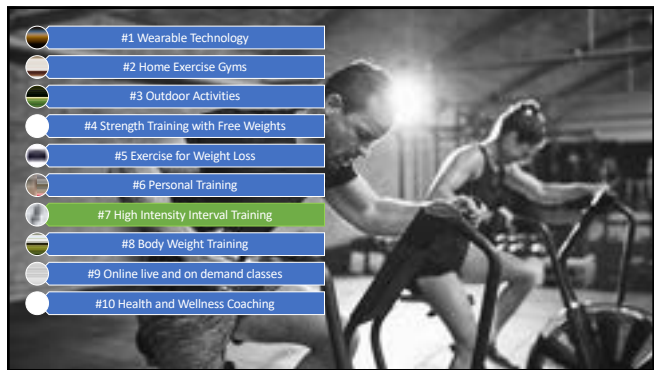
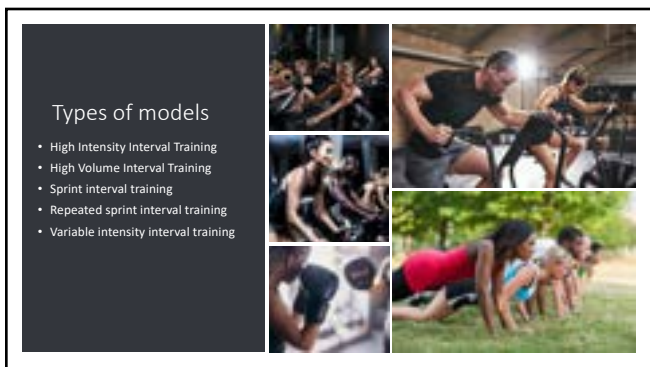




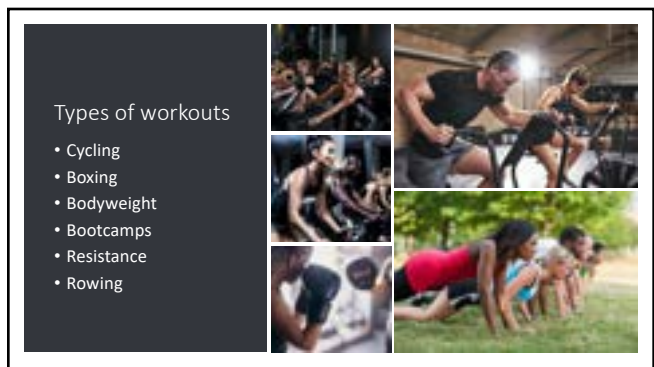
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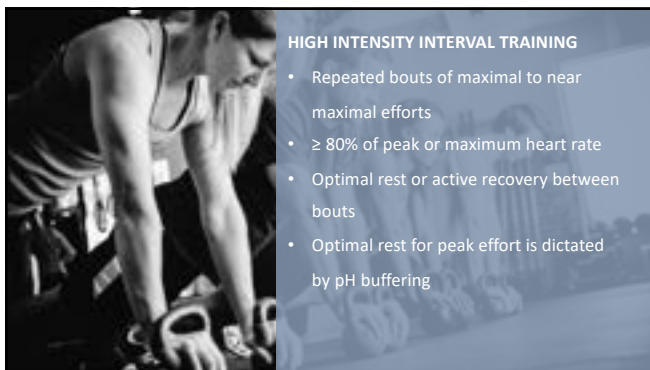
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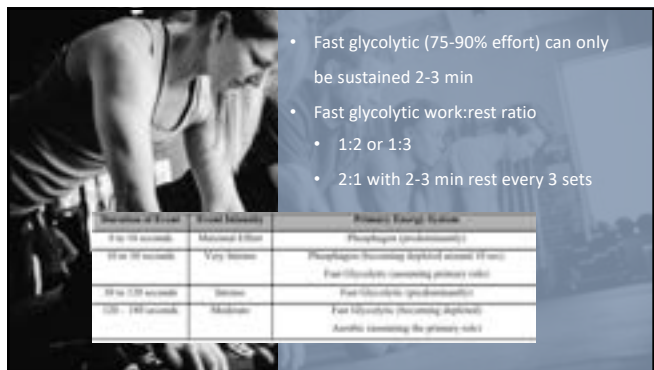
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4



