

# Abstract

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## Effect of physical activity on glutamine metabolism.

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**PURPOSE OF REVIEW:** Glutamine is largely synthesized in skeletal muscles and provides fuel to rapidly dividing cells of the immune system and precursors to gluconeogenesis in the liver. Physical exercise is known to affect glutamine synthesis and to modulate glutamine uptake. Overtraining is frequently associated with reduced availability of glutamine and decreased immunocompetence. Inactivity affects glutamine metabolism, but this subject was poorly investigated.

**RECENT FINDINGS:** Strenuous physical exercise as well as exhaustive training programs lead to glutamine depletion due to lowered synthesis and enhanced uptake by liver and immune cells. Evidence suggests that postexercise glutamine depletion is associated with immunodepression. Counterwise, moderate training leads to improved glutamine availability due to a positive balance between muscle synthesis and peripheral clearance. Physical inactivity, as investigated by experimental bed rest in healthy volunteers, reduced glutamine synthesis and availability.

**SUMMARY:** After exercise, a reduced glutamine availability may be considered as a marker of overtraining. An increased glutamine availability may contribute to decreased inflammation and health benefits associated with optimal training. Thus, glutamine supplementation may enhance immunocompetence after strenuous exercise. The potential of glutamine supplementation during physical inactivity needs to be explored.

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