

PERFORMANCE CYCLING CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING CYCLISTS

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From Frazier Cycling: Youth Cycling #33 TrainingPeaks Charts Usage

Ralph Frazier and Kelli Rogan- Frazier Cycling

Frazier Cycling's Atlanta-based Junior Development Program was developed by Ralph Frazier and Kelli Rogan. Ralph has over 35 years of cycling experience as an endurance and marathon racer and a coach. Kelli has 15 years experience of coaching juniors and masters as well as an impressive track and race racing career. Frazier Cycling has a mission to develop the next generation of serious cyclists with an appreciation for the sport, life-long physical fitness, sportsmanship, teamwork and commitment. As the southeast's largest junior development program, they have been recognized by USA Cycling News as "an excellent model for other junior development initiatives" ...focusing on "character as much as athletic ability." The Frazier Cycling Juniors team holds 6 national championship titles.



Ralph Frazier



Kelli Rogan

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XTP** **M**y training and coaching career has spanned more than 40 years. In that time, training and coaching has moved into the "Age of Technology". Our Juniors Program, which we began more than a decade ago, has wholly existed in this "Age of Technology". Although reluctant at times, both Coach Kelli and I have managed to embrace this age!

Like many cycling coaches, we at Frazier Cycling use Peaksware's TrainingPeaks software for our primary set of training tools. We use these tools to monitor the effectiveness and apply improvements to our Juniors Program by means of evaluating the training of select team members. Within this column, we are going to discuss the technology side of our Juniors Program. We will share some data from some of our select individuals and disclose how we use it. We will point to three of our top juniors for reference.

First, we will show how we monitored "peaking" a 15-year-old girl for three important events using the Performance Management Chart. Her target events were the Women's Georgia State Road Race in June; USA Cycling Amateur & Para-cycling Road National Championships in Madison, Wisconsin, in early July; and the River Gorge Omnium Road Race, in late August. Our methodology proved effective as she won the women's state road race. At road nationals, she was the only 15-16 junior woman to medal in all three events (road race, time trial, criterium). At River Gorge, she won the Women's Cat 3 Omnium by placing second in the time trial (fourth overall including Women's Cat 1 and 2), winning the Women's Cat 3/Cat 4 criterium, and finishing second overall (first Women's Cat 3 finisher) in the 36-mile road race that finished at the top of Raccoon Mountain following a 5 km climb.

Next, we discuss how we use the Power Profile to identify strengths and weaknesses. We will show the Power Profiles for the three athletes: the same 15-year-old girl referenced above, a 15-year-old boy, who won this year's Men's Cat 4 River Gorge Omnium Road Race, and a 13-year-old boy, who is a past national road medalist and who placed 6th in the same River Gorge Omnium Road Race.

Although many of you are familiar with TrainingPeaks software, we'll briefly discuss some of the terminology we'll use within this column.

We have two primary training objectives: 1) prescribe the appropriate workouts and rest over time to achieve the highest



possible fitness and 2) before an important event, achieve the highest possible form. Each workout has a target intensity based on an individual athlete's Functional Threshold Power (FTP) and duration based on the athlete's fitness level. FTP is the highest mean maximal power a cyclist can maintain for one hour.

To evaluate fitness, we use the athlete's Chronic Training Load (CTL). CTL is the workload (frequency, duration, intensity) of training over the recent six weeks and it is expressed as a Training Stress Score (TSS) value – the higher CTL, the higher fitness. TSS is a workload value for each workout, which is reflected by the duration and the intensity relative to FTP.

In managing fitness increases, we monitor CTL and Acute Training Load (ATL). ATL is the workload (frequency, duration, intensity) of training over the recent week expressed as a Training Stress Score (TSS) value. In addition, we make adjustments to our athlete's training by considering Training Stress Balance (TSB). TSB is the difference between CTL and ATL ($TSB = CTL - ATL$); hence, TSB is an indicator of how "fresh" an athlete is likely to be. When TSB is zero, the athlete is neither "fresh" nor fatigued. A positive TSB shows freshness and a negative TSB implies fatigue.

Finally, we monitor and adjust the athlete's training schedule with all of the elements mentioned above to achieve increased "form" to coincide with a specific event or race period. Form is expressed $Form = CTL + TSB$.

