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Optimizing What We Have

Recent pieces in *Master Trainer,* and certainly the last issue's piece about 'Letting Go' of psychologically needing to use a specific heavier resistance for different movements, have emphasized accepting the limitations and effects of getting older. These pieces should not though be construed as 'throwing in the towel' and essentially giving up.

On the contrary, our accommodations to aging can lead to searching for information and knowledge bases, creative ideas, and new ways of doing things such as resistance training. For example, finding out that higher effort but with moderate resistance is an effective way to train – at any age – and creatively reworking how we perform resistance training is a good example of this process. And, rather than 'throwing in the towel', it's a huge set of steps forward.

"We're Moving Forward And Not Throwing In The Towel!"

The first of those steps can entail adopting and adapting this different approach to training. The next steps can involve 'optimizing what we have'. Just thinking in those terms and having that perspective is renewing.

Ideas about how to optimize what we have include some things *not* to do and some things *to* do.

Let's start with the *nots*:

Soreness, Injuries, Functional Limitations: We can't train in ways that lead to excessive musculoskeletal soreness or even 'just' minor injuries. These conditions are the way our body tells our brain, if we're paying attention, that whatever we are doing, we need to stop. An exercise or training pattern that hurts us is not likely to stop hurting if we keep doing it. Whatever we are doing in training that causes pain, we can replace by some other exercise or training pattern that can have positive effects. While we may have been able to ignore this kind of physiological feedback when we were younger, that doesn't mean it was a good or intelligent thing we did. And simply consuming drugs to mask pain and discomfort from a self-imposed training regime is a sure way to make things worse. This only will allow us to continue to train for awhile longer in a way that is sure to make things worse.

Quite related, we can't train in ways that demonstrate good ability in a session but have negative consequences in the rest of our life. Here's a personal example and a good amplification of the first point about paying attention to soreness.

Example: I developed a 'walk up and down the stairs to and from my office' on the third floor of an office building as test of the soundness of my lower-body training. If I decided to take the elevator up three flights because I was tired, this was a bad sign. If my

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These and other studies from the McMaster University group and other groups demonstrate that the notion of productive resistance training and bodybuilding as necessarily another form of heavy weightlifting is simply incorrect.

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Richard A. Winett, Ph.D., Owner and Publisher

"More Accurate Data Indicate That Performing Olympic Lfits Is Associated With A High Injury Rate."

How Safe Are The Olympic Lifts? The Olympic Style Lifts and Injury Rates

By Matt Brzycki

Any exercise that exposes the muscles to an adequate workload within the anaerobic domain and, over time, is made progressively more challenging will stimulate improvements in muscular size and strength. This includes the exercises that are performed by competitive weightlifters (aka "the Olympic-style lifts"), namely the snatch and clean and jerk along with their derivatives such as the power clean and push press. There's considerable debate, however, as to whether or not these exercises are safe.

One study that has been cited regularly as evidence that the Olympic-style lifts are safe is Hamill 1994[1]. The researcher surveyed British schools with a questionnaire "to determine the injury rate among students [aged mainly 13 to 16] receiving instruction in weight training and weightlifting." In the study, "weight training" was defined as "progressive resistance exercise with machines or free weights, for body conditioning to achieve fitness, strength, or improvements in other sports"; "weightlifting" was defined as "competition in the snatch and the clean and jerk; associated weight training."

The survey found that more than 1,634 students participated in weightlifting for a total of 168,551 hours. All told, three injuries were reported. From this, Hamill calculated that weightlifting had an injury rate of 0.0017 per 100 participation hours.

Additionally, the survey collected information on injuries that were sustained in a number of winter and summer sports. According to these data, weightlifting had a lower injury rate than any of the sports that were listed including basketball, gymnastics, rugby and soccer.

