



TRAINING FOR FAT-LOSS

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- Sometimes viewed as “conditioning” in the strength training world
- Nutrition is just as, if not more important than exercise
- Energy balance equation: $\text{Energy In} - \text{Energy Out} = \text{Stored Energy}$
 - Balance may be: Positive | Negative | Balanced



THE FAT BURNING ZONE?

- Higher percentage of fat is burned at lower heart rate intensities.
- However, this is a greater percentage of a smaller number. Higher intensity exercise burns more calories and more total fat calories.
 - 30 min @ 6 kmh (50% fat contribution) = 225 total kcal (113 from fat)
 - 30 min @ 12 kmh (30% fat contribution) = 451 total kcal (135 from fat)
- Ultimately, intensity is key to burning fat during a training session

POST-EXERCISE ENERGY EXPENDITURE

- So what happens after exercise?
 - The body continues to need oxygen at a higher rate than before
- This sustained oxygen consumption is known as Excess Post-Exercise Oxygen Consumption (EPOC)
 - Recovery of metabolic rate back to pre-exercise levels depends on intensity not duration of exercise
 - High intensity interval training (HIIT) produces the greatest EPOC
- HIIT training
 - Tabata protocol (1996): 20s / 10s, 8 reps performed for 4 min of total work
- Today, work-to-rest intervals vary considerably
 - e.g. 1:1, 2:1, 3:1, etc. (30/30, 60/30, 45/15, etc)
 - Duration: typically 3-10 min

KEYS TO TRAINING APPROACH

- Understanding and controlling work to rest ratios
 - Managing and not overdoing intensity
- Build work capacity through progressive overload
- Programs need to manage adaptation and efficiency
 - The longer the same workout is repeated, the more efficient the body becomes. May be ok for strength and size but lowers the benefits for fat loss
- Key is to perform lots of work, using large muscle mass, with short rest periods between sets

KEYS TO TRAINING APPROACH

- Common variables in fat-loss programs
 - Total-body workouts
 - Supersets
 - Most efficient pairing are between exercises that have no relation to each other
 - Alternate upper and lower body movements
 - e.g. squats followed by pulling mvt or deadlift followed by pushing mvt
- Circuit training
- Progressively harder work
- Progressively shorter rest periods

SAMPLE TRAINING

- Circuit Training
 - No. of exercises: 4-8 (or more)
 - No. of repetitions per set: up to 60
 - No. sets per sessions: 1-4
 - Rest interval b/w sets: 10 sec - 1 min
 - Rest interval b/w circuits: 1 min - 5 min
 - Frequency: 2-3

Bodyweight Challenge	200	350	500
Prisoner squat	30	45	50
Pushup	30	40	50
Jumps	10	20	25
Stability ball leg curls	10	20	25
Stability ball jack-knife	10	20	50
Step-ups	10	20	25
Pull-ups	5	10	25
Lunge	15	20	25
Close grip pushup	20	40	50
Inverted row	15	20	50
Squats	15	40	50
Chin-ups	5	15	25
Time-to-beat (minutes)	≤15	≤30	≤45





CrossFit

Forging Elite Fitness

Conditioning

CROSSFIT – PHILOSOPHY

- Develop general physical skills
 - CV endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy
- Ability to perform various athletic tasks in a randomized fashion
 - Deadlift, clean, squat, presses, C&J, and snatch, master the basics of gymnastics: pull-ups, dips, rope climb, push-ups, sit-ups, presses to handstand, bike, run, swim, row, etc
- Focus on energy systems that ‘drive human action’
 - Training is usually performed at high intensities regardless of duration
 - “A regimen of constantly varied (CV), functional movements (FM) performed at high intensity (@HI) in a communal environment leads to health and fitness.”

