

Managing the Training Process

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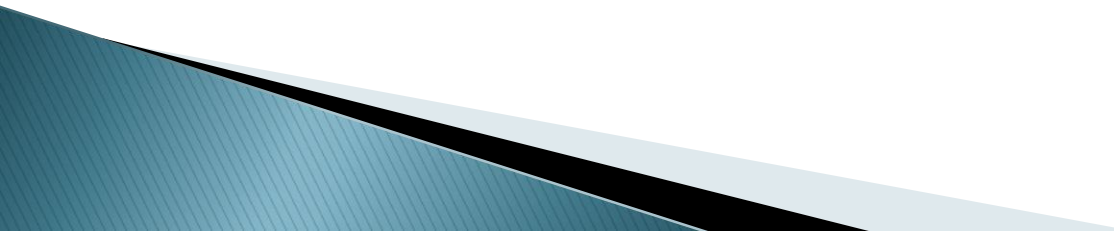


Introduction

- ▶ Who am I?
- ▶ My Training Management story...

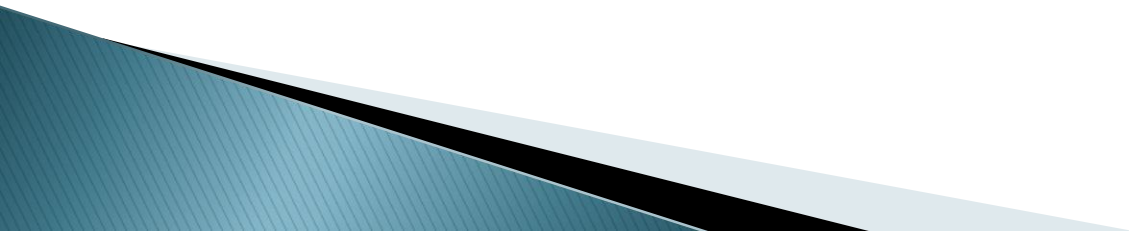


Introduction

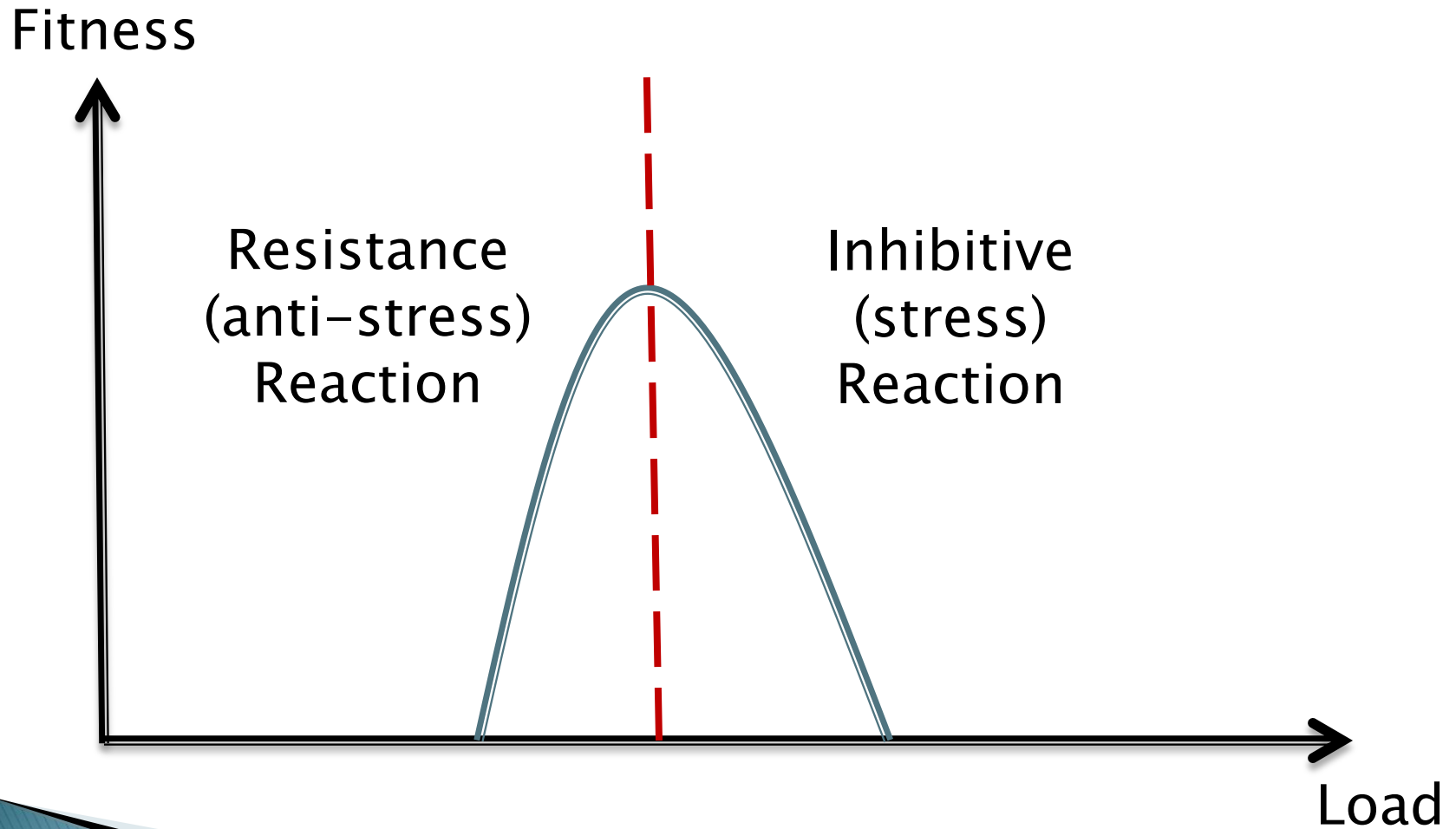
- ▶ Part I: The Overtraining Continuum
 - ▶ Part II: Managing the Training Process
 - ▶ Part III: Managing the Training Day
 - ▶ Part IV: Managing the Training Week
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OVERTRAINING

Part I: The Overtraining Continuum



Adaptation Reaction



Overtraining Is...

- ▶ “...an adaptive strategy by the body designed to minimize the impact of a chronically excessive level of **allostatic load**”

