#NSCACoaches23

CONFLICT OF INTEREST STATEMENT

I have no actual or potential conflict of interest in relation to this presentation.

The Four Agreements

BE IMPECCABLE WITH YOUR WORD

DON'T TAKE ANYTHING PERSONALLY

DON'T MAKE ASSUMPTIONS

ALWAYS DO YOUR BEST

Don Miguel Ruiz

The Begining

Toyota Driver Development Program

6 Drivers in a storage unit

J44

"Get them to work out"

Toyota Performance Center 1.0

Toyota Performance Center 2.0

The Big Questions

How do we provide value to the athlete?

How do we show that value to those who keep the lights on?

Heat Questions

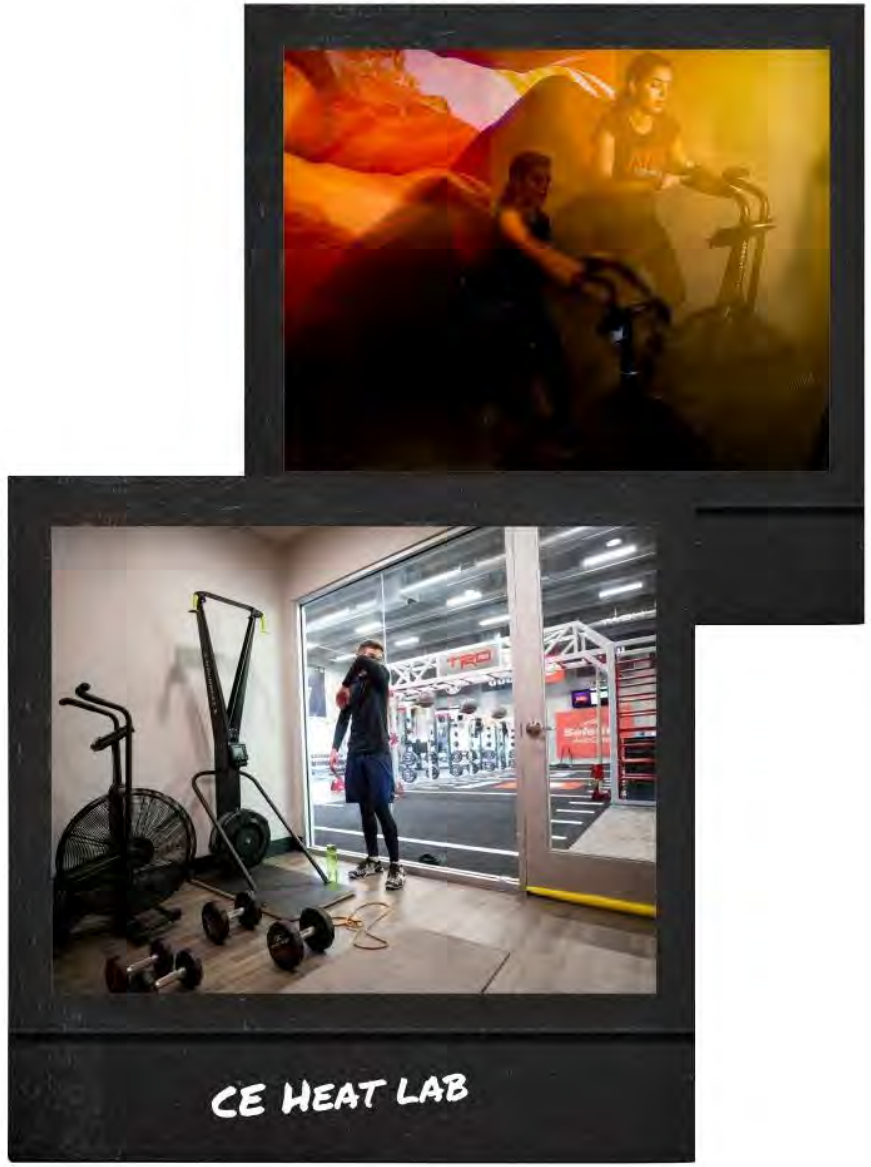
Constantly seek questions without answers.

EX.

- How hot are the driver's core temperatures actually getting in the car during a race?
  - How do we train that to make it more efficient
    - Can we seek education on heat illness and the benefits of heat tolerance training?
    - Can we find an expert to advise?
- How hot are the driver's core temperatures actually getting in the car during a race?
  - How can we measure the temp?
    - How do we build a valid and reliable test to measure heat tolerance and subsequently heat tolerance improvement?

Heat Questions

- How hot are the driver's core temperatures actually getting in the car during a race?
  - What is the cost?
  - Is it feasible (logistically)?
  - Will the drivers be willing?
  - What do we hope to learn?
- How hot are the driver's core temperatures actually getting in the car during a race?
  - What do we do with the data?
    - How do we clean the data?
    - ...visualize the data?
    - ...share the data?
    - ...make the results meaningful?
  - What did we learn?
    - What will we change?
    - What do we do in the future?
    - W**as it worth it?**



Metabolic Questions

- What are the metabolic demands of a driver?
  - What sports are similar to their metabolic needs?
  - Can we use training heart rate and compare it to research?
  - Does the HR of training compare to the demands in the car?
    - Can we get in-car race heart rate?
  - Can we predict competition substrate utilization?
- How do we build a valid and reliable model to predict substrate utilization?
  - Is the research enough to work from?
  - What are the options for testing substrate utilization?
- Can we measure the actual metabolic demand of our drivers?
  - What is the cost?
  - What training is required for administration of the test?
  - Will drivers participate well enough for reliable results?
  - What do we hope to learn?
  - What will we do with the data we collect?

- So what actually are the metabolic demands of our drivers?
  - What are the actual logistics of collecting the data?
  - How do make the data applicable or actionable?
    - How is the data visualized?
    - How is the data shared with the drivers?
- But really, what do we do with this information?
  - What will we change?
  - What do we do in the future?
  - Was it **worth it**?
  - What's other questions did this spark?
    - Glycemic response through blood glucose monitoring?
    - Can we quantify the effect of heat metabolically for our drivers?

