

Research Study Comes To A Completion

Subject Decides To Bowl Second 300

I have completed the study, one of the first of its kind, and wouldn't you know it, the subject decided to roll another honor score just before the conclusion. Isn't that fantastic. I'm happy to say he has faithfully stuck with *The Bowling-Specific Training Program* for over 12 consecutive months and continues to exemplify the commitment of a bowler-athlete. And what about his progress. During the 1997-1998 season and beginning the 1998-1999 season:

- **Two sanctioned 300 games.**
- **(1997-1998) league high game and team high game & series.**
- **Financial returns over-exceeded his financial commitment.**
- **Tremendous sport specific fitness improvements.**
- **Confidence and Competence are high.**

An average increase of 5 pins above and beyond the previous several seasons.

Beginners luck no way. Listen to what he thinks:

"I must confess that when I started this program, I was looking for the benefits of cardiovascular training and conditioning on my lifestyle. I was not directly looking to improve my bowling abilities except through indirect means. I suppose that I didn't fully buy into the bowler-athlete concept. My mental image of the sport was one of concentration and thought processes. I thought that as long as I could get to the line, I could bowl well as a matter of mental skills and physical repetition. I've since learned that's not entirely the case."

Well, consider me a convert. I lived the other side of the coin, heck, I could be the poster child for that well-worn belly image of the bowler. I am a believer, I have seen a direct improvement in my physical skills as a bowler from this program, and I have not done anything different from any of the previous eight years except this program."

So where does this leave us. Well, this month I will interpret the final physiological evaluation providing all the juicy numbers on his sport specific fitness and attempt to tie them to his bowling.

The Final Evaluation

This year long study concluded with a final evaluation performed in exactly the same manner as the first. Every controllable variable including the time of day, day of week, instrumentation, procedures, and order of evaluation were synonymous to the first. This method of repeated measures helped minimize error and contribute to the validity of the methodology (the way the study was conducted).

Blood Profile

The National Cholesterol Education Program recommends HDL levels greater than 60 and LDL levels less than 130.

The subject had a blood profile done to determine his cholesterol level that is one of the major risk factors for cardiac incidence. Though it doesn't necessarily directly apply to bowling directly, there are several correlations with cardiovascular efficiency and sport performance. The subject's cholesterol level measured at 191 some 62 points lower than the initial 253. GREAT. His good cholesterol, HDL, was a moderate 43, slightly down from its original 47. His bad cholesterol, LDL, was 119, also down from its previous 178. The overall decrease in blood cholesterol probably contributed to the slight decline in HDL; this is partially expected and a realistic finding.

	Pretest	Posttest	Difference
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Cholesterol	253	191	-62
HDL	47	43	-4
LDL	178	119	-59

Since the subject's cholesterol level is lower, it leads me to believe his cardiovascular fitness would also have improved, but we'll see. Read on and find out.

Body Composition

The subject's body composition and girth measurements have been evaluated from the start. Though weight loss is not a direct goal of *The Bowling-Specific Training Program*, the training should have impacted his overall body composition in two ways. First, the mere fact the subject is training means he is expending more calories on his training days. (*note: the subject was not doing any form of exercise or activity prior to the study*). Second, as the subject tones his body the metabolic rate (metabolism) should increase thereby burning more total calories daily. You see, lean body tissue is a furnace for calories. As the subject toned his body, it should have become more metabolically active, consequently burning more calories daily and not just while he is training.

At the start of the study, the subject and the researcher both acknowledged weight loss could be beneficial since he was carrying a lot of body fat (31%). His chest, waist, and upper thighs were extremely high in body fat and seemed to hinder a smooth fluid arm swing due to the friction caused by the arm rubbing against the body and the swing being forced around it.

