FITNESS & EXERCISE

How Many Sets and Reps Do You Really Need?

The research offers useful direction on load and effort, but no universal formula-and far less precision than workout plans suggest.

The tidy answer does not exist

You are standing beside the weights, trying to remember whether the magic number was eight, ten or twelve. One plan demands several punishing sets. Another promises the same result with lighter weights and heroic repetition counts. Both sound certain. The research is not.

The reviews here cannot tell you the perfect number of sets. They do not establish one repetition range that everyone should use, either. What they can do is separate three questions that often get bundled together: whether you want strength or muscle growth, how heavy the resistance is, and whether every set must end in failure.

That distinction matters because "sets and reps" are not a single dose. A set with a load you can lift no more than eight times is different from one requiring more than 15 repetitions. Stopping before failure is also different from continuing until you cannot complete another repetition. A number written on a program leaves much of the workout undescribed.

So the honest answer starts with an admission: there is no research-backed combination in these sources that deserves to be called best for everybody. The evidence supports choices rather than commandments. Your goal determines which finding matters most, and pain changes the question again.

Strength favors heavier work

If your priority is becoming stronger, load appears to matter more than finding a sacred repetition count. A 2021 systematic review and network meta-analysis examined 28 studies involving 747 healthy adults. It compared low loads, defined as more than 15 repetition maximum, moderate loads of nine to 15, and high loads of eight or fewer. Every included set was taken to voluntary failure.

Strength improved more with high and moderate loads than with low loads. High loads produced a nonsignificant but larger effect than moderate loads. That does not prove that only very heavy training works. It says that, within these studies, low-load sets taken to failure were

not equally effective for increasing strength.

The same review found a different pattern for muscle growth. Hypertrophy did not differ significantly among low, moderate and high loads, either in the overall analysis or in the subgroup of higher-quality studies. In other words, a broad span of repetition ranges was associated with muscle growth when the sets were taken to voluntary failure.

That result gives you room to choose, but not a blank cheque. Because all the sets in this review reached failure, it cannot tell you that any casual set with any load will produce the same result. It also cannot identify an ideal number of sets. The study compared load categories, not a universal workout formula.

Training to failure can feel like certainty, but the evidence does not make exhaustion the price of progress.

Failure is optional, not magical

The last difficult repetition can feel like proof that a set counted. Yet a 2022 systematic review and meta-analysis found no significant overall difference between failure and non-failure training for either strength or muscle growth. The review included 15 studies, all conducted in young adults.

When researchers separated studies by body region, exercise type or study design, they still found no significant differences between the two approaches. In studies where the groups did not perform equal training volume, non-failure training actually produced greater strength gains. That complicates the story that more suffering automatically means more progress.

There was one wrinkle. Among resistance-trained participants, failure training had a small significant advantage for muscle growth. The authors still concluded that failure does not appear necessary for gains in strength or size, while also noting that it does not appear harmful to those adaptations.

The limits deserve equal billing. The evidence came from young adults, and the authors called for more research in older adults and highly trained people. Failure may be a tool, particularly for someone experienced and focused on muscle growth. It is not an entrance fee you must pay on every set.

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The missing number is sets

Here is where many confident programs outrun the material. None of these reviews establishes a single best set count for healthy adults. The failure review considered whether training volume was equal between groups, but that is not the same as proving that a particular number of sets is optimal.

The 2021 load review found that people with some training background had greater muscle gains when they completed more resistance-training sessions. That finding concerns sessions, not the ideal number of sets inside each one. Untrained participants also showed greater hypertrophy, which is another reason not to assume the same formula applies across experience levels.

A 2023 review of resistance exercise for tendinopathy makes the uncertainty even clearer. Across 110 studies and 3,953 participants, reporting of exercise dose was poor. Evidence connecting training volume with outcomes was minimal and inconsistent. Higher-intensity therapies using additional external resistance, and frequencies lower than daily, showed greater average effects.

That does not turn a tendinopathy finding into a general gym rule. It shows why set-count certainty is hard to justify even in a large evidence base. Volume, load, frequency and recovery travel together, but studies do not always report them well enough to isolate the contribution of each. A precise-looking prescription can therefore imply knowledge the evidence has not earned.

Pain changes the assignment

If you are choosing repetitions around persistent pain, this stops being a generic workout puzzle and becomes a medical or rehabilitation question. The relevant evidence concerns particular conditions, not simply whether you should perform eight repetitions or twelve.

For chronic non-specific low back pain, a 2020 network meta-analysis included 89 studies and 5,578 adults. Resistance training ranked among the approaches with the highest probability of being best for physical function and mental health. Pilates ranked highest for pain, while stabilisation or motor-control exercise also ranked highly for physical function.

But the authors rated the synthesised evidence as low quality. Studies differed substantially, and few had a low risk of bias. The analysis could not be performed for trunk muscle endurance or pain-medication use. Even a large review, then, did not produce a neat sets-and-reps answer for an aching back.

Tendinopathy evidence is similarly condition-specific. The 2023 review covered the rotator cuff, Achilles tendon, lateral elbow, patellar tendon and gluteal tendon. Its patterns favored

additional load and lower frequency on average, but volume findings remained uncertain. Pain is not a reason to borrow a bodybuilding formula and assume the numbers transfer.

What to carry into next week

Start with the outcome you actually care about. If it is strength, the evidence favors moderate or high loads over very low loads. If it is muscle growth, the 2021 review found similar results across a wide range of loads when sets reached voluntary failure. Those are directions, not guarantees.

You also do not need to treat failure as the judge of whether a workout was worthwhile. Across the 2022 review, stopping short produced similar overall strength and muscle-growth results. The possible small hypertrophy advantage for trained people is not the same as a universal requirement.

Be suspicious when a plan claims that one exact set-and-repetition combination is scientifically optimal. These sources do not support that confidence. Record what the set actually involved-its load, repetition range and whether you reached failure-because the set count alone hides the variables that research suggests can matter.

For the next week, make one decision before you lift: are you pursuing strength, muscle growth or managing pain? Let that answer filter the advice you hear. And if persistent pain is driving your choices, treat the plan as condition-specific rehabilitation rather than a numbers game. The most honest program begins by admitting what its numbers cannot promise.

Where this comes from

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