Hamill also compared the data from his survey to that of a study by Zaricznyj and his colleagues conducted in1980[2]. These researchers garnered information from accident reports that involved sports-related injuries to school-age children from kindergarten through high school (aged five to 18) in Springfield, Illinois, over a one-year period beginning in November 1974. The accident reports covered injuries that were sustained during four levels of play: school-organized team sports; community-organized team sports (such as Little League); physical education classes; and non-organized and non-supervised sports (such as pick-up games). In comparing the data in the Zaricznyj study[2] to that of his study, Hamill[1] concluded that the injury rate associated with weightlifting was much lower than all but a few sports and activities.

A Closer Look: Typically, studies that examine injury rates do so based on the hours of participation (or "exposure") and/or the number of injuries per participant. When using participation hours, how the exposures are counted has an enormous impact on how injury rates are reported and interpreted.

As an example, let's look at American football. A high-school football game consists of four 12-minute quarters for a total of 48 minutes. A game actually lasts much longer, though, since the clock stops frequently. Among other things, the clock stops for injuries, penalties, incomplete passes, plays that go out of bounds, measurements, changes of possession, scores, a 15-minute halftime, and, of course, timeouts. In addition, the clock stops twice when the players switch sides of the field (between the first and second quarters and third and fourth quarters).

So while a high-school football game is 48 minutes, the actual length of the contest could easily be two hours. And this is where the reporting of participation hours becomes fuzzy. Is the length of a game counted as 0.8 hours (48 minutes) of participation, 2.0 hours of participation or something else altogether? Furthermore, is each participant counted as having been in the entire game even though he might only participate for one play?

The fact of the matter is that injury rates would be grossly underestimated if a football game is counted as anything greater than 0.8 hours. Indeed, what injury has ever occurred when the clock is stopped for something like a penalty, timeout or halftime? Similarly, injury rates would be grossly underestimated if participants were credited for playing an entire game despite being involved in a fraction of it. Participation shouldn't be counted for a complete game unless the participants are on the field for every single play on offense, defense and special teams.

Returning to the Zaricznyj study[2], the researchers reported that 445 participants experienced 126 injuries in organized football and noted an injury rate of 1.05 per 1,000 participation hours. (In his study, Hamill[1] reported this as 0.1 injuries per 100 participation hours.) The researchers didn't disclose the number of participation hours. But some quick math shows that if there were 126 injuries and an injury rate of 1.05 per 1,000 participation hours, it would require 120,000 participation hours. This means that each of the 445 participants needed to log an average of about 270 hours of football which works out to about 5.2 hours per week for 52 weeks. Even over the course of a year, this amount of time is an incredibly high number. Recall that the data were collected in 1974-75; back then, the season likely consisted of 10 games in the fall and football practices would've been limited to the pre-season and in-season. In brief, it seems almost certain that the participation hours were greatly overestimated which means that the injury rates were greatly underestimated.

The same questions arise about the reporting of participation hours for other sports and activities including weightlifting. If 25 participants were in the weight room for two hours, was it counted as 50 participation hours? Remember, simply because the

participants were in the weight room for two hours doesn't mean that they were weightlifting for two hours. Here again, an overestimate of participation hours would lead to an underestimate of injury rates.

Also, if we are to believe the data that were compiled by Hamill[1], the injury rate in squash (0.10 injuries per 100 participation hours) is the same as American football (0.10); the injury rate in badminton (0.05) is greater than gymnastics (0.044); and the injury rate in British tennis (0.07) is more than 25 times greater than powerlifting (0.0027) while the injury rate in powerlifting (0.0027) is more than 2.5 times greater than American tennis (0.001). Go figure.

To make a long story short, participation hours – which are often used as the basis for injury rates – are, in nearly all cases, only estimates. For the most part, it's virtually impossible to count participation hours in an accurate manner which means that injury rates will be highly suspicious. (Oddly enough, neither the Hamill study[1] nor the Zaricznyj study[2] included a definition of participation hours.)