CROSSFIT – PROGRAM DESIGN

- General Template
 - 3-days on and 1-day off (sustain maximum intensity) OR 5-days on and 2 days off
 - After warm-up, 3-5 sets of 3-5 reps are performed with a fundamental lift (moderate intensity)
 - 10-minute circuit with gymnastic elements at a blistering pace
 - Creativity dictates the combination of movements
 - 2-10 minutes of high intensity metabolic conditioning
- Training sessions highly variable

CROSSFIT – WORKOUT OF THE DAY (WOD)

Day 1	Day 2	Day 3	Day 4
For time “Murph”: 1 mile Run 100 Pull-ups 200 Push-ups 300 Squats 1 mile Run	Split Jerk 7 x 1	5 rounds of: 30 wall-ball shots, 20-lb. ball 5 squat snatches Rest 2 minutes	Off

Day 1	Day 2	Day 3	Day 4
Back Squat 5 x 3	Complete as many rounds as possible in 10 minutes of: 20 box jumps, 24-inch box 10 handstand push-ups	12-9-6 reps for time of: 225-lb. squat cleans Muscle-ups	Off

CROSSFIT – WORKOUT OF THE DAY (WOD)

Day 1	Day 2	Day 3	Day 4
Complete as many rounds in 20 min: 5 Handstand Push-ups 10 L Pull-ups 15 Steps, Walking Lunges	"CrossFit Total" Back squat, 1 rep Shld Press, 1 rep Deadlift, 1 rep	Complete as many rounds in 30 min: 5 pull-ups 5 ring dips 15 Sit-ups	Off

Day 1	Day 2	Day 3	Day 4
Clean and Jerk 7 x 1	For time "Jackie" 1000m row 50 x 45-lb Thrusters 30 pull-ups	Run 5 K	Off

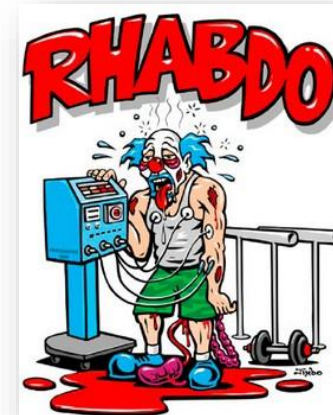
CROSSFIT – NOTES

- Lack of screening
 - Movement assessment, training history
 - No screening for individual exercise tolerance (suitability)
- Pushing endurance limits too excessively
 - CF programs seems to display a disconnect between training "hard" and training "smart"
 - Adheres to the “Just Kill Them” school of thought

"Pukey the Clown"



“Uncle Rhabdo”



CROSSFIT – NOTES

- Many strength coaches disapprove of the randomness of the training sessions
 - No focus on single training protocol/methodology
 - ex. One day 120 pull-ups and 120 dips, 2 days later 5x5 push jerk with max loads (may compromise shoulder health)
 - “If you try to do everything in your workout, you get nothing. CrossFit is different, and maybe even fun for some people, but it's not very effective. No athlete has ever gotten good training like that.” - Charles Poliquin
- Not meant for those specializing to compete in 1 sport
 - Although CrossFit is quickly becoming a sport itself

CROSSFIT – NOTES

- Misuse of exercises
 - Exercise order (sequencing)
 - Ex, DL to the point of lower back fatigue before O-lifts
 - Using power exercises in an endurance fashion



CROSSFIT – ANALYSIS

- Despite the apparent shortcomings, CF does offer a fun, challenging, and effective training method (assuming its goals matches an individual's goals)
 - For people who just love to train





WAYS TO ORGANIZE TRAINING



BASIS FOR TRAINING ORGANIZATION

- Training needs to be structured to manage stress and offer variety for long-term fitness improvements
 - General fitness
 - Sport-specific
- The physiological basis underscoring the numerous ways to organize training is grounded in the body's response to stress
 - Dr. Hans Seyle's General Adaptation Syndrome