Race Day Heart Rate

2543 calories

1%	4%	12%	43%	41%
0:01:07	00:05:54	00:16:49	1:01:46	00:58:32

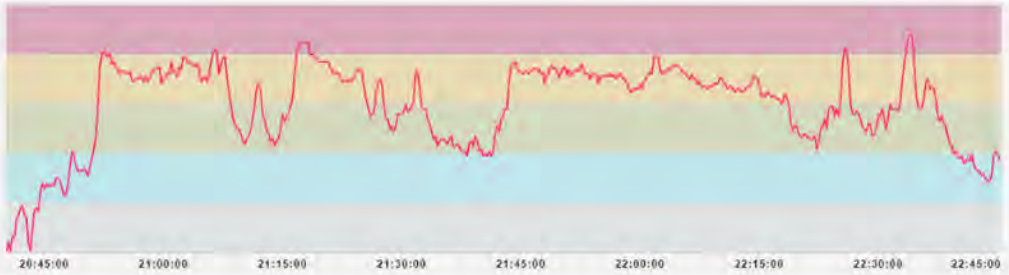
78% HR avg
98% HRmax | 43% HRmin

1912 calories

24%	10%	20%	34%	2%
0:43:59	0:18:24	00:37:16	1:04:19	00:03:26

70% HR avg
94% HRmax | 38% HRmin

Charlotte



The Journey of Answers

What are the metabolic demands of our drivers? Can we create metabolic profiles to inform nutrition prescriptions for training and competition?

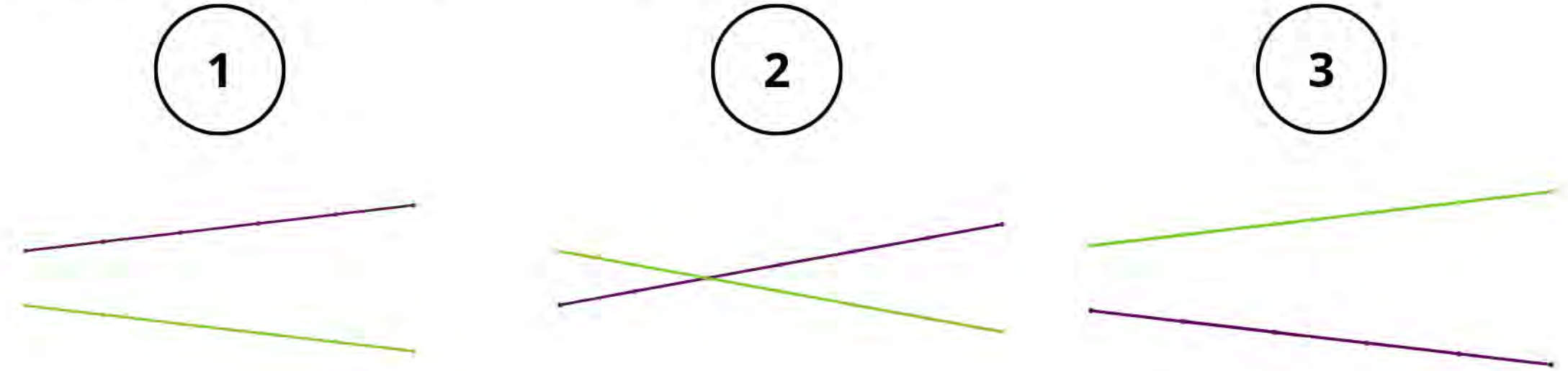
Metabolic efficiency describes what source of energy an individual utilizes or is best adapted to utilize at different exercise intensities.

Metabolic efficiency testing ™ **(MET)** is a graded treadmill test using indirect calorimetry to determine the contribution of fats and carbohydrates (CHO) to energy expenditure during exercise.

Respiratory Quotient (RQ) indicates the particular ratio of fats & carbohydrates used to fuel the activity being measured

- RQ increases as relative intensity increases
- Greater reliance on carbohydrates

Metabolic Profiling



Carbohydrate burner
An athlete who uses predominately carbohydrate as fuel.

More likely to run out of carbohydrate (energy) and depend on exogenous carbohydrate sources.

Intermediate
An athlete who uses both fat and carbohydrate as fuel.

Fat burner
An athlete who uses predominately fat as fuel.

Less likely to run out of carbohydrates and overall carbohydrate needs are lower.

What Happened to our Athlete

Athlete complained of...

- Feeling like SpongeBob out of the ocean
- "Falling out of the seat"
- Brain fog the first 10-15 minutes of every race
- Frequent URTI

What are the demands in the car?

Physical stress from car control, g forces, vibration, track type
  - METs range from 5.3 to 13

Heat stress
  - Increased fluid loses through sweat
  - Greater carbohydrate dependency

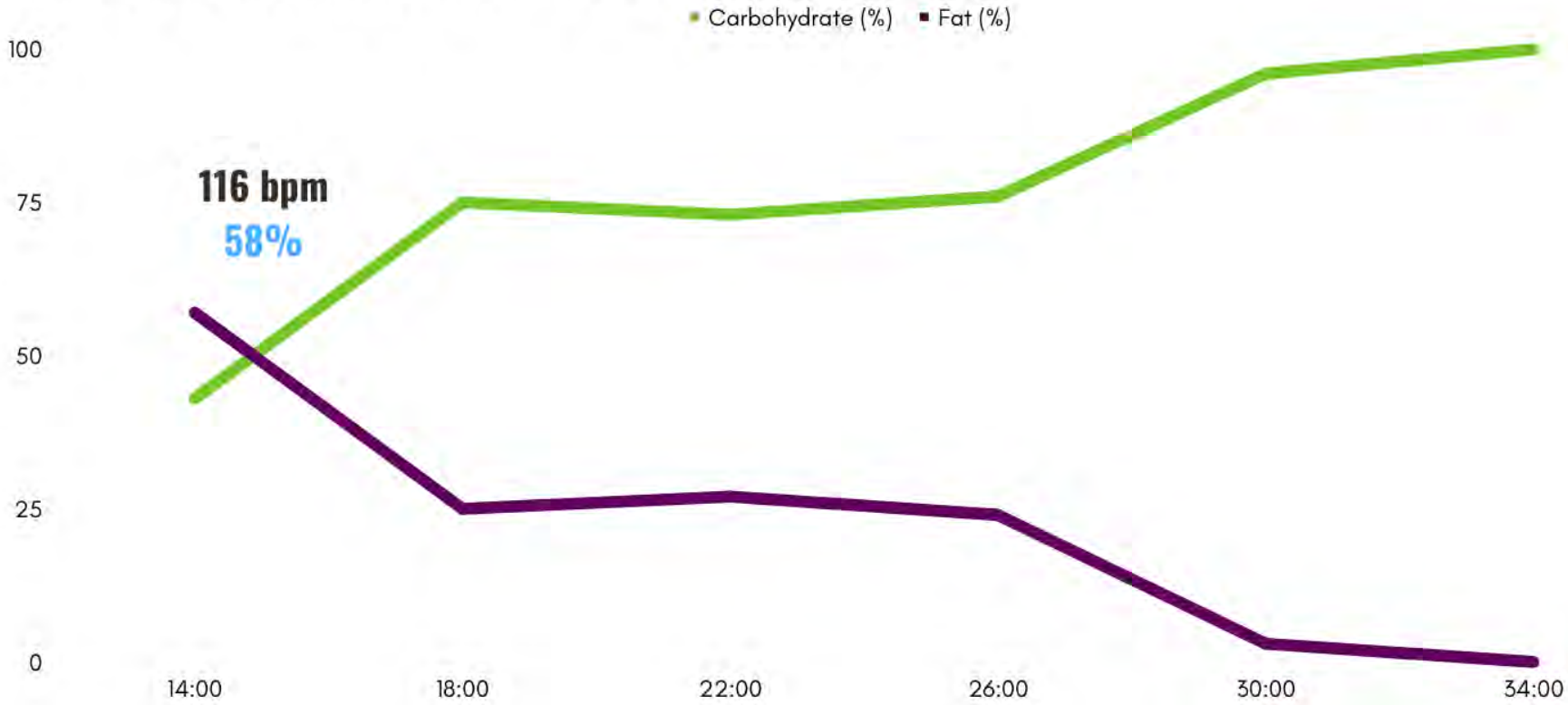
What are the factors we looked to address?