Allostatic Load

Training Load

Training Frequency

Training History

Fitness Level

Nutrition

Mental Stress

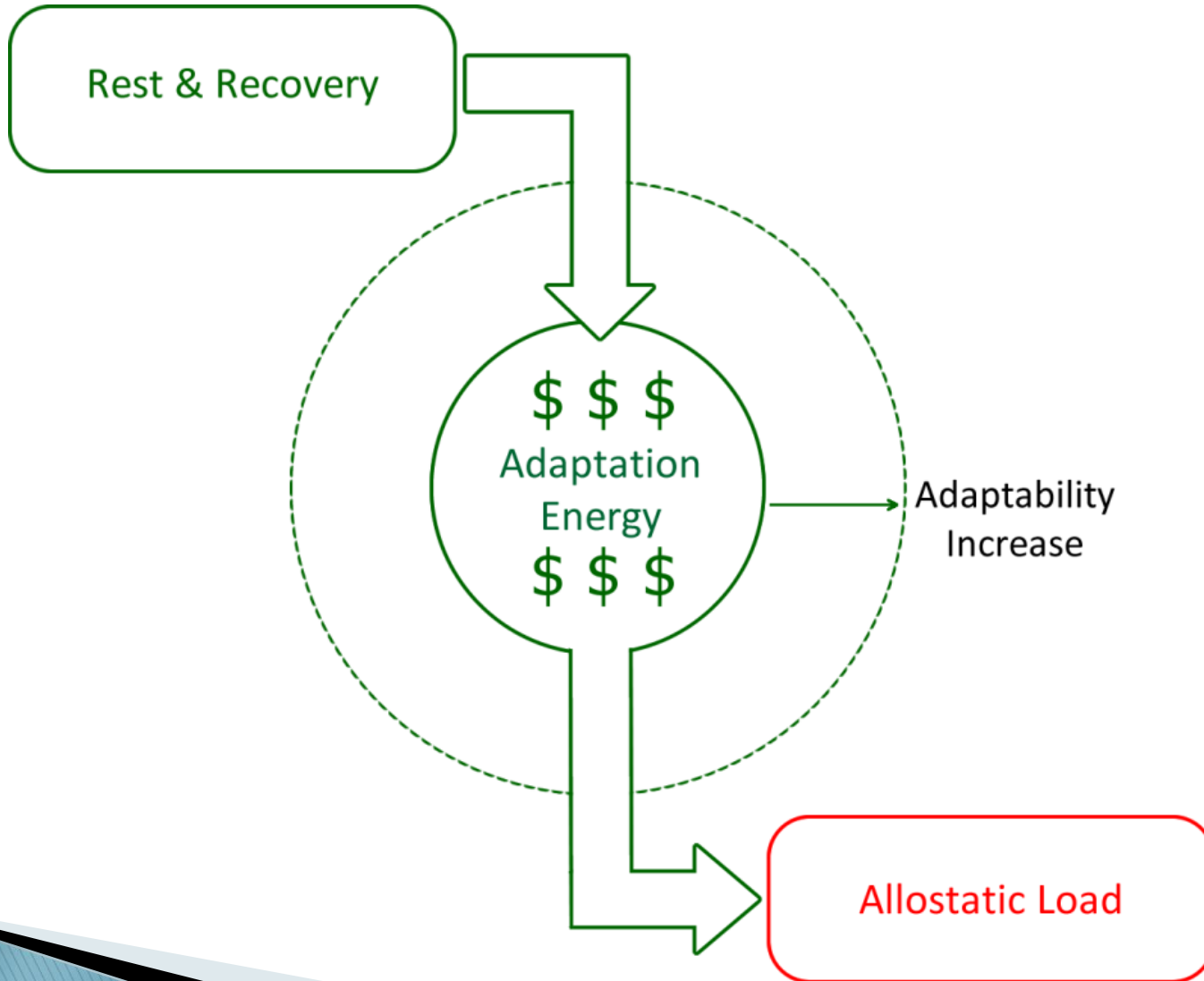
Genetics

Sleep

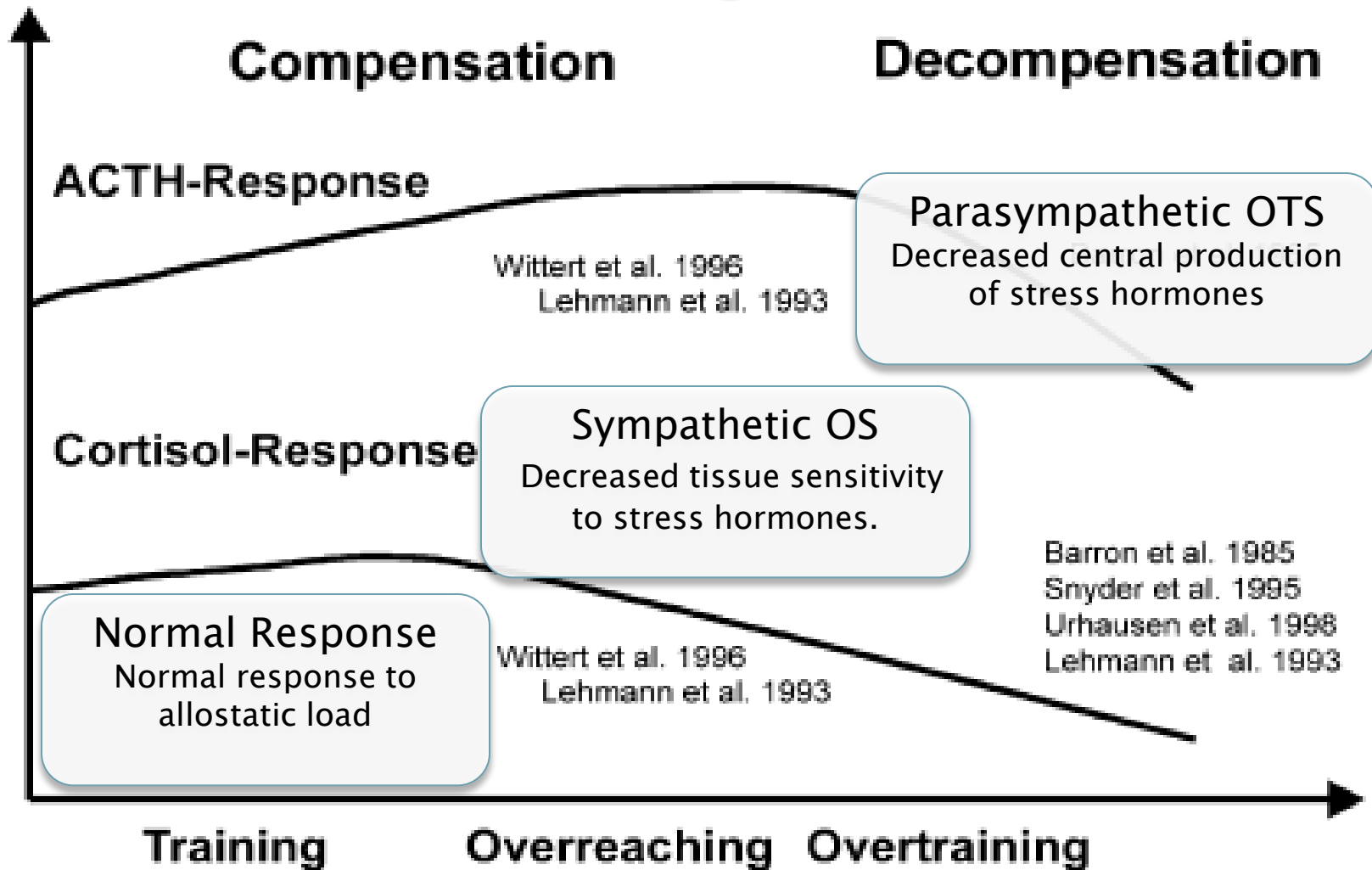
Allostatic Load

Allostatic Load is the cost of maintaining homeostasis (adaptation) in the face of physiological and psychological demands

The Energy Cost of Adaptation



The Overtraining Continuum



The Research

B2-Adrenergic Receptor Downregulation and Performance Decrements During High-Intensity Resistance Exercise Overtraining

- ▶ The OT group performed 10x1 100% 1 RM daily for 2 wk, whereas the Con group performed normal training 2 days/wk.
- ▶ Muscle 2-adrenergic receptor (2-AR; fmol/mg protein) density significantly decreased by 37.0% for the OT group and was unchanged for the Con group
- ▶ Overtraining occurred as indicated by a 5% decrease in 1-RM strength for the OT group as well as a 36.3% decrease in mean power at 100% 1-RM loads
- ▶ 2-8 wk before the OT subjects were able to resume their normal weight training

The Immune System Link

Chronic Stress, Glucocorticoid Receptor Resistance, Inflammation, and Disease Risk

- ▶ Study 1: After covarying the control variables, those with recent exposure to a long-term threatening stressful experience demonstrated GCR; and those with GCR were at higher risk of subsequently developing a cold
- ▶ Study 2: With the same controls used in study 1, greater GCR predicted the production of more local proinflammatory cytokines among infected subjects. These data provide support for a model suggesting that prolonged stressors result in GCR, which, in turn, interferes with appropriate regulation of inflammation
- ▶ “Because inflammation plays an important role in the onset and progression of a wide range of diseases, this model may have broad implications for understanding the role of stress in health”

The Overtraining Continuum

- ▶ Decreased tissue sensitivity to stress hormones preserves magnitude of stress response through increased production
- ▶ HRV shows persistently higher sympathetic function and decreased parasympathetic function
- ▶ Increased localized inflammatory response
- ▶ Symptoms include: anxiety, sleeplessness, loss of appetite, lack of ability to concentrate, increased resting heart rate, decreased motivation to train, decreased strength/power and performance
- ▶ Decreased central production of stress hormones combined with poor tissue sensitivity leads to greatly diminished response to training
- ▶ HRV shows heightened parasympathetic function with decrease in sympathetic drive
- ▶ Increase in infections
- ▶ Symptoms include: lethargy, depression, decreased resting heart rate and HRR, lack of motivation to train, muscle loss, decreased strength/power and all around performance

Overreaching




Overtraining

Managing the Training Process

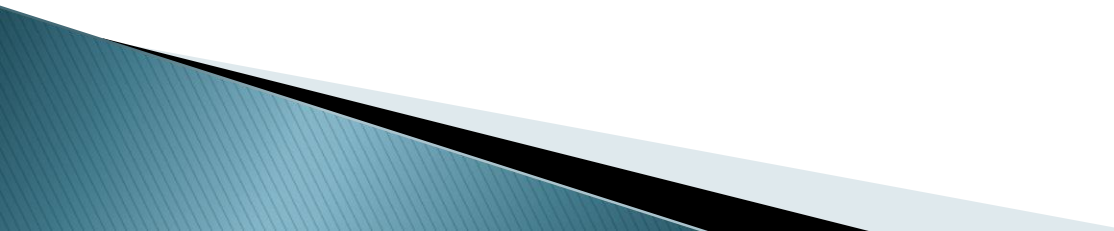
Part II: An overview of training optimization



Why Manage the Training Process?

- ▶ There is often a fine line between overreaching/overtraining and optimal loading. The goal of effective programming and coaching is to push the athlete to edge of that line without going over
 - ▶ Everyone is different
 - ▶ Life Happens
 - ▶ The best results are always achieved from applying the right amount of the right types of training at the right time. This is not possible without training management
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Everyone Is Different

- ▶ Training history
 - ▶ Genetics
 - ▶ Neuromuscular profile
 - ▶ Work capacity/Adaptability
 - ▶ Neurotransmitter levels
 - ▶ Psychological profile
 - ▶ Nutritional habits
 - ▶ Personal Goals
 - ▶ Age
 - ▶ Gender
- 

A Variety of Demands

- ▶ Life stress
- ▶ Family stress
- ▶ School stress
- ▶ Financial stress
- ▶ Social stress
- ▶ Travel
- ▶ Nutritional intake
- ▶ Quantity and quality of sleep
- ▶ Volume and intensity of training
- ▶ Type of loading – mechanical vs. metabolic
- ▶ Training frequency
- ▶ Competition frequency
- ▶ Periodization
- ▶ Recovery strategies between competition and training

Non-Specific Demands

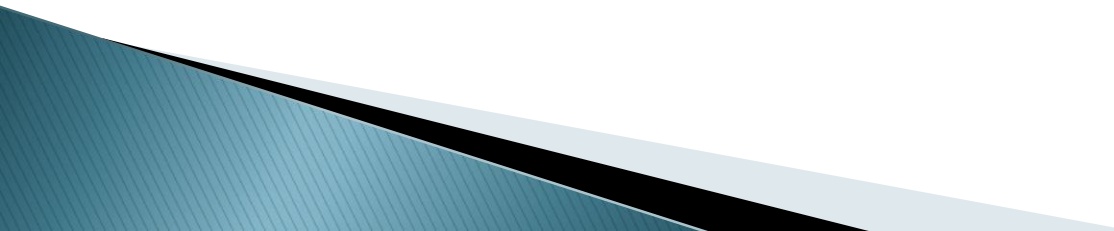
Specific Demands

Stress & Performance

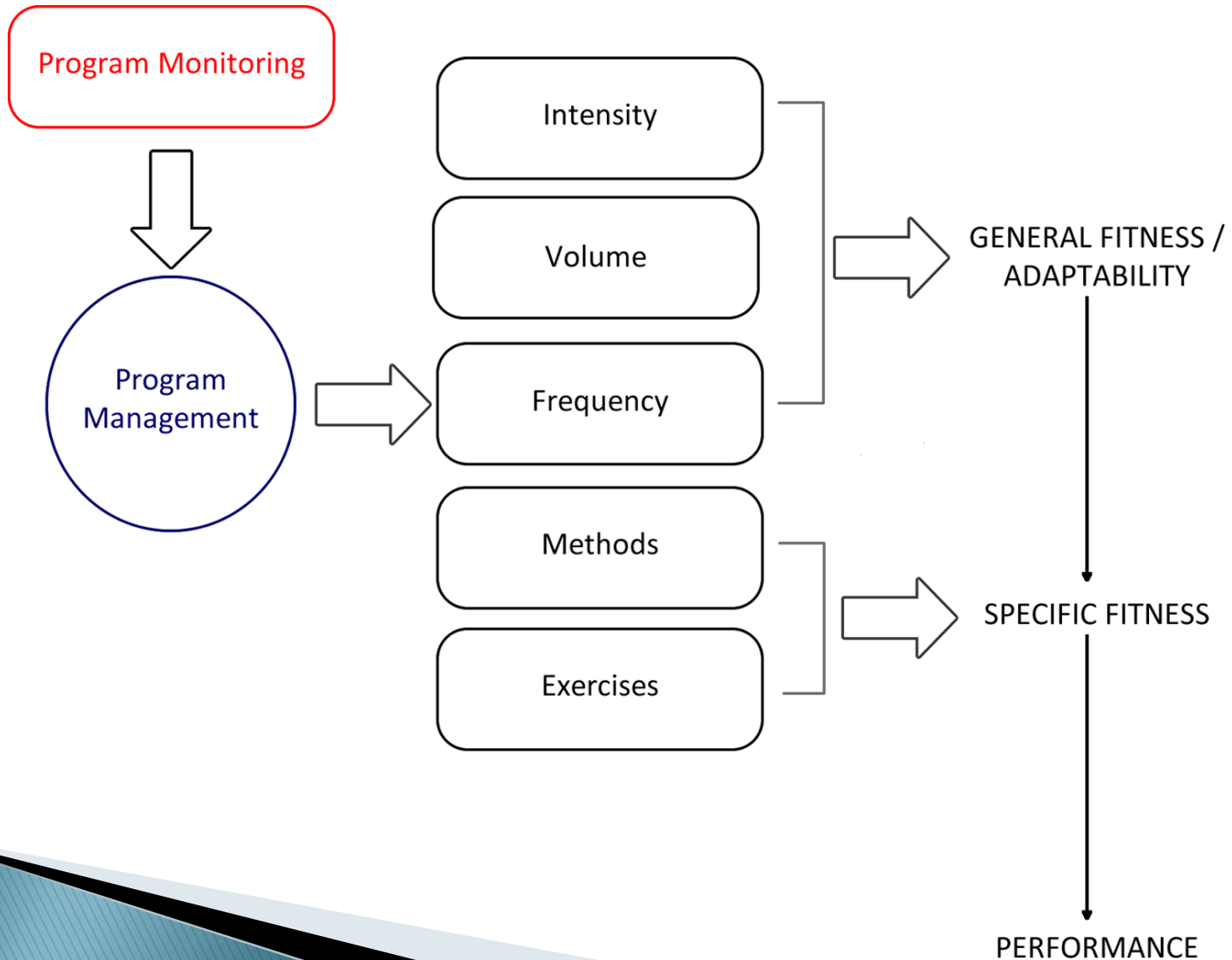
	Bench 1	Bench 2	%Change
Low stress	129.73 (55.88)	148.67 (60.34)	14.60
High stress	127.16 (62.57)	142.02 (67.57)	11.68
	Squat 1	Squat 2	
Low stress	177.66 (67.70)	222.19 (71.98)	25.06
High stress	173.88 (86.54)	212.84 (93.58)	22.41
	Arm size 1	Arm size 2	
Low stress	15.04 (7.25)	18.00 (6.97)	19.68
High stress	14.36 (6.75)	16.82 (6.78)	17.13
	Thigh size 1	Thigh size 2	
Low stress	33.70 (7.83)	34.16 (8.93)	1.36
High stress	32.45 (8.85)	32.50 (9.27)	0.15

Values are means (standard deviation).

