The Potential Dangers of Using Rapid Weight Loss Techniques

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ABSTRACT

PERSONAL TRAINING CLIENTS OFTEN HAVE BODY COMPOSITION GOALS THAT REQUIRE THEM TO LOSE LARGE, OR EXTREME, AMOUNTS OF WEIGHT OVER A SHORT PERIOD. CONSEQUENTLY, THIS MAY LEAD TO THE USE OF A WIDE VARIETY OF RAPID WEIGHT LOSS TECHNIQUES THAT CAN BE HARMFUL TO THEIR HEALTH AND LONG-TERM SUCCESS.

INTRODUCTION

Personal trainers are frequently confronted by clients interested in using rapid weight loss (RWL) techniques to lose weight quickly for a sporting event (e.g., mixed martial arts, wrestling, boxing, weightlifting, etc.) or for esthetic reasons (an upcoming social event or obesity intervention) (3). However, there is no uniform definition to describe RWL in the current body of literature. RWL generally includes techniques used to improve weight loss results in a shorter period than what could be achieved by following a lower calorie diet and exercise. Unfortunately, many of these practices are not only unsafe, but could be potentially life threatening in some circumstances (7,11,12,16,43). For this reason, it is important that personal trainers be able to recognize individuals who may be putting their health in jeopardy and provide appropriate educational strategies and/or resources to help them safely and effectively lose weight and manage a healthy weight over time.

COMMON RAPID WEIGHT LOSS STRATEGIES

There are myriad weight loss strategies, many of which are propagated by the Internet, the media in the form of endorsements of specific supplement and exercise regimes by celebrities and athletes, and diet books and magazines. Table 1 lists several common RWL techniques. It should be noted that individuals may use a combination of the methods listed.

POTENTIAL NEGATIVE EFFECTS OF RAPID WEIGHT LOSS STRATEGIES

There are numerous physiological and psychological effects associated with RWL (Table 2). One potentially serious side effect is severe dehydration. Research indicates that even a 2% drop in water weight can lead to increased mental fatigue, sleepiness, nausea, vomiting, and apathy (10,19,38). Moreover, extreme dehydration may lead to an increased risk of heat-related illness, hospitalization, or even death. For instance, in 1997, 3 collegiate wrestlers died because of hyperthermia and dehydration caused by their precompetition weight-cutting methods (12). On a less severe note, dehydration and caloric restriction can impair exercise performance (1–5,8,33,34).

Extreme caloric restriction may lead to malnourishment, and over time, vitamin and mineral deficiencies (7). These nutrient deficiencies may result in any number of side effects such as dry or brittle hair and fingernails, muscle atrophy, fatigue, cramps, muscle weakness, depressed immune system, decreased energy metabolism, or dizziness (6,7,26,40). Severe caloric restriction may also lead to an increased reliance on stored muscle proteins as a fuel source during exercise (6,7,37) and a subsequent reduction in training gains when combined with a resistance-training program. In fact, a study by Garthe et al. (18) found young athletes (24 ± 3 years) randomized to either slow weight loss (0.7% body weight loss per week) or fast weight loss (1.4% body weight loss per week) along with 4 resistance-training sessions per week were better off losing weight slowly. The lean body mass increased significantly in the slow weight loss group, whereas it remained unchanged in the fast weight loss group. They noted that adults who want to gain lean body mass while also reducing fat mass should aim for a slower rate of weight loss at about 0.7% body weight per week (18).

Potential degradation of lean muscle tissue due to RWL may result in a decreased resting metabolic rate, which

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Table 1
Common rapid weight loss strategies

Restricting food intake and/or fasting
Fad dieting (i.e., juice diets, etc.)
Restricted fluid intake
Excessive exercise training sessions
Dehydration through
Training in extreme heat
Wearing excessive layers of clothing, trash bags, sweat suits, or other weight-cutting suits
Sauna
Water and salt–loading/unloading methods
Overloading water and salt intake for 3–4 days followed by completely avoiding salts and severely restricting fluid intake for the next 1–2 days
Excessive spitting
Self-induced vomiting
Use of nutritional supplements, diuretics, laxatives, and various other types of drugs
Enemas

(1–5,8,9,13–15,18,22,29,32–35,41).

Table 2
Potential side effects of rapid weight loss

Physiological	Moderate-to-severe dehydration
	Depressed immune function
	Hormonal imbalance
	Reduced bone density
	Temporary growth impairment
	Hyperthermia
	Reduced muscle strength
	Reduced plasma and blood volume
	Lower renal blood fluid and the volume of liquid filtered by the kidneys
	Comprised thermoregulation
	Electrolytic imbalances
	Nausea
	Cramps
	Kidney failure (improper use of diuretics)
	Vomiting
	Fainting
	Death (in the most extreme cases)
Psychological	Mental fatigue
	Increased tension
	Sleepiness
	Headaches
	Mood swings (such as increased anger and irritability)
	Reduced cognition and processing speed
	Reduced vigor
	Increased risk of developing eating disorders
Performance	Reduced time to exhaustion in aerobic activities
	Reductions in anaerobic performance
	Decreased myocardial efficiency
	Decreases in maximum oxygen consumption

(1–4,6–9,13–21,23–25,27–37,39,40,42).

may be counterproductive when considering long-term weight management (6,19). However, a diet that contains more protein than the Recommended Dietary Allowance for protein may help to attenuate losses in lean body mass by helping maintain a positive nitrogen balance while on a reduced calorie diet (2,43). Additionally, incorporating 2–3 days of resistance training per week may also be beneficial for preserving lean muscle tissue, especially moderate to heavy (70–85% of the 1 repetition maximum) resistance training. It may be difficult for individuals to maintain these higher intensities because of the lower energy levels often associated with reduced caloric intake. Long-term caloric restriction may also lead to other chronic health issues and diseases, such as osteoporosis, muscle atrophy, lowered bone density, abnormal growth and development, anemia, heart damage, anorexia, and possibly death in extreme cases (7,42).

SITUATIONS THAT MAY WARRANT RAPID WEIGