WHITE PAPER 2016: Smarter Training
The Brutal Basics...

- **TRAINING ZONES & GOALS**
  Goals determine plans which should set the sessions you do.
  Elites/Top AG train 20-35h/wk & 8-18h/wk (400-1200h/year)
  But remember: Racing teaches you the craft of racing.

- **NUTRITION**
  Correct diet + the right sports nutrition products = better gains
  e.g. low glycogen sessions; protein timing; L-Carnitine augmentation
  Personalised nutrition programmes are the new marginal gains

- **EQUIPMENT**
  This can improve performance through “Kit Doping” (Aston 2013)
  e.g. optimised wetsuits; drag reduction bikes/clothing, compression
  It is developing faster than your genes (220 Science of Speed)*
1st Rule of Smarter Training
Base level must be 75-90% of time

Base level is 55-80% HRmax or in “low lactate” ZONE ONE predominates in all phases of the year:

Coach of Ironman Cozumel ’13 winner “85% base training” (2013).

UK OD National Squad ~70% below race pace.

Top 10 Olympian - Swim 74% Bike 88% Run 85% in Zone One (2012).
NEW EVIDENCE

Orie (2014) 38 years of Olympic Speed Skaters data
Note: Z1 volume is increasing Z2/Z3 proportions are dropping.
NEW EVIDENCE

Tonnessean (2014) XC Ski/Biathletes “Road to Gold”
Note: the light column is Z1 and it predominates, in every phase of training.
NEW EVIDENCE

Seiler (2014 webinar) Biathlete Training
Note: how Z1 increases, volume increases and VO2max increases.
THE BIG MISTAKES

- **Going too hard to soon**
  All interval studies, Elite training plans and their diaries include time to get the muscles warmed-up. Too-hard, too-soon activates “stress” response

- **Calling low Zone 2 “base” training or steady**
  80%HRmax is the Zone 1 limit. Above is stressful “no-mans land” training - if you are meant to be there good, otherwise it truly is junk!

- **Not doing sessions to a plan**
  It is your training so be in control of session plans, outcomes and future tweaks (route, time of day, training partners, equipment)
2nd Rule of Smarter Training
Quality must be quantified

- Using planned High Intensity Training (HIT) works best
  Such as the proven 6 x 4’ @ 88-90%HR (+RI of 2 - 4’)
  This is very potent therefore must be surrounded by pure Z1 days

- Only do HIT when Low Intensity Training (LIT) is correct
  So Z2 “lapses of concentration” come out of your HIT allowance
  You may be “HIT” too many days per week already (2-3 is optimum)

- Only add HIT if required for your goal
  For a beginner, those in “get-around” mode or coming back to
  training the top of Z1 into Z2 to get “race-ready” (2-3 x 10’) is hard
  enough to achieve race completion and enjoy training.
NEW EVIDENCE

Tonnessen (2015) Orienteering elites across a whole season. Note: there is always at least 70% of training time in Zone 1.
THE BIG MISTAKES

- Randomly doing an interval session or “block”
  Intervals cannot just be added to volume rises, competitions starting or when recovery or health is chronically affected.

- Doing an interval that is traditional yet unproven
  Several are erroneous: e.g. minute-on/minute off; build of speed towards end of long-ride/group run; time trials to replace endurance.

- Failing to let adaptation take priority once work is done
  If Elites/Top AG only do 2-4 intervals per week how can you do more and add additional “racing” sessions and then properly adapt?
3rd Rule of Smarter Training
Strength Training is essential

● Make time to keep strength/conditioning:
  Resistance training (machine, free weights, body weight) and Pilates/Plyometrics(?) NOT random circuit training

● Make things harder from late WINTER into PRECOMP:
  e.g. swim: two costumes, proper drag shorts (not t-shirts!), paddles, less drafting.
  e.g. bike: add weight, low cadence hills (4-6’@60rpm @60-75%PPO), ride on higher CRR tires.
  e.g. run: 8-15” hill reps, heavier shoes, pool DWR, pushing a Buggy, WeightBelt( ? jury still out)

● Prehab, rehab, beat ageing/bone-mineral-density drops:
  It makes an athlete more “complete” and is no longer considered damaging to performance.
Rønnestad et al (2014) Cyclists endurance trained (E) or added strength (E+S). Note: E+S improved cycling economy and Time Trial ability (power output)
4th Rule of Smarter Training
Plan 3:1 Blocks of Training

- Use technology (paper & pen) or computer to plan:
  e.g. 3:1 weeks, lighter days (low Z1 technique), transition training, non-training days, alternative sports in offseason

- Use realistic training volume (8hrs; 220 Reader Survey)
  Don’t get hooked on a number it will vary: 10, 8, 12, 6
  The training bank “builds” your fitness over time.
  It’s all about ability, consistency and “ABSORBING”

- Don’t go Over-The-Top after your season
  Less is gained Oct to Dec, more from Feb to April.
  Aim 60%-75% of volume you intend to peak “in-season”
NEW EVIDENCE

Stellingwerff (2012) Elite marathoners training and practicing feeding. Note: 74% training was Z1; notice ebb & flow of volume ~3:1
5th Rule of Smarter Training
Nutrients can tweak genes/results

- Use carbs in training - it's the predominant fuel choice. Some fasted sessions help lean-burn ability but do compromise quality and the session must be controlled.