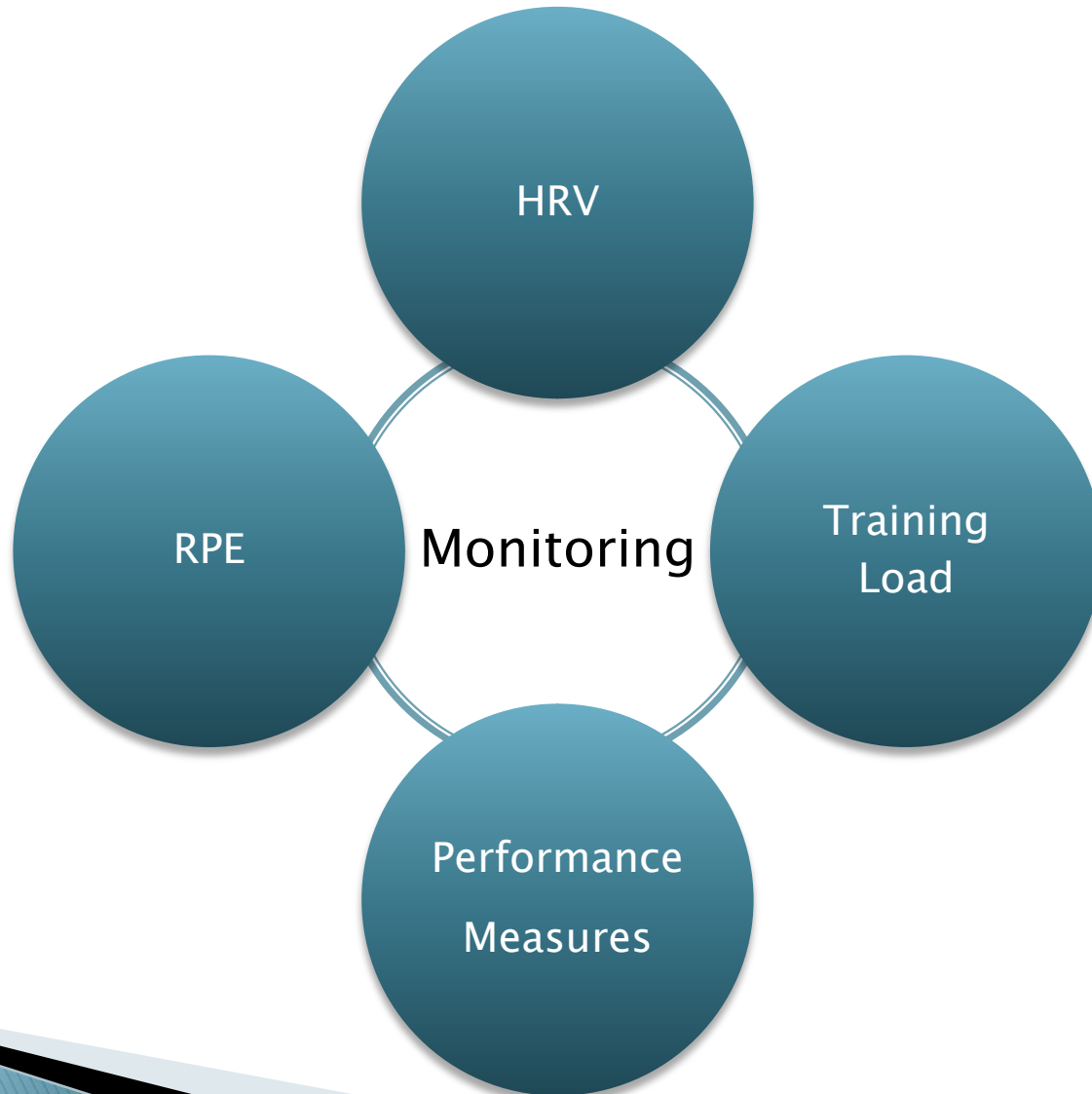
Training Program Management

- ▶ Answers the simple question of “How much training is the right amount on a daily, weekly and monthly basis?”
 - ▶ Always starts with monitoring the training process to determine where an individual is on the training continuum
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Training Program Management



Training Management Tools



Heart Rate Variability

- ▶ Measures acute and cumulative changes in nervous system function in response to non-specific demands
 - Omegawave Sport Technology System
 - BioForce HRV
 - Polar RS800cx w/Polar Pro Trainer Software
 - Firstbeat Software
 - Kubios

