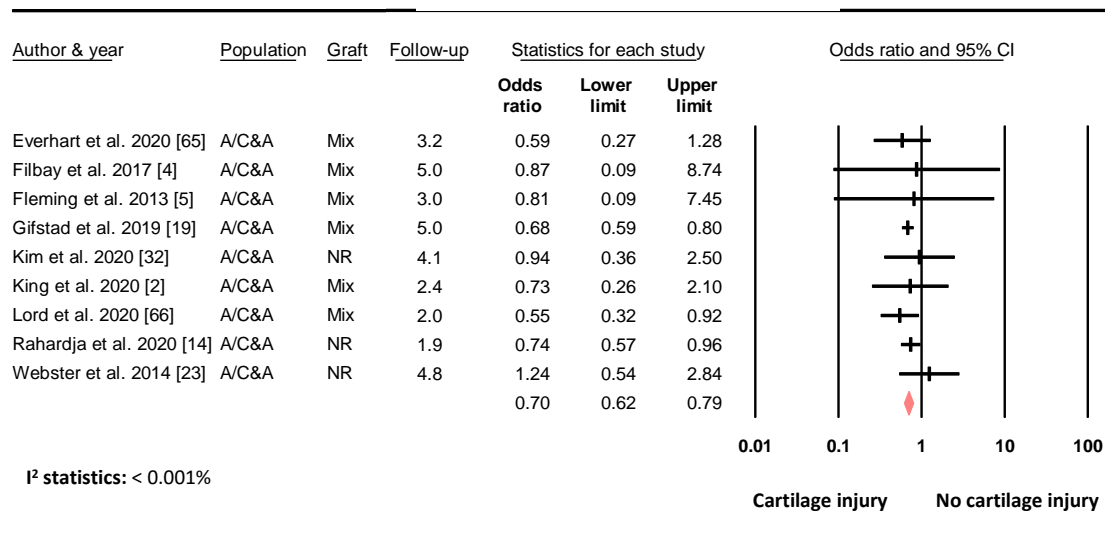
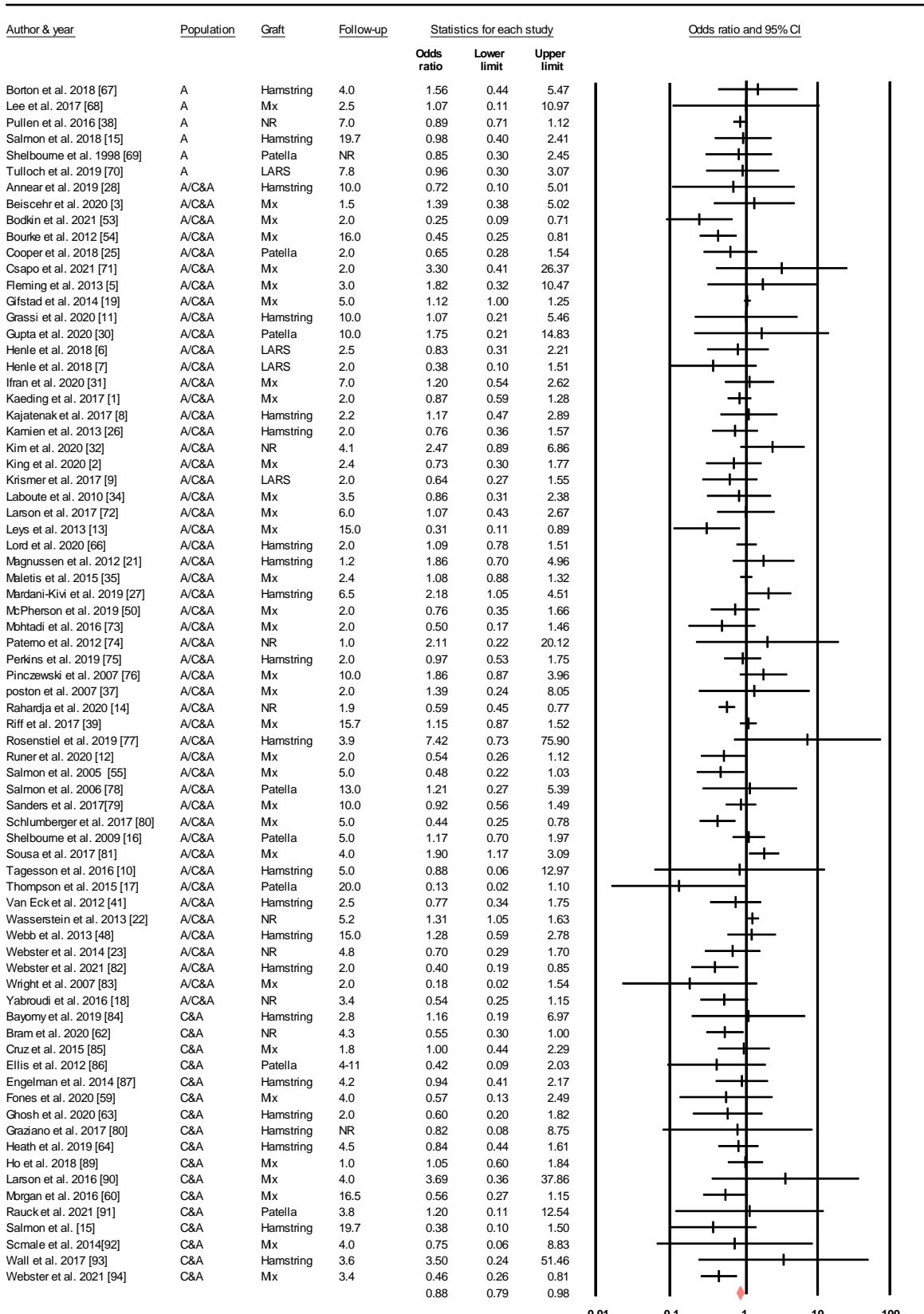


Figure 9. Meta-analysis on the association between concomitant cartilage injury and graft rupture (graft ruptures n = 1740, controls n = 62038). NR = not reported, Mix = mix of different grafts, A = adults, C&A = children/adolescents, Follow-up = year

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Sex



I² statistics: 42%

Women Men

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Figure 10. Meta-analysis on the association between sex and graft (graft ruptures n = 4817, controls n = 128 377). NR = not reported, Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, A = adults, C&A = children/adults, Follow-up = years.