TRAINING AS A STRESSOR

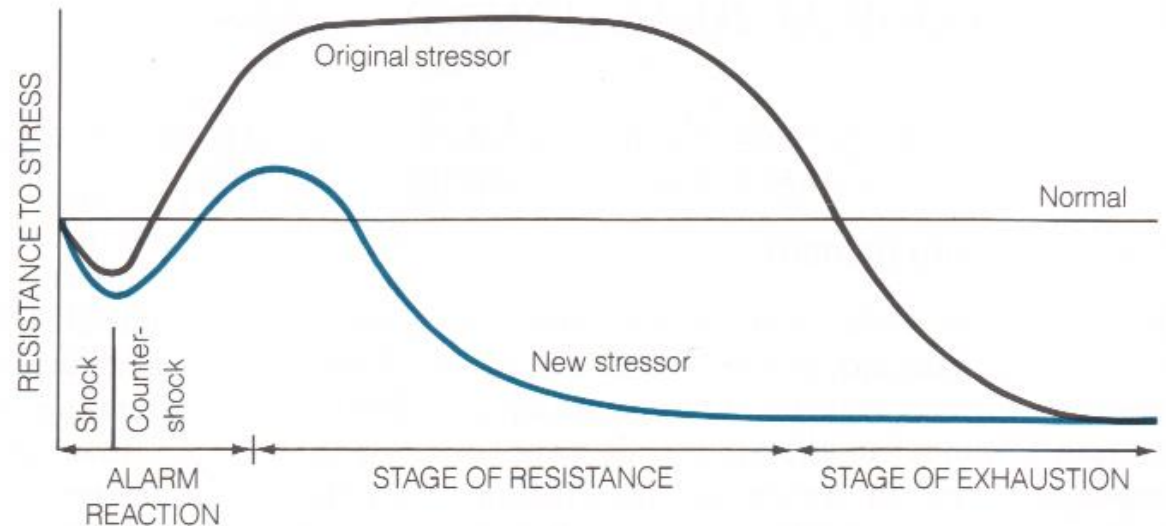
- Dr. Hans Selye defined stress as a “nonspecific response of the body to any demand made upon it”
 - Nonspecific refers to a similar pattern of responses that could be produced by any number of different stressful stimuli
 - What happens when you are put in a stressful situation?
- Selye studied the effects of persistent stress over time, a model termed: *General Adaptation Syndrome (GAS)*
 - Physical training embodies the principles of GAS
 - 3 stages: Alarm, Resistance & Exhaustion

(1907-1982)



GENERAL ADAPTATION SYNDROME

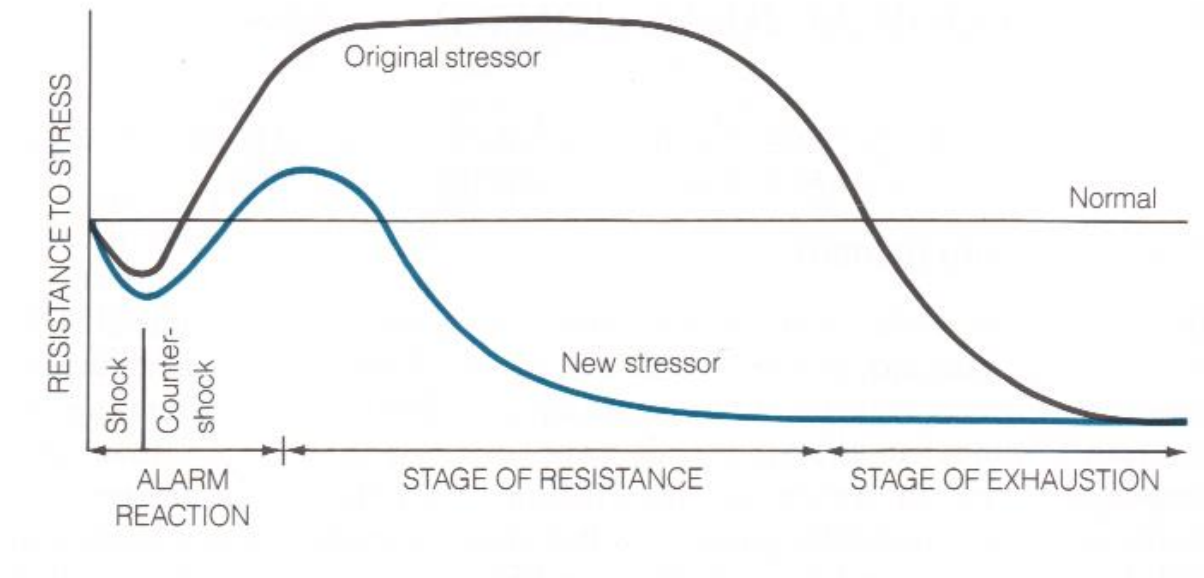
- Alarm Reaction “fight-or-flight”
 - Shock: temp and BP drops, HR quickens, muscles relax
 - Countershock: body rebounds, heightened degree of arousal → fight-or-flight response