Heart Rate Variability

Low Readiness

Reduced Readiness

High Readiness

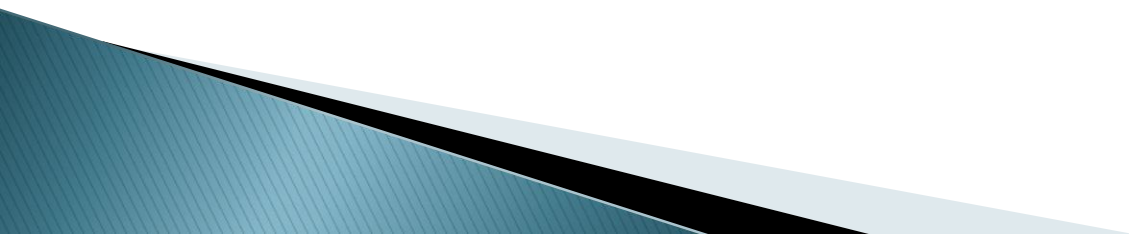
Reduced Readiness

Low Readiness

Allostatic Load

HRV

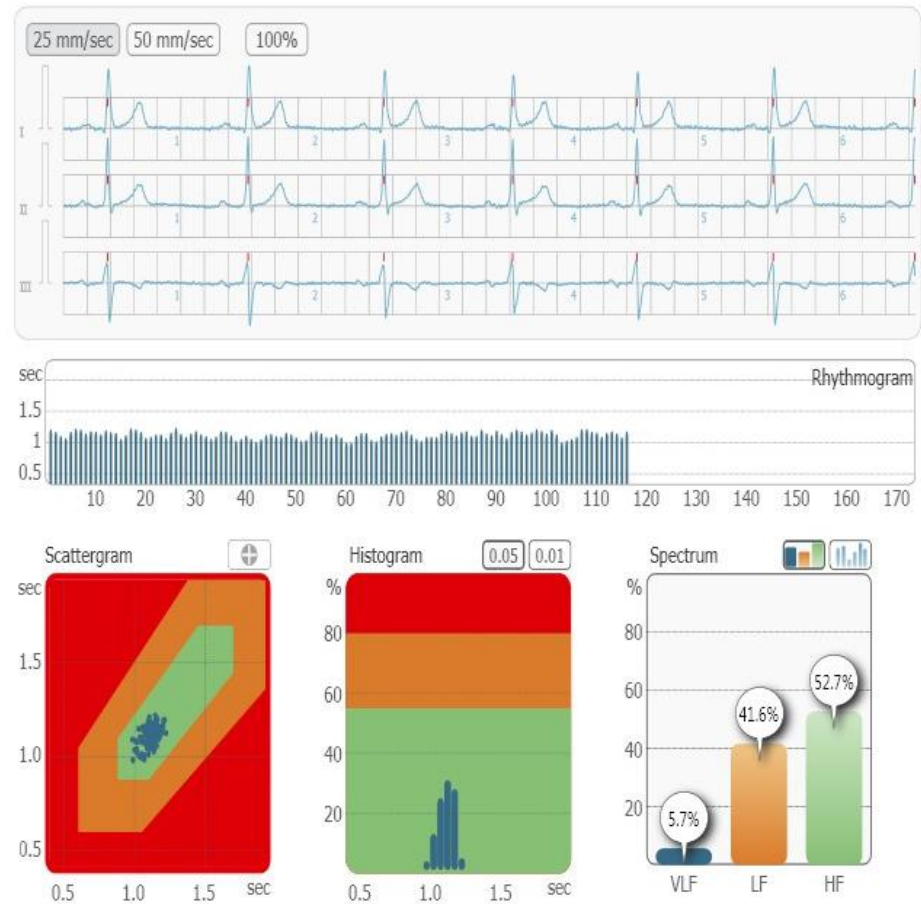
Recovery



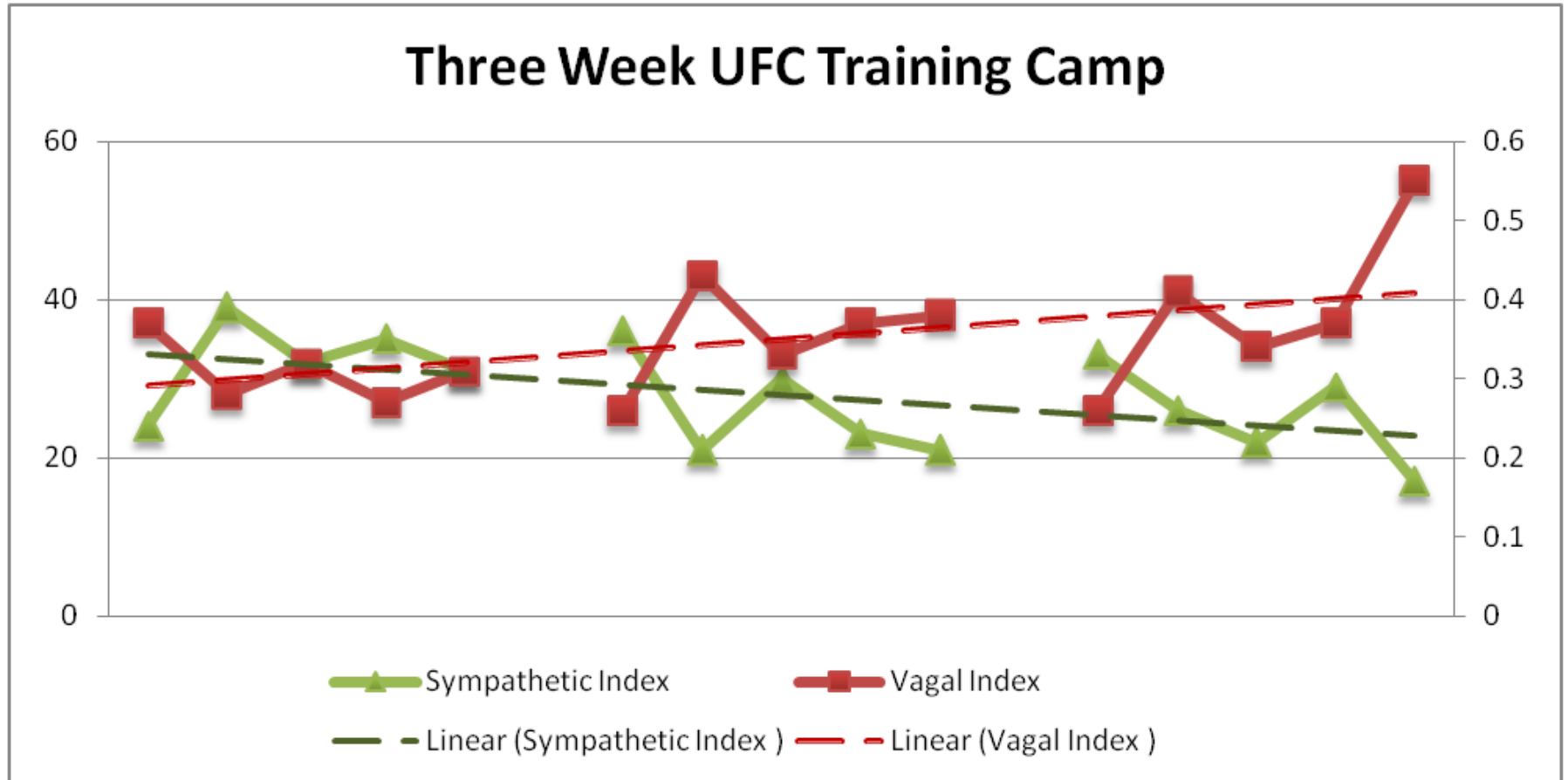
Heart Rate Variability



HRV



3 Week Training Response



RPE & Subjective Measures

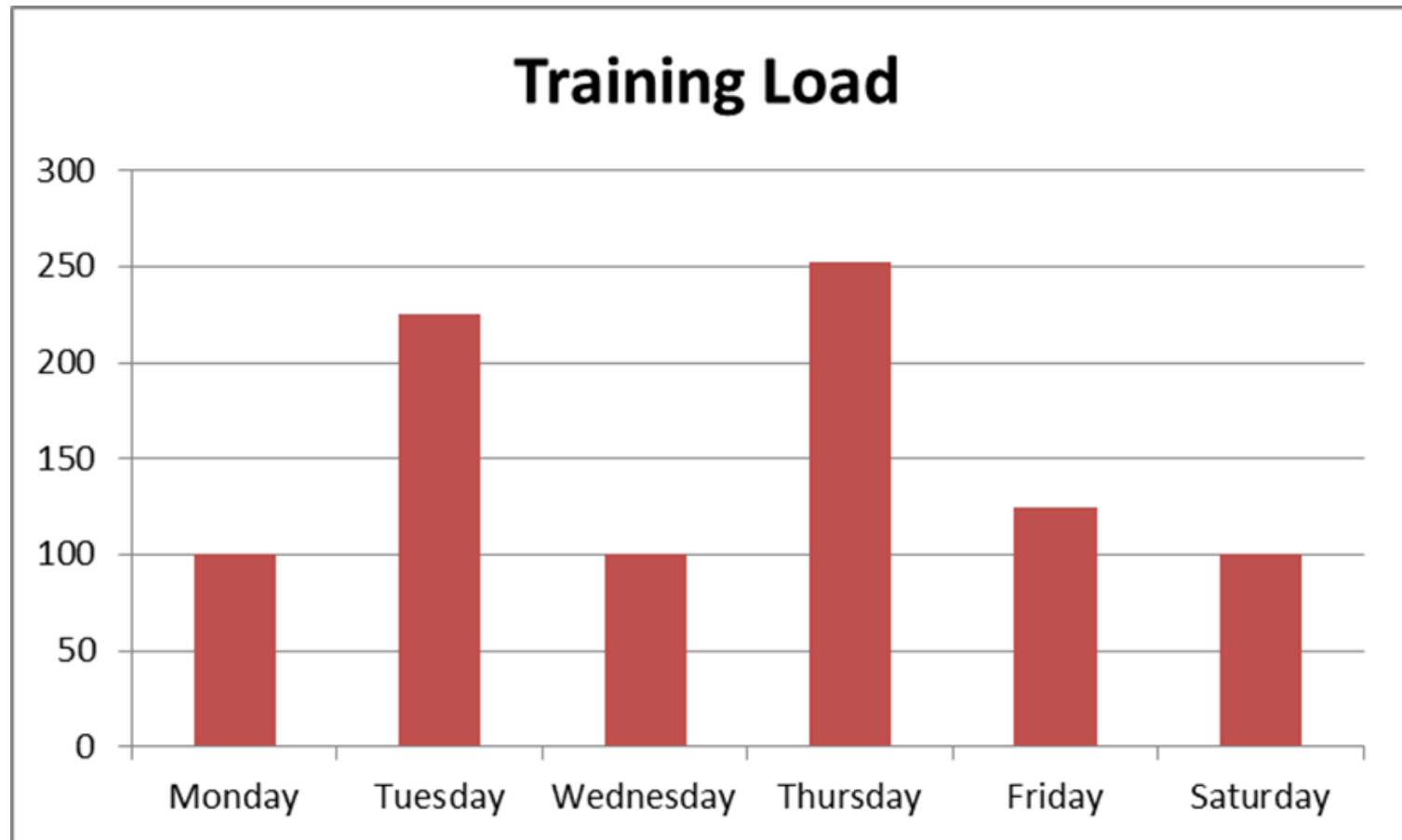
- ▶ Low cost method to pre-screen for various symptoms of overreaching/overtraining
- ▶ Daily/Weekly athlete/client training session RPE
- ▶ RPE Scale:
 - 1–3 Very easy – low load
 - 4–6 Moderate work level – minimal residual fatigue
 - 7–8 Hard training – fatigue will accumulate
 - 9–10 Maximum training – high fatigue

RPE & Subjective Measures

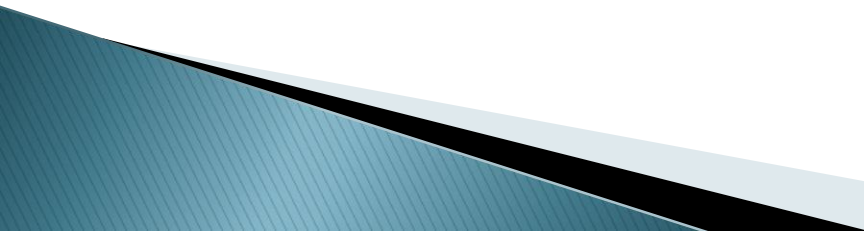
▶ Weekly Lifestyle Questionnaire:

- Mental stress levels/ life events
- Changes in sleep patterns
- Increased/Decreased appetite
- Motivation level
- Energy levels– lethargy
- Anxiety/restlessness
- Mood/behavior
- Sex drive

Training Load



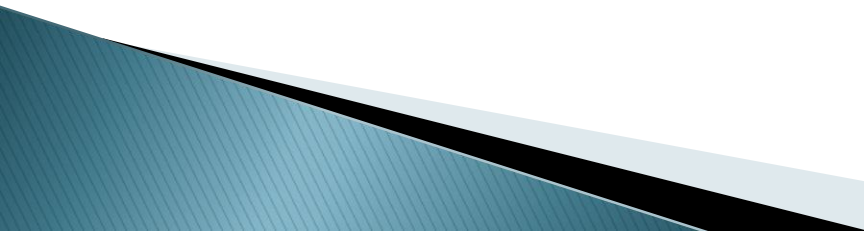
Training Load

- ▶ Polar RS400 or other Polar – Polarpersonaltrainer.com
 - ▶ Training Intensity X Volume
 - ▶ Total Training Time
 - ▶ Time HR > 90%
 - ▶ Number of sets > 90%, number of sets 80–90%
- 

Performance Measures

- ▶ Keeping track of performance measures throughout in all aspects of training/competition can provide valuable insight into adaptation
- ▶ Monitoring methods:
 - Heart rate monitoring – changes in heart rate / power output and heart rate recovery
 - Tendo unit / Myotest speeds
 - Strength changes
 - Aerobic performance changes
 - Body composition changes
 - Sport specific performance