At the completion of the study, the subject weighed in at 239 pounds, some 17 pounds less than his initial 256. FABULOUS. He also registered a body fat percentage of 20.4% that is 10.6% less than his initial 31%. OUTSTANDING. Remember now, this study only tested the training program without dietary manipulation. My only dietary recommendations were to drink more water and leave a little food on his plate at each meal. Manipulating diet at the same time as testing the training program would have made it very difficult to pinpoint which impacted his sport specific fitness and bowling. Though the subject had his own freewill choice to control his diet any way he chose, I strongly encouraged him to maintain his current lifestyle habits as not to adversely affect the study.

	Pretest	Posttest	Difference
Weight	256	239	-17
Body fat %	31%	20.4%	-10.6%
Lean Body Mass	177	190	+13
Fat Body Mass	79	49	-30
Waist	45.5"	44"	-1.5"
Thigh	24.5"	21"	-3.5"

Looking at the numbers, the subject was initially carrying 79 pounds of body fat, yet ended up with only 49 pounds, equaling a 30-pound fat loss. WOW. At the same time, his lean body tissue rose 13 pounds thereby providing the 17-pound overall weight loss. Anyway, his now 20.4% body fat is a strong indicator of healthy weight loss. **The real question remains, has the body fat loss affected his bowling?** Let's find out. The following statement was given by the subject after the final evaluation. (*Note: the subject was not fully aware of his final results when interviewed to prevent bias judgment*).

"The weight loss and subsequent fat reduction seems to have freed my arm swing even further and another honor score is the result. Lowering the girth in my midsection and loosening my shoulder joint has reduced the tendency for my swing to 'bump' out. I feel the ball closer to my ankle and see it on video. My leverage has increased at the bottom of my swing and the pro-groove is looking good."

So, has the body fat reduction and weight loss affected this competitive bowler? According to him, it had a positive impact. Just listen to the confidence oozing out. Talk about body-mind connection. The subject cites a freer arm swing, a reduced "bump", a swing closer to the ankle, increased leverage, and a better looking pro-groove. WOW. No bowling ball you could ever purchase can give you all that. Implications - if you are having trouble with some of these things, try *The Bowling-Specific Training Program* and let it be your swing doctor.

Strength

I have written for years that sport specific strength and conditioning is important for those of us who seek to bowl better and have an injury free (reduced) career. Strength training has been tested, proven, and documented to enhance athletic performance in just about every other sport and activity, so why not bowling. In fact, the multitude of sport federations generally has their own sport science researchers performing multiple studies in this area. I hope someday our sporting leaders will recognize my work in sport science and look into it more seriously. You my friends need to be the sounding board for the bowler-athlete.

Following up on the belief that strength and conditioning enhance athletic performance, the subject's upper body and lower body strength were constantly monitored throughout the study. Unfortunately, the subject was ill the week prior to and during the final testing. Knowing illness directly impacts energy levels by diverting it to enhance the immune system and fight off infection, the researcher thought the strength tests might be adversely influenced. We'll see. The subject tested at 170 pounds upper body strength and 260 pounds lower body strength. These measurements were both exactly the same as the beginning of the study. I consider this finding to have been influenced by the two extraneous variables; the subject's illness and the accompanying depleted energy levels. Noting this, these numbers are not necessarily true indicators of his actual strength. Referring back to the subject's training program, it is easy to see the tremendous improvements in strength throughout the year. So what do I do, nothing. This is something any trained researcher is prepared for.

Strength	Pretest	Posttest	Difference
Upper Body	170	170	questionable
Lower Body	260	260	questionable

Flexibility

Flexibility is vital to effective sport execution. The subject was not on a stretching program because the training routine utilized full range of motion exercise. Sport science has shown complete range of motion exercise enhances flexibility. The subject performed the standard sit-and-reach test that measures flexibility of the hamstrings, hip extensors, lumbar muscles and those of the spine. The subject reached 15.75" increasing over 2.75" on the test placing him into the 45th percentile for his age group.