5




6



**HIGH VOLUME INTENSITY TRAINING**

- Repeated bouts of submaximal
- Stimulates power endurance and anaerobic capacity

7



Up to **90%** less training volume

Up to **67%** less time commitment

- Time efficient
- Improve VO<sub>2</sub>
- Endurance capacity
- Resting metabolic rate
- Substrate metabolism
- Comparable reduction in liver fat
- Body composition
- Improved cognitive outcomes

Cholewiak, M., Lane, J.P., MacDonald, M.J., and Healy, J.J. (2018). Physiological Adaptations to Interval Training: A Review of Interval Training in Health and Disease. The Journal of Physiology, 590(12), 3159-3168.

Takera, Y., Nishimura, K., Kusaki, M., Hirai, Y., Orita, T., Yaguchi, M., et al. (2017). High-Intensity Interval Training Improves Metabolic and High-Intensity Intermittent Capacity. Journal of Applied Physiology, 117(12), 3822-3828.

8

**Other Benefits**

- Improved insulin sensitivity
- Improved blood vessel function (similar to MICT but in less time)
- Increased protein production for mitochondrial activity
- Improved fat free mass



Balducci, M.M., Davila, S., Scarpato, A.M., Lombardi, M., Marzocchi, S., Scarpato, A.M., et al. (2017). Metabolic and Hemodynamic Adaptations to Interval Training in Healthy and Overweight Individuals. Journal of Applied Physiology, 117(12), 3822-3828.

9



**92%!!**  
Preferred HIIT over MICT

Thum, J.S., Parsons, G., Whittle, T., Astorino, T.A. (2017). High-Intensity Interval Training Elicits Higher Enjoyment than Moderate Intensity Continuous Exercise. PLoS ONE 12(11): e0166239

10



**Top 3 Extrinsic Motivators**

1. Being active 46%
2. Mental Wellbeing 35%
3. Losing Weight 32%


11



**Coach Beyond Expectation**

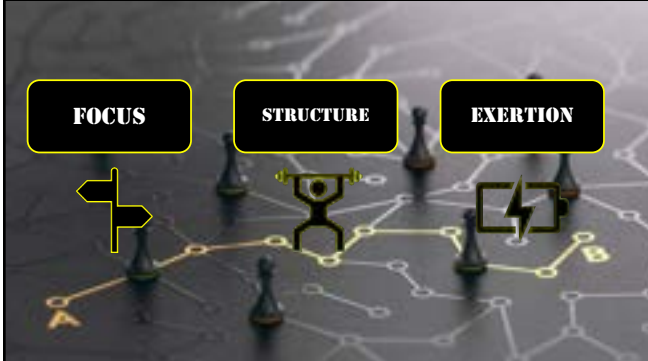
- Easy to follow and understand
- Move safe and effective
- Challenge participants and manage fatigue
- Adherence
- High level of enjoyment

12



FOCUS	STRUCTURE	EXERTION
External Focus	Purpose	Give control
Less is more	Peak effort	Immediate gratification
Visual Cue	Highlight the end	Coach how it feels

13



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### TYPES OF CUES

**FOCUS**

- Internal Focus Cues
- External Focus Cues
- Spatial Cues
- Temporal Cues
- Fragmented Cues
- Holistic Cues
- Qualitative Cues
- Radical Cues

Visual  
Auditory  
Kinesthetic


15

### ATTENTIONAL FOCUS

The focus of an individual's attention at a particular moment. This focus may be **internal** (i.e., attending to cognitive, emotional, or pain cues) or **external** (i.e., attending to environmental cues).

American Psychological Association

- Internal** – Body movement
- External** – Environment and imagery
- Neutral** – No focus – “just do it”



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### ATTENTIONAL FOCUS

#### External Focus

- Less attentional demand
- Improved movement efficiency (less muscle activation)
- Improved movement retention when moves are reintroduced.
- Improved muscle endurance under load

Wu WF, Porter JM, Brown LE. Effect of Attentional Focus Strategies on Peak Force and Performance in the Standing Long Jump. *J Strength Cond Res*. 2011 Nov 11.