GENERAL ADAPTATION SYNDROME

■ Resistance Stage

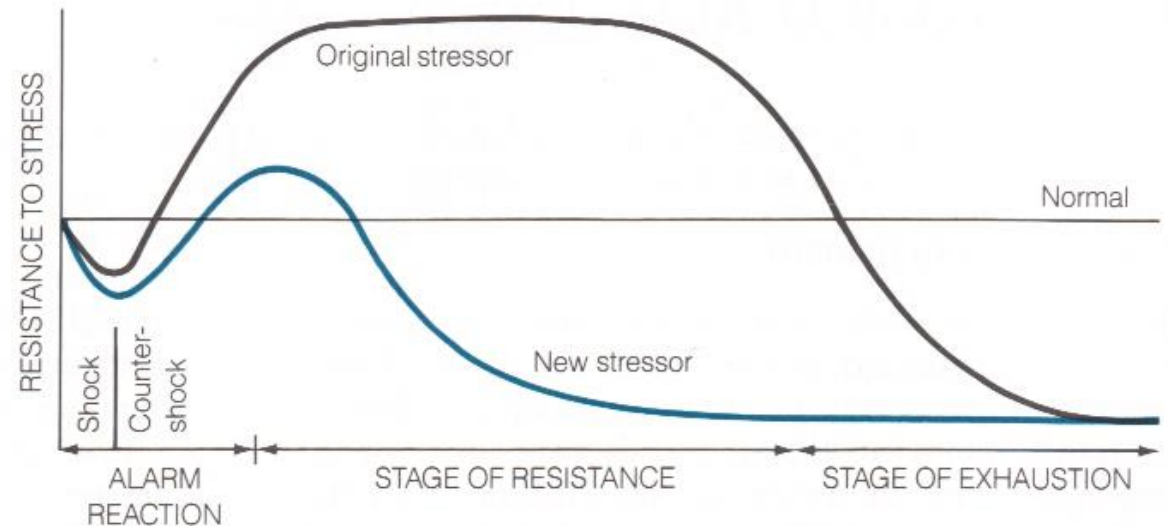
- The body adapts to the stressor, period of recovery for repair, return to homeostasis (resistance appears to increase)
- Exhaustion can result if exposure to a stressor continues for too long or if a new stressor is added



GENERAL ADAPTATION SYNDROME

■ Exhaustion Stage

- Ability to resist stressor is lost, alarm reaction reappears, pituitary and adrenal cortex are unable to continue secreting their hormones and ultimately death can result



GAS APPLIED TO TRAINING

- Alarm Reaction: Acute and short-term timeframe (days to a few weeks). Exposure to new overload
 - Introduction of a stressor leads to soreness, stiffness, and a temporary drop in performance

GAS APPLIED TO TRAINING

■ Resistance Stage

- Body demonstrates its ability to withstand the stress and adapts to the stressor and returns to more normal functioning → Accommodation
- In training this could manifest itself in hypertrophy, enhanced neural drive, or metabolic adaptations.
- If training stress is consistently high or another stressor is encountered (daily hassles, life changes, competition) recuperative abilities will be compromised → Exhaustion