Performance Management Chart

As detailed above, we use TrainingPeaks' tools to manage training of select athletes on our team. In particular, we use the Performance Management Chart to manage "peaks" for our athletes to their maximize performance for particular events or specific time periods. We showed that $Form = CTL + TSB$. In order for an athlete to perform at his/her maximum, his/her form should be at its maximum. In order to increase "freshness", there has to be an increased difference between CTL and ATL meaning that ATL must be reduced significantly. Indeed, this reduction in workloads will cause a loss of fitness because adaptation to lesser stress will occur. However, CTL will decrease at a lesser rate because it is the six week daily average of TSS; whereas, ATL is only one week's average. The result is that the combination of CTL and TSB becomes greater for a period producing increased "form". Knowing your athlete's fitness level and abilities dictate how you manage his/her workouts to achieve top form for the particular athlete. This is the art of "Technology Coaching".

We schedule each athlete's workouts on his/her Training Peaks calendar and the athlete updates the daily workout by uploading the corresponding workout file. Our aim is to train our athlete such that he or she is "fresh" on race day or during a race period. The art of determining an athlete's form is the determination of the combination of fitness and fresh to maximize performance for a particular event or specific time period.

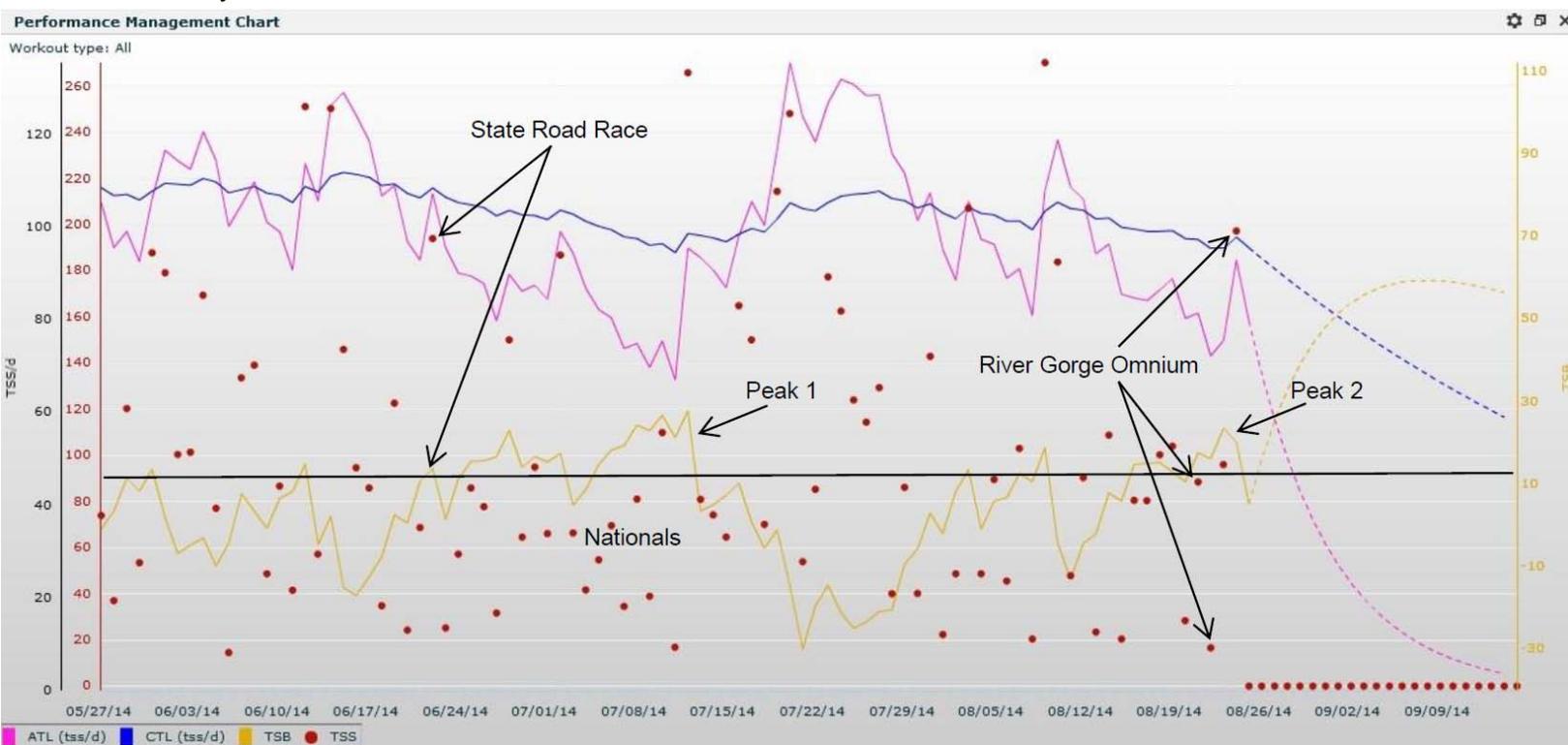
Peaking with Power: $Form = Fitness + Freshness$ ($Form = CTL + TSB$).