- Adequate energy availability
- **Adequate carbohydrate availability**
- Hydration status

Muscle glycogen

Glycemic response

Athlete Metabolic Profile



bpm	107	125	158	178	194	199
% HRmax	54%	62%	79%	89%	97%	100%

This athlete has a greater dependent on CHO as an energy source

What We Learned

Each individual driver has their own unique metabolic "thumbprint"

In the car, the reliance on carbohydrate is high from physical and heat-related stressors

Carbohydrate stores in the body are limited

Drivers with a high dependency on CHO as an energy source are at a greater risk of depleting CHO stores early

Drivers are more likely to "fall out of the seat"

APPLYING IT

Help to inform personalized strategies to meet CHO requirements

Bucket drivers based on profiles

Driver input is key in successful implementation & evaluation

Personal data is powerful

SPARKS MORE QUESTION

What is the glycemic response to these interventions?

Does this impact cognitive function and subsequently performance?

Carbohydrates and Performance

Associated with Endurance/Work Capacity & Ability to Sustain Higher Intensities

Delay Fatigue

Improve performance between bouts of exercise

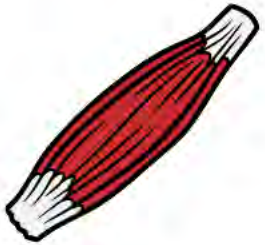
Reduce risk of injury and illness

Reduce risk of mental mistakes

Energy Stores

Carbohydrates

Liver Glycogen
~60–100 g
240–400 calories



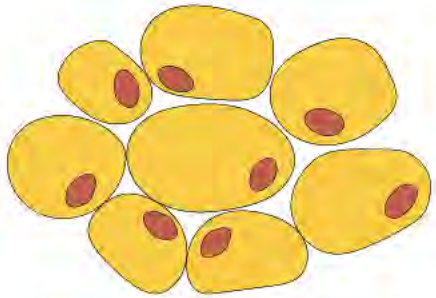
Skeletal Muscle Glycogen
~400–800 g
1,600–2,400 calories
300–600 g IMTG

Blood Glucose
~5 g

Carbohydrate stores are limited.

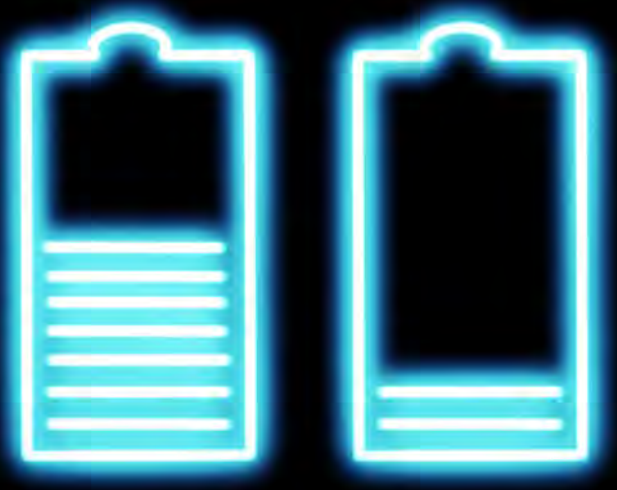
Inadequate carbohydrate availability is a limiting factor to performance.

Fats



Adipose Tissue
>3,500 g TG
36,000 calories

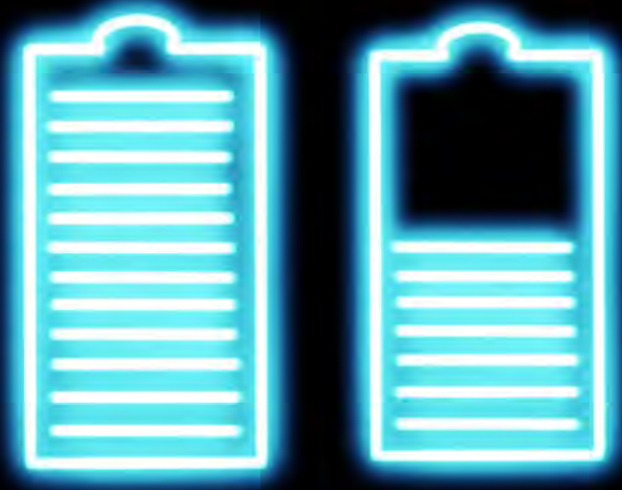
Muscle Glycogen



Begin exercise with low muscle glycogen stores.

Deplete muscle glycogen stores early.

Fatigued.



Implement strategies to optimize muscle glycogen stores.

Delay fatigue.


PAUSE

Carbohydrates and Performance

Reduced Work Capacity & Inability to Sustain Higher Intensities

Early Onset Fatigue

Poor performance between bouts of exercise

Increased occurrence of injury and illness

Increased mental mistakes

Where are you getting your nutrition info?

The Moral of the Story

We needed to test to get relevant data to then go back and evaluate our drivers, watch them, look at performance, look at HR, and talk to them to see how they were reacting to training stimuli and how their current beliefs about training and NUTRITION were effecting their current state.

What Did We Do About It

STAFF

- Shared insight gained through entire process
- Discussed how this information impacts or influences:
  - In-car performance
  - Adaptations
  - Nutrition recommendations, cueing, planning, and support
- Discussed additional ways we as a staff can support the behavior change:
  - Environment - resources
  - Social Support - outside of TPC, team support

TEAMS

- Shared findings and implications with teams
- Presented how we are helping their drivers execute on race day
- Offered or extended support
  - Various forms
    - More information on driver plans
    - Providing resources
    - Involving them in the process

EXECUTIVES (ADMIN)

- Shared findings and implications with admin
- Requested a presentation be created
- Presented to small group
  - Implications and impact meaningful enough to reach out to affiliated teams to share information/findings
  - Opportunity to build relationships with teams
    - Begin with offering insight to ways we (collectively) can influence driver performance
    - Make ourselves available for support

Multidisciplinary Approach

- Each discipline shares insight based on their expertise.
- Simply having the department or role on staff is not enough.
- A unifying mission allows all departments to work off the same guiding principles
- A framework is needed for effective communication.
- Leadership is required to protect/maintain the framework and stay on task in pursuit of the mission.

