


Enjoy this site?  Gift the author a WordPress.com plan.

## Physical Culture Study

A Website Dedicated to the Study of Strength, Health, Fitness and Sport  
Across Centuries, Countries and Contests.

# The Harmful Squats Myth: Dr. Karl Klein and the Back Squat

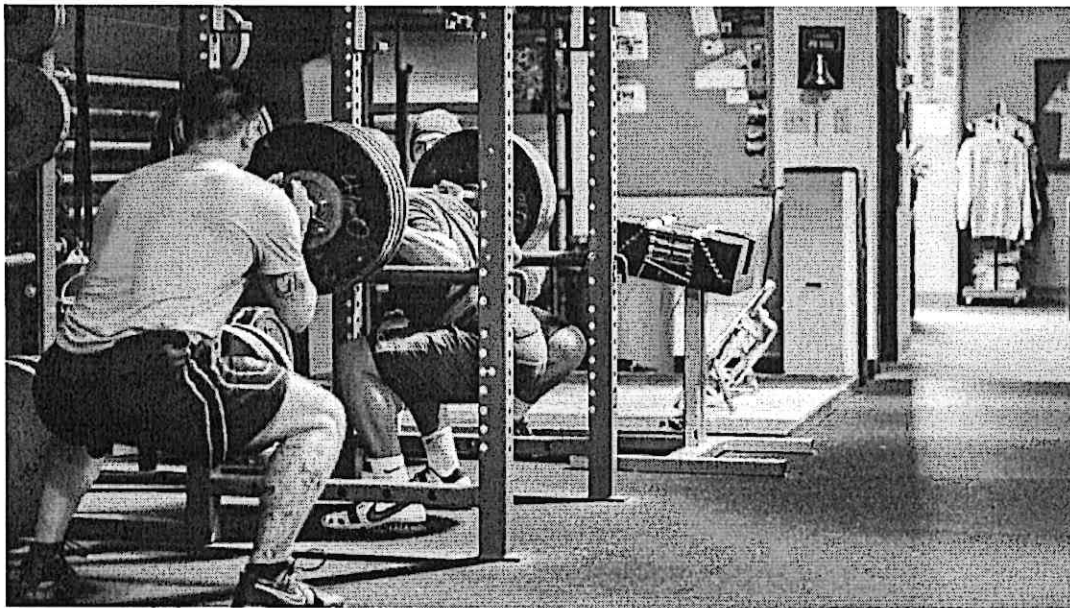


Image Source.

When I began lifting in my teens, the coaches and older men in the gym floor seemed like fountains of indisputable knowledge. Don't bring the bar all the way down to your chest on the bench press. Stability work on Bosu Balls worked your core and brought muscle

gain. Drink a protein shake within 30 minutes of your workout or your anabolic window will shut. The most sacred of their dictates revolved around the back squat.

When learning how to squat we were told two simple things. Never go below parallel and under no circumstances should the knees track over the toes. These rules were so infallible that none of us dared to cross them. Even when we realised their advice on other lifts had been misguided to say the least, we adhered to their squat advice. It wasn't until I changed gyms that I realised squatting with a full range of motion, even letting those knees slip over my toes, wasn't going to kill my knees.

Where had this idea about the squat come from? Whenever we asked we were told about vague scientific studies that 'everyone knew about'. It wasn't until I dug into the history of the back squat for a recent article on Barbend that I became reacquainted with this subject.

Our goal today is simple. Who first promoted the idea that squatting below depth was harmful and how did this theory become so prevalent? Our story today revolves around Dr. Karl Klein and his followers.

### **Dr. Dr. Karl Klein A.K.A. The Knee King**

Born in Buffalo New York in 1916, Klein's early years are remarkably difficult to trace. What we do know however is that Klein spent two years during WW2 assisting soldiers at the Physical Rehabilitation Centre in Corvallis, Ore. Sometime, either before or after the conflict, Klein earned a masters degree at Springfield Mass where