Below is a snapshot of the Performance Management Chart of a 15-year-old girl on our team who medaled in all three events this July at USA Cycling Amateur & Para-cycling Road National Championships in Madison, Wisconsin.

Peak 1 indicates road nationals. Her "form" for the national road race, the most important race on her schedule, on July 2 was: $Form = CTL + TSB = 120.8$. She placed second. On the Fourth of July, she competed in the time trial and placed fifth. Her form was down a little, 109.7. Nationals ended on July 6 with the criterium. Her form on that day was back up to 117.3 and she was fourth.

You may notice that we started "peaking" her before nationals. On June 23, we had our state road race championship. Our 15-year-old junior girl was competing for the Women's Cat 3 Georgia State Road Race Championship. This was "dress rehearsal" for the national's road race. Her form was her highest for the season at 121.9. She was the overall winner for Women's Cat 1/Cat 2/Cat 3.

Finally, our girl's second most important race for the season was the River Gorge Omnium Road Race on August 24. Her form on that day was 117.6.



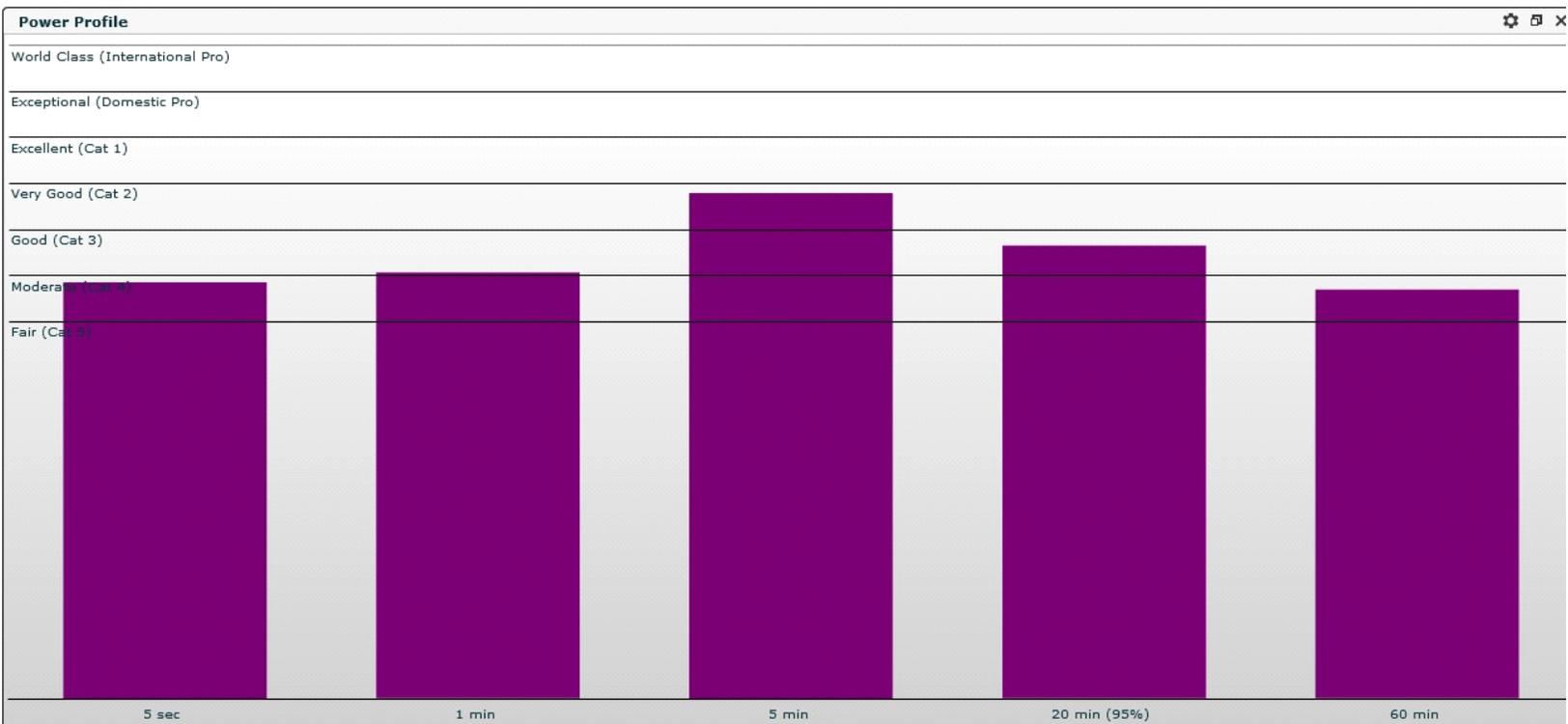
As you may see, we weren't able to have our star girl at her top form on the most important race of her season by the numbers. To be honest, we don't believe that the "numbers" are the "Holy Grail". There are so many factors that affect the outcome of each race. Yet, what we have found and do believe is that the "numbers" are very important and helpful in preparing our athletes for competition.

Power Profile

We use Power Profile Charts for various reasons like comparisons for Category upgrades. Another reason is for identifying strengths and weaknesses. In this column, we will discuss strengths and weaknesses and how we use the Power Profile Charts to give our athletes visual feedback. Specifically, we want to show how we present data to a 15-year-old team member on how his weakness in 5-second and 1-minute power-to-weight compares to his contemporaries on our team. This 15-year-old boy won this year's Men's Cat 4 River Gorge Omnium Road Race that culminated atop Raccoon Mountain following a 5-km climb. He's had success in road races and time trials, but he hasn't achieved nearly the same in criteriums.

Before discussing this topic, I should point out that we don't train, nor do our juniors have races, where one-hour power-to-weight is pertinent. Our juniors don't compete in one-hour time trials and their road races do not require "all out" efforts for an hour. Indeed, we basically ignore one-hour power for our juniors and we concentrate on 5-second, 1-minute, 5-minute, and 20-minute power. **Furthermore, we use 20-minute power data to extrapolate the individual's FTP.**

It is quite apparent in his Power Profile that his 5-minute power-to-weight number is his strength. His 20-minute power-to-weight is good, too. Noticeably, his 5-second and 1-minute ratios are significantly lower. Not coincidentally, he has more success in road races, especially hilly races, and time trials. He's able to finish in the field of criteriums with the Men's Cat 4's, but he hasn't enjoyed a top placing.