Confirmation Bias

The tendency to interpret new evidence as supporting or upholding one's existing beliefs or theories.

Confirmation bias can place the weight of the solution more heavily in one's own area of expertise.

Multidisciplinary Approach

1. The group identifies the **desired adaptation.**
2. The **athlete's capabilities** are considered.
3. The **ideal program** demands are weighed against the athlete's **current capabilities**.
4. The **most impactful area** is identified, and that area takes the lead.
5. All other areas create program goals in **support** of the most impactful area.
6. The group continues to **assess and provide feedback.**

Voice & Vote

Everyone always has a VOICE,
But not everyone always gets a VOTE.

Voice: Expressing your interpretation of a problem and sharing expertise in pursuit of a solution.

Vote: A WEIGHTED voice
Voters bear the responsibility of the decision for better or worse.

Pros

Voice:
- heard, valued
- diversity of thought
- battles confirmation bias
- not ultimately responsibly for undesirable outcomes

Vote:
- ideas/solutions are weighted more heavily
- may receive accolades decisions/ideas

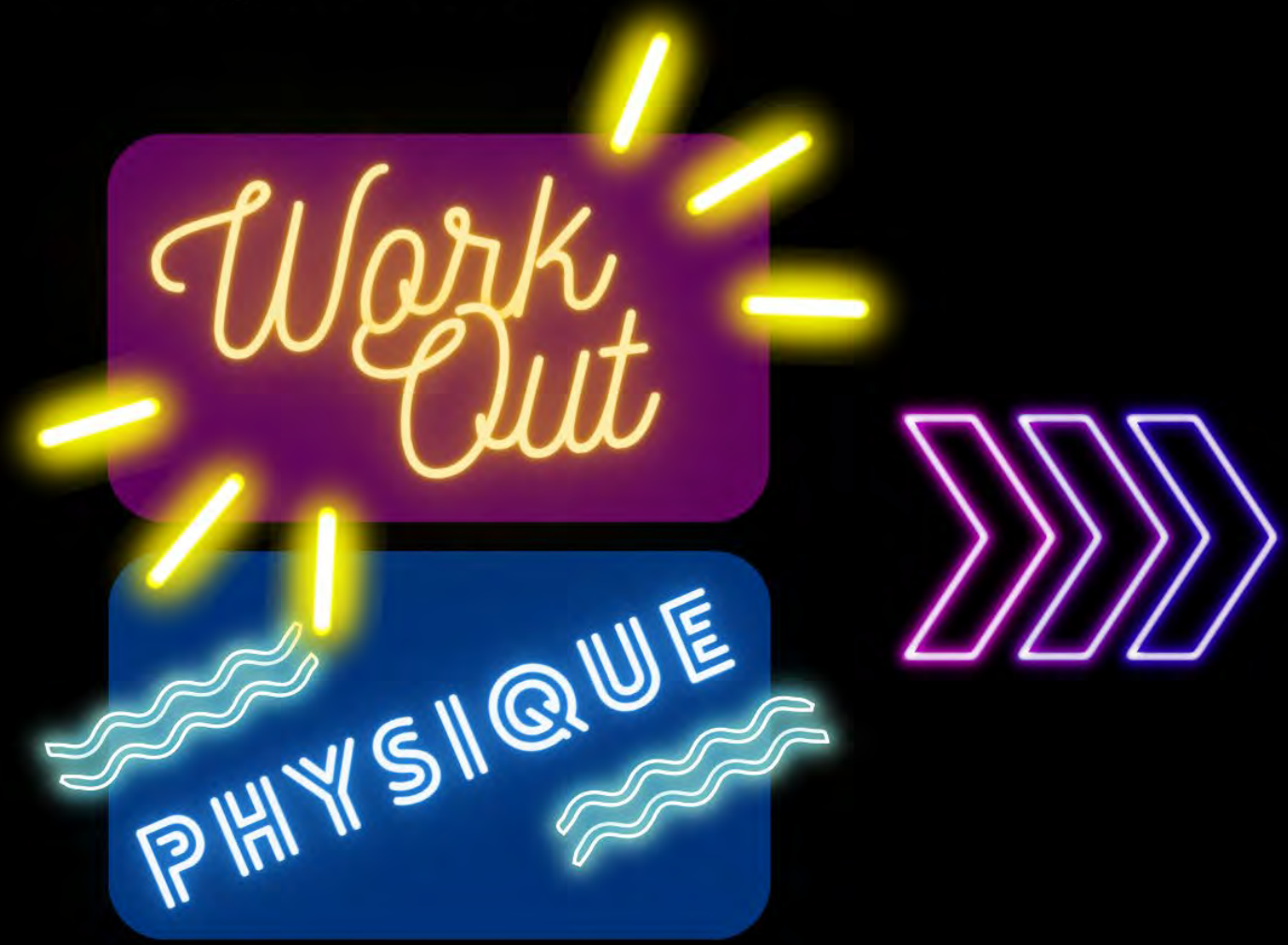
Cons

Voice:
- may not receive credit for a great decision/idea
- ego hit when ideas/solutions are not utilized

Vote:
- ultimately responsibly for undesirable outcomes
- ego hit when ideas/solutions yield poor results
- responsibility to
  - make sure fellow decision makers remain involved
  - keep a 10,000 foot view
  - battle confirmation bias on all fronts, **especially** one's own

The best program is the one you'll do.

