

Physical education and sports

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OPTIMAL JUMP WORK VOLUME FOR STRENGTH ATHLETES

Summary. *Jumping (plyometric) work can improve power, rate of force development, and jump performance, with some studies finding improvements comparable to the effects of traditional strength training/weightlifting for a range of speed-strength parameters. For strength athletes, the key question is not "should I jump?" but "how much should I jump" to achieve a stimulus without overloading the tendons or impairing recovery after lifting. This article proposes a practice-oriented model of "optimal volume" using clear metrics (contacts, intensity, frequency, weekly distribution) and based on data from systematic reviews/meta-analyses and methodological recommendations on plyometric volume.*

Key words: *plyometrics, jump training, strength athletes, powerlifting, weightlifting, strongman training, speed-strength, rate of force development (RFD), stretch-shortening cycle (SSC), muscle–tendon stiffness, neurotendon adaptation.*

Why do strength athletes do jumping work?

Jumping is a compact way to train a speed-strength profile (RFD, muscle-tendon complex stiffness, stretch-shortening cycle efficiency) that complements slow strength work and can be transferred to acceleration in the squat/deadlift, the start of pulls/snatches/clean jerks, and overall explosiveness. The effect of plyometrics on athletic performance indicators is confirmed by numerous reviews

and meta-analyses, although the optimal "dose" remains controversial and context-dependent.

For strength athletes (powerlifting, weightlifting, strongman-oriented strength athletes), the limiting factor is often not "cardio endurance," but local tissue tolerance (Achilles, patella, metatarsophalangeal structures), as well as competition for recovery with heavy squats/deadlifts. Therefore, the optimal jump volume is the minimum adequate volume (MED) that provides a power boost without depleting recovery or increasing the risk of chronic overload. This concept is especially important when the rate of force application, rather than strength per se, is the barrier to progress.

In applied literature, plyometric volume is often standardized by the number of foot contacts per workout/week and by intensity distribution. It is emphasized that "more" does not equal "better," and low/moderate frequency and volume are often sufficient. This approach is particularly logical for strength athletes, where jumping adds to the already high mechanical load from the barbell.

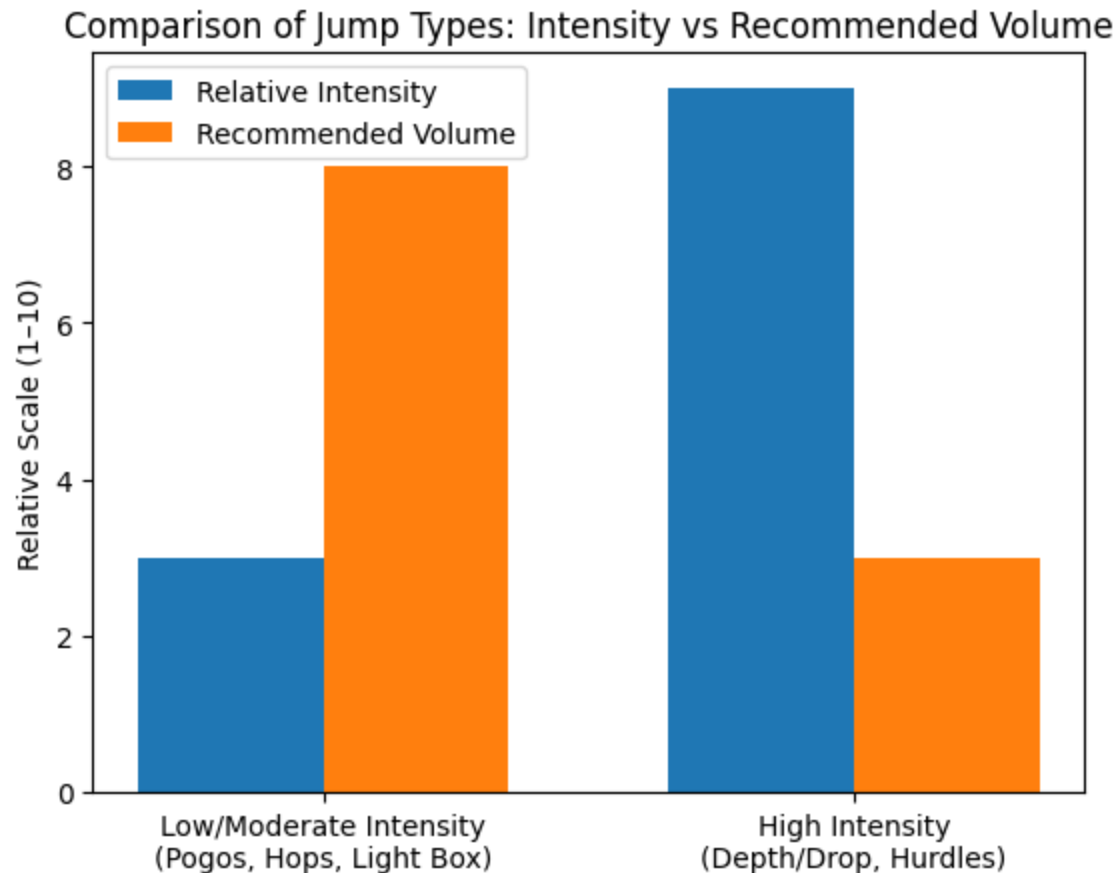
Mechanisms: What exactly do jumps "train"?