GAS APPLIED TO TRAINING

- Exhaustion Stage: Adaptive energy is exhausted
 - Monotony, overtraining, and other training maladaptation's develop (reappearance of alarm stage)
 - Injuries, psychological staleness, illness, depression

TRAINING MODEL

- Preparedness (potential for performance) results from the interaction between physical fitness (slow changing) and fatigue (fast changing)
- Preparedness immediately following a training session/workout is a combination of:
 - Gain in fitness prompted by the workout, but
 - Masked by the effects of fatigue
 - e.g. strength gains immediately following a workout are absent due to fatigue, improvements only become visible in the subsequent days

TRAINING MODEL

- It is speculated that with an average training load, the gains in fitness persists 3x longer in duration than fatigue effects
 - i.e. if it takes 24 hrs to recover, the positive traces from the workout will remain for 72 hr
- Goal becomes to schedule workouts when all the negative traces of the preceding session passes but the positive fitness gains persists
- Ultimately, excessive stress prevents fitness gains from being displayed

VARIETY: PROBLEMS W/ UNORGANIZED TRAINING

- You need variety and organization....what happens with Unorganized training?
- Results in both physical and mental staleness
- Remember...different goals in RT complement one another, but the big picture must be kept in mind
 - Training must address all components of fitness
 - The extent to which each is developed depends on the individual and/or the sport demands

ORGANIZED TRAINING – WHY?

- Provides a sense of direction
- Aim is to promote long-term training, health and performance improvements
- Organized schemes should serve as approximate guidelines to be followed and modified by on ongoing analysis of various physiological and psychological markers of progress
 - Need for periodic evaluation
 - Nothing is set in stone!!

HOW DO YOU ORGANIZE? CLASSICAL PERIODIZATION

- There are different schemes which are best suited for different levels of fitness and athletes
- Achieved through alternations in training load (intensity, volume, and frequency) in planned periods or cycles within an overall program
 - Macrocycle: typically constitutes an entire training year (could be up to 4 years)
 - Mesocycle: several weeks to several months (2 or more within macrocycle)
 - Microcycle: typically one week long but could last up to four weeks (2 types of Periodization: Linear vs. Undulating)

HIGHLIGHTS OF LINEAR PERIODIZATION

- Each time block (microcycle) has one goal
 - Unidirectional training (i.e. size – strength – power)
- Duration / Goal of each mesocycle typically ranges from 1 to 10-12 weeks.
 - 4 to 12 weeks for less experienced athletes
 - 1 to 3 weeks for more experienced athletes
- Duration and sequential order of goals should be modified by on ongoing analysis of progress

PROBLEMS WITH LINEAR PERIODIZATION

- If training focuses on a single goal (component of fitness) for too long, others may regress (detrained)
 - We all adapt differently
 - Usually observed in trained athletes, for example:
 - Training for hypertrophy or power usually results in some loss of maximal strength capacity
 - Training for maximal strength frequently results in a loss of muscle size

NON-LINEAR PERIODIZATION

- a.k.a: Undulating model
- NLP addresses a number of goals concurrently
 - Option A: train different goals in separate sessions

e.g.	Monday	Tuesday	Wednesday	Thursday	Friday	Sat/Sun
A	Hypertrophy	Strength		Hypertrophy	Strength	Off
B	Strength	Endurance		Strength	Endurance	Off
C	Hypertrophy		Strength		Power	Off

- Option B: train different goals in the same session

NON-LINEAR PERIODIZATION

- May not be suitable for beginners
- For fit individuals, the NLP (vs LP) approach may be more suitable for maintaining and developing fitness
- Fitness adaptations may decrease if multiple components are trained simultaneously during a single workout or microcycle
- Therefore, it is not a good idea to have more than two or three main targets in one microcycle
 - No one can adapt / develop all components at the same time