Recent research on the adolescent brain has revealed important findings that have serious implications for youth bowlers as well as those who coach high school and college bowlers. Specifically, research has revealed that the brain of youths undergoes a restructuring, at the start of adolescence lasting into the early 20s. Due to these findings, youth bowlers from 13- to 22-year-olds, face challenges that are unique to any other period of one’s life. Consequently, both coaches as well as the bowlers themselves must understand these findings in order to maximize their performances on the lanes.

During this restructuring and rewiring of the adolescent brain, individuals encounter a changing sleep cycle requiring unique sleep needs and they must deal with increasing emotional ups and downs as well as increased self-doubt. Each of these areas presents potential problems and requires specific solutions to meet the needs of these bowlers. Without acute attention to these areas, bowlers are likely to under-perform on the lanes.

Accordingly, in this installment of Slowinski at-large, I share with readers several important topics that require special attention to enable elite youth bowlers to maximize their full performance potential. In addition, I share specific strategies to help coaches and players become more proactive in dealing with these unique needs.
The teenage brain reveals new truths

Recent research on brain development has found that a significant restructuring happens during the teenage years lasting into the early 20s. During this time, areas of the brain are rewired. This is literally why teenagers and young adults act and do the things they do. And, this is why we need to pay special attention to helping bowlers in this age group perform at a higher level. The areas of the developing brain include the frontal lobe, responsible for emotional regulation, judgment and self-control. This can manifest itself as emotions in a youth bowler such as outbursts on the lanes when encountering difficulties or rash decision-making when the lanes are changing. This is also why teenagers are more likely to engage in risky behavior. In addition to the frontal lobe, the corpus callosum is also continuing to develop during this time. The corpus callosum is responsible for self-awareness and intelligence. Finally, the temporal lobes, which are responsible for emotional maturity, remain undeveloped in a teenager.

What does this mean for youth bowlers and coaches?

With an evolving research base revealing unique differences in brain development of youth bowlers 13 to 20, it is critical to be proactive in these differences. Specifically, youth bowlers will likely need special attention in areas of sleep, dealing with self-doubt and improving emotional control. Coaches need to understand how important strategies and solutions are in each of these areas.

Sleep needs of the teenage & young adult athlete

Often overlooked and unrecognized, the sleep cycle of a teenager is literally different than any other period of life. Teenagers naturally stay up later and they also need more sleep during this period of their life. Consequently, if a teenager is serious about competing at a high level, a better understanding of sleep and sleep needs will help improve their performance on the lanes.

As children go from pre-adolescence to adolescence, they require more sleep to be healthy, a recommended 8.5 to 9.25 hours of sleep per night. And, research has shown that children will naturally undergo a phase delay during this time. Specifically, a teenager’s natural bedtime will be typically 11:00 o’clock p.m. or later.

A survey of more than 3000 adolescents revealed that most of them do not get an adequate amount of sleep. To illustrate, 26 percent of teenagers surveyed slept less than 6.5 hours per night with only 15 percent sleeping 8.5 hours or more each night. Worse yet, the research found that teenagers have irregular sleep patterns sleeping approximately 2 hours more on weekend nights compared to weekday nights. This can cause sleep problems in youths leading to disrupted sleep patterns during the week.

As a coach or youth bowler, sleep is a major issue to address in order to maximize performance levels. As illustrated above, teenagers are prone to be sleep deprived. And, sleep deprivation is a serious issue for a competitive athlete. For teenage bowlers who do not get enough sleep, a major drop in potential performance will be likely because sleep deprivation causes the following to occur:
• Impaired motor function
• Delayed visual reaction time
• Diminished mental functioning such as the ability to pay attention and engage in abstract thinking and problem-solving
• Reduced ability for decision-making involving the unexpected
• Impaired moods and increased moodiness
• Reduced endurance
• Increased perceived exertion
• Delayed auditory reaction time
• Reduced motivation
• Impaired moods and increased moodiness

Each of these liabilities can contribute negatively to an athlete’s performance on the lanes. The ability to focus with clear observation skills and uncluttered decision-making are fundamentally important to high-level performances.

With sleep being such an important contributor to brain functioning and physical performance, coaches can promote the idea of a consistent amount of sleep and the same bed time for every night through the whole week. And, athletes serious about high performance on the lanes should be sleeping at least 8.5 hours of sleep each night, especially during the competitive season.

What to do?

Here are specific recommendations that you can provide to your bowlers to help promote improved sleep (The National Sleep Foundation, 2000):

• Exercise regularly, but complete the fitness routine at least 3 hours before bedtime.
• Avoid drinks high in sugar or caffeine as well as nicotine before bedtime. These can all interfere with falling or sleep and nicotine can promote fragmented sleep.
• Have a standard and relaxing pre-sleep routine. Make sure your room is dark, cool and quiet.

