

November 29, 2014

## Fitness is not Stagnant

One of our favorite statements that describe the reality of fitness is a simple expression:

“Fitness is not stagnant – you’re either getting better or getting worse all of the time.” – Joe Friel, *The Cyclists Training Bible*

Sometimes coaches and athletes tend to forget that fitness is a moving target. With power meter technology at our disposal, some get overwhelmed with metrics and data such that the side effect is a roadblock to common sense. This is the opposite effect that one should expect. Instead of clarity, confusion happens. As a result, some have become convinced that the resulting data should be the “holy grail”. We know this is happening based on the number of coaches and athletes who’ve made inquiries about how to get absolutely “accurate” power data. This phenomenon is further enhanced by manufacturers promoting their products as “the most accurate power meter on the market”. These promotions can be further distractions for those who have an obsession of getting their hands on the most accurate attainable data.

Frankly, having the most accurate power meter can be a futile waste of effort and expense. Wow! You may say that conclusion is just an opinion, but we encourage you to withhold your judgment until you read the rest of this article.

Reality begins with Joe Friel’s statement, “Fitness is not stagnant – you’re either getting better or getting worse all of the time.” Here’s a companion statement that we have selected, “**Exactness** is unnecessary and it is impractical, while **nearness** is essential and it is useful.” Why do we embrace this statement?

To answer that question, we must review a couple of important power-based training fundamentals. Power-based training centers on establishing an athlete’s *Functional Threshold Power (FTP)* and *identifying his/her training zones*, which are ranges of training intensities relative to FTP. Functional Power Threshold is a concept originated by Andrew Coggan, PhD; that an athlete can hold his/her lactate threshold intensity (measured in watts) for about an hour. Power training zones are ranges of power that establish targeted training intensities... yes, ranges of power, not a specific power.

### POWER BASED TRAINING ZONES – Andrew Coggan, PhD

| % of FTP  |                     |
|-----------|---------------------|
| <55       | Active recovery     |
| 56 – 75   | Aerobic/endurance   |
| 76 – 90   | Tempo               |
| 91 – 105  | Lactate threshold   |
| 106 – 120 | VO <sub>2</sub> max |
| 121 – 150 | Anaerobic capacity  |
| >150      | Sprint power        |

You don’t have to be a math whiz to see the span of these ranges shows that absolute accuracy of FTP is not significant. Furthermore, you should note that the boundaries of the ranges are somewhat arbitrary. Making slight changes to these boundaries would also be insignificant.

Indeed, the insignificance of these boundaries becomes clearer when examining an example. We have a junior on our team, Johnathan, who weighs 150 pounds and has a tested FTP of 260 Watts. Incidentally, he uses a SRAM Quarq Power Meter, which brings up our next point. In general, power meter manufacturers claim accuracies between  $\pm 0.5\%$  and  $\pm 2.5\%$ . For our example, we are going to assume that Johnathan's FTP was **absolutely** accurate at the time he was tested. The following charts show comparisons of FTP and Power Training Zones that differ in measurement by  $\pm 2.5\%$ .

|                               |                    | FTP   |     | 260      |      |
|-------------------------------|--------------------|-------|-----|----------|------|
| Power Training Zones - Coggan |                    | Watts |     | % of FTP |      |
| 1                             | Active recovery    |       | 143 |          | 55%  |
| 2                             | Aerobic/endurance  | 146   | 195 | 56%      | 75%  |
| 3                             | Tempo              | 198   | 234 | 76%      | 90%  |
| 4                             | Lactate threshold  | 237   | 273 | 91%      | 105% |
| 5                             | VO2max             | 276   | 312 | 106%     | 120% |
| 6                             | Anaerobic capacity | 315   | 390 | 121%     | 150% |
| 7                             | Sprint power       | 393   |     | 151%     |      |