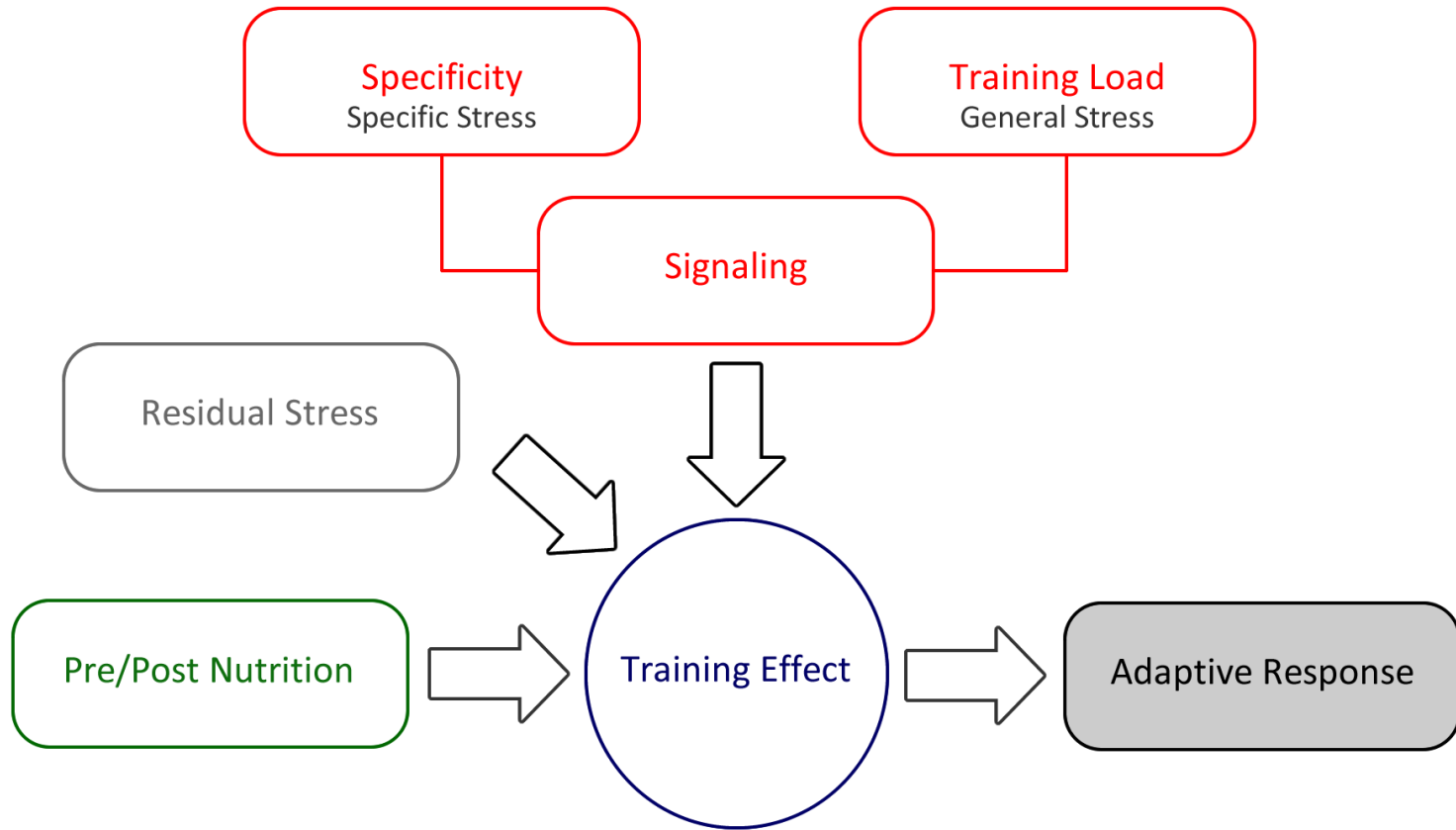
Managing the Training Process

- ▶ Three goals of management...
 1. Make sure the body ready to handle the highest loads when they are used in training – Train each day within your adaptability threshold
 2. Avoid the accumulation of fatigue across microcycles that will trigger the body's inhibition response
 3. Use the optimal amount of loading to ensure adaptation and improve performance
- 

The Training Day

Part III: Get the most out of each session

Model of the Training Response



Managing the Daily Training Load

Adaptability
Threshold

Maximum Stress Loads

High Readiness

Reduced
Readiness

Low
Readiness

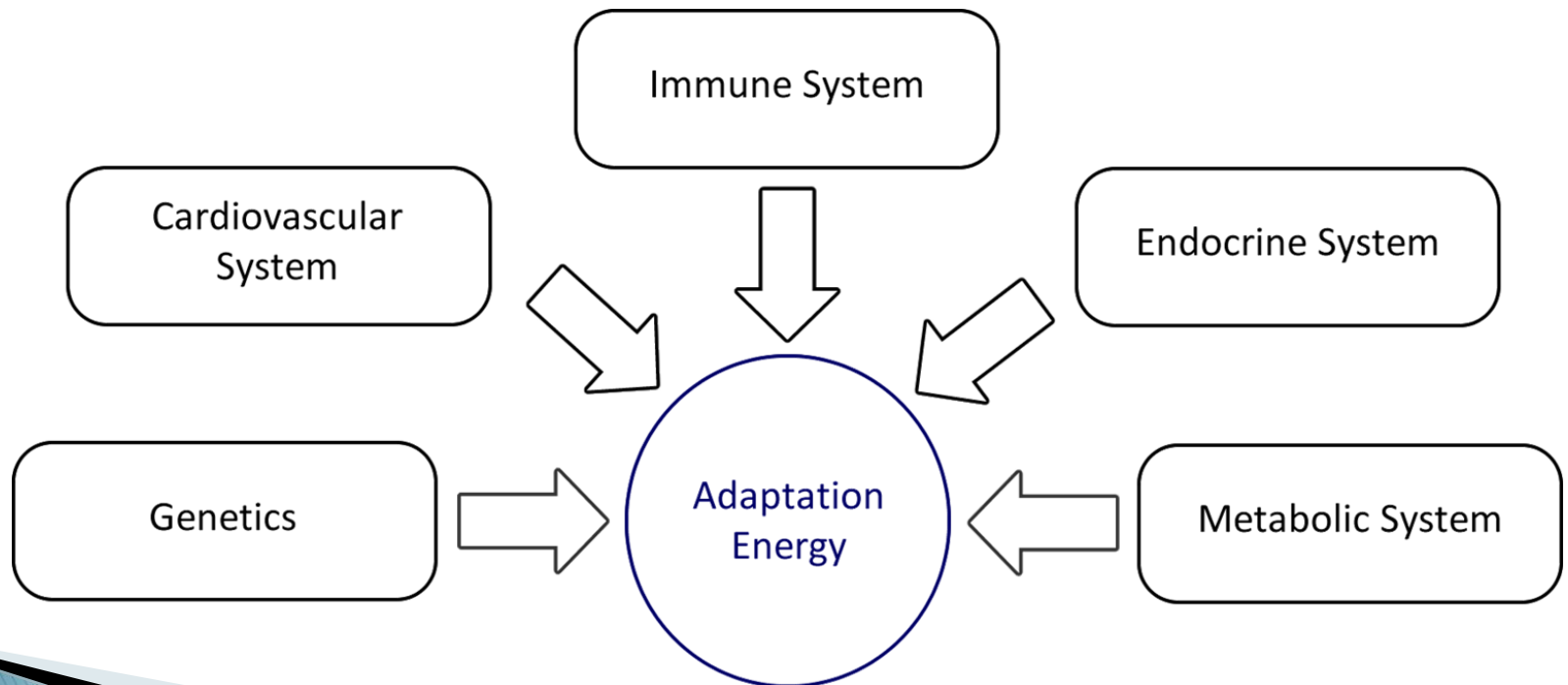
Developmental Loads

Stimulative Loads

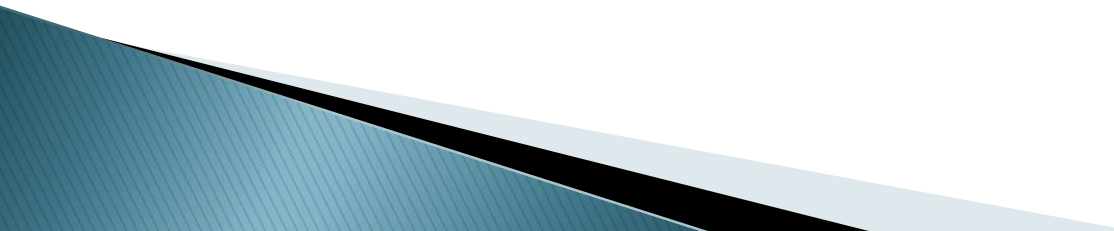
Rest

Daily Training Readiness

- ▶ “A measure of the body’s functional ability to effectively respond to the challenges to homeostasis that results from training on a given day – Current state of adaptability”



Daily Training Readiness Indicators

- ▶ HRV
 - ▶ Jump tests
 - ▶ Tap tests
 - ▶ Morning resting HR
 - ▶ RPE on previous days
 - ▶ Performance measures
 - ▶ Subjective feelings
- 

Managing the Daily Training Load

Readiness	Appropriate Training Load
High	Highest Loading
Moderate	Reduce training load 20–30% from max
Low	No training or recovery/regeneration