Improving self-efficacy in elite youth bowlers

Self-efficacy is the belief an individual has that he can successfully do a specific skill or achieve a certain level of performance. Self-efficacy is an important psychological state needed to achieve an optimal performance. To illustrate, when someone is self-efficacious they have a positive effect. Like being “in the zone,” positive effect is associated with high levels of concentration, energy and joy. When self-efficacy is high, an individual will try harder at a task. Conversely, when an individual loses the belief they can do or perform specific skills, their effect becomes negative leading to higher levels of lethargy and sadness.

For elite bowlers and their coaches, it is critical to help bowlers remain in a state associated with a positive effect and high levels of self-efficacy. This is particular important in dealing with poor performances. Without intervention, a poor performance can lead to a loss of self-efficacy leading to negative effect, self doubt and a loss of confidence. One of the most important aspects of being an elite bowler is not to doubt your ability when you have a bad performance. This is far more important than many athletes and coaches realize.

From research identifying critical psychological skills and mental states of the most successful champions, it was revealed that these great athletes are both positive perfectionists and optimistic. Specifically, these champions have high standards, but do not concern themselves with mistakes or failure. They are able to move on after a setback without losing confidence. Sport psychologists refer to this as adaptive perfectionism. On the other side of the coin are those who are maladaptive perfectionists. In these cases, athletes are overly concerned with failure and often doubt their abilities.

So, it is important to be proactive to reduce the likelihood that a bowler will lose their self-efficacy and begin to doubt their abilities especially after a poor performance or underperformance in a tournament. Research has found that a journaling activity can actually reduce the likelihood that athletes will lose confidence after a poor performance.

Brown et al (2005) conducted self-efficacy intervention with 111 participants (53 males and 58 females), 11 to 17 years old, who played competitive handball or soccer in local clubs in Australia. In the study, the experimental group of teenagers responded to each of the six prompts, listed below, before a competition. After a loss in competition, the researchers compared the self-efficacy of the athletes before and after the loss. For those who responded to the six prompts, their confidence remained significantly higher than those who did not complete the journal activity. In other words, those who participated in reflecting on the six prompts listed below loss less of their confidence than those who didn’t engage in the experiment. So, the act of thinking about past positive competitions or training led to a significant preservation of the individual’s self-efficacy or belief he could do it. The six prompts were:
1. **Personal mastery**  
a. Think about something you did well during the competition.  
b. Think about winning you next event and how you will feel.  

2. **Encouragement or positive feedback**  
a. Think about a time when your coach praised you.  
b. Think about a time when your coach showed confidence in you.  

3. **Vicarious mastery**  
a. Think about a great athlete who failed at first and then succeeded.  
b. Think about a great athlete who works harder after losing so s/he can win in the future.  

By focusing on positive experiences, the athletes were insulating themselves against doubt when a poor performance happened. And, this would be more effective after frequent reflection of these six prompts.

To promote positive effect and self-efficacy, have your bowlers keep a journal and respond to these six prompts on a weekly basis. Remind your athletes to think about different experiences in response to each prompt. This will provide a repository of more positive experiences. By doing this simple journal activity, you will be building an adaptive perfectionism in your athletes similar to that possessed by the greatest champions of all time. This will preserve self-efficacy and confidence in your athletes allowing higher performance levels.

**Improving the emotional balance of elite youth bowlers on the lanes**

How many times have you seen youth bowlers express anger on the lanes? I recall many such moments in my own bowling career as a youth bowler. It shouldn’t be surprising considering the new research findings on the brain of a teenager. Recall the earlier discussion about sleep deprivation in teenagers. This can be a source of moodiness and emotional feelings. Moreover, the areas of the developing brain associated with emotional regulation and emotional maturity are not yet developed. Consequently, it is very likely that youth bowlers are more likely to encounter emotional ups and downs. And, we know that emotional instability can adversely effect a bowler’s performance.

To help youth bowlers improve their emotional balance, I have successfully implemented lane play planning, daily use of positive self-talk and a pre-shot routine with elite youth bowlers. Specifically, I have had tremendous success with the implementation of my 7-step pre-shot routine. When using this 7-step process, teenage bowlers who have a history of emotional responses including anger outbursts become emotionally balanced. When these athletes focused on the 7-step pre-shot routine, they were more focused on executing the best possible single shot. This enabled them to be more emotionally balanced. Such balance led to improved consistency in scoring and performance.

In summary, I recommend three specific actions to help a bowler improve emotional balance on the lanes:

1. Extensive practice of the pre-shot routine which promotes an equal balance on every single shot  
2. Bowlers share their positive self-talk statements each day during the warmup stretching  
3. Lane play planning provides a reflective process to ensure that decisions were well thought-out in advance.

**Better understanding of what youths face**

This month’s installment addresses some very important areas associated with the realities faced by youth bowlers due to the restructuring of their brains during the teenage years into the beginning of adulthood. It not only helps us better understand why young people do what they do and act they way the do, but it also provides us with a wakeup call to address areas of need to help youth bowlers maximize their potential on the lanes.

**Resources**