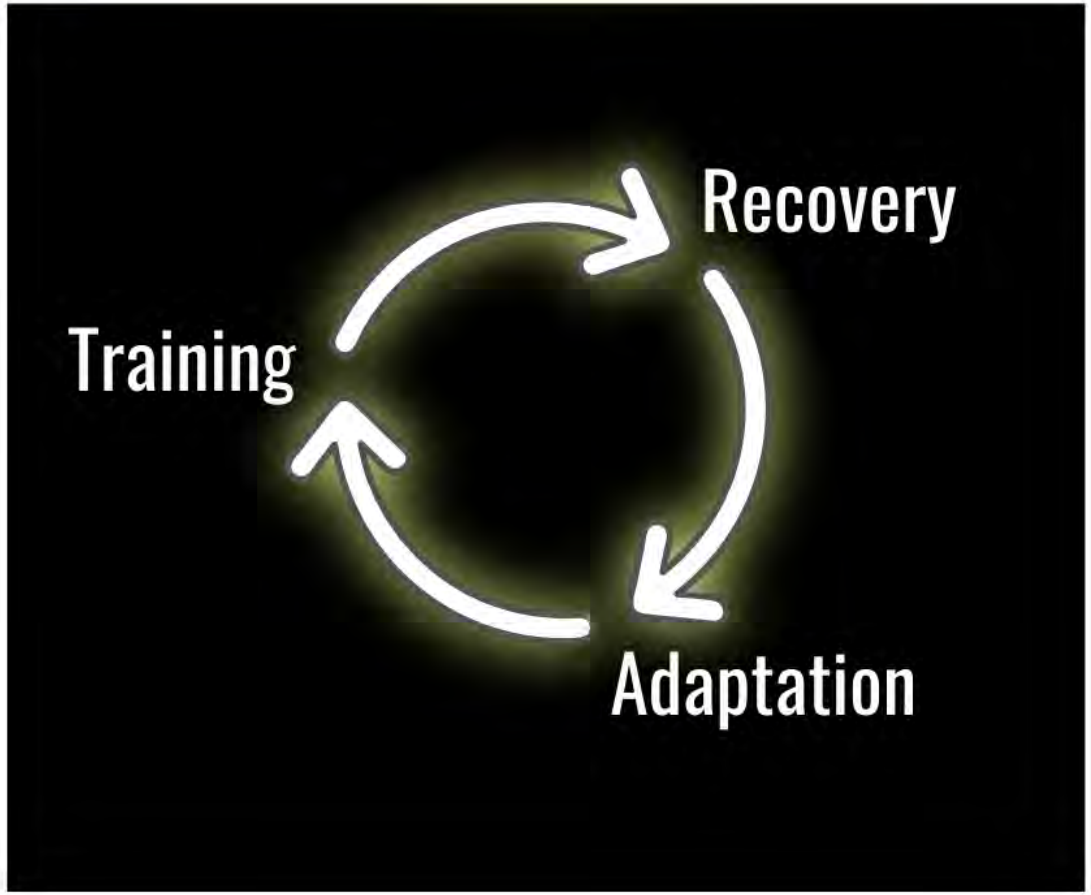
Perspective Shift



TRAIN

FUEL

Improvement Process



Training

Actively applying a specific stress to elicit a specific adaptation

examples:

- strength & conditioning workouts
- heat room sessions
- MMA
- playing a basketball game

Recovery

Pointedly helping along the process of rebuild

examples:

- mobility session
- meditation
- massage
- basketball shoot around

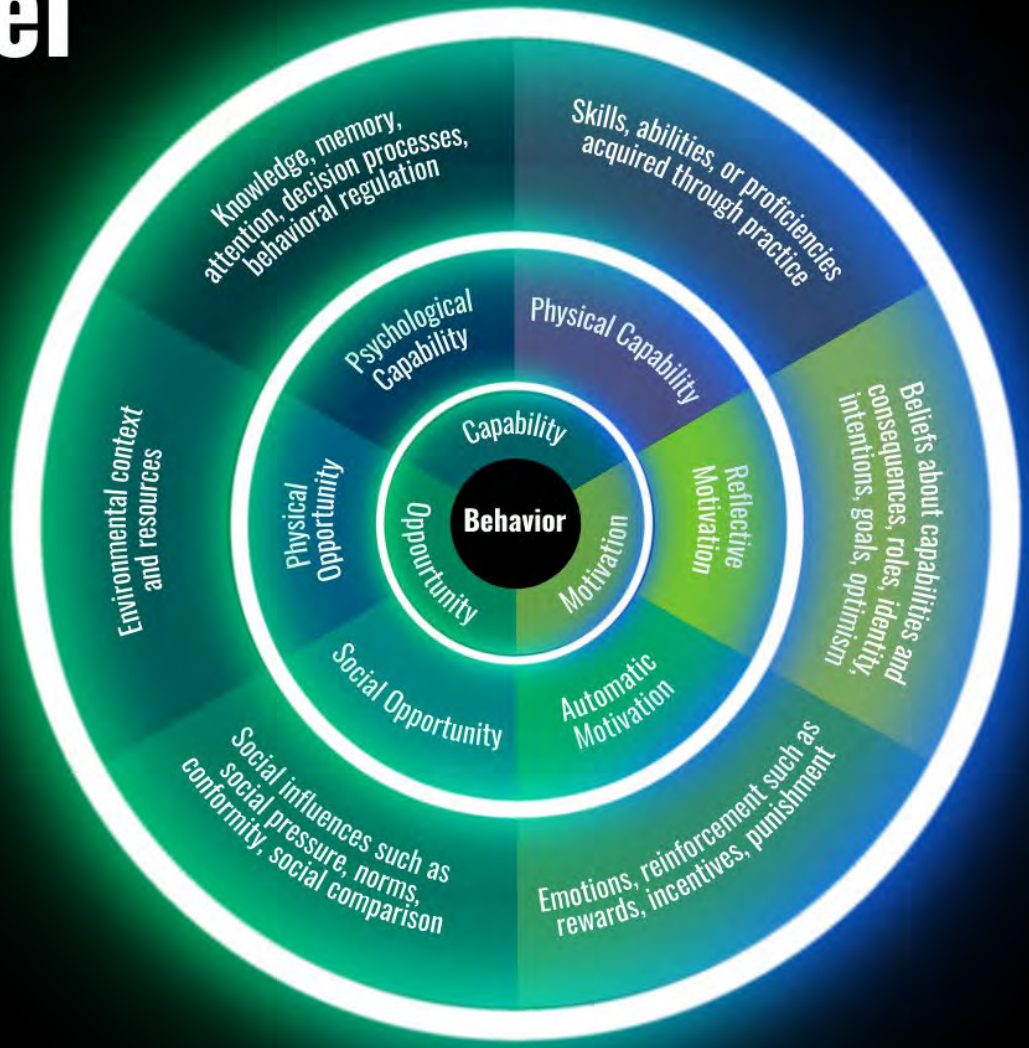
Nutrition

Enhances both TRAINING & RECOVERY

COM-B MODEL

"For any behavior to occur there must be the capability and opportunity to engage in the behavior, and the strength of motiviation to engage in it must be greater than for any competing behaviors."

COM-B Model


Knowledge, memory, attention, decision processes, behavioral regulation
Skills, abilities, or proficiencies acquired through practice
Beliefs about capabilities and consequences, roles, identity, intentions, goals, optimism
Emotions, reinforcement such as rewards, incentives, punishment
Social influences such as social pressure, norms, conformity, social comparison
Environmental context and resources
Psychological Capability
Physical Capability
Reflective Motivation
Automatic Motivation
Social Opportunity
Physical Opportunity
Capability
Opportunity
Motivation
Behavior

COM-B Model

- **Understand the behavior first.** Analyze and identify various factors that influence behavior.
  - Who, What, When, Where, How often, With whom?
  - What components of the behavior needs to change?
- **Design your interventions.** COM-B proposes that capability, opportunity, and motivation drive behavior.
  - Focus on the skills, techniques, relationships, and resources.