|                               |                    | FTP -2.5% |     | 254      |      |
|-------------------------------|--------------------|-----------|-----|----------|------|
| Power Training Zones - Coggan |                    | Watts     |     | % of FTP |      |
| 1                             | Active recovery    |           | 139 |          | 54%  |
| 2                             | Aerobic/endurance  | 142       | 190 | 55%      | 73%  |
| 3                             | Tempo              | 193       | 228 | 74%      | 88%  |
| 4                             | Lactate threshold  | 231       | 266 | 89%      | 102% |
| 5                             | VO2max             | 269       | 304 | 103%     | 117% |
| 6                             | Anaerobic capacity | 307       | 380 | 118%     | 146% |
| 7                             | Sprint power       | 383       |     | 147%     |      |

|                               |                    | FTP +2.5% |     | 267      |      |
|-------------------------------|--------------------|-----------|-----|----------|------|
| Power Training Zones - Coggan |                    | Watts     |     | % of FTP |      |
| 1                             | Active recovery    |           | 143 |          | 55%  |
| 2                             | Aerobic/endurance  | 146       | 195 | 56%      | 75%  |
| 3                             | Tempo              | 198       | 234 | 76%      | 90%  |
| 4                             | Lactate threshold  | 237       | 273 | 91%      | 105% |
| 5                             | VO2max             | 276       | 312 | 106%     | 120% |
| 6                             | Anaerobic capacity | 315       | 390 | 121%     | 150% |
| 7                             | Sprint power       | 393       |     | 151%     |      |

The top chart shows the **absolutely** accurate FTP and corresponding Power Training Zones. The middle chart shows the -2.5% inaccurate FTP and the corresponding Power Training Zones. The bottom chart shows the +2.5% inaccurate FTP and the corresponding Power Training Zones.

The variances in accuracy become less important when you consider that an athlete will normally use the same power meter for his/her workouts. As a result, all of his/her workouts contain the same deviation. But even if the cyclist switches power meters, the possible deviations in accuracies are insignificant in the real-world as shown in the previous charts.

Although **exactness** is unnecessary, **nearness** is essential! In order to ensure “nearness”, we suggest that the power meter is “re-zeroed” before using it, such that the wattage will be zero when there is no load on the power meter

As seen here, even when combining the results of the -2.5% and the +2.5% power training zones by alternating the boundaries, these boundary changes don’t create any significant difference from the original.

| POWER BASED TRAINING ZONES – Coggan |                     | Combination of $\pm 2.5\%$ variance |                     |
|-------------------------------------|---------------------|-------------------------------------|---------------------|
| % of FTP                            |                     | % of FTP                            |                     |
| <55                                 | Active recovery     | <55                                 | Active recovery     |
| 56 – 75                             | Aerobic/endurance   | 56 – 73                             | Aerobic/endurance   |
| 76 – 90                             | Tempo               | 75 – 90                             | Tempo               |
| 91 – 105                            | Lactate threshold   | 91 – 103                            | Lactate threshold   |
| 106 – 120                           | VO <sub>2</sub> max | 104 – 120                           | VO <sub>2</sub> max |
| 121 – 150                           | Anaerobic capacity  | 121 – 147                           | Anaerobic capacity  |
| >150                                | Sprint power        | >147                                | Sprint power        |

The power training zones have “built in” variability because: “fitness is not stagnant”. And of course, FTP, the basis for the power training zone scheme, is not exempt from varying day-to-day. FTP is not stagnant. Indeed, FTP is a moving target and that’s the reason for another Friel statement:

“Check it (FTP) at least every six weeks and preferably more frequently.” – Joe Friel, The Power Meter Handbook

FTP changes, fitness changes, and the power training zones change; hence, FTP should be tested – not for “**exactness**”, but for “**nearness**”.

In summary, we recommend using a power meter with high reliability, ease of use, versatility, and “practical accuracy” at a fair and competitive price. Once more, don’t be overly concerned with absolute accuracy – always remember: “Fitness is not stagnant – you’re either getting better or getting worse all of the time.”