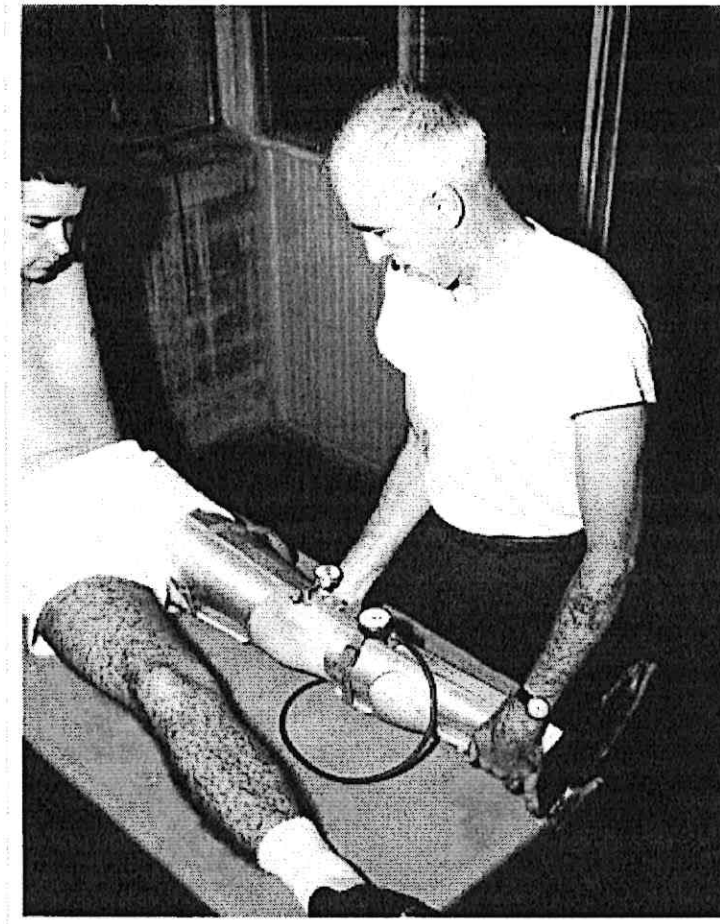
he was also tasked with lecturing. In the 1950s, Klein moved to the University of Texas at Austin where first he earned his Doctorate before lecturing at the University for the next several decades.

By the early 1960s, Klein suggested that he had spent 20 years devoted to the study of knee health and therein lies the purpose of today's post. In a fascinating interview given to Dr. Terry Todd, also of the University of Texas, Klein explained that he came to Texas to establish a programme of adaptive and rehabilitative exercise for students. Part of this work entailed an examination of what caused a student's injury and with knee pain a recurring issue, his mind began to work.

Soon Klein began to suspect that knees bent to acute angles, as happens in the bottom position of the squat, are susceptible to injury. By 1957 Klein had begun to present this idea at academic conferences. Two years later Klein devised his famous, or infamous, study on heavy squatting.

The study itself appeared rather thorough. Utilising an experimental group of 128 weightlifters taken from the 1959 Pan American Games, several local colleges or lifting meetings around Texas and combining them with 386 subjects with no competitive lifting experience and little experience by way of squatting, Dr. Klein and his team set about examining the Back Squat's safety record.

Using the device shown below, the results appeared unequivocal. Full depth back squats had 'a debilitating effect on the ligamental structures of the knee.' To combat this, the study recommended that trainees squat to parallel and no further.



*Dr. Klein with his measurement device. Source.*

A series of papers were then published alongside Klein's co-authored work with F.L. Allman entitled 'The Knee in Sports.'

### **Why Did This Theory Become so Popular?**

Well two reasons really. In the first instance, Klein's work was soon picked up by the popular media for its groundbreaking results. One year after his co-authored work hit the shelves, Sports Illustrated featured a piece on Klein. Due to the difficulty in securing access to Klein's studies and published articles, many critics and promoters of Klein's suggestions seem to have taken the Sports Illustrated article as a faithful retelling of Klein's work.

This was a rather dangerous thing to do. As noted by Todd, Klein's quote in the article that

anything below a half knee bend," he says glumly, "is useless and ruinous

was somewhat removed from Klein's more measured conclusions in his academic work. Nevertheless, the idea took hold in the public consciousness. In 1963, The Alcaide magazine deemed Klein a hero for saving thousands from the danger of deep knee bends and duck walks. The US military also got involved as in the wake of Klein's findings the Military removed the squat jump exercise for fear of ligament damage.

### **But What of the Lifting Community?**

Surely the men and women who graced the gym floor knew the folly of Klein's conclusions. Yes and no is the answer I'm afraid.

Returning to Todd's article, we find that Bob Hoffman's York Magazines were hugely vocal in criticising Klein and his work. These critics included stars like John Grimek and Paul Anderson alongside physicians such as Dr. John R. Pulskamp.

Writing in another publication Bill Starr criticised Klein's methodology, stating that

I happened to be one of the subjects of Professor Klein on many different occasions. There was no attempt to weigh out Klein's bias or prejudice involved in this experiment. Another person could just as easily, in my opinion, could get the exact opposite results by not applying as much pressure at specific times. .. It should be noted that he always asked the subjects beforehand, not afterwards whether he did full squats. I find his methods very unscientific.”