Determining the Intervention

BEHAVIOR

Develop and execute nutrition strategies to support race day performance.

WHAT'S IDEAL

- 'Fuel for the work required'
  - Adjust CHO availability in accordance with demands
- Increase CHO intake in the 1-2 days prior to race
- Compose plan, execute, & evaluate post-race

DRIVER INPUT

- Current behaviors & routines
- Knowledge base
- Resources at track
- Travel and transportation
- Ability to plan
- Time management

ACTUAL PROGRAM

- Education on energy systems and substrate use
- 4-5 days prior to race, map out schedule and fueling opportunities in Apple Notes
  - Scout area (online)
  - PCR Kit
- Evaluate week-to-week

Raceday Hydration Plan Example

4:44 5G

Notes

November 2, 2022 at 9:46 AM — Shared

CEckes Nutrition:

MST – 3 hours behind EST.

Hotel: Radison 427 North 44th Street
Phoenix, AZ 85008

Track: Phoenix Raceway 7602 Jimmie Johnson Dr, Avondale, AZ 85323

-11/03-
Breakfast (8-9 AM)
The Bread and Honey
Over Easy
Snooze AM Eatery
First Watch

Carbohydrates	1 Bagel **OR** 2 slices Whole Wheat Toast **OR** 1 1/2 cup Oatmeal **OR** 1 1/2 cups of potatoes **OR** 2 pancakes (large waffle
Protein	3 Whole Eggs
Fruit	1 medium to large bowl
Fat	1/2 Hass avocado OR pea butter/almond butter
Fluids	20 ounces of water

Lunch (1 PM)
Flower Child
ProteinHouse
Original Chop Shop
Modern Market Eatery
MAD Greens

Garage Open: 2:00PM MST

Snack
1/2 sandwich + smoothie
16 ounces of water OR 1 Skratch

Practice: 5:05PM MST
Garage Close: 7:00PM MST

Dinner Spots
Flower Child
True Foods Kitchen
Modern Market Eatery
Pizzeria Bianco - highly recommend to carb up (can add a side salad and extra protein)

-11/04-
Breakfast
The Bread and Honey
Over Easy
Snooze AM Eatery
First Watch

Carbohydrates	1 Bagel **OR** 2 slices Whole Wheat Toast **OR** 1 1/2 cup Oatmeal **OR** 1 1/2 cups of potatoes **OR** 2 pancakes (large waffle
Protein	3 Whole Eggs
Fruit	1 medium to large bowl
Fat	1/2 Hass avocado OR pea butter/almond butter

Garage Open: 9:00AM MST

Lunch
Kitchfix - Rice
20 ounces

Qualifying: 3:00PM MST

Pre-Race Meal
Kitchfix - Pasta
16-20 ounces

Toyota Appearance: 5:15PM MST
Driver Intros: 6:20PM MST

Topper (Optional)
1/2 sandwich + smoothie/acai bowl
12-16 ounces of water (or Skratch)

Race: 7:00PM MST

-11/05-

Leave PHX: 12:15 PM MST
Arrive CLT: 7:09 PM EST

RACE DAY NUTRITION
NHMS

TPC Toyota Performance Center

	Pre Race Meal (3-5 hours prior)	1-2 Hours Before	During Race	Immediately Post-Race STOP	Post-Race Meal
TIME	10:00-12:00 PM	2:00 PM	3:00 PM	Within 30-45 minutes afterwards	
NUTRITION	6-7 oz. of Chicken Breast 2 cups of Gluten-Free Pasta OR White Rice 1/2 cup of zucchini + squash **OR** 1 Large Gluten-Free Wrap 1/2 cup of white rice 1/4 cup of low-fat shredded cheese 5-6 oz of chicken Shredded lettuce or kale, tomato, cucumber Combine all for a wrap 1 cup of cantaloupe	GoMicro Bar **OR** BellaWell Bar + 1 cup of pineapple **Optional:** Take Hot Shot (within 30 minutes before)		**RECOVERY STARTS NOW** CORE POWER Protein Shake	6-7 oz. of lean beef/steak OR chicken 2 cups of rice OR 1 large baked potato 1 cup of cooked carrots OR sauteed bell peppers ***Understand that this is challenging. Do your best by aiming for:*** • Source of protein • High energy carbs like rice, potatoes • Nutrient dense fruit/vegetables
HYDRATION	16-20 ounces of **SKRATCH OR PEDIALYTE**	16-20 ounces of **SKRATCH OR PEDIALYTE**	Try to drink at least **2-3, 16 ounce bottles of SKRATCH OR PEDIALYTE** ICE IT DOWN (Make it really cold)	16-20 ounces of **SKRATCH OR PEDIALYTE** ICE IT DOWN OR SLUSHY (Make it really cold)	**Continue to drink water** For every pound that you lose in sweat, you need to drink 20-24 ounces Aim to hit at least 2-3 more 16 ounce bottles

COM-B Model

What Needs to Change	Domain	Potential Interventions
Need a source of carbohydrate before high intensity training sessions	Knowledge	Education session with dietitian/nutritionist on role of carbohydrate for training
	Resources	Source of carbohydrates available near weight room (i.e. fruit, gummies, carb-rich bars)

Foundational Nutrition

COMPREHEND AND APPLY THE FOLLOWING CONCEPTS:

- Metabolism, calories, and energy balance and availability
- Match nutrition demands of training and competition
- Supplementation
- Impact of heat on hydration & CHO needs
- Role of macronutrients and micronutrients
- Nutrition for recovery
- Pre- and intra-training nutrition

UTILIZE AND PRACTICE THE FOLLOWING HABITS:

PLATING TECHNIQUES

TRACKING NUTRITION HABITS USING TOOLS AND TECHNOLOGY

MEAL PREPARATION AND PLANNING

REGULAR SUPPLEMENTATION

RACE DAY NUTRITION AND HYDRATION PLAN

ANALYSIS, EVALUATION, & COMMUNICATE THE INFLUENCE OF NUTRITION PROGRAM AND HABITS ON HEALTH & PERFORMANCE

Meal Prep

COMPREHEND AND APPLY THE FOLLOWING CONCEPTS:

Match nutrition demands of training and competition

Metabolism, calories, and energy balance and availability

Role of macronutrients and micronutrients

Nutrition for recovery

OPPORTUNITIES FOR CONVERSATIONAL ENGAGEMENT:

