Don’t Bonk – BOOM!

“IT BEGINS IN THE GUT!” ~ DYSBIOSIS, HPA-AXIS IMPAIRMENT, AND ATHLETIC PERFORMANCE

Presented at NTA’s 10th Annual Conference, Vancouver WA, March 3, 2017

Cathy Eason, NTP, CHFS, GAPS, CSFP

www.cathyeason.com
Dysbiosis, HPA-Axis & Athletic Performance Decline

- **Dysbiosis** is commonly overlooked in sports nutrition, yet many athletes -- amateur and professional -- continue to feed microbial imbalance with a high-sugar/high-carb diet… *or through a poorly digested ancestral diet*
Usually Meaning on Race Day...
Industry Encourages Feeding the Beast(s) on Game Day
Instead of Fueling the Athlete Every Day
Gut-Brain Connection Evidence Everywhere

The Gut-Brain Connection is widely studied, yet we still expect athletes should be able to just “push through” pain/fatigue/weakness without addressing gut health first

No Athlete is an Island...

- Microbiome adds 100 trillion bacteria to your Team!
- Comprised of Several Hundred Species of Microbes
- Built from 3 Million non-human genes
- Feeds an athlete more than 10% of their daily calories
Athletes Who Rely On This to Perform…
Without Addressing the HPA-Axis and the Gut...
Feed These Beasts Instead
Winning at What Cost?
Nutritional Therapists Know How to Support the Gut!
Take a Multi-Faceted Approach to Dysbiosis in Athletes

**Diet:** Bio-individually modified AutoImmune Paleo or Full GAPS Diet are good places to start

- Nutrient dense organ meats, higher fat, anti-inflammatory, less restrictive
- Added starchy carbohydrates and fats may be indicated for energy production in endurance athletes, especially with endocrine system compromise
- *Review NTA Mod 15 Sports Nutrition Audio Lecture for more ideas*…
Therapeutically Targeted Approach

Digestive Support: Gut Repair Starts Where?

• North to South – but *which way is North?*
  • HPA-Axis and impact on Autonomic Nervous System overload – the brain may be North
  • Athletic Adrenals are often the most compromised – the Adrenals may be North
  • Small Intestine ("The Center of the Digestive Universe" and "Where the Outside World Meets the Inside World") and truly healing the mucosal lining (Big Key: *this takes time!*)

• Probiotic Support and/or Anti-Dysbiosis agents – use your training and skills to assess
• Coach the athlete through the healing crisis
More Targeted Nutritional Therapy

- Support for North to South – remember to determine *which way is North first*
  - **HPA-Axis:** Pituitary/Hypothalamus glandulars like Biotics Research Corp. CytoZyme PT/HPT, NeoNatalMultiGland, minerals manganese, selenium, zinc
  - **Adrenals:** Adrenal glandulars from Biotics Research Corp. (Cytozyme AD, ADB5 Plus) or Apex Energetics Adrena-Stim cream for hypo-adrenic; Adrenal adaptogenic herbs from Medi-Herb (Adrenal Tonic, Rhemannia, Ashwagan)
  - **Small Intestine:** **BONE BROTH!**, Biotics Research Corp. L-Glutamine, Apex Energetics RepairVite, Vital Proteins Collagen Peptide Proteins, many more
  - **Probiotic Support:** homemade wild-fermented foods; supplemental support Prescript-Assist, Gut-Pro, Klaire Labs, Flora, many more…
Another Key Facet to Dysbiosis

Lifestyle Modifications – MAJOR CHALLENGE FOR ATHLETES!

• **Vitamin S – Sleep is the athlete’s best training friend! 8 Hour Minimum**
  • Coach athletes to rearrange training days to allow longer sleep, and to train at time similar to event

• **Reduce/Restructure/Re-Time the Training Routine – Over-Training Syndrome is real** *(more on this coming up)*
  • Reduce Training – really! A well-conditioned athlete can use high-intensity, skill-specific, short duration training to help win the “race within the race” while reducing overall training stress and see better results

• **Reduce Toxin Exposure in all areas of life: chemical, allergen, emotional**

• **Mindfulness – while eating, training, in human connection**
  • Breathing exercises – to calm your sympathetic nervous system and return to parasympathetic state
  • Guided visualizations of the event really work! See the activity before you do it
  • Guided meditation on your dysbiosis – simply ask those little buggers to leave, or at least behave!