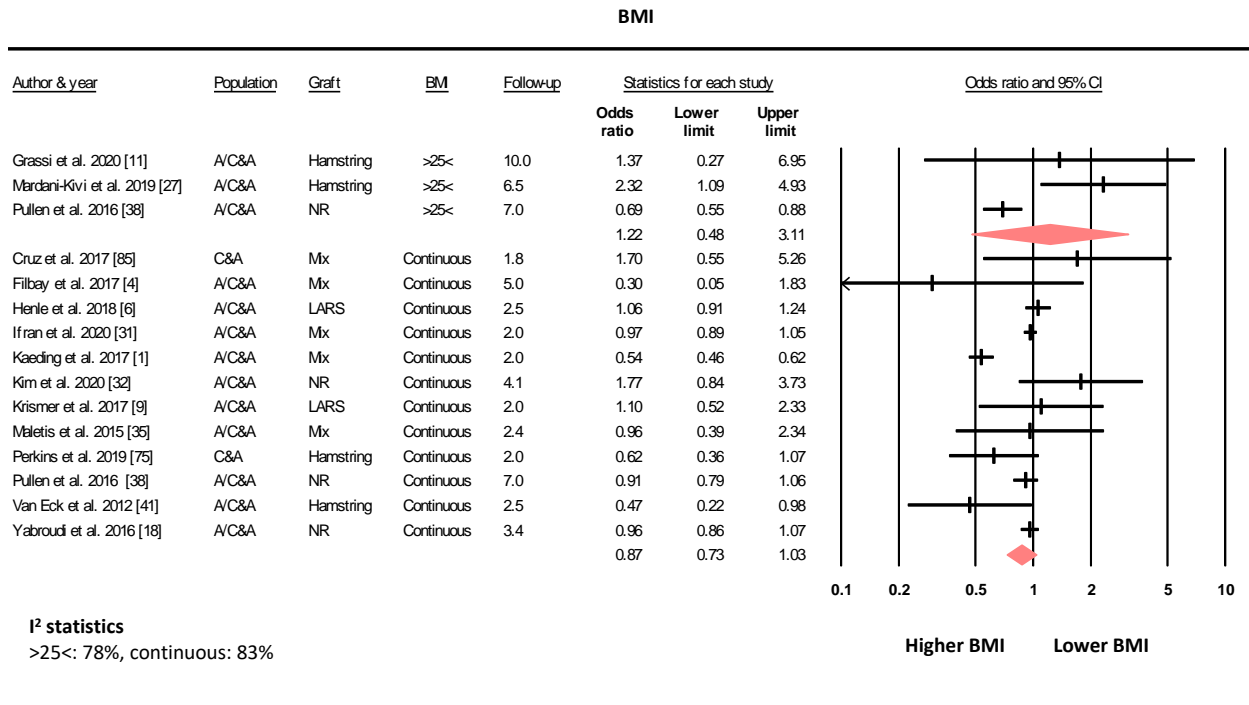


Figure 11. Meta-analysis on the association between Body Mass Index (BMI) and graft rupture. ≥25 vs. <25 (graft ruptures n = 664, controls n = 17595), continuous: (graft ruptures n = 1740, controls n = 62038). NR = not reported, Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, A = adults, C&A = children/adolescents, Follow-up = years.

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Smoking status

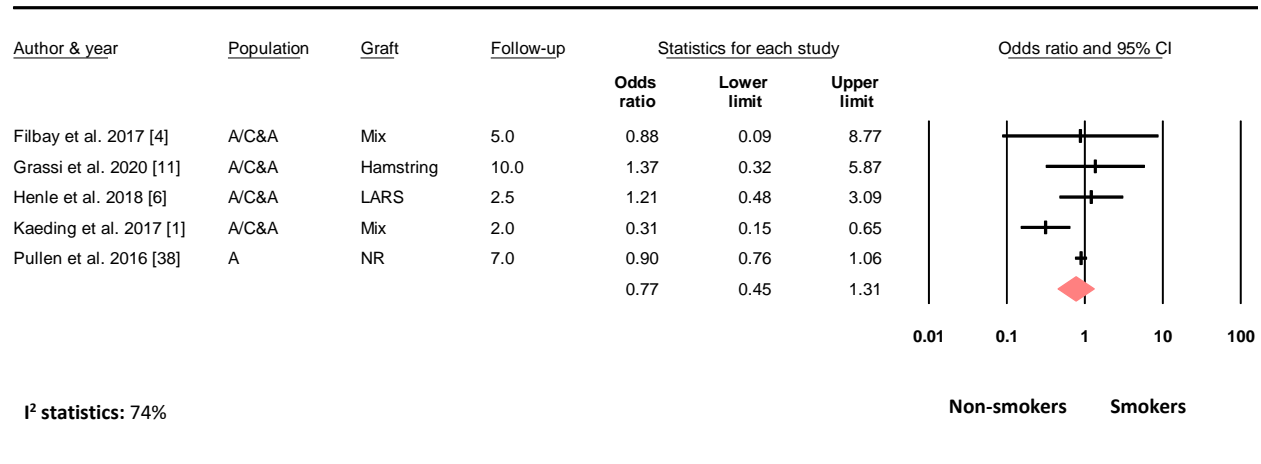


Figure 12. Meta-analysis on the association between smoking status and graft rupture (graft ruptures $n = 741$, controls $n = 9969$). NR = not reported, Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, A = adults, C&A = children/adolescents, Follow-up = years.

Injury mechanism

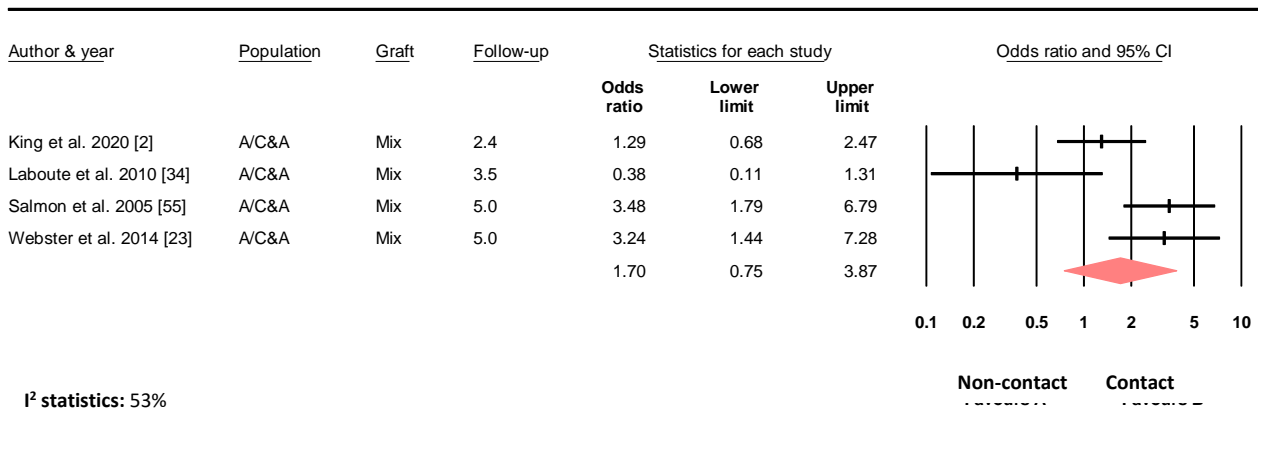


Figure 13. Meta-analysis on the association between injury mechanism and graft rupture (graft ruptures $n = 123$, controls $n = 2647$). Mix = mix of different grafts, A = adults, C&A = children/adolescents, Follow-up = years.