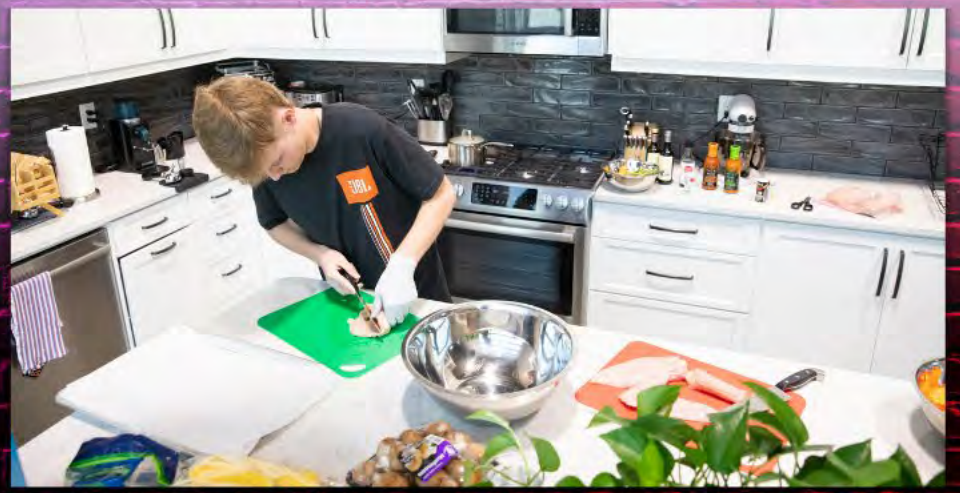
Impact of heat on hydration & CHO needs

Regular Supplementation

Supplementation

Race day nutrition and hydration plan

Pre- and intra-training nutrition



TRACKING NUTRITION HABITS USING TOOLS AND TECHNOLOGY

ANALYSIS, EVALUATION, & COMMUNICATE THE INFLUENCE OF NUTRITION PROGRAM AND HABITS ON HEALTH & PERFORMANCE

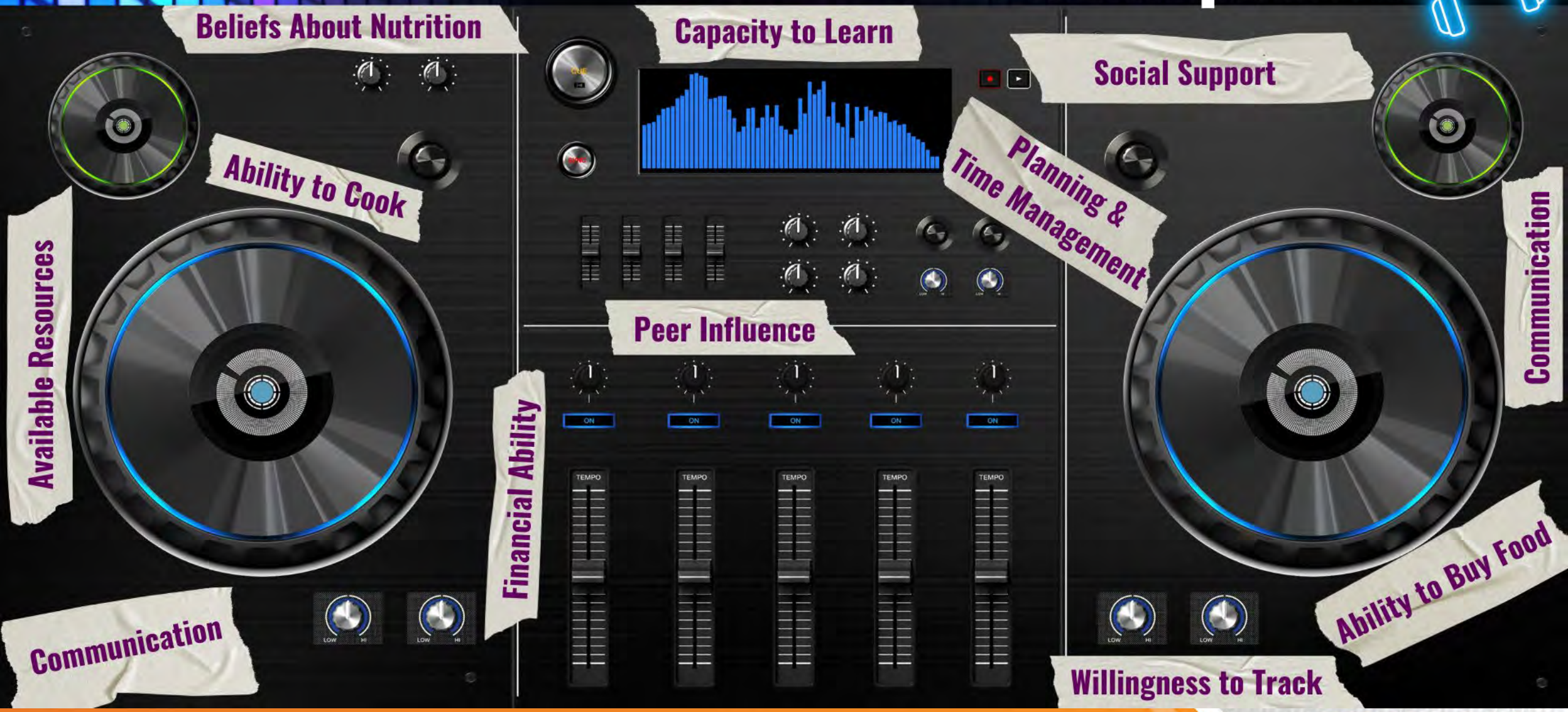
PLATING TECHNIQUES

Stephanie Fernandes MS, RD/LDN & Caitlin C Quinn, MS, CSCS

Where the Rubber Meets the Road

NSCA COACHES CONFERENCE 2023

DJ Stephanie



Stephanie Fernandes MS, RD/LDN & Caitlin C Quinn, MS, CSCS

Where the Rubber Meets the Road

Meal Prepping

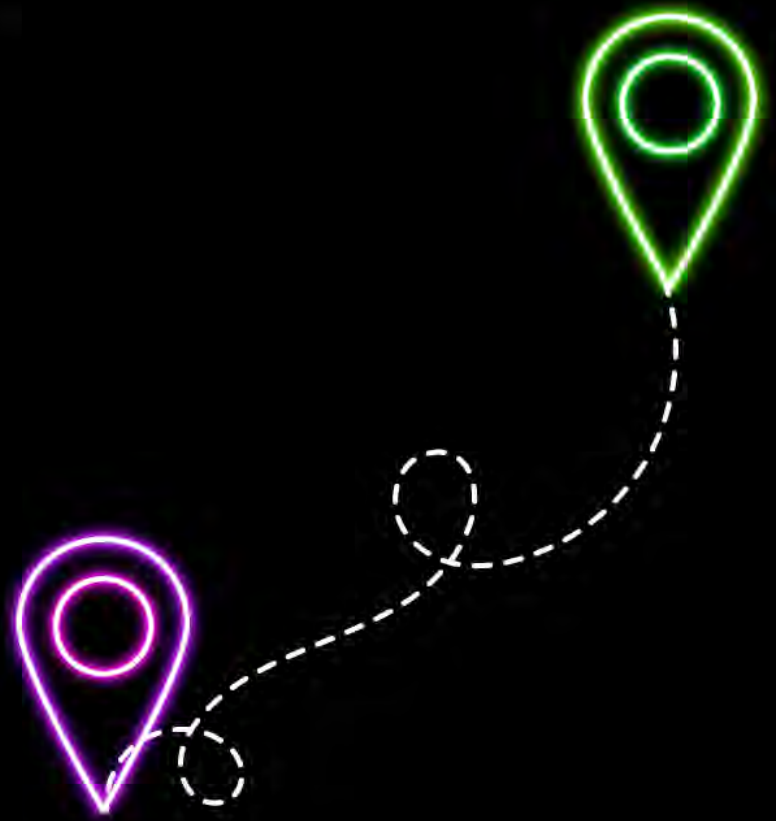
Physical Capabilities
- **Recipe execution**
- Knife skills
- Roast, sauté, boil, bake
- Grocery Shopping
- Portioning

Psychological Capabilities (Knowledge)
- Tutorials on physical skills
- Grocery store tours
- **Planning** for meal prep
- How menus align with nutrition plan

Social Opportunity
- Guided **grocery shopping**
- Other drivers participating
- Performance staff support
- Toyota racing support

Physical Opportunity
- Teaching kitchen
- **Time management**
- Staff support
- Menu matches financials

Reflex & Automatic Motivation
- **Self-efficacy**
- Alignment with performance goals
- Belief meal prepping will help
