Components of an elite training program for tenpin bowlers

For teams and individuals

by Joe Slowinski

In many ways, bowling as a sport, especially in regard to training methods for elite bowlers, remains in its infancy. Specifically, there are few available resources for coaches to utilize in the development of an effective holistic training program that includes bowling, fitness, nutrition and psychology training for competitive teams, whether it is preparing a high school, college or a national team for a country. Collectively, the bowling community doesn’t have the knowledge it needs.

On the other hand, in Asia, bowling is treated more like a sport than anywhere in the world. In this region, the elite national teams of Singapore and Malaysia have access to sport psychologists, fitness trainers, physiologists and biomechanics staff. Bowling is viewed from a holistic standpoint in order to improve human performance and the access to scientists illustrates this fact.

With this in mind, I offer some advice on how to establish and run a world-class team training program. And, although written more for coaches and not exhaustive, this article can be applied to individuals to improve their performance. This is a minimum blueprint in building success on the lanes.

To develop an elite program, a coach should take a holistic approach to program development and helping players reach their peak performance. In order to achieve this, an elite program must include the following components:

- A curriculum to educate athletes in advanced bowling knowledge
- Opportunities to practice this knowledge on diverse lane conditions
- The establishment of a baseline set of data and ongoing assessment of bowlers’ skills and knowledge
- Monthly goal-setting and evaluation of progress in relation to the goals
- Fitness and strength training
- Mental game practice

With these six areas, a program can develop bowlers to their full potential.

Bowling knowledge

As a coach of an elite team, knowledge development must be the first priority. World-class bowlers are those who are diverse and can play anywhere on the lane due to the ability to alter their release and angle of attack. Specifically, elite players have the ability to change the amount of skip, the shape of the shot and the back end reaction with their physical game as well as prepare their equipment for various conditions.

To illustrate the above, recall the responses of some of the most successful PBA players on tour in the February 2007 issue of BTM. Players were asked, “What are the three most important phases of your game that allow you to be successful?”

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Norm Duke
(1) Mental Game
(2) Ability to change ball speed, tilts, etc.
(3) Ability to make spares

Walter Ray Williams
(1) Being able to play different parts of the lane
(2) Being fairly accurate
(3) Shooting spares

Parker Bohn III
(1) Mental Game
(2) Lane Play (how to play and when)
(3) Versatility

Robert Smith
(1) Rev rate
(2) Speed
(3) Ability to change axis tilt

Ryan Shafer
(1) Versatility of releases
(2) Reading lanes
(3) Knowing my equipment and what drilling works for me

Tommy Jones
(1) Understanding lane patterns and how they break down
(2) Being able to stay calm under pressure
(3) Good spare shooter

In other words, knowledge + practice = skill. With the acquisition of skill comes confidence. Bowlers should know how to increase/decrease skid, change the shape of the shot and increase/decrease back end reaction. And, the ability to change ball reaction can't be understated.

According to research conducted at Columbia 300, a bowler can increase the amount of hook two boards for every increase of 30 rpms. Moreover, Columbia 300 found that a bowler can realize five more boards of hook by increasing their release, from 30 degrees to 45 degrees. With this 15-degree increase, the entry angle will increase from 3.1 to 4.5 degrees. Moreover, by increasing to 60 degrees of axis rotation, from 45 degrees, a bowler would hook the ball three more boards on the backend and increase the entry angle from 4.5 degrees to 5.6 degrees.

Columbia 300 also conducted research on the impact of ball reaction with increases in both speed and the RG of a bowling ball. For every MPH increase, the ball will hook two to three boards less and see .2 to .3 less degrees of entry angle. For every .1 increase in the RG of a bowling ball, the ball hooked an extra board.

The R&D lab at Ebonite found that, on a shorter high volume house condition, a bowler could achieve 2.5 feet extra of length with a 4000 grit surface as compared with a 3600 surface. Do you have Abralon pads yet?

As a coach, schedule a weekly seminar for your players prior to the season or at the beginning of the season. Align the seminar topic for the week with the practice sessions. Accordingly, in the development of an elite training program, coaches should include classroom lesson time. In my role, I have developed a 40-week training program for three levels: U12, U15 and U18. Each week bowlers are exposed to learning new knowledge. This knowledge becomes the foundation of that week's training. And, each new knowledge and skill should build on the previous week's learning.

Data collection

Simply put, data reveals truth. And, without data, a coach can not truly know what strengths and weaknesses their bowlers possess on the lanes. In other sports, such as basketball and baseball, statistical information provides players and coaches with a complete picture of skills.

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And, bowling can learn from these sports. In my opinion, we rely too frequently on average information in isolation. Readers know clearly that scoring can be elevated through lane conditions. We need more information.

Elite coaches should maintain an individual portfolio for each player. This can be as simple as a collection of statistical performance data such as scoring, pocket percentage, carry percentage, double percentage, overall spare conversion percentage, multiple-pin spare conversion percentage, and single-pin conversion percentage. Or, if available, this portfolio can also contain an analysis from BowlersMap as well as other information from such programs as C.A.T.S. or DigiTrax.

Elite coaches who want to see improvement in their athletes must purposefully collect data to determine strengths and weaknesses in an individualized portfolio. The more serious a coach is about understanding his/her player in depth, the more this coach can impact a positive change with their athletes.

**Nutrition & hydration**

Coaches also need to understand the nutrition and hydration needs of players in practice and competition. Bowling has been reported as burning as many as 300 to 400 calories an hour. When bowlers are participating in competition play or training, coaches should help to insure their bowlers are hydrated and prepared for pre-event, during, and post-event consumption needs to maintain appropriate glycogen levels.

When preparing for a tournament or effective practice, it is recommended that you understand how. An effective way to do this is to know the glycemic index (GI). The Glycemic Index was invented in 1981 by David Jenkins and Thomas Wolever of the University of Toronto. For more information on this system, www.bowlingthismonth.com/resources. Most importantly, this site includes a glycemic index web site to search food by GI level. The GI is a scale based on how quickly food elevated blood sugar (glucose) levels in the body. High GI foods are listed as >70, medium (55 – 69) and low < 54.

Low GI foods include: fruit (apple, orange, pear, etc.), yogurt, low fat milk, cookies/biscuits (eat, vegetable), pasta, noodles, basmati rice or a müsli bar. Low GI foods also include breads with stoney-ground flour, whole grain kernels, or sourdough.

High GI foods include: watermelon, tuna sandwich, banana, cereal bar, bread. Recent research has also shown that chocolate milk is an outstanding recovery drink. And, of course, this would be a favorite for many.

The National Sports Institute of Malaysia (ISN-M) designed a competition plan for food and beverage consumption during the 2006 Asian Games in Doha, Qatar. The nutritional guidelines for the 8-day tournament included before, during and post-tournament play guidelines. These guidelines are for hydration and GI in order for a bowler to maintain appropriate glycemia levels. Specifically, these preparation and recovery guidelines included:

**Pre-event (30 minutes prior to competition)**
- Eat a low GI snack.

**During the event (every 15 to 20 minutes)**
- Consume an intermediate to high GI food with an electrolyte drink, such as Gatorade.

**Post-event (Within 30 minutes of completion)**
- Consume a high GI with water and an electrolyte, such as Gatorade.

In addition, as a coach, you should understand the digestion process times for various meals. Obviously, digestion should be close to completion for optimum performance. Specifically, a large meal will take 3 to 4 hours to digest with a medium meal 2 to 3 hours. Liquid meals or small snack will require 1 to 2 hours of digestion.

**Fitness and strength training**

Due to the short burst of energy in the approach and release, bowling is a sport that requires primarily anaerobic fitness. But, due to the carrying of the bowling ball and the length of tournament play, aerobic fitness is also needed.

Consequently, coaches should incorporate fitness training into the daily practice process. Bowling is a sport and requires athletes to be physically fit for competition. Training should include both strength training and cardio work.

An easy-to-use workout, with specific information on effective implementation, is presented in *The Bowling-Specific Training Manual*, by Jeff Brigg, sports physiologist, who has identified training areas specific to bowling, recommends a workout including: seated chest press, seated row, seated lateral raise, seated arm curl, seated tricep extension, seated overhead-grasp wrist curl, seated underhand-grasp wrist curl, abdominal curl, lower back extension, seated leg extension, seated leg curl and seated calf raise.

Another bowling-specific workout was created by Exercise Kinesiologist David Grissaffi and appeared in the
August 2002 issue of Bowling Digest. Here is the 3-days a week workout Grisafi wrote for 1999 USBC (then WIBC) Hall of Fame inductee, Jeanne Maidoff-Naccarato.

Important mental skill areas that an elite bowler should possess include: pre-shot routine, visualization, self-talk, self-efficacy interventions as well as relaxation and arousal methods.


This article was intended to get coaches and players to think more about creating and using a holistic training program. Too many coaches and bowlers simply go to the lanes and throw a bowling ball without reflection on the development of skills and knowledge as well as increased physical and mental skills fitness. If you want to improve and take the step up to a world-class level or just improve significantly, then treat bowling as a sport and incorporate a holistic multi-pronged approach to training.

**Recommended Minimum Daily Training Schedule**

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<tr>
<th>Minutes</th>
<th>Activity</th>
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<tbody>
<tr>
<td>15</td>
<td>TEAM MEETING</td>
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<tr>
<td>15</td>
<td>STRETCHING</td>
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<tr>
<td>15</td>
<td>DAILY DRILL SEQUENCE</td>
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<tr>
<td>60</td>
<td>INDIVIDUAL SKILL DEVELOPMENT</td>
</tr>
<tr>
<td>60</td>
<td>PSYCHOLOGY (mental game practice)</td>
</tr>
<tr>
<td>60</td>
<td>FITNESS</td>
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**References**


Note: Special thanks to Dr. Robert Morford, acting Director of the National Sports Institute of Malaysia, for permission to use the recovery guide prepared for the national tenpin bowling team for the Asian Games 2006.

**Mental Game Training**

Since elite athletes have similar levels of their physical game, what differentiates great from good is the mental game. Consequently, coaches are reminded that mental skill development should be embedded daily into practices. At the elite or developmental level, coaches should be promoting a number of skills in their players. But, this requires a commitment during the practice sessions.