Medial tibial slope

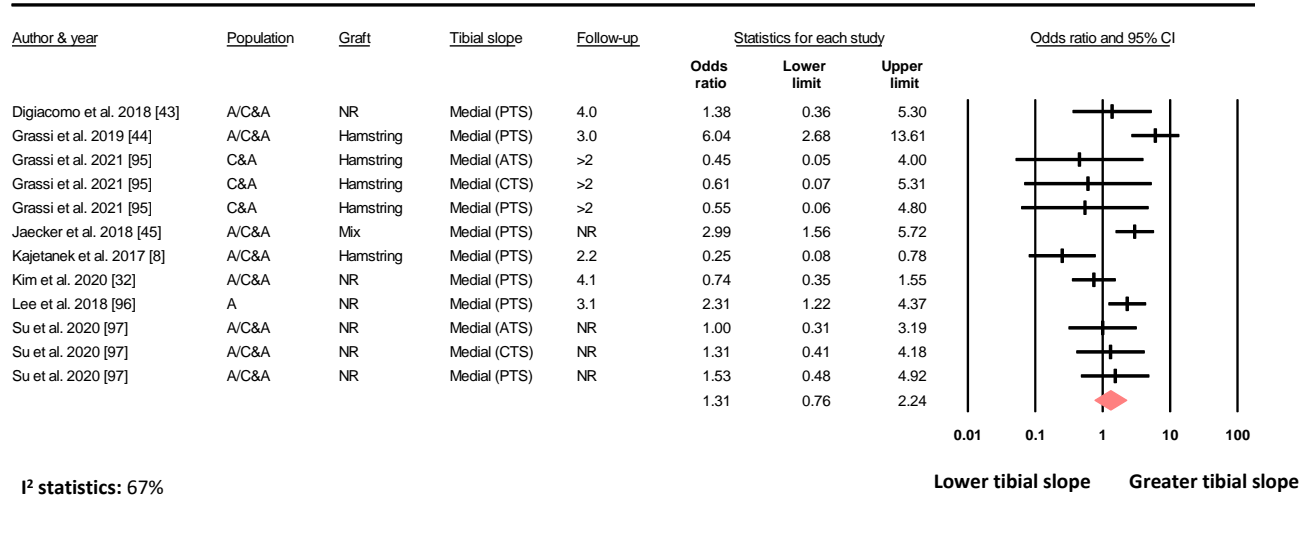


Figure 14. Meta-analysis on the association between medial tibial slope and graft rupture (graft ruptures n = 123, controls n = 2647). NR = not reported, Mix = mix of different grafts, PTS = posterior tibial slope, ATS = anterior tibial slope, CTS = central tibial slope, A = adults, C&A = children/adolescents, Follow-up = years.

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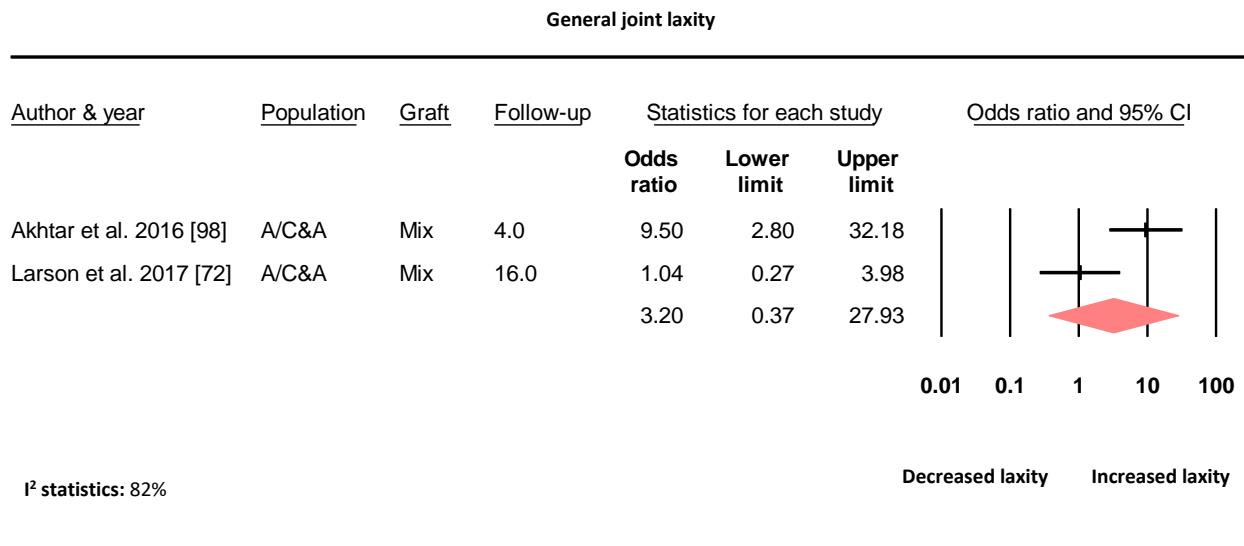


Figure 15. Meta-analysis on the association between general joint laxity and graft rupture (graft ruptures n = 57, controls n = 309). Mix = mix of different grafts, A = adults, C&A = children/adolescents, Follow-up = years.

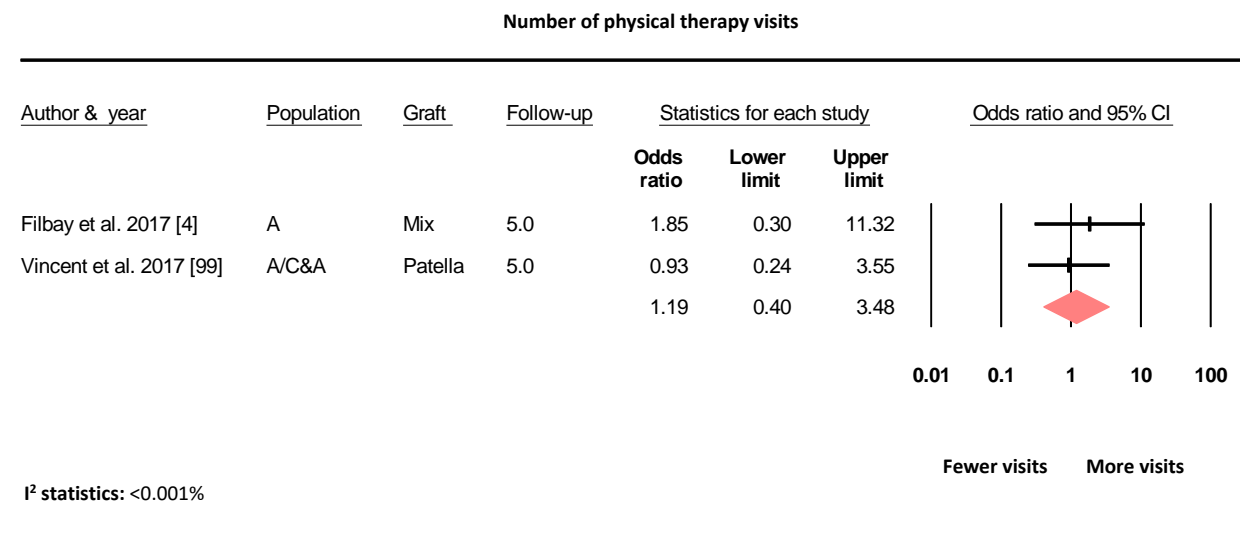


Figure 16. Meta-analysis on the association between the number of physical therapy visits and graft rupture (graft ruptures n = 13, controls n = 142). A = adults, C&A = children/adolescents, Mix = mix of different grafts, Follow-up = years.