- Potential reward or consequence
- Emotional response
- Extent meal prep is a priority



Identifying Opportunity

Program Development

Science

IDEAL

- Assessments performed pre program development
- Goals set based on sport requirements and assessments
- Program framework based on science of sport quality
- Habits necessary for ideal program adherence identified

DRIVER INPUT

- Goals refined, specified
- Driver training age (experience) factored in
- Habits narrowed to meet current
  - skill knowledge
  - skill execution capabilities
  - attitude
  - effort

Program Adherence

Art

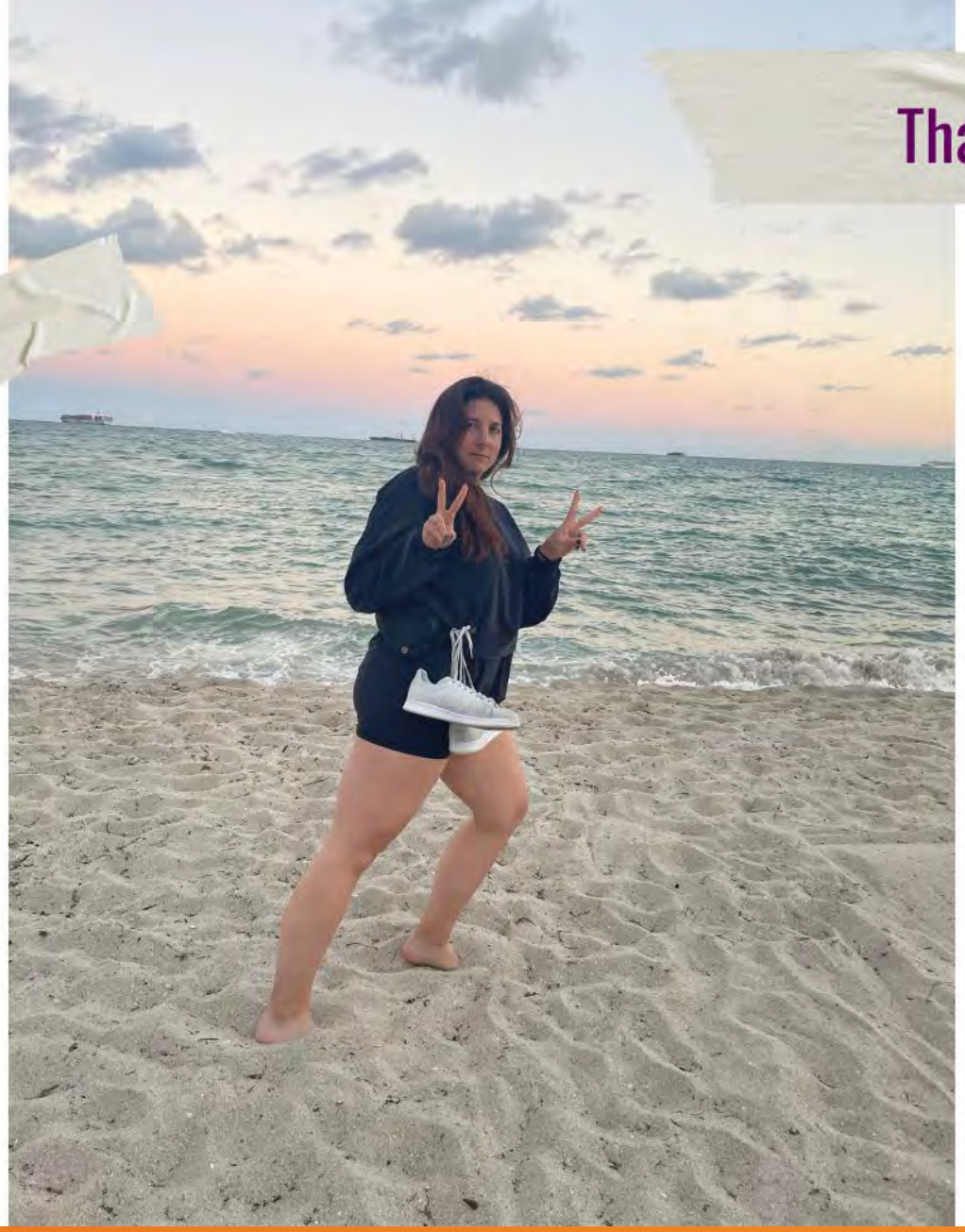
REALISTIC

- Program framework based on
  science of sport quality + driver input = realistic program
- Habits necessary for realistic program adherence identified
- Smaller goals based on habit execution are outlined
- Program created for progressive, consistent movement toward goals
- Adherence, skill execution, and skill knowledge improvement tracked
- Adjustments continually made based on drivers continually exhibited
  - **skill knowledge**
  - **skill execution capabilities**
  - **attitude**
  - **effort**

  OR

  - **Capability**
  - **Motivation**
- Assessments performed post program execution to measure success and inform next program

Thank You.



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