Flexibility	Pretest	Posttest	Difference
Sit-N-Reach	13"	15.75"	+2.75"

The subject has noted on several occasions a greater balance at the foul line and the ability to increase ball speed more consistency. After reviewing his sport specific fitness improvements, it is my professional opinion the reductions in body weight combined with increased leg strength and flexibility have to some degree contributed to his enhanced finish position and boosted level of confidence and competence. When referring to his league bowling and both 300 games the subject states:

"Where I bowl, the heads are deteriorated and ball speed is a premium. I struggled with that over the years. I've seen a definite ball speed increase 1-2 miles per hour without diminishing my form at the line. I can throw the ball harder more consistently and not lose my balance as in years past. What an asset."

The subject has mentioned to me in frequent contacts (e-mail, phone, in person) he thinks the greater flexibility in his shoulder joint has allowed an increased back swing attributing to his ability to increase ball speed. Now some people may frown on this, but he believes his timing hasn't changed and his balance at the line has improved tremendously.

Back to the flexibility issue, other multiple joint angles were evaluated and are as follows:

Bowling Shoulder (R)	Pretest	Posttest	Difference
Flexion	193	216	23
Extension	60	56	-4
External Rotation	95	110	15
Bowling Slide Leg (L)			
Flexion	102	125	23
Extension	22	57	25

As shown above, all but one joint angle increased in range of motion. These increases lend support for full range of motion training enhancing flexibility, though body fat reduction may have contributed as well. Wonder why the subject is holding his finish position so firmly and confidently, it may have something to do with his increased flexibility. Could it work for you - give it a try.

Cardiovascular Fitness

Our sport does not apply high intensity cardiorespiratory demands on the average person, but training the cardiovascular system has many other valuable benefits. Sport science has shown athletes with higher levels of cardiovascular fitness can handle exceptional amounts of stress for greater lengths of time. Therefore, the implication is a strengthened cardiovascular system will enable us to bowl longer and stronger as well as recover quicker from practice and training. For those who bowl frequently, increasing your VO2 will improve your bowling endurance. Having mentioned that, our subject's maximum VO2 was measured at 54.6 ml/kg/min that escalated an astonishing 20.3 points from an initial 34.3 ml/kg/min. This is by far the most amazing of all physiological adaptations. This figure placed him in the upper 3/4 of his age group. WOW, now that's incredible. No wonder he's bowling longer and stronger.

Cardiovascular	Pretest	Posttest	Difference
VO2 Max	34.3	54.6	+20.3
METS	9.8	15.6	+5.8

The subject believes he is bowling longer and stronger exemplified by his acknowledged improvements at the line, ability to increase ball speed more consistency, enhanced balance and stability, first two sanctioned honor scores, and his teammates noticing differences as well. Quantifying much of this was difficult but qualifying with sources such as the subject and his teammates was a good start. To conclude this month's review of the final evaluation and how it applied to the subject's bowling, let us look over his training routine and current training ranges, then hear what he has to say.

Training Program	Initial	Current	% Increase
Recumbent Bike	26 minutes	42 minutes	61%
Shoulder Press	50 pounds	125 pounds	150%
Behind the Neck Pull-down	70 pounds	130 pounds	86%
Chest Press	70 pounds	150 pounds	114%
Bicep Curl	50 pounds	110 pounds	120%
Triceps Extension	33 pounds	75 pounds	128%

Wrist Curl - over	20 pounds	40 pounds	100%
Wrist Curl - under	40 pounds	80 pounds	100%
Back Extension	body weight	body weight	not factored
Abdominal Curl	body weight	body weight	not factored
Leg Extension	73 pounds	120 pounds	64%
Leg Curl	60 pounds	120 pounds	100%
Calf Press	150 pounds	350 pounds	133%

Subject:

"It is my observation that virtually every area of my bowling game has improved from training, both mental and physical. The benefits are far-reaching and universal through my life. It is truly unfortunate that it is not available in a pill. You need to move to get the benefits. As for the trade offs, I have paid for the gym membership many times over: it is among the best dollars that I have ever spent on my sport. Making this kind of change is a lifestyle one and that "old me" is just waiting around for me to slip up. The "old me" is a powerful force not to be underestimated, as I have failed before when attempting a change like this. Vigilance is the key. Thank you Jeff."

Next month, find out who are the subject and the closing scope of the study. See you then.