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Timing of return to sport

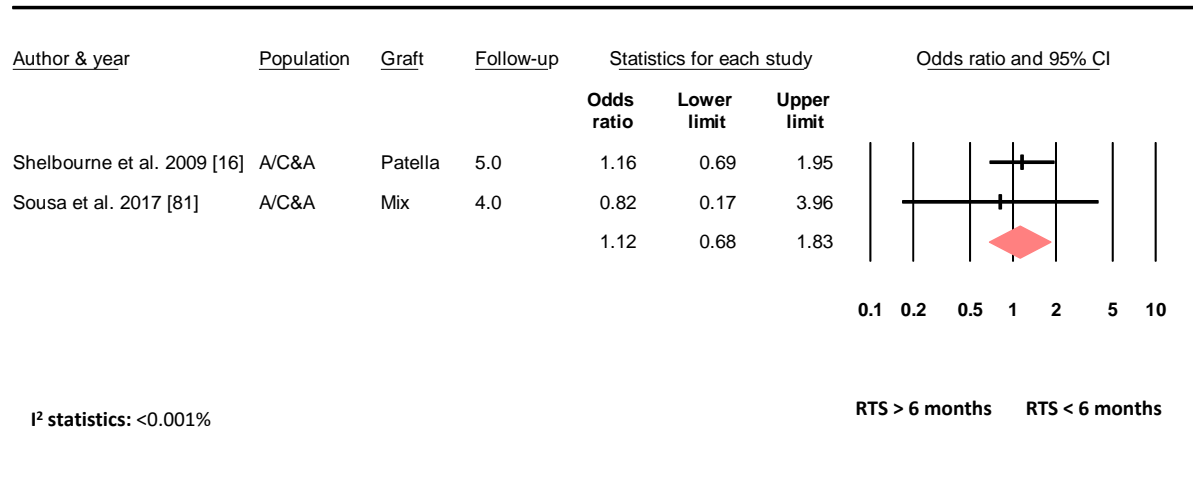


Figure 17. Meta-analysis on the association between timing of return to sport (RTS) and graft rupture (>6< months) (graft ruptures n = 71, controls n = 1467). A = adults, C&A = children/adolescents, Mix = mix of different graft, Follow-up = years.

Soccer vs. other sports

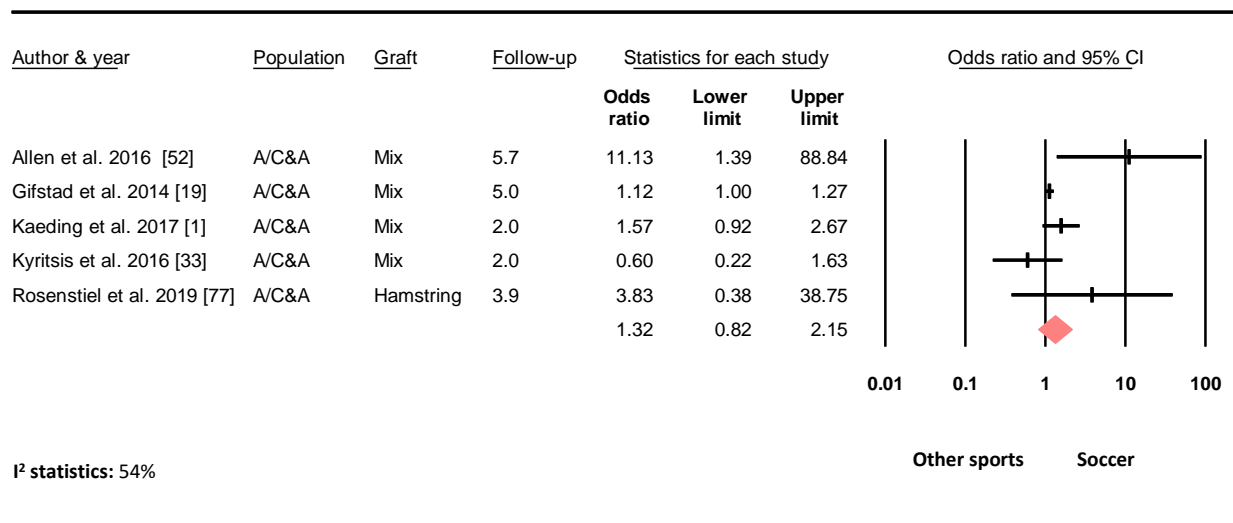


Figure 18. Meta-analysis on the association between playing soccer and graft rupture (graft ruptures n = 1248, controls n = 43422). A = adults, C&A = children/adolescents, Mix = mix of different grafts, Follow-up = years.

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Hop performance

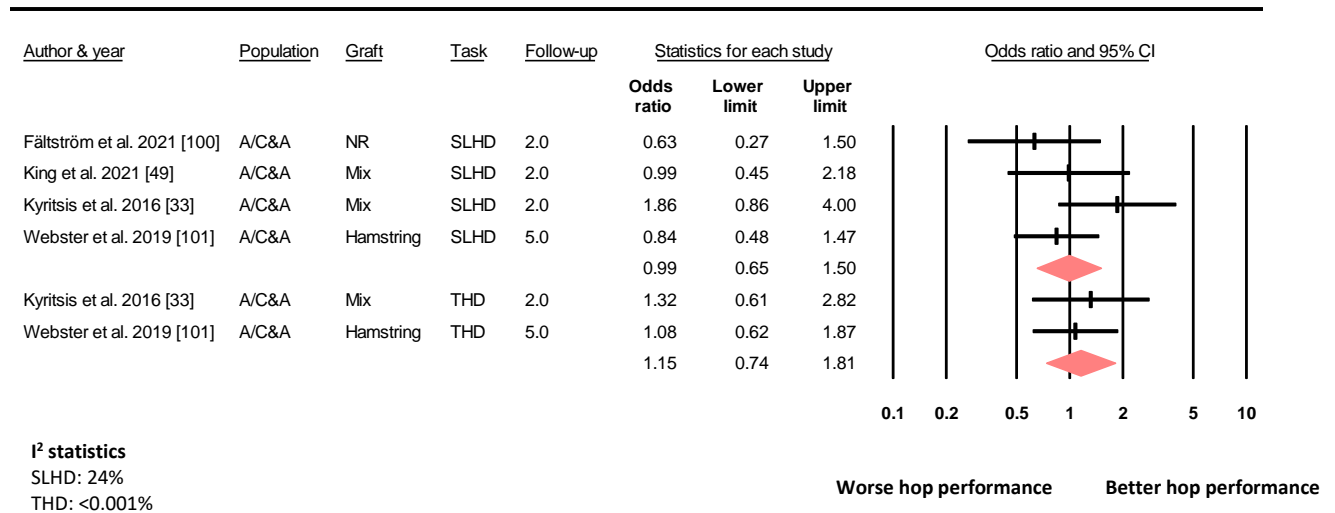


Figure 19. Meta-analysis on the association between hop performance and graft rupture (SLHD: graft ruptures n = 128, controls n = 571, THD, respectively: graft ruptures n = 76, controls n = 366). A = adults, C&A = children/adolescents, Mix = mix of different grafts, SLHD = single leg hop for distance, THD = Triple leg hop for distance. Follow-up = years.