But, and this is important, some agreed with Klein. Those in the Weider Empire such as Jim Murray maintained that there was something to Klein's idea. Maybe lifters didn't need to squat with a full range of motion after all? In Britain, Jim Halliday of Health and Strength similarly approved Klein's message.

From then on many in the lifting community and those outside it such as athletic coaches seemed to adopt the mantra 'better safe than sorry' or, if you'll allow me to be poetic, 'better parallel than patella pain.'

### **Revisiting the Study**

There have, especially in the past decade, been a series of academic and lay papers criticising Klein's conclusions. To return for the last time to Todd's paper written in the 1980s, Todd noted the spurious nature of Klein's measuring equipment, noting that examiners could manipulate the results quite easily.

In a comprehensive paper written a few years ago for the NSCA, Brad Schoenfeld noted that

Subsequent research, however, has refuted Klein's findings, showing no correlation between deep squatting and injury risk (13,15,18). In fact, there is some evidence that those who perform deep squats have increased stability of the knee joint. In a study using a knee ligament arthrometer to test nine measures knee stability, Chandler, et al. found that male powerlifters, many of them elite class, demonstrated significantly tighter joint capsules on anterior drawer tests compared to controls (3). Moreover, both the powerlifters as well as a group of competitive weight lifters were significantly tighter on the quadriceps active drawer tests at 90 degrees of knee flexion than control subjects.

Despite such work, there is no denying the power that Klein's findings had. In 2001, Charles Stanley noted the regularity with which people stated that squats were bad for your knees. From my own experience, this was still being peddled a decade later and indeed oftentimes when friends train with me for the first time, their fears about the squat and knee health need to be addressed.

Klein's findings were among the most influential over the past half-century. They dictated people's training programmes and body



movements in a way that other studies simply haven't. By promoting squatting to parallel and not full depth, Klein may have opened the way for the 1/4 squats we regularly see on the gym floor, a point humorously pointed out by Tommy Suggs. More seriously, Klein's findings, whether he meant to or not, inhibited people from training with a full and healthy range of motion. His findings prejudiced many to the full squat despite its centuries old usage.


Moving away from Klein's study has been slow and painful for the general public and many in the Iron Game.

As always...Happy Lifting!



Published by **Conor Heffernan**

Conor is a Lecturer in the Sociology of Sport at Ulster University. When not in the library or the gym, he likes to try his hand at writing, often with mixed results.

 [View all posts by Conor](#)

Heffernan

**April 23, 2018**

**Basics, Biographies, Training**

**American History, Bodybuilding, Dr. Karl Klein, Exercise, Fitness, Gym, History, Is Squatting Dangerous?, Knee Pain, Leg Day, leg workout, Sport, Sports Conditioning, Squat, Squat Depth, Squat Form, Squats bad for knees?, Workout**

## 9 thoughts on “The Harmful Squats Myth: Dr. Karl Klein and the Back Squat”

**Naturalbodybuilder.com**

April 24, 2018 at 6:00 pm

Nice research on this topic.

Liked by 1 person

**Conor Heffernan**

April 25, 2018 at 11:20 am

Thanks so much. It's a fascinating topic isn't it?

Glad to hear you enjoyed it!

Liked by 1 person

**irvrube**

March 10, 2023 at 3:14 am

Fascinating review of this topic. The one thing, however, that never gets discussed when critiquing Klein's work is the evolution of squats from the 1950s to today. In the old days, squatting was performed mostly from the knees, not the glutes with the hip hinge as we now do it. Thus, improper squats, going straight down so the knees go well beyond the toes, may be more debilitating than squats as we know them today. Just a thought...

Like

**Pingback: Forgotten Exercises: Cyclist Back Squats – Physical Culture Study**

Pingback: Bill Kazmier, 'Competitive Squatting Style and Techniques' from Bill Kazmier, The Squat and Deadlift (Crain Power-Plus, 1981) – Physical Culture Study

Pingback: Bill Kazmier, 'Competitive Squatting Style and Techniques' from Bill Kazmier, The Squat and Deadlift (Crain Power-Plus, 1981) | Engraved In Iron

Pingback: Reading This Article Makes You Lose Body Fat (seriously) | Jacked To The Future

Pingback: The B.A.W.L.A. Primary Physical Improvement Course c. 1948 - Physical Culture Study

Pingback: Ian King, 'How Hard Should I Train?', Get Buffed (2002) - Physical Culture Study

SUBSCRIBE TO BLOG VIA EMAIL

Join 9,005 other subscribers

---

FOLLOW US



UP ↑