Lohan K.R, Sherwood D.E, & Healy A.F. (2011). Neuromuscular effects of shifting the focus of attention in a simple force production task. *Journal of Motor Behavior*, 43, 173-184.

Marchant, DC, Greig, M, and Scott, C. Attentional focusing instructions influence force production and muscular activity during isometric elbow flexions. *J Strength Cond Res* 23: 2358-2366, 2009.


Porter, JM, Nolan, RP, Ostrowski, EJ, and Wulf, G. Directing attention externally enhances agility performance: A qualitative and quantitative analysis of the efficacy of using verbal instructions to focus attention. *Front Psychol* 1: 216, 2010.

Wulf, G., McConnel, N., Gitzner, M., and Schwarz, A. (2002). Enhancing the learning of sport skills through external-focus feedback. *J. Mot. Behav.*, 34, 177-182.


Marchant, David C. "Attentional Focusing Instructions and Force Production." *Frontiers in Psychology, Frontiers Research Foundation*, n.d. (2015)

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### ATTENTIONAL FOCUS



**DIRECTION**



**IMAGERY**




**TEXTURE**

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## ATTENTIONAL FOCUS

Internal Focus	External Focus
<p>Focused on the movement</p> <ul style="list-style-type: none"> <li>"Extend hips and ankles"</li> <li>"Push down with your toes"</li> <li>"Swing your arms up"</li> </ul>	<p>Focused on the environment or imagery</p> <ul style="list-style-type: none"> <li>"Touch the ceiling"</li> <li>"Kick the ground away"</li> <li>"Rip the chains off"</li> </ul>



**Wu WF, Porter JM, Brown LE. Effect of Attentional Focus Strategies on Peak Force and Performance in the Standing Long Jump. J Strength Cond Res. 2011 Nov 11.**

**Lohso, K.R., Sherwood, D.E., & Healy, A.F. (2011). Neuromuscular effects of shifting the focus of attention in a single force production task. Journal of Motor Behavior, 43, 173-184.**

**Marchant, D.C., Grigg, M. and Scott, C. Attentional focusing instructions influence force production and muscular activity during isokinetic elbow flexions. J Strength Cond Res 23: 2358-2366, 2009.**

**Porter, JM, Nolan, RP, Ostrowski, EJ, and Wolf, G. Directing attention externally enhances agility performance: A qualitative and quantitative analysis of the efficacy of using verbal instructions to focus attention. Front Psychol 7: 216, 2016.**

**Wolf, G., McConnell, M., Gärner, M., and Schwarz, A. (2003). Enhancing the learning of sport skills through external-focus feedback. J. Mot. Behav. 34, 171-182.**

**Marchant, David C. "Attentional Focusing Instructions and Force Production." Frontiers in Psychology. Frontiers Research Foundation, n.d. (2014)**

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## CUING TASKS



**Gabbett, T. J., & Abernethy, B. (2012). Dual-task assessment of a sporting skill: Influence of task complexity and relationship with competitive performance. Journal of Sports Sciences, 30(18), 1735-1748. doi: 10.1080/02643194.2012.713979**

**Abernethy, B. (2001). Attention. In R. N. Singer, H. A. Hausenblas, & C. Janelle (Eds.), Handbook of research on sport psychology (2nd ed., pp. 83-89). New York: Wiley.**

**Abernethy, B. (1988). Dual-task methodology and motor skills research: Some applications and methodological constraints. Journal of Human Movement Studies, 14, 101-132.**

**Meyer D, Evans J, Rubenstein (2001) Executive Control of Cognitive Processes in task switching. Journal of Experimental Psychology: Human Perception and Performance, 27(3), 493-527**

**Yagi Y, Cohum KI, Estes KM, et al. (1999) Effects of aerobic exercise and gender on visual and auditory P300, reaction time, and accuracy. Eur J Appl Physiol, 80, 402-408**