Muscle strength

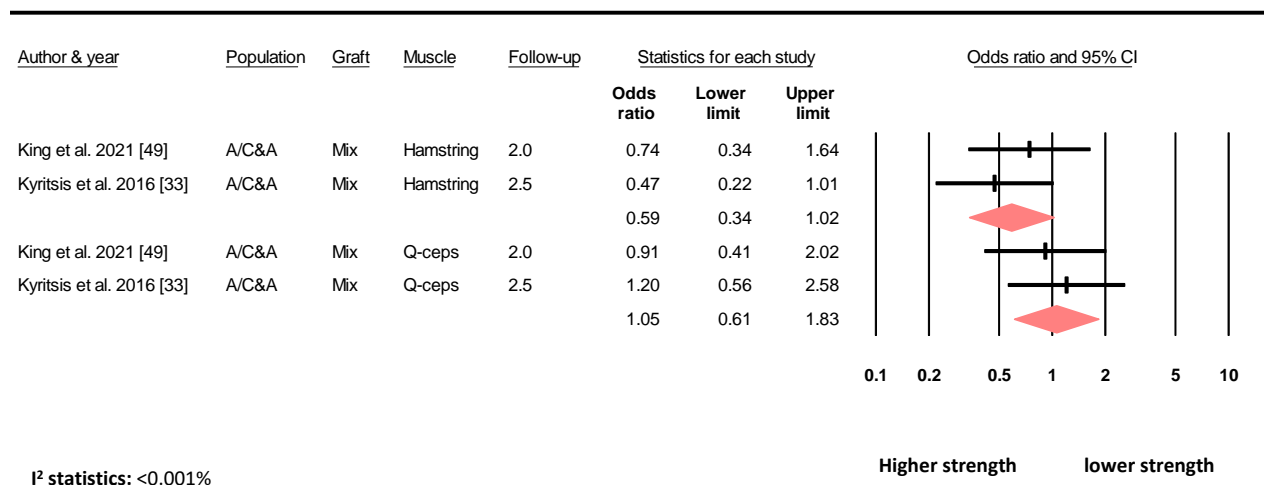


Figure 20. Meta-analysis on the association between muscle strength and graft rupture (Quadriceps (Q-ceps) & hamstring strength, respectively: graft ruptures n = 57, controls n = 163)

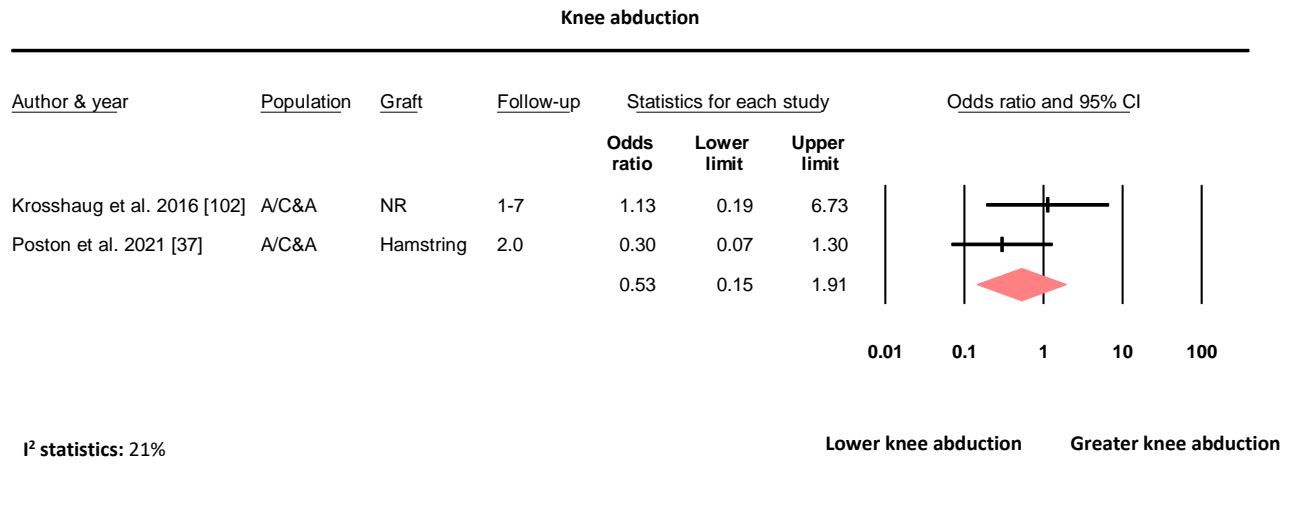
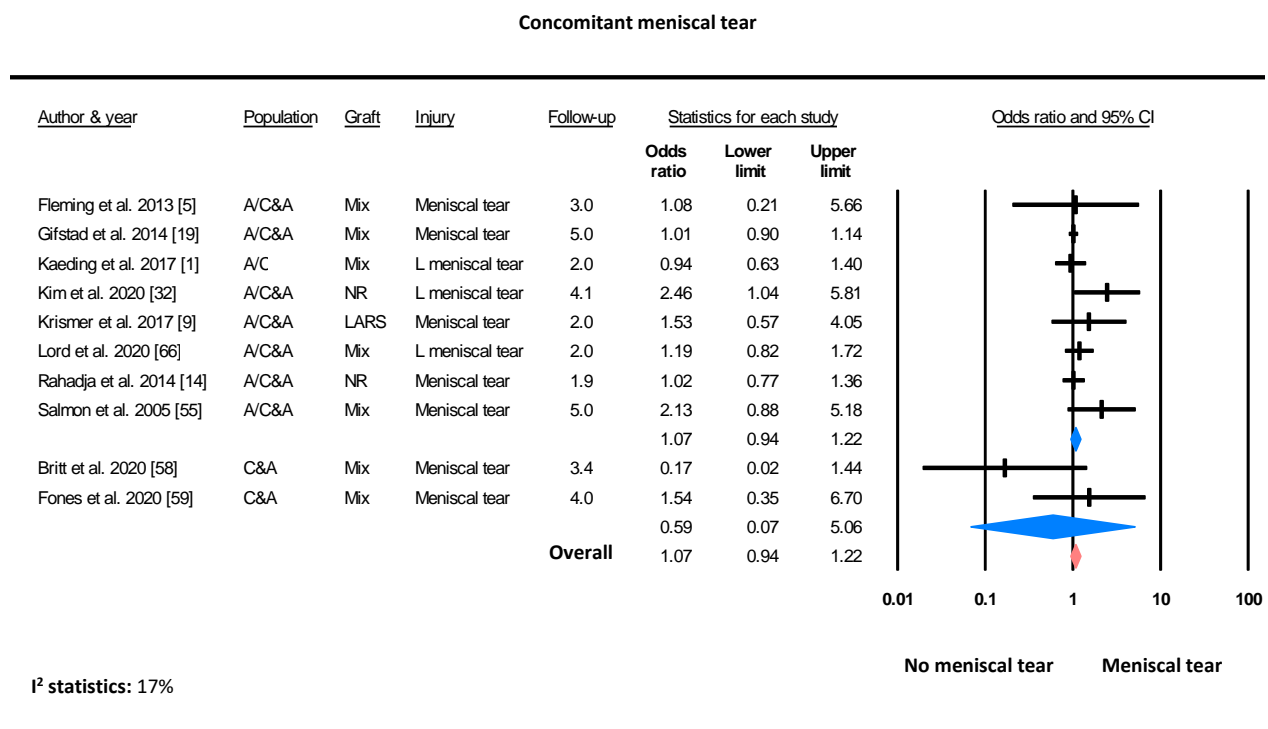


Figure 21. Meta-analysis on the association between knee abduction and graft rupture (graft ruptures n = 11, controls n = 655). A = adults, C&A = children/adolescents, NR = not reported, Follow-up = years.



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Figure 22. Meta-analysis on the association concomitant meniscal tear and graft rupture (graft ruptures n = 1799, controls n = 59841). A = adults, C&A = children/adolescents, NR = not reported, Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, L = lateral, Follow-up = years. Blue color = sub group total, pink color = overall, irrespective of subgroup

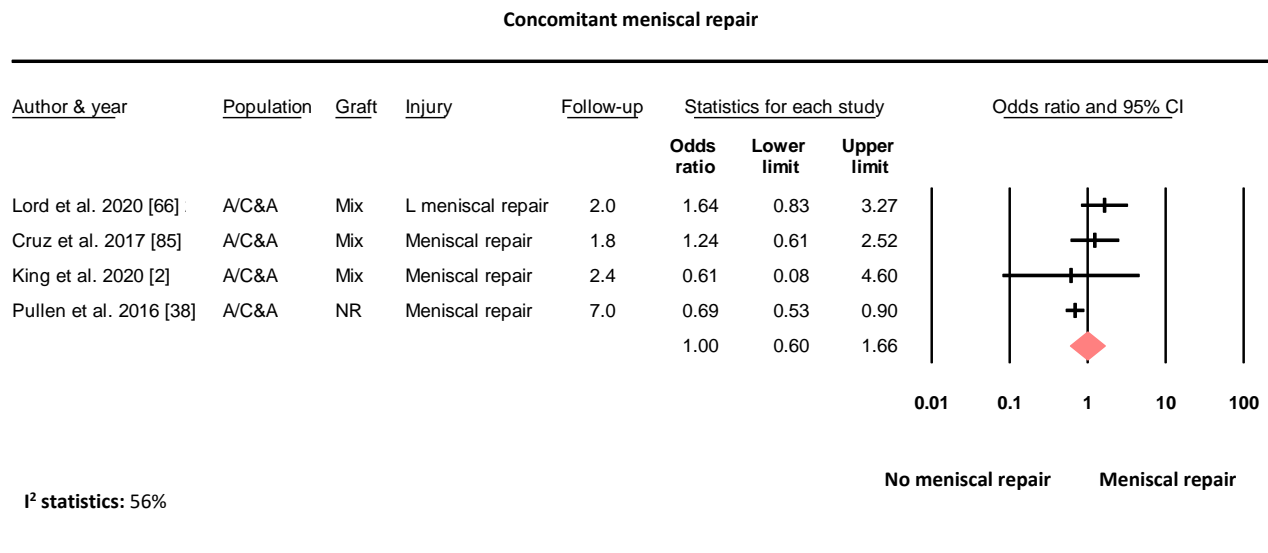


Figure 23. Meta-analysis on the association between concomitant meniscal repair and graft rupture (graft ruptures n = 776, controls n = 22404). A = adults, C&A = children/adolescents, Mix = mix of different grafts, L = lateral, Follow-up = years.

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Concomitant meniscectomy

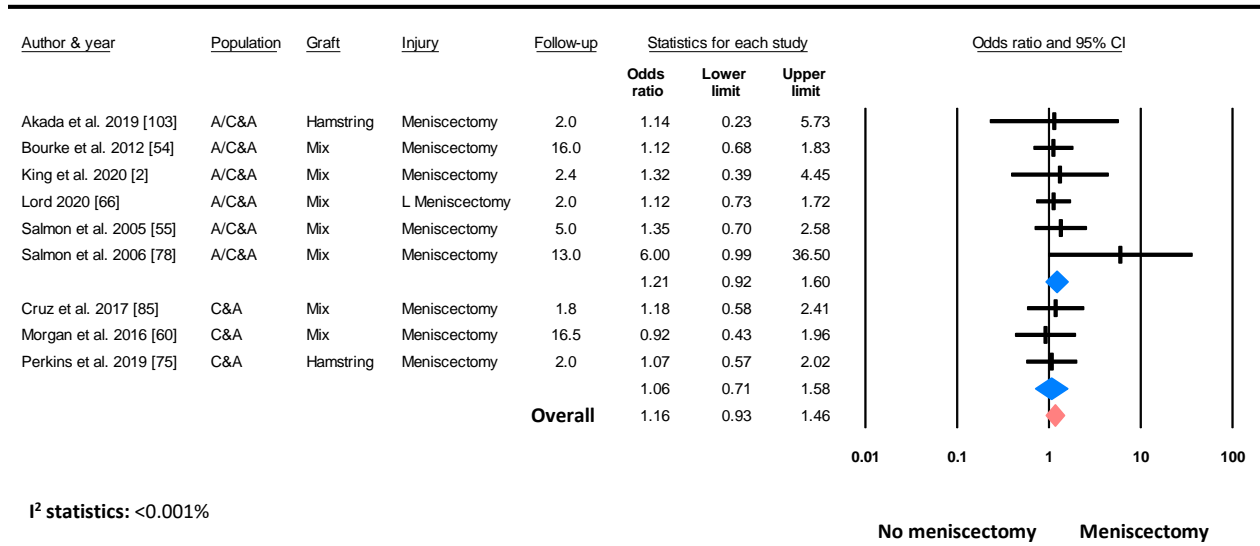


Figure 24. Meta-analysis on the association between concomitant meniscectomy and graft rupture (graft ruptures n = 373, controls n = 8906). A = adults, C&A = children/adolescents, Mix = mix of different grafts, Follow-up = years, L = lateral. Blue color = sub group total, pink color = Overall, irrespective of subgroup

Concomitant MCL injury

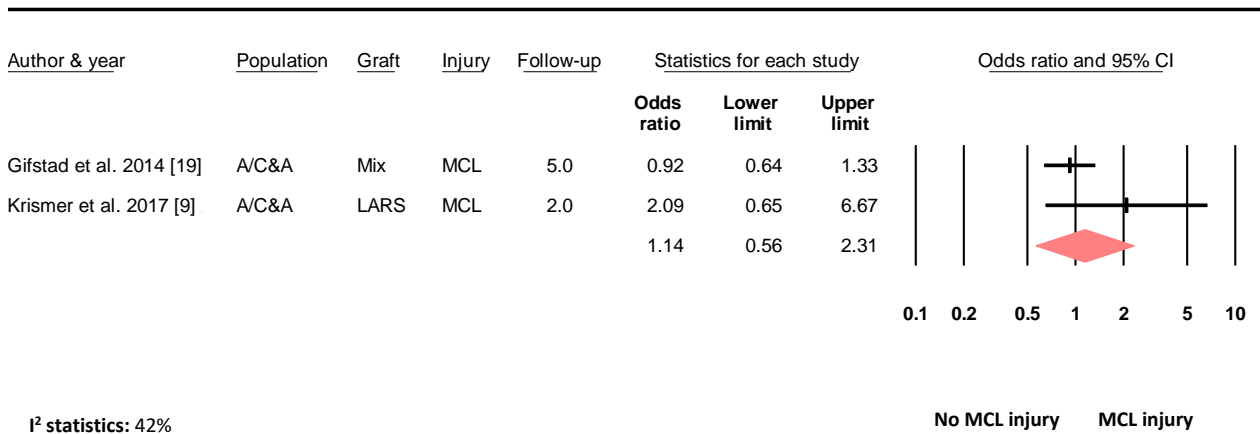


Figure 25. Meta-analysis on the association between concomitant medial collateral ligament (MCL) injury and graft rupture (graft ruptures n = 1223, controls n = 44443). A = adults, C&A = children/adolescents, Mix = mix of different grafts, Follow-up = years.