• **STOPPING** –the end goal of *health* should mean more than winning
Over-Training Syndrome IS a Thing

Common Warning Signs and Symptoms:

- Fatigue, feeling drained, lack of energy
- Mild limb soreness, general aches/pains
- Pain in muscles and joints
- Sudden drop in performance
- Insomnia
- Headaches
- Decreased immunity (increased # of colds, sore throats)
- Decrease in training capacity / intensity
- Moodiness and irritability
- Depression
- Loss of enthusiasm for the sport
- Decreased appetite (but not for sugar)
- Increased incidence of injuries
- A compulsive need to exercise
- Over-training syndrome greatly increases microbial imbalance

Heart Rate Variability Testing as a Training Tool

**Heart Rate Variability:** HRV measures the variability in the time between heart beats. The higher the variability, the more adaptive to stress you are in general. Infant HRV testing at birth provides early indicators of a baby’s ability to thrive.

- HRV testing:
  - The higher the variability, the more adaptive to stress you are in general.
  - Lower HRV values suggest overtraining and the need to understand your body’s limit – it’s time to REST.
  - HRV Apps work with most chest-strap style heart rate monitors to measure HRV: iThlete, Elite HRV, BioForce.
  - By tracking HRV regularly, one can establish a baseline value and then be alerted to excessive stress or insufficient recovery when HRV readings are lower than normal.

  **High HRV** indicates **parasympathetic dominance**, the rest and digest system.

  **Low HRV** indicates **sympathetic dominance**, seen in overtraining, inflammation, stress.
Patterns of Sympathetic Dominance

• **Vagal Nerve Support** –
  • Athletes MUST activate the parasympathetic nervous system for anabolic recovery (muscle tissue rebuilding, improved glycogen store uptake)
  • Athletes need to be adaptive to *switch between Sympathetic and Parasympathetic* quickly to support healthy neurotransmitter production – a huge key to sport performance
  • Breathing Exercises like Pranayama integrate the two branches of the CNS
  • Essential Oils, used topically and well-timed, can tone the Vagal Nerve
    • See Meo Energetics at their booth during the conference weekend and ask about their Vagal Tone oil and NeuroReboot spray – two of my clinically proven favorites
STOPPING

Now let that sink in for just a moment…
Most athletes dream of success – the BOOM! of crossing the finish line like Carmelita Jeter, aka “The Jet” ~ World’s Fastest Woman, and 3x Olympic Medal Winner for Team USA

Like Carmelita…

- They’ve trained hard
- They’ve “put in the miles” every day
- They’ve sacrificed (too) much
All too often, these athletes can’t cross the finish line, or score the winning goal, or jump the last hurdle, or climb the final wall…

**Because they BONK!**

- True Bonking refers to the near-total depletion of accessible glycogen stores, causing the brain to slow down all the body’s functions.
- Your body will NOT continue to perform, it’s only in survival mode – and you can’t will your way through to the finish line.
When Athletes complain they’ve “Hit the Wall”, it’s FATIGUE affecting their performance, and **HPA-Axis Dysfunction is a root cause**, but it’s a fine line before you Bonk…

<table>
<thead>
<tr>
<th>HPA-Related Fatigue</th>
<th>BONK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional outbursts</td>
<td>Irrational Irritability</td>
</tr>
<tr>
<td>Slow response time, ‘dead’ legs</td>
<td>Severe fatigue/weakness</td>
</tr>
<tr>
<td>Muscle cramping</td>
<td>Severe cramping/immobility</td>
</tr>
<tr>
<td>Fatigue, air hunger</td>
<td>Extreme tiredness/sleepiness</td>
</tr>
<tr>
<td>Anxiety about performance</td>
<td>Confusion and disorientation</td>
</tr>
<tr>
<td>Nausea/stomach pain</td>
<td>Severe nausea/vomiting</td>
</tr>
<tr>
<td>Impaired sight &amp; hearing</td>
<td>Temporary partial loss of vision or hearing</td>
</tr>
<tr>
<td>Shortness of breath</td>
<td>Fainting</td>
</tr>
</tbody>
</table>
A Brief Review of the HPA-Axis

**Hypothalamus** – *Corticotropin-Releasing Hormone (CRH)* produced & secreted in response to stress, stimulates the pituitary. The greater the stress on your body (from diet, dysbiosis, lifestyle, overtraining) the more CRH your hypothalamus will churn out.

