

A Second Look

WOW, we are nearing the halfway point of this research study of the bowling-specific training program. The subject has faithfully stuck with the program even while traveling on vacation, bowling in Reno, through sickness and the Christmas holidays. He'd better, or we'll all come after him. And what about his progress:

- **First sanctioned 300 game**
- **Current league high game and team high game & series**
- **Average up 5 pins from the previous several seasons**
- **Financial returns well beyond his financial commitment (membership)**
- **Strength gains beyond my early expectations**

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 this 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 bowlers. 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."

I didn't say that, he did.

Let us continue by exploring why the subject seems to be singing praise. This month we view the subject's second physiological evaluation completed at the same university testing lab and compare the results to those from the first. Has he improved? Are we blowing smoke and using mirrors? You be the judge.

The 2nd Evaluation

The 2nd evaluation was performed in exactly the same manner as the first. Every variable including the time of day, day of week, instrumentation, personnel, procedures, and order of evaluation was synonymous to the first. This method of repeated measures helps minimize researcher error that often occurs if not properly planned.

Without further ado, the subject's blood was drawn for a blood profile. Wahah - the subject has lowered his cholesterol an amazing 74 points to 179. The good doctor liked those numbers. His good cholesterol, HDL, was an outstanding 42. Eventually though we'd like to see that number around 60 as recommended by the National Cholesterol Education Program. His bad cholesterol, LDL, was GGGRRREEEEAAATTTT, down 66 points to 112. Another excellent finding since the National Cholesterol Education Program recommends less than 130. His total cholesterol ratio was 4.3 that plummeted from 5.4. This ratio signifies his training has lowered both his total and bad cholesterol. Fantastico. His triglyceride level dropped 15 points to a satisfactory 127. All in all, his blood work revealed a lower risk for heart disease and greater opportunity for energy usage while bowling.

Name	1st Eval	2nd Eval	Difference
Blood Profile	-	-	-
Cholesterol	253	179	-74
HDL	47	42	-5
LDL	178	112	-66
Ratio	5.4	4.3	-1.

Triglycerides	142	127	-15
Blood Pressure	132/82	142/84	-

The subject's body composition and girth measurements were evaluated even though they are not direct program goals. So that everyone is clear, weight loss is not a program goal, instead the study is attempting to determine whether or not the training program impacts physical fitness and bowling performance. Furthermore, such as this month's report, the use of clinical exercise testing reveals quantitatively whether or not the subject's fitness has improved. Therefore, weight loss or gain is not important, though a body fat loss is desired being one of the five components of physical fitness. Fortunately, the Christmas holidays did not take a significant toll on this individual who loves to eat, instead he lowered his body fat percentage 1% to 30%.

Remember, this study is only testing the training program without dietary manipulation. Changing the subject's diet will be my project next year. Anyway, his now 30% body fat is a sign of healthy weight loss. The subject does need to drop plenty of body fat to function more efficiently and represent our sport as one of its athletes. In fact, 30% body fat is still a risk factor for cardiac problems. Fortunately, his body fat percentage is on the risky borderline so any further reduction will take him out of the risk category.

I have speculated for years that sport specific muscular strength and endurance are important for bowlers seeking enhanced performance and longevity. Following up on that belief, the subject's upper body and lower body strength were measured. A flat bench press was used to evaluate upper body strength and the seated leg press for lower body strength. Upon completion, the subject tested at 200 pounds upper body strength and 460 pounds lower body strength.

Strength	1st Eval	2nd Eval	Difference
Upper Body	170	200	+30 pounds
Lower Body	260	460	+200 pounds

Standards for upper and lower body strength are based on a strength to body weight ratio. The subject increased his upper body strength 30 pounds and had a ratio of .75 that rose into the 15th percentile. The subject's lower body strength, which increased an amazing 200 pounds, had a ratio of 1.73 and rose into the 55th percentile. Needless to say, our subject has, tremendously increased his strength levels. His ratios and percentile rankings will improve as he continues to gain strength while slowly reducing his body fat percentage.

Flexibility of many body parts is vital to improved bowling. The subject is currently not on a stretching program because the training routine utilizes full range of motion exercise that has been shown to increase flexibility. Our subject did the standard sit-and-reach test that measures flexibility of the hamstrings, hip extensors, lumbar muscles and those of the spine. The subject reached 13.5" increasing over ½" on the test placing him into the 25th percentile. Other multiple joint angles were evaluated and will be reported upon completion of the study.

Flexibility	1st Eval	2nd Eval	Difference
Sit-N-Reach	13"	13.5"	+.5"

It is true our sport does not apply high intensity cardiorespiratory demands on the average person, but training the cardiovascular system has many other valuable benefits to our lives. A person with a higher VO₂ can handle greater amounts of stress for greater lengths of time. Therefore, the implication is greater cardiovascular fitness will help you to bowl longer and stronger as well as recovery 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 49 ml/kg/min that escalated an astonishing 15 points from an initial 34 ml/kg/min. This is by far the most amazing of all physiological adaptations to date. This figure placed him in the 85th percentile for his age group and gender. WOW, now that's incredible. No wonder he's bowling better.

Cardiovascular	1st Eval	2nd Eval	Difference
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VO2 Max	34.3	47.9	13.6
METS	9.8	13.7	+2.9

The subject has trained for six months at the time of this writing. He has maintained the program with extreme sincerity exercising an average of three days per week performing only the specific program. No extra physical activity beyond the scope of this training program has been recorded.

Training Program	Initial	Current %	Increase
Recumbent Bike	26 minutes	42 minutes	62%
Training Range 129-156 bpm	20 minutes	35 minutes	75%
Shoulder Press	50 pounds	110 pounds	110%
Behind the Neck Pull-down	70 pounds	120 pounds	71%
Chest Press	70 pounds	130 pounds	86%
Bicep Curl	50 pounds	100 pounds	100%
Triceps Extension	33 pounds	80 pounds	142%
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	310 pounds	106%