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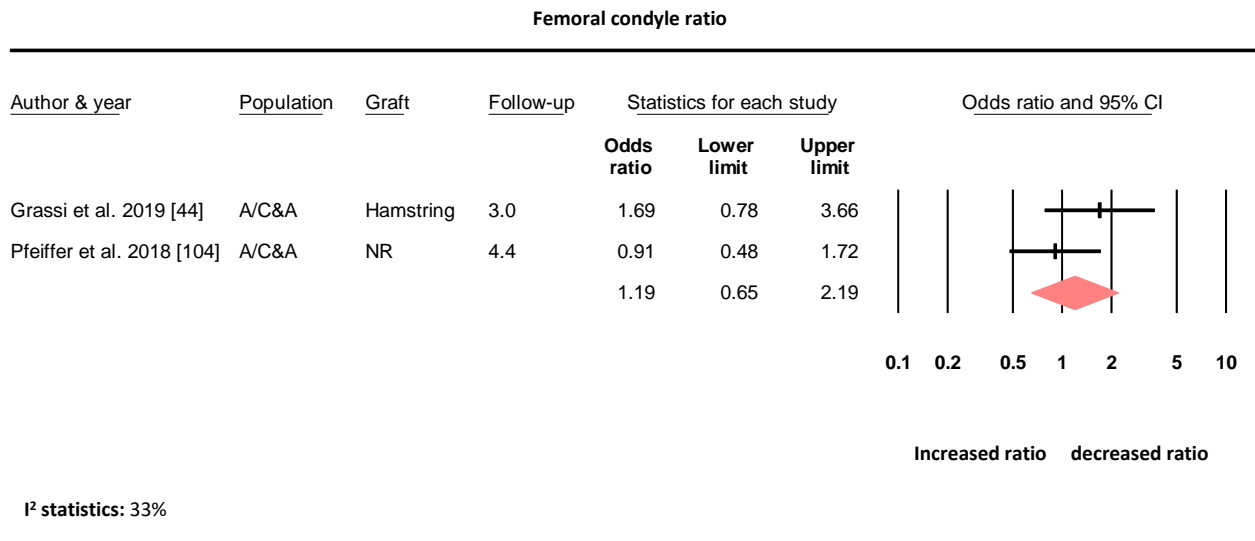


Figure 26. Meta-analysis on the association between femoral condyle ratio and graft rupture (graft ruptures n = 65, controls n = 352). A = adults, C&A = children/adolescents, NR = not reported, Follow-up = years.

Sex – sub group analysis age

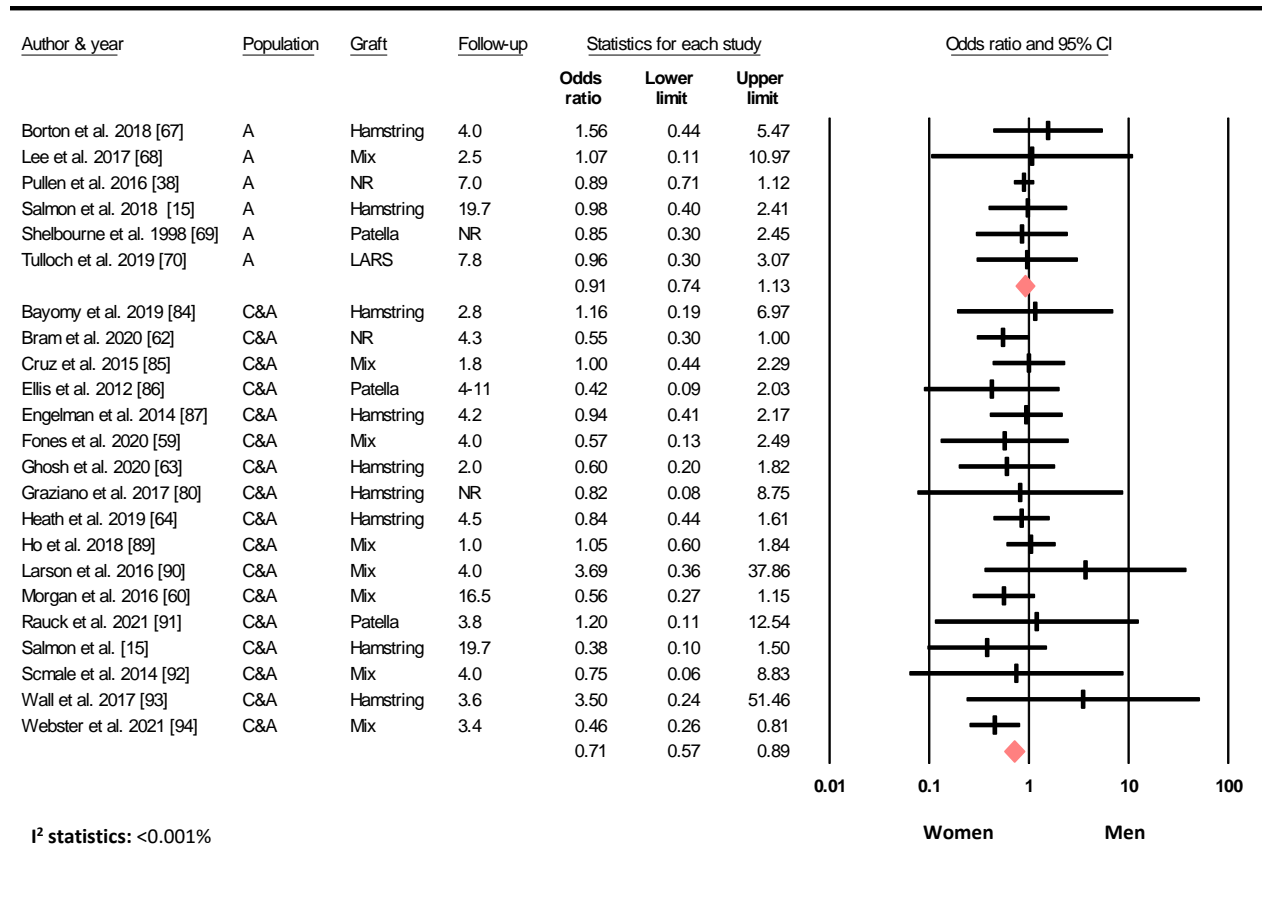


Figure 27. Meta-analysis on the association between sex and graft rupture in the sub groups of adults (A) and children/adolescents (C&A), respectively (graft ruptures n = 1018, controls n = 18 379). Mix = mix of different grafts, LARS = Ligament Advanced Reinforcement System, NR = not reported, Follow-up = years.