**Pituitary** – *Adrenocorticotropic Hormone (ACTH)* released by anterior pituitary gland, stimulates the adrenal glands to increase production of glucocorticoids, including cortisol.

**Adrenals** – release **Cortisol** from the adrenal cortex glucocorticoids produced in the adrenal glands are steroids that are necessary regulating metabolic rate, inflammation and immune response.
Determine the Athlete’s Adrenal Pattern

- **Hyper-adrenic pattern**: sufficient on Ragland’s Test, Paradoxical Pupillary Test. Addicted to exercise and training. “Night person”. Overcharged and amped up! Many athletes are in this pattern (and usually stuck in Sympathetic State) -- don’t beat up an already overworked gland with more stimulatory glandulars. Try using Phosphatydl-serine to quench hippocampus (which monitors circadian rythym and cortisol output)

- **Hypo-adrenic pattern**: You might be tempted to provide lots of stimulation, keep in mind hormonal resistance after prolonged periods of elevated cortisol prior to shift to the low pattern. Think rest, adaptogens, interval training of short duration.
REMEMBER: Cortisol is **Catabolic**

- Chronically elevated cortisol contributes to further breakdown of an already impaired intestinal mucosal lining
The H-HPA-Axis: Don’t Forget the Hippocampus

- Like the Hypothalamus, the Hippocampus has corticosteroid receptor sites and is impaired by chronic stress such from dysbiosis and overtraining
- Hippocampus monitors cortisol levels along the circadian rhythm
- Chronically elevated cortisol disrupts this negative feedback loop and keeps the hyper-adrenic athlete “wired and tired”
Extreme Physical Exercise and the HPA-Axis

- Extreme physical exercise is a type of allostatic load (wear and tear) for several endocrine systems, notably the hypothalamic-pituitary-adrenal (HPA) axis, and inclusive of the hippocampus.

- Athletes undergoing a strenuous training schedule develop a significant decrease in performance associated with systemic symptoms or signs: the overtraining syndrome (OTS). This is a stress-related condition that consists of alteration of physiological functions and adaptation to performance, impairment of psychological processing, immunological dysfunction and biochemical abnormalities.

- The pituitary-adrenal response to a standardized exercise test is usually reduced in overtrained athletes. The most attractive hypothesis that accounts for the observed neuro-endocrine-immune dysregulation is the Smith's cytokine hypothesis of OTS. It assumes that physical training can produce muscle and skeletal trauma, thus generating a local inflammatory reaction. With the excessive repetition of the training stimulus the local inflammation can generate a systemic inflammatory response. The main actors of these processes are the cytokines, polypeptides that modulate HPA function in and outside the brain at nearly every level of activity.
Additional Considerations…

• Consider **uBiome testing for microbial diversity**, then target pathogens and rebalancing with specific strains of probiotics ([www.uBiome.com](http://www.uBiome.com))

• **EnteroLabs** gut microbe assay – looking for problematic pathogens to target

• **Adrenal Stress Index panel** – monitors Cortisol, Insulin, s-IgA (low in impaired immunity secondary to chronic Dysbiosis and HPA-Axis dysfunction

• **Stress Related Mineral Testing:**
  • K+/NA+/Cl-/Glucose (K+ increased and all others decreased in hypoadrenic function)
  • K decreased and all others high in hyperfunction (also high TriGlycerides)

• **Vit D3** – low levels associated with poor immune function and declining metabolic performance

• **CRP** – inflammatory marker and also suggestive of poor protein metabolism
As you can see, we could go on and on…
So, Where to Start?
“It Begins in the GUT!”

MANY THANKS FOR LISTENING…

Cathy Eason, NTP, CHFS, GAPS, CSFP

www.cathyeason.com