**Vallboombout D, Christou E (2013). Slowed reaction time during exercise: what is the mechanism?. Exercise and sport sciences reviews, 41(2), 75-76**

**McMorris T, Hale B (2015) Is there an acute exercise-induced physiological/biochemical threshold which triggers increased speed of cognitive functioning? A meta-analytic investigation. Journal of Sport and Health Science, 4(1), 4-13**

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## CUING TASKS



**Visual cue**   **↓ complexity**   **Single focus**

- Increased **cognition** and **recall**
- Improved **reaction time**
- Reduced **dual tasking** and improved **performance**

**Gabbett, T. J., & Abernethy, B. (2012). Dual-task assessment of a sporting skill: Influence of task complexity and relationship with competitive performance. Journal of Sports Sciences, 30(18), 1735-1748. doi: 10.1080/02643194.2012.713979**

**Abernethy, B. (2001). Attention. In R. N. Singer, H. A. Hausenblas, & C. Janelle (Eds.), Handbook of research on sport psychology (2nd ed., pp. 83-89). New York: Wiley.**

**Abernethy, B. (1988). Dual-task methodology and motor skills research: Some applications and methodological constraints. Journal of Human Movement Studies, 14, 101-132.**

**Meyer D, Evans J, Rubenstein (2001) Executive Control of Cognitive Processes in task switching. Journal of Experimental Psychology: Human Perception and Performance, 27(3), 493-527**

**Yagi Y, Cohum KI, Estes KM, et al. (1999) Effects of aerobic exercise and gender on visual and auditory P300, reaction time, and accuracy. Eur J Appl Physiol, 80, 402-408**


**Vallboombout D, Christou E (2013). Slowed reaction time during exercise: what is the mechanism?. Exercise and sport sciences reviews, 41(2), 75-76**

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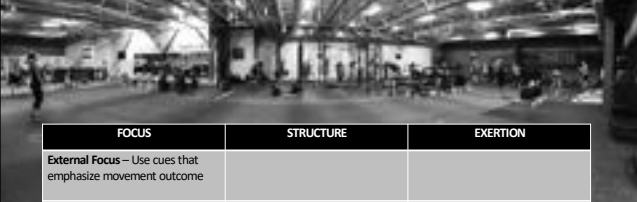
## PICK AN EXERCISE

**FOCUS**




- ONE 45 second round
- Visual demonstration
- One external focus
- Reinforce during set

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FOCUS	STRUCTURE	EXERTION
<p><b>External Focus</b> – Use cues that emphasize movement outcome</p> <p><b>Less is more</b> – Keep cueing complexity low and on one thing at a time if/when possible</p> <p><b>Visual Cue</b> – Bring attention to a single visual focus</p>		

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**FOCUS**

**STRUCTURE**

**EXERTION**

24


**STRUCTURE**

The **purpose** of the block of work

**Number** rounds

**Length** of time

Target **repetitions**



25

**STRUCTURE**

**Longer sets, shorter rest, and higher effort** decreases enjoyment most participants

Zemke, B. (2011). Attention. In B. N. Singer, D. R. Hassinbaker, & C. Jacobs (Eds.), *Handbook of research on sport psychology* (2nd ed., pp. 53-85). New York: Wiley.

Mingos, H., Jung, M., Nee, I., Rong, Z. Affective and Enjoyment Responses to Sprint Interval Training Intensity Intensity: A Systematic Review and Meta-analysis. *Front. Psychol.*, 09 March 2022 [10.3389/fpsyg.2022.813355](https://doi.org/10.3389/fpsyg.2022.813355)

Mitcaka, R., Williams, S., Fernandes, G., Stork, M., Antonino, T., Phillips, S., & Niven, A. (2022). Affecting effects on affect: The impact of protocol permutations on affective responses to sprint interval exercise: A systematic review and meta-analysis of pooled individual participant data. *Frontiers in Sports and Active Living*, 4, |813355|.

Oliveria, Bruno S., Santos, Tony & Ribeiro, Marcus & Pires, Flavio & DeLencastre, Andreia. (2018). Affective and enjoyment responses in high-intensity interval training and cardiovascular training: A systematic review and meta-analysis. *PLoS One*, 13, e0207124. [10.1371/journal.pone.0207124](https://doi.org/10.1371/journal.pone.0207124).