Age – sub group analysis children/adolescents

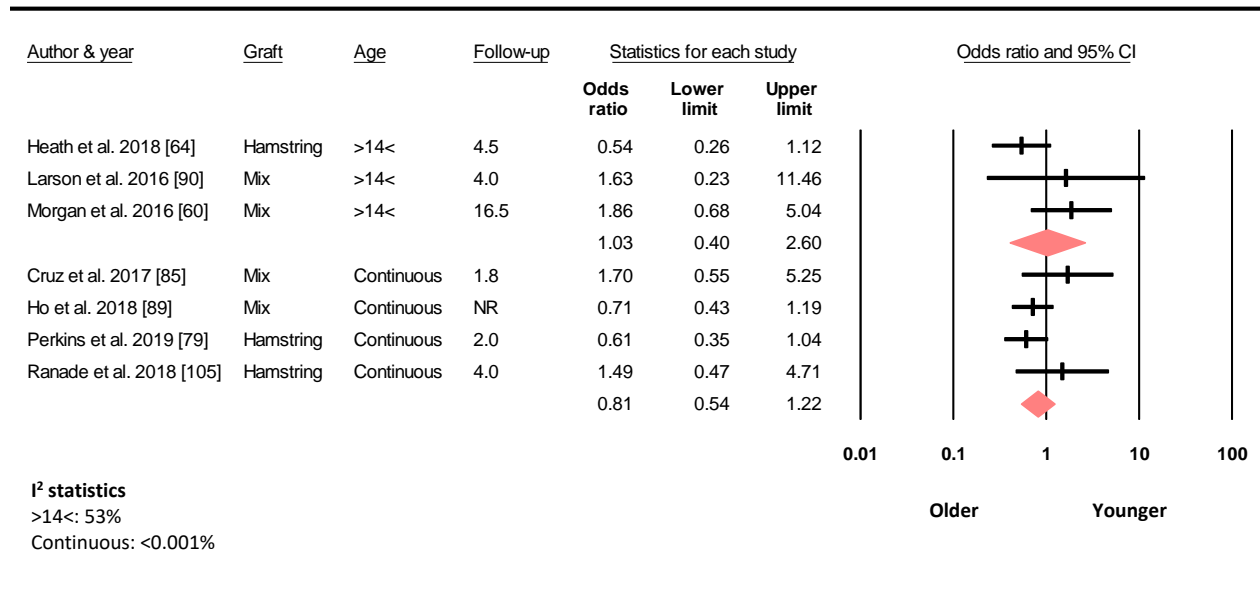


Figure 28. Meta-analysis on the association between age and graft rupture in the sub group of children/adolescents (C&A) (>14<; graft ruptures n = 149, controls n = 519, continuous; graft ruptures n = 116, controls n = 913). Mix = mix of different grafts, NR = not reported, Follow-up = years.

BMI – sub group analysis children/adolescents

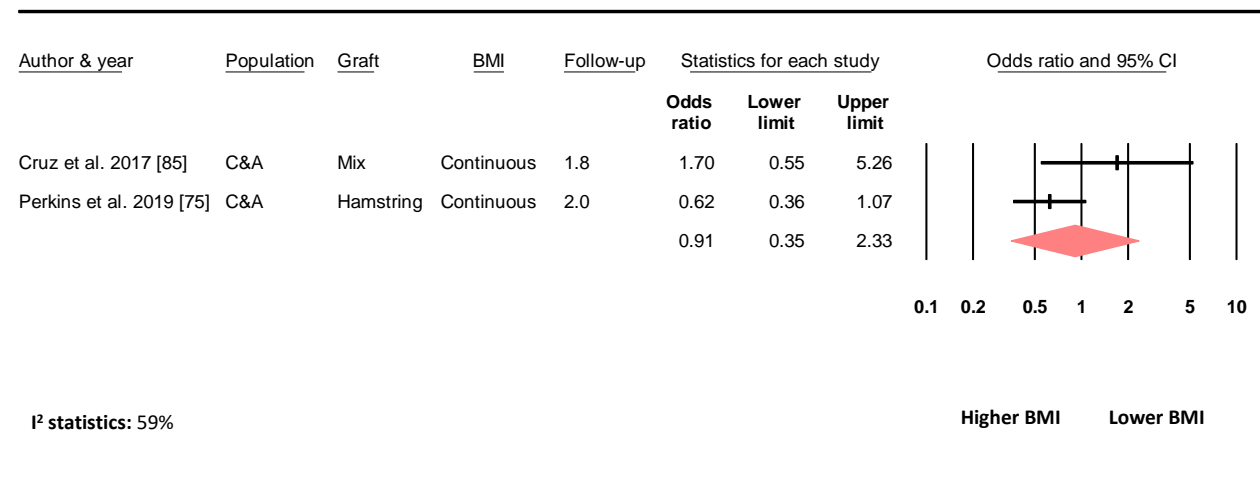


Figure 29. Meta-analysis on the association between BMI and graft rupture in the sub group of children/adolescents (C&A) (graft ruptures n = 62, controls n = 344). Mix = mix of different grafts, Follow-up = years.

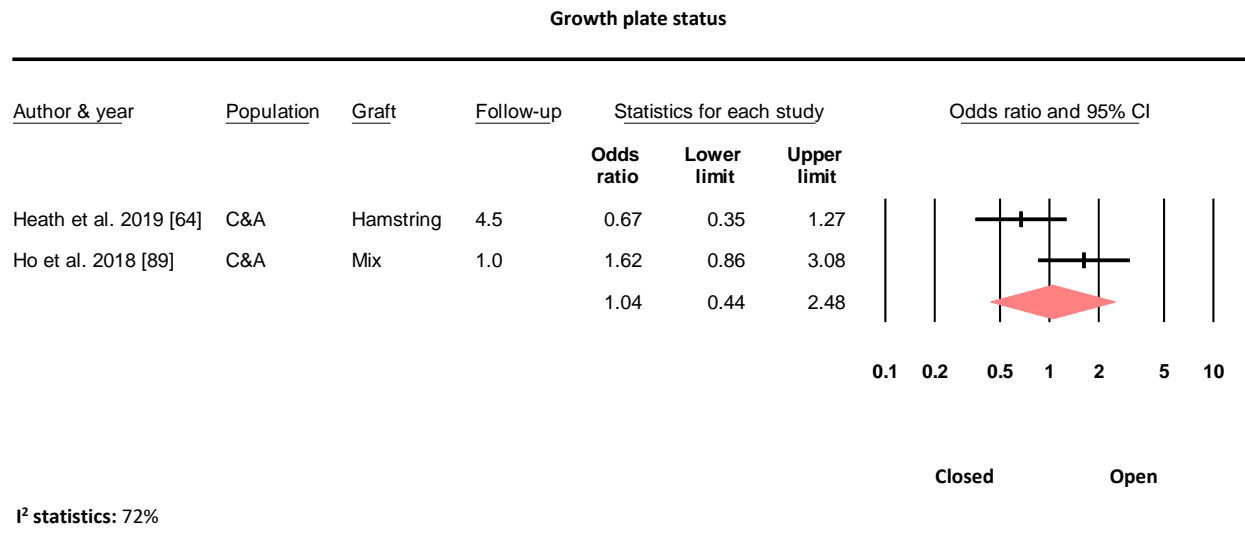


Figure 30. Meta-analysis on the association between growth plate status and graft rupture in the sub group of children/adolescents (C&A) (graft ruptures n = 113, controls n = 746). Mix = mix of different grafts, Follow-up = years.

References

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