Individual vs. Team Management

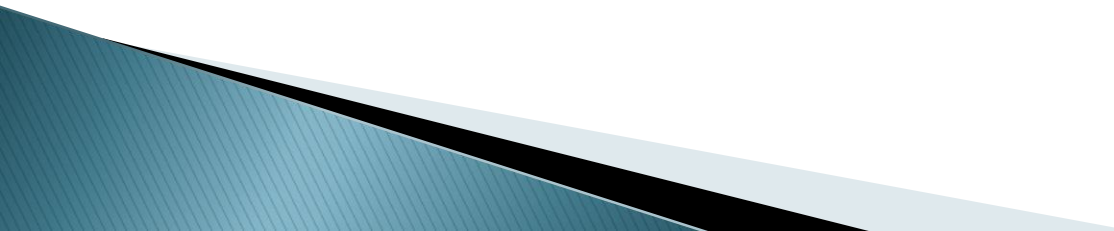
- ▶ Daily HRV
 - ▶ Jump test/tap test
 - ▶ Subjective discussion with athlete/client
 - ▶ Individualized changes to training load
 - ▶ In-Session changes
- ▶ HRV
 - ▶ Morning resting HR
 - ▶ Excel worksheet filters to identify potential reduced readiness
 - Previous 3–5 day RPE >
 - Training Load total
 - Subjective screenings

Individual

Team/Group

The Training Week

Part III: Get the most out of each week

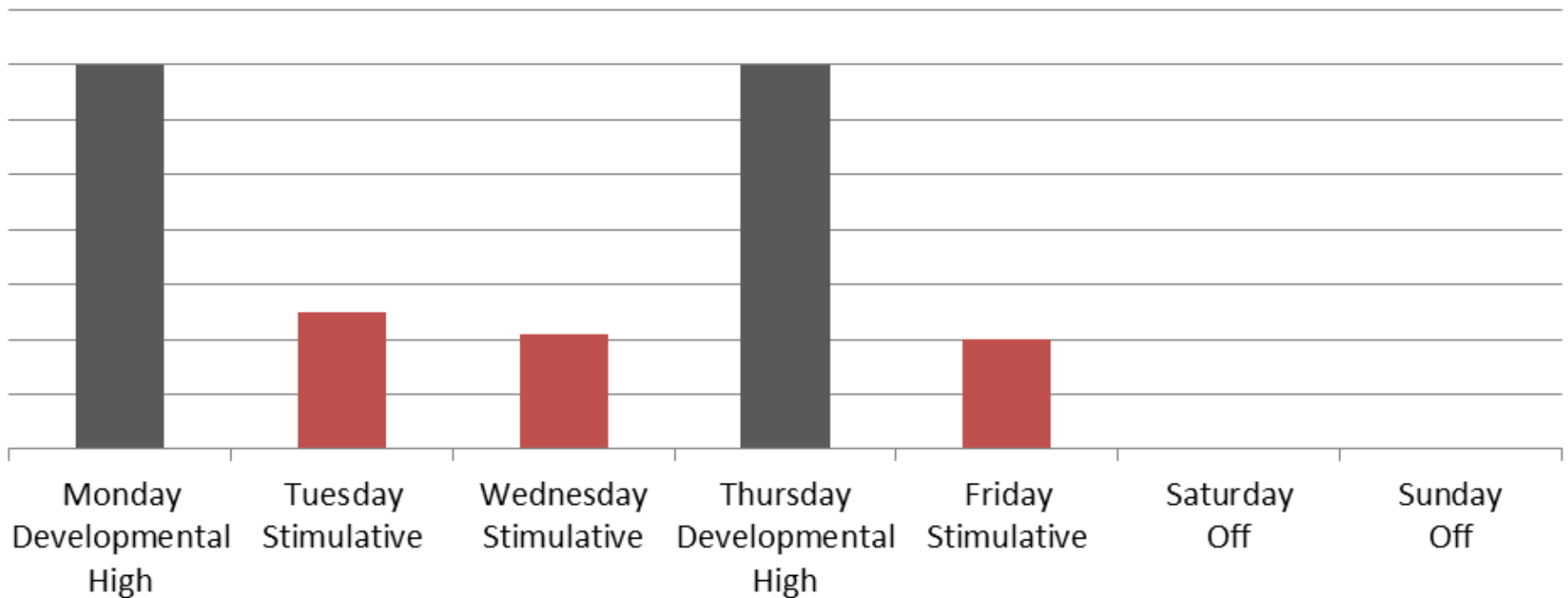


Managing the Training Week

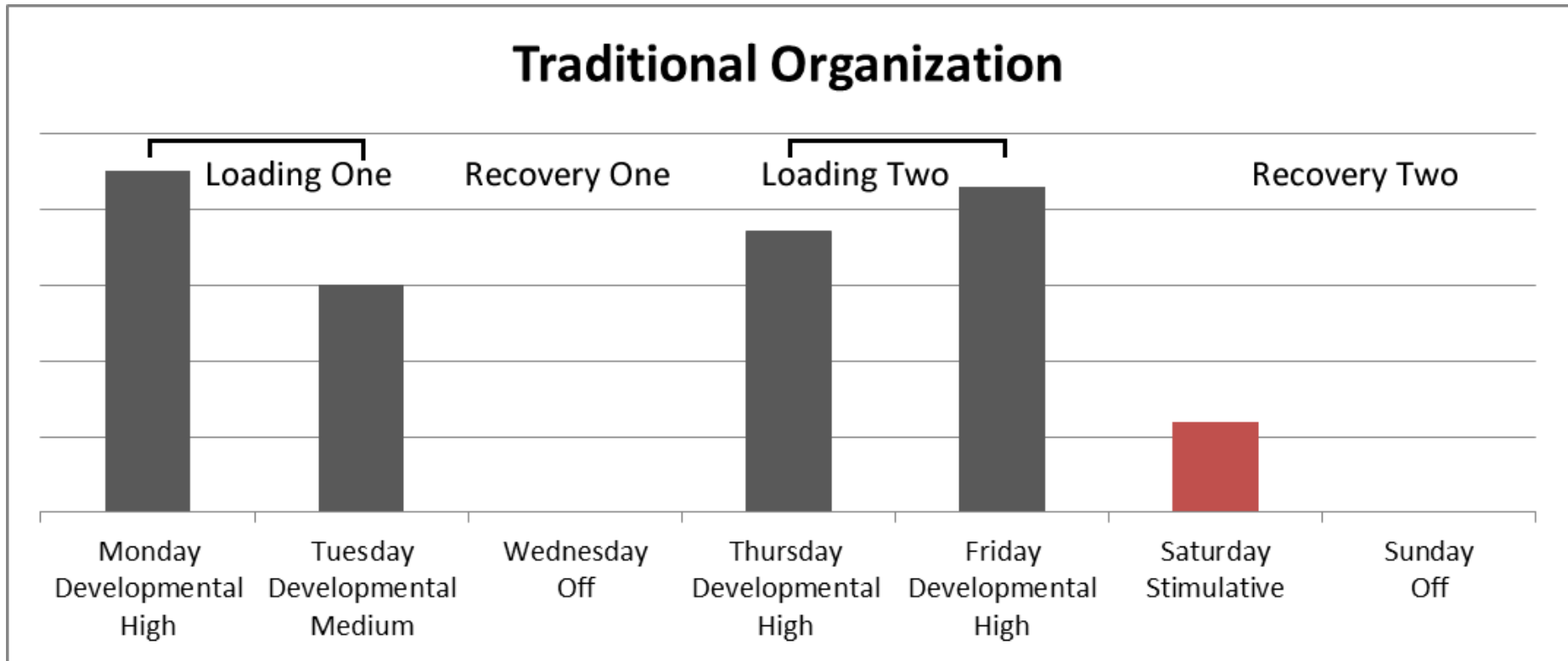
- ▶ What should the weekly training load be?
 - Restorative
 - Foundational
 - Shock
 - Competitive
- ▶ The Weekly Training Model
 - ▶ Weekly HRV Load
 - ▶ Weekly RPE Total
 - ▶ Total Training Load

Managing the Training Week

High/Low Organization



Managing the Training Week



Heart Rate Variability

Weekly HRV Load

Daily Change Indicator	HRV Load Scale
Green	+ 1 point
Amber	- 1 point
Red	- 2 points