- Protein timing has been shown to help “adaptation” e.g. around weight training or endurance sessions. Plus shakes add an extra “easy” quality protein dose to the diet.

- Assessment of nutrient status is vital e.g. blood profiling for Vitamin D, B12, Folate, Testosterone and others to ensure RBC, immune and health optimisation.
NEW EVIDENCE

Stellingwerff (2014) Diet & supplementation can plug various areas of fatigue
Note: the correct place to supplement/target diet depends on the fatigue cause
NEW EVIDENCE

Stephens et al (2014) L-Carnitine loading actually triggers fat-use genes
Note: This is despite lots of carbs being used to push it into the muscle.
NEW EVIDENCE

Shing et al. (2006) Colostrum (10g/d) had 1.9+/−2.2% improvement in TT40 performance and prevented a decrease in ventilatory threshold following the HIT period (4.6+/−4.6%).
THE BIG MISTAKES

- Missing the basics of diet & sports nutrition
  Nothing is THE super food or pill. Carbs fuel, water hydrates, treats are treats, protein should be spread out, good fats are “essential”

- Random use of a supplement or super-nutrient
  Most effective results are using an effective dose for a specific time e.g. colostrum x 10g x 2 weeks or more = rebuilding/immunity

- Assuming you “are” fit and you “have a great diet”
  If you don’t know your “nutrient status” how can you tell what you need? Try to get a blood profile to find your weak nutrient areas. e.g. 1990 Student (23): Hbn 13.3 … 2015 Post Training Camp (47): 15.7
6th Rule of Smarter Training
Nuture not Nuke your body

- Good Sleep is central to development
  It’s all about ability, consistency and “ABSORBING”
  Elites 10-12h/day and Amateurs 50-hour minimum rule.
  Setting bodies daily pattern with use of light is very effective!

- Make daily wholefood nutrition a natural habit:
  e.g. slow release carbs, real-food proteins, quality fats
  Don’t try to be perfect just remember YAWYEAD
  (You Are What You Eat And Drink)

- Body Work/flexibility must focus on your imbalances
  e.g. poor shoulder mobility, leg tightness or cramping
  The right expert that is the challenge
7th Rule of Smarter Training
Kit can make you faster

- Buoyancy, flexibility, drag reduction wetsuits
  It has to fit, be practised in year-round and be removed fast!

- The bike has evolved beyond belief
  Aero tubing, integrated hydration, electronic shifting, power measurement, lower effort tires, aero clothing.

- Running requires good rebound, hence foam
  Light mass means fast but rebound must aid running - use of DeepWater Running, body work and regular new shoes
THE BIG MISTAKES

- Not doing the sessions on your plan and training randomly
- Using equipment based on a whim not on science/sense
- Ignoring the importance of strength & conditioning
- Too high vitamin C and random supplementation
- Seeing bike power measurement/aerodynamics as “elitism”
- Not enough Zone One Training [55% - 80% of max HR]
- Ignoring recovery tools (e.g. foam rollers, compression tights/socks, TCLS)
HUNCHES THAT WORKED

- Training below 80% HRmax and using carbohydrate products
- Getting aero-optimised & very clothing, kit and pacing “savvy”
- Quality tires for racing with latex tubes
- Colostrum use on a regular basis in and off-season
- Pacing using bike power measurement to run better off the bike
- L-Carnitine supplementation
- Using blood data to tweak diet, supplements, training, lifestyle
- Using off round chainrings (e.g. Biopace, Osymetric, Rotor Q, QXL, Absolute Black, AeroCoach)
- Being consistent as a result of enjoying the here-and-now
TAKEAWAYS

- Training <80%HRmax must be a key habit, see www.bit.ly/road2gold
- Hard work sessions must be well planned/spaced
- Nutrition timing and type impacts performance gains significantly
- Bikepower technology is a serious but effective tool
- Bodywork, DIY foam rollering etc remains a priority
- Fasted sessions & low-carb training has a place
- Blood profiling and TCLS (?) are the new “super-hacks”
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