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**STRUCTURE**

Increase enjoyment and adherence by cueing time remaining **toward the end of the set**

**Communicate** the peaks in effort

Highlight the **final** blocks and/or rounds of work



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**STRUCTURE**

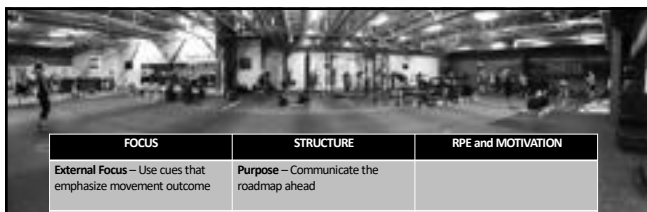
**PICK AN EXERCISE**

**Three rounds**

- 30:30
- Purpose and structure
- Communicate end of round
- Highlight final round



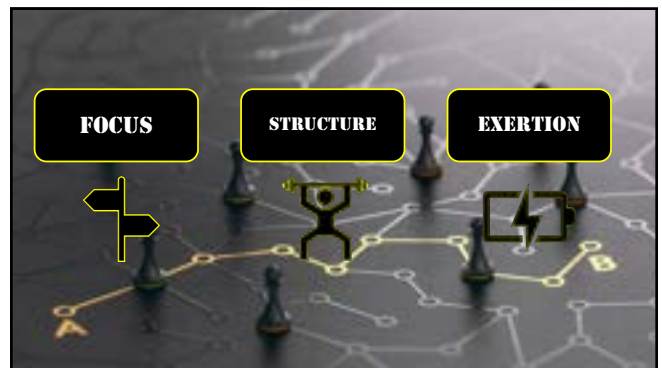
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FOCUS	STRUCTURE	RPE and MOTIVATION
<b>External Focus</b> – Use cues that emphasize movement outcome	<b>Purpose</b> – Communicate the roadmap ahead	
<b>Less is more</b> – Keep cueing complexity low and on one thing at a time if/when possible	<b>Peak effort</b> – Communicate where the effort peaks are	
<b>Visual Cue</b> - Bring attention to a single visual focus	<b>Highlight the end</b> – Increase affect by communicating the end near end	

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**FOCUS**      **STRUCTURE**      **EXERTION**



30

### RPE – Relative Perceived Exertion

Borg's Scale		Borg's CR10 Scale	
6		0	
7	Very very light	1	Very very light
8		2	
9	Very light	3	Very light
10		4	
12	Fairly light	5	
13	Somewhat hard	6	Fairly light
14		7	Somewhat hard
15	Hard	8	
16		9	Hard
17	Very Hard	10	
18			
19	Very very hard		
20			

**BORG's – 15 to 17**  
**CR10 – 7 to 8**

**What should it feel like?**  
Hard to get a sentence out  
Breathing very heavy  
Challenging to maintain

1. Williams N. The Borg Rating of Perceived Exertion (RPE) Scale. Occup Med. 2017;67(5):426-429. doi:10.1093/occmed/kgx065  
Centers for Disease Control and Prevention. <https://www.cdc.gov/physicalactivity/basics/rpe/>  
Institute of Medicine (IOM) Board. Washington, DC: Centers for Disease Control and Prevention; 2013. Department of Health and Human Services

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### GIVE CONTROL

- Choose regressions
- Choose exercises
- Empower determination of exertion
- Allow to stop and/or reduce intensity

**Self – Selected high intensity interval exercise (HIIE) created higher power output and higher enjoyment than imposed HIIE**

Kelllogg, Erin, Cantacessi, Cheyan, McNamee, Olivia, Holmes, Heather, Von Bergen, Robert, Ramirez, Richard, Gallagher, Darren, Vaughn, Stacy, Santa, Ben, Rodriguez, Karim, Alfonso, Todd A. Comparison of Psychological and Physiological Responses to Imposed vs. Self-Selected High Intensity Interval Training. Journal of Strength and Conditioning Research, November 2019, Volume 33 - Issue 11, p.2945-2952, doi: 10.1519/jsc.0000000000002928

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### DEFINE SUCCESS

- Immediate gratification
- What it should feel like
- Focus on effort cues

Middle-aged adults displayed **significantly lower** exercise task self-efficacy scores towards HIIT than moderate intensity exercise.