Heart Rate Variability

Sample Weekly HRV Load

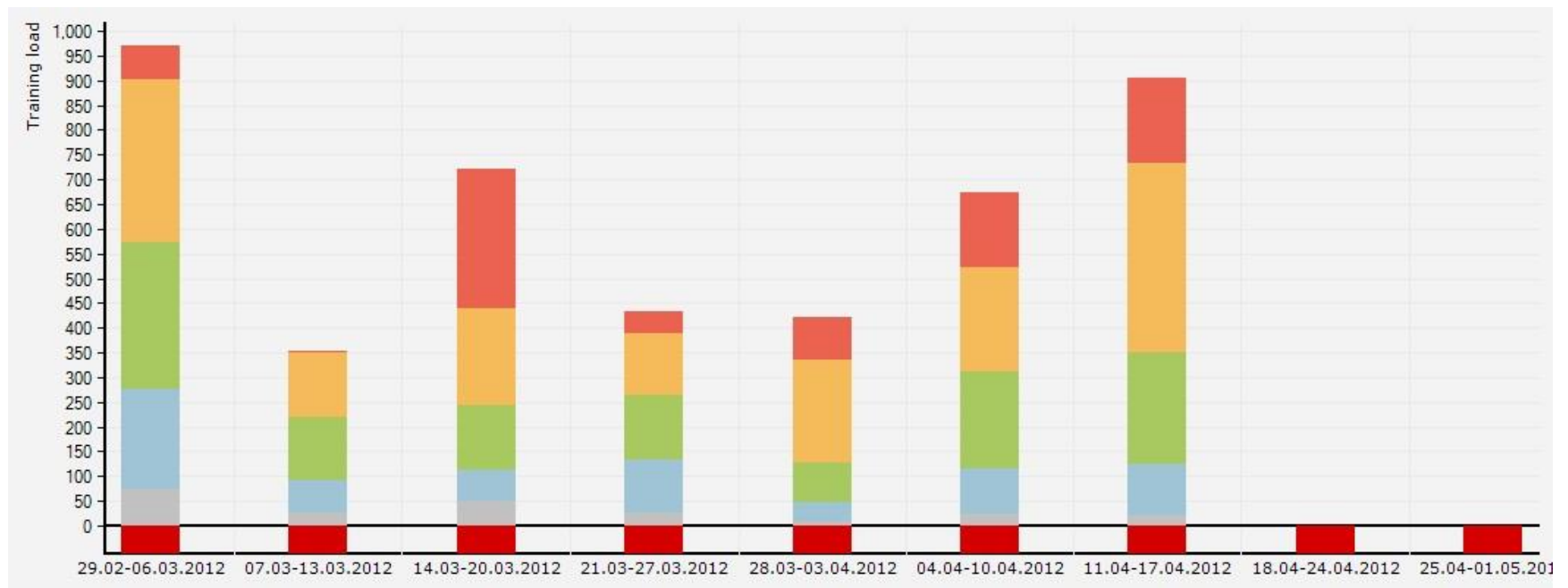
Day	HRV	Indication	HRV Load
Monday	69.7	G	+1
Tuesday	81	A	-1
Wednesday	77.7	G	+1
Thursday	80.3	G	+1
Friday	67.1	A	-1
Saturday	77.1	G	+1
Sunday	64.3	A	-1

Weekly HRV Load = 1

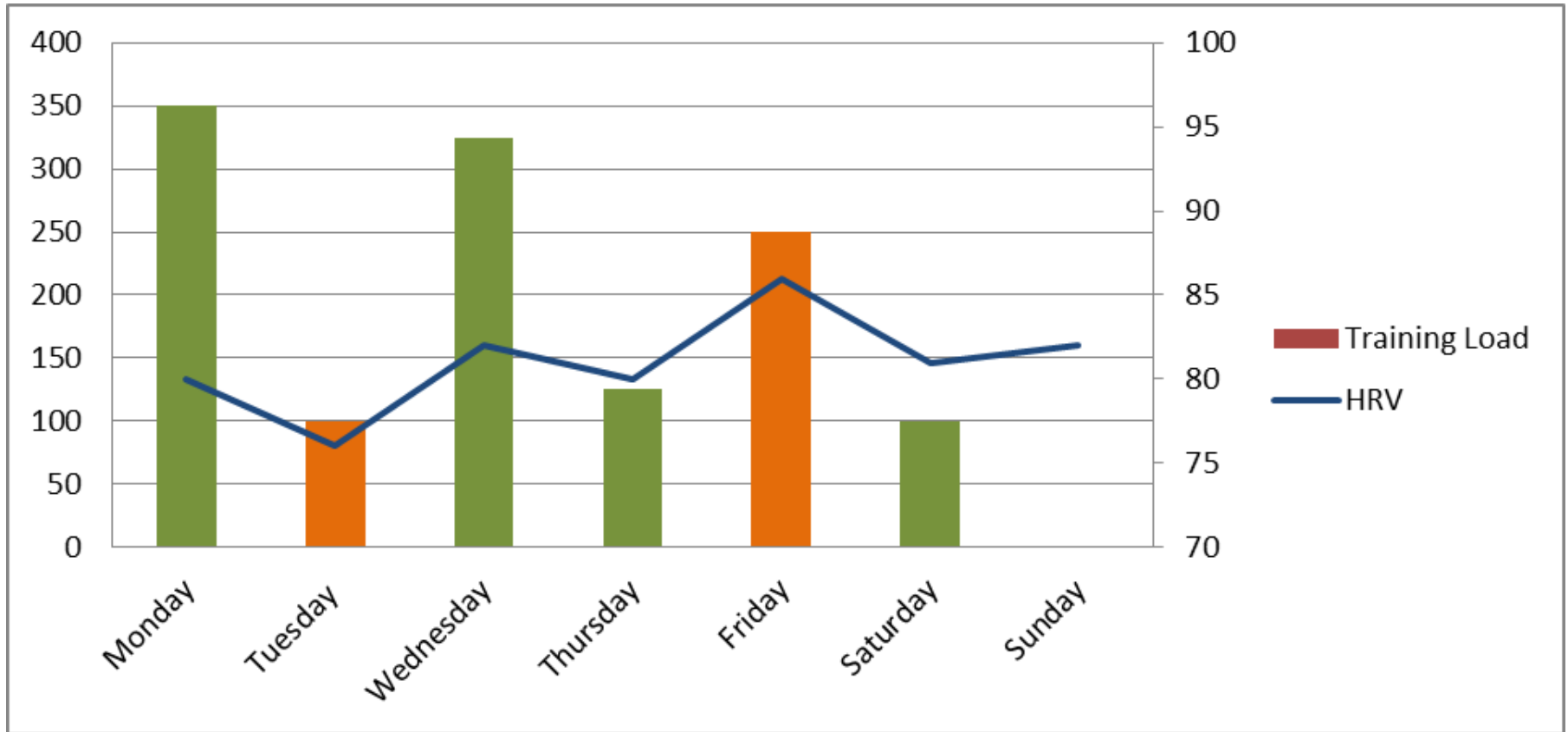
Weekly HRV Load Total

6-7	3-5	0-2	< 0
Low	Moderate	High	Maximum

Weekly Training Load – Polar



Sample Training Week



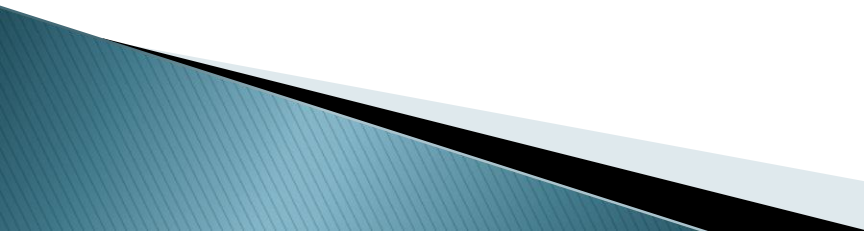
Individual Sample Training Week

Day	Training Load	RPE	HRV Load
Monday	350	8	1
Tuesday	100	5	-1
Wednesday	325	8	1
Thursday	125	6	1
Friday	250	7	-1
Saturday	100	4	1
Sunday	0	0	1
	1250	38	3

Weekly Team Management

Athlete	Training Load	RPE	HRV Load
Steve	1000	38	2
Mike	1250	39	1
Jason	1125	41	2
Rob	1100	40	1
Jake	1300	42	-1
Blake	800	36	3
Adam	975	43	0
Chris	1285	44	1
Average	1104	40	1
St. Dev.	174.4	2.7	1.3

Management Guidelines

- ▶ Consistent monitoring over time is the most important factor to effective management
 - ▶ Learn how to use excel to track data, analyze trends and track results. Visual is always better than raw numbers
 - ▶ Don't get overly analytical with every number change, fluctuations are normal. Look for trends and consistently abnormal results
 - ▶ Work with what you have. Large team/group settings require different strategies than one on one or small group training
 - ▶ Give it time. Learning how to effectively manage the training process is not easy and requires time, effort, and persistence. The more you do it, the better you'll get at it
- 

Thanks For Listening...

Everything I've said may be wrong





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