Plyometric work overloads the muscle-tendon complex under short contact times and requires high preactivation, which enhances the contribution of elastic structures and neuromuscular coordination to power output. This distinguishes jumps from most strength training exercises, where the time under tension is higher and speed is often limited by the load. Therefore, the "dose" of jumps should be balanced against the fact that adaptation largely occurs in the area of neurotendon changes, which are sensitive to overload.

It is important to distinguish between jump types based on the dominant stimulus. Low- and moderate-intensity jumps (pogos, jumping in place, hops, light box

jumps) provide volume, "train" shock absorption, and prepare tissues; high-intensity jumps (depth/drop jumps, series hurdles, hard split jumps with short contact) dramatically increase peak forces and stiffness requirements. This is why methodological reviews separately discuss volume and intensity criteria for drop/depth jumps, as they require more stringent dosing.

For strength athletes, it's critical that "jump power" and maximal strength correlate, but this correlation doesn't make jumps a substitute for the barbell; they are a tool that improves the ability to quickly generate force. Studies on training interventions often observe improvements in jump/speed performance after plyometrics and/or its combination with strength work, but the magnitude of the effect depends on the baseline level and program variables. Hence, the practical conclusion: jump volume should be chosen not "for maximum," but rather based on the task (speed/power/reactivity) and the phase of the strength cycle.



How to Measure Jump Work Volume: Practical Metrics

The most transferable metric is foot contacts: each landing/contact in a jump = 1 contact (or 2, if counting by foot in some schemes; the key is consistency). This metric is convenient because it allows you to summarize different exercises and track weekly volume, as well as build progression. In sports practice, contact ranges per training session are often used as benchmarks depending on the sport and intensity.

The second axis is intensity, which is most easily defined not by "feel" but by the type of exercise and the target contact mechanics: (a) "training/preparatory" jumps with soft cushioning; (b) moderate-intensity jumps with an emphasis on height/distance; (c) high-intensity reactive jumps with short contact time (RSI-oriented) and/or depth/drop. A systematic review of drop jump

volume/intensity emphasizes that it is here that it is most important to standardize drop height, contact criteria, and volume progression. The third axis is frequency (number of sessions per week) and the placement of relatively heavy weightlifting days. Several reviews have compared low and high contact volumes (for example, 50–60 versus 110–120 contacts per session in some studies), where the power gains could be comparable, suggesting a "moderate volume, precise intensity" strategy. This is especially relevant for strength athletes: if similar results are achieved at a lower "impact" cost, it makes more sense to choose a lower dose.

What the literature says about “dose”: volume, frequency, duration

Meta-analyses of plyometrics show that effectiveness depends on program variables: block duration, weekly frequency, exercise selection, and athlete level. A classic meta-analysis by Sáez de Villarreal et al. analyzed the variables associated with improvements in vertical jump height, emphasizing the role of program factors and the need to tailor parameters to the individual athlete. However, the generalizability of these findings to strength events requires caution: strength athletes already have a high strength load, and the "addition" should be sparing.

NSCA guidelines and related publications often emphasize that low/moderate frequency (2-3 times/week) and low volume of sets/repetitions in plyometrics are sufficient in many cases, and that trying to "accumulate a huge number of jumps" is unnecessary. Some reviews in NSCA publications also provide benchmarks for contact volume per session for different groups, which can be used as upper limits,

and for strength athletes, as a guideline: "You don't need to reach the athletic volumes of games/running events."

Finally, there is evidence that, for a number of indicators, plyometrics and weightlifting/strength work can provide comparable improvements in speed/power, and the choice is often determined by availability, goals, and the total load. This reinforces the practical thesis: for a strength athlete, the optimal jumping volume is

that which adds the missing stimulus (speed/reactivity), rather than duplicating what the barbell already provides.