As noted earlier, another way to examine injury rates is to look at injuries per participant. Hamill's survey[1] found that in weightlifting, three injuries were sustained by 1,634 participants. That's one injury per 544.7 participants. Moreover, Hamill noted[1] anecdotally that in Britain's Schoolboy Championship, over a period of at least 18 years and involving a minimum of 109,200 competitive lifts (that were, in his words, "maximal or nearly so"), there were a grand total of two injuries. Two injuries! Contrast this to the injuries that were sustained by competitive weightlifters during the 2008 Summer Olympic Games in Beijing. In a surveillance study[3], the researchers found that 43 injuries were sustained by 255 weightlifters over a 16-day period. That's one injury per 5.9 participants. In this study, weightlifting had the fifth highest risk of injury behind soccer, taekwondo, field hockey and handball and just ahead of boxing. (Interestingly, the Zaricznyj study[2] reported 11 injuries from weightlifting: seven in non-organized sports and four in physical education.)

Additional Considerations: As discussed, the Hamill study[1] likely overestimated participation hours which underestimated injury rates. There are several other limitations of his study that are worth noting.

Because of the nature of Hamill's survey[1], responses to the questions may have been biased. Think about it: Those who passed a course that was sanctioned by the British Amateur Weightlifters' Association (BAWLA) were asked to acknowledge weightlifting injuries that occurred under their direct supervision. Some respondents might not have been forthcoming

about injuries or too eager to admit that their athletes incurred any injuries while weightlifting.

Along these lines, the questionnaires weren't distributed randomly. Rather, Hamill[1] surveyed teachers "who had attended instruction courses held by the British Amateur Weightlifters' Association." Furthermore, the teachers "show[ed] evidence of skill and knowledge in the field, as evidenced by participation of pupils in competitive weightlifting." The fact of the matter is that not everyone who does the Olympic-style lifts has access to knowledgeable instructors. It would have been more interesting and more telling if all physical educators and coaches were surveyed about injuries that occurred in weightlifting, not just those who passed a BAWLA course.

Finally, Hamill[1] made comparisons between his data and those of Zaricznyj[2]. However, the two studies used markedly different age groups: mainly 13 to 16 in the Hamill study[1] and five to 18 in the Zaricznyj study[2]. This, of course, makes it impossible to compare the data and/or draw meaningful conclusions.

Final Comments: In his study, Hamill[1] noted that two factors "may explain the perhaps unexpected relative safety of weightlifting." His points are interesting.

First, Hamill[1] stated that "weightlifting skills are complex and require a high coach-to-participant ratio, with knowledgeable coaching." I couldn't agree more. The Olympic-style lifts are the most complicated exercises that can be done with a barbell. As a result, the Olympic-style lifts require the constant, hands-on attention of a qualified instructor who provides close supervision and teaches proper technique. When a large group is doing these exercises in the same facility – such as would be the case during a physical education class or team workout – it's very difficult for each person to receive adequate instruction and individual attention. Since the Olympic-style lifts require so much time to learn correct technique, their use by athletes who participate in sports other than weightlifting is questionable.

Second, Hamill[1] stated that "[weightlifting] skills can only be learned with light or easy weights at first." Question: Why would someone who isn't a competitive weightlifter need to spend time learning complex exercises with "light and easy weights" when they could invest their time doing simple exercises with heavy and demanding weights? Lifting "light and easy weights" does absolutely nothing to improve muscular size and strength. Athletes would be better off investing their time learning and practicing skills that are specific to their sport or activity.

Let's not forget that even if a person has very good technique, injuries can result from doing the Olympic-style lifts. Just look at the large number of injuries that were sustained by weightlifters at the Beijing Olympics[3]. And these weightlifters were literally the best on the planet. If highly experienced weightlifters get injured – despite spending several hours each day practicing the Olympic-style lifts – imagine the potential for injury in others who include those exercises in their workouts as part of their training.

Bottom-line: Although it has been cited as proof for more than 15 years, Hamill's[1] study offers no solid evidence to support the belief that the Olympic-style lifts are safe.

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