Young participants **experience improved self-efficacy** when they receive positive feedback on **effort**.

Amelia Trimmer, Lindsay Fitzgerald, Anna Cramp, Paul Valulis, Harry Prosser. Self-efficacy and affect responses to interval exercise. Training Psychology of Sports and Exercise, Volume 14, Issue 6, 2013, Pages 886-890, ISSN 1469-0292.  
Kelllogg, Erin, Cantacessi, Cheyan, McNamee, Olivia, Holmes, Heather, Von Bergen, Robert, Ramirez, Richard, Gallagher, Darren, Vaughn, Stacy, Santa, Ben, Rodriguez, Karim, Alfonso, Todd A. Comparison of Psychological and Physiological Responses to Imposed vs. Self-Selected High Intensity Interval Training. Journal of Strength and Conditioning Research, November 2019, Volume 33 - Issue 11, p.2945-2952, doi: 10.1519/jsc.0000000000002928

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### COMMUNITY

- Encourage social interaction
- Dissociate attention stimuli

Participants show **greater initial output** during strenuous exercise in a **social support** condition when compared to controls.

Research supports that **listening to music** continuously through HIIT creates greater post-task enjoyment and remembered pleasure than no music or in rest only.

Dissociative attention stimuli (audio and visual) has been shown to **lower perceived exertion**

Jones, L, Stone, M, Oliver, G. Affective responses to high-intensity interval training with continuous self-regulated music. J Sports Sci. 2020 Dec;38(24):2803-2810. doi: 10.1080/02643196.2020.1881134. Epub 2020 Aug 10. PMID: 32779461.  
Muller, J, Stone, M, Kelllogg, E, Matos, G. Listening to music during high-intensity interval training: the effect on exercise performance and enjoyment. Journal of Sports Sciences, 2019, 36(16), 1848-1856, doi: 10.1080/02643196.2019.1644444  
Davis, A, Cahoon, E. The Effects of Social Support on Strength and Interval Exercise. Adaptive Science & Technology. Physiology, 4, 315-327 (2018). <https://doi.org/10.1007/978-94-007-0864-4>

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### GIVE CONTROL

- "Exercise A or try B"
- "As high/far/low as you personally can"
- "It's ok to shake it and come back in"
- "You choose your level (demo)"

### SELF EFFICACY

- "If you feel \_\_\_\_ you're in the right place"
- "You should be breathing heavy right now"
- "Find your personal 8 out of 10 effort"
- "Tap into how good it feels to finish each rep/set"

### COMMUNITY

- Encourage social interaction
- Dissociate attention stimuli

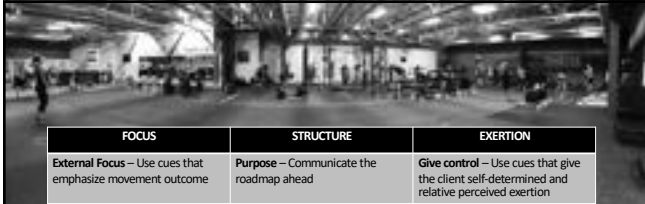
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### PICK AN EXERCISE

**One Round**

- 45 seconds
- Give control to partner
- Communicate what success feels like now
- Bring some energy!!

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FOCUS	STRUCTURE	EXERTION
<b>External Focus</b> – Use cues that emphasize movement outcome	<b>Purpose</b> – Communicate the roadmap ahead	<b>Give control</b> – Use cues that give the client self-determined and relative perceived exertion
<b>Less is more</b> – Keep cueing complexity low and on one thing at a time if/when possible	<b>Peak effort</b> – Communicate where the effort peaks are	<b>Immediate gratification</b> – Cue short term successes
<b>Visual Cue</b> - Bring attention to a single visual focus	<b>Highlight the end</b> – Increase affect by communicating the end near end	<b>Coach how it feels</b> – Highlight what effort should feel like in each set

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sheldonmcbec

@sheldonmcbec

IDEA WORLD

**LIMITLESS**

Cuing the HIIT Session

PRESENTED BY Sheldon McBee, MS  
Executive Director  
Universal Athletic Club

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## Cueing the HIIT Session

IDEA World Conference 2022

July 21, 2022

Sheldon McBee, MS

Executive Director

Universal Athletic Club

[sheldonm@universalathleticclub.com](mailto:sheldonm@universalathleticclub.com)

High Intensity Interval Training (HIIT) continues to be a popular method of exercise for fitness consumers. Since 2014, HIIT has remained in the top 10 of worldwide fitness trends according to ACSM's global survey of health and fitness professionals. HIIT can be defined as repeated exercise bouts of maximal to near maximal effort sets with strategic rest that optimizes peak performance for subsequent sets. It is important to distinguish HIIT versus high volume interval training (HVIT) sets which feature near maximal to sub-maximal effort sets with shorter recovery. HVIT is unique in that it enhances power endurance and anaerobic capacity with the increased risk of decreased performance and injury.

HIIT is well documented to have a host of benefits for a wide variety of participants. These benefits are comparable and may even exceed that of moderate intensity exercise efforts. This includes improved insulin sensitivity, time efficiency, improved VO<sub>2</sub>, improved substrate metabolism, improved cognitive function, and improved fat free mass. Research also supports that, with proper effort and work to rest ratios, HIIT is more enjoyable for participants than moderate intensity exercise for longer duration.

Coaching and cueing HIIT comes with the challenge for the instructor as it calls for coaching people through very high effort sets while maximizing enjoyment, adherence, and positive mood. Currently there is no defined model for cueing a HIIT session. This presentation proposes tips that can enhance cueing and coaching using best practices and research.

### FOCUS

- **Emphasize external focused cues** – These cues emphasize the outcome of the movement pattern. They can be created by using visual, auditory, or kinesthetic cues that emphasize a direction, imagery, or movement texture.
  - For example: Mountain climber – “slice the air underneath you!”, “corkscrew into the ground”, “push the sled across the room”
- Use **visual cues, low complex sentences, and one focus** to minimize dual tasking

### STRUCTURE

- Research supports that participants mood and enjoyment in HIIT are negatively affected by longer sets, higher effort, and shorter rest period.
- When cueing the HIIT session you can enhance the experience by...
  - Clearly communicating the roadmap of the intervals and where the efforts are
  - Cueing the end of a timed set as it nears the finish
  - Highlighting the final block of work so participants can manage their effort



## EXERTION

- Exertion can be managed with wearable technology and relative perceived exertion. As noted earlier higher effort may be associated with discomfort and negative attitude towards HIIT, especially for deconditioned participants.
- There are three great tips you can apply to help maximize motivation and effort. These are also well documented variables that improve intrinsic motivation.
  - **GIVE CONTROL** – Focus on cues that offer participants the choice of patterns, regressions, self-determined rest if needed.
  - **SELF-EFFICACY** – Use cues that identify immediate gratification, allows participants to self-identify perceived exertion, and feel rewarded for effort and small improvements.
  - **COMMUNITY** – Initial output and relative perceived exertion are improved when there is social support and disassociating attention stimuli. If possible, arrange participants to safely interact. Using music, sound triggers, and motivating visual stimuli can effectively manage perceived exertion and enjoyment.

FOCUS	STRUCTURE	EXERTION
<b>External Focus</b> – Use cues that emphasize movement outcome	<b>Purpose</b> – Communicate the roadmap ahead	<b>Give control</b> – Use cues that give the client self-determined and relative perceived exertion
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<b>Visual Cue</b> - Bring attention to a single visual focus	<b>Highlight the end</b> – Increase affect by communicating the end near end	<b>Coach how it feels</b> – Highlight what effort should feel like in each set

*If there are one to two aspects of cueing the HIIT session that you can improve on indicate this below. How can you practice to improve through practice, client feedback, and peer to peer development?*