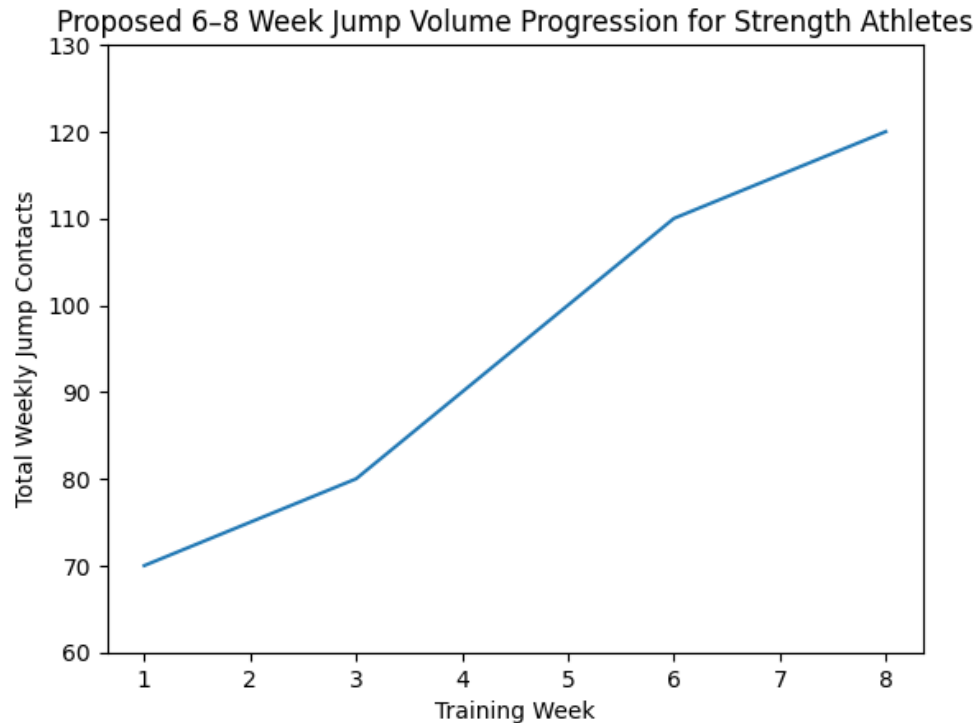
Proposed model of optimal volume for strength athletes

The basic recommendation (for most healthy strength athletes): 1–2 jumping sessions per week, 30–60 contacts/session in the preparatory/strength phases and 20–40 contacts/session in the peak phases (when barbell intensity increases and recovery capacity declines). The logic is simple: the volumes found in jumping/running events (and especially high contact volumes) are usually excessive for strength athletes, while methodological sources emphasize the adequacy of low frequency and volume.

Intensity distribution within the week: (a) 1 day of "low/moderate intensity volume" (pogo + light box/long jumps, more contacts, but softer); (b) the second session – "high intensity, but low" (e.g., 3–5 x 3–5 reactive jumps or 4–6 x 2–3 drop jumps with strict technique and complete rest). This approach is consistent with the fact that drop/depth variations require particularly careful volume dosing and intensity standardization.

A practical 6-8 week progression template: start with ~60-80 contacts/week (in 2 sessions), gradually increasing to ~90-120 contacts/week by moderately increasing

contacts on the "light" day, while keeping the high-intensity day low and high-quality (20-30 contacts). If, with progression, jump results/the feeling of "spring" improves without Achilles/knee pain and without a decline in squat/deadlift quality, the volume is close to optimal; if soreness/stiffness increases or the bar "sags," the volume is too high, and it is more logical to roll back to the lower limit. It is useful to remember that studies comparing low and high contact volumes sometimes showed similar gains, which supports the "less is better, but consistent" strategy.



Risks, Load Control, and Individualizing the "Optimum"

The main risks of excessive jumping volume in strength athletes are not acute injuries (which are easier to avoid with technique), but cumulative tendinopathy and foot/calf overload due to heavy squats and deadlifts. Therefore, the optimal volume should always be "limited by the weakest link": if the Achilles/patella respond to jumping faster than the muscles, the volume should be restrained and the intensity increased later. This is critical for drop/depth jumps, which is why methodological reviews insist on clear criteria for selecting intensity and progression. A simple monitoring system: (1) morning Achilles/patellar stiffness (0-10), (2) "contact quality" (loss of spring, increasing contact time), (3) squat warm-up speed (subjectively/video), (4) jump test stability (CMJ/standing long jump every 1-2 weeks). If the jump drops with the same effort and discomfort increases, you've exceeded the optimal range. The relationship between strength and jump metrics is

actively discussed in modern literature, so this monitoring makes sense as a "quick indicator" for strength athletes.

Individualization of "optimal volume" depends on body mass, injury history, current squat/deadlift volume, and sport specialization. A weightlifter can tolerate slightly more reactive work, but at the peak of a competitive cycle, the volume should still be minimal; A powerlifter with a high squat volume is often better off staying at the lower limits of the contact and choosing softer variations (box jumps, pogos), reserving reactive jumps as a measured stimulus. The general idea is consistent with the idea that plyometrics are effective, but optimizing parameters (volume/intensity) is more important than "jumping more."

Conclusion. The optimal volume of jump work for strength athletes should be determined using a minimally sufficient dose, based on the contacts, intensity, and placement in the weekly/cycle plan: most often, this is 1-2 sessions per week and approximately 60-120 contacts per week (with a decrease in volume during peak phases and strict limitation of high-intensity drop/depth variations). This model is consistent with the fact that plyometrics are generally effective, but results are often achieved without extreme volumes, and for strength athletes, the key limiting factor is tendon recovery and tolerance.

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