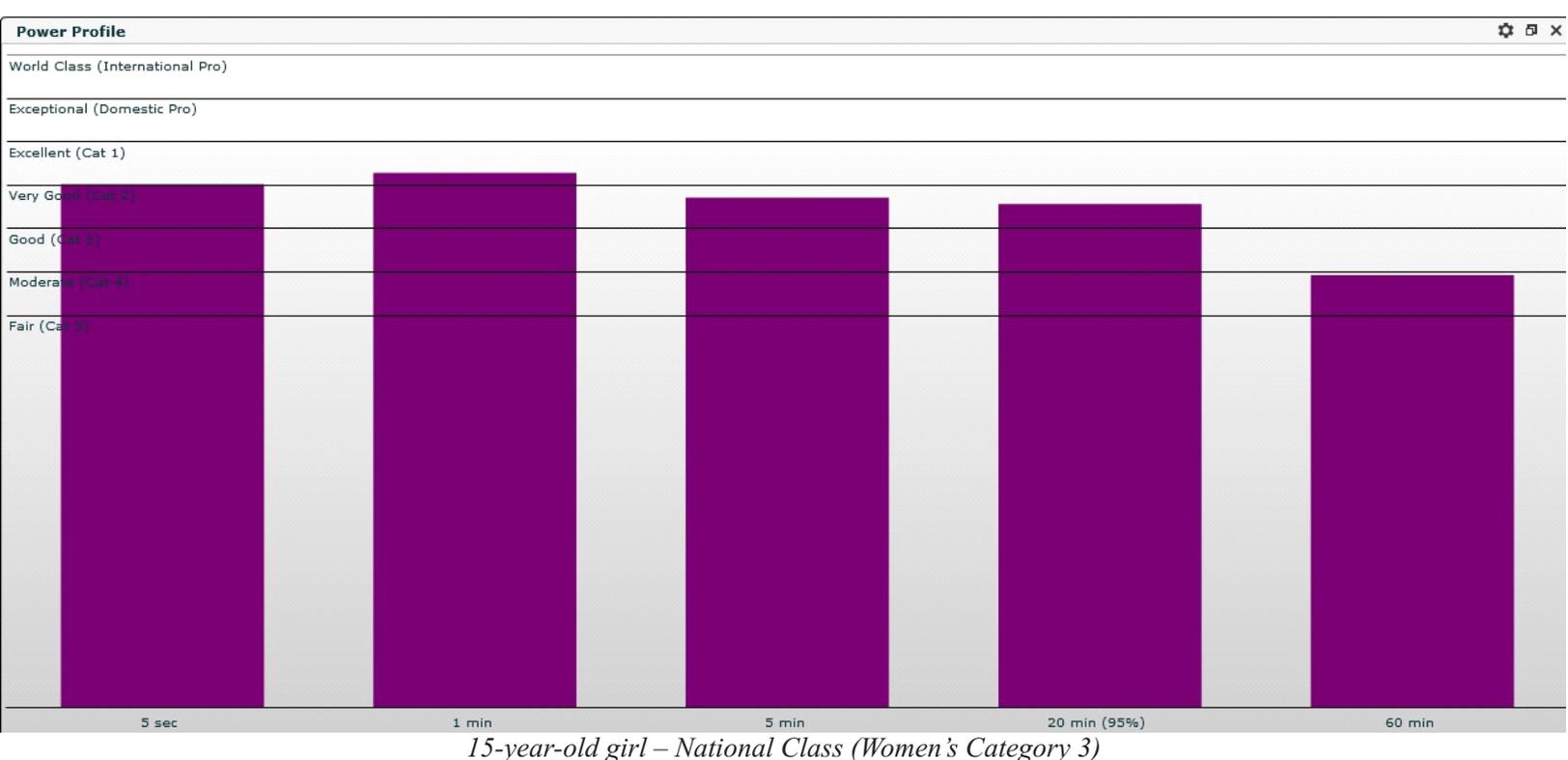


15-year-old boy

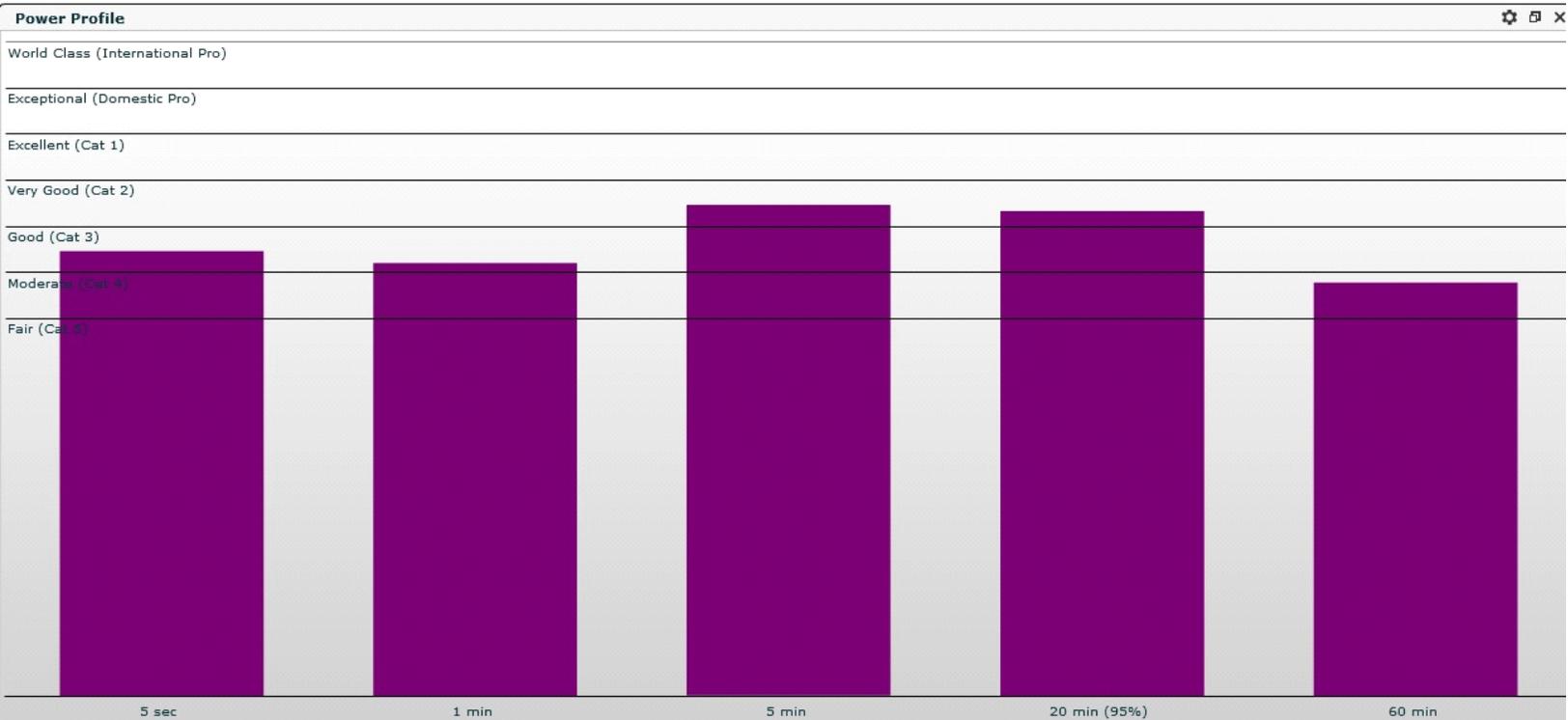
Below (next page) is the Profile for our 15-year-old girl that we detailed earlier. She has excellent numbers across the board. Her power-to-weight ratios for 5-second and 1-minute are significantly higher than our 15-year-old boy. Her training schedule includes regular team criterium practices and team sprints.

The following (next page) Power Profile is for our 13-year-old boy who competes as a Cat 4 with the 15-year-old boy. Again, his power profile shows stronger 5-second and 1-minute ratios than our 15-year-old boy.

All three of these juniors are normal physically for their ages. The 15-year-old boy is not physically behind for his age and both the 15-year-old girl and 13-year-old are not physically advanced. All three kids participate in the typical group rides that include "traffic sign" sprints and similar sprint segments. The big difference in training is that the 15-year-old girl and 13-year-old boy are local to our team practices and both participate routinely. The 15-year-old boy identified here is the only select team member who is a remote member to our Juniors Program. As a result, he seldom is able to participate in our team practices or skills lessons. Although his training plan incorporates similar workouts, he misses out on the structured lessons and practice competition enjoyed by his teammates that are located together.



15-year-old girl – National Class (Women's Category 3)



13-year-old boy – National Class (Men's Category 4)

Our local team members have an advantage of training together; thereby, competing among one another in practices. The local members practice sprints and simulate criterium races regularly. For next season, not only do we need to insure that our 15-year-old is given the appropriate intervals, sprints, etc., but we need to find a way for him to push his limits in sprints. Finding other cyclists with which our 15-year-old can practice sprints and intervals is unlikely. A good solution will be to have him routinely practice sprints and short intervals on an indoor training using his power meter display proving him with targets and feedback to help improve his short distance power.

What we haven't mentioned to this point is the importance of obtaining complete data. The more information obtained, the greater the probability that the tools, and thereby, your coaching, will be effective. Coaches must schedule appropriate workouts and recovery and the athlete must supply the resulting input. The three junior cyclists that we reference in this column are exceptional about providing their data. Not every junior will have this motivation and that's a huge part why we rely only on a select few. [\[O\]](#)

Resources:

- *Training and Racing with a Power Meter*, Velo Press, by Hunter Allen and Andrew Coggan, PhD
- *The Power Meter Handbook*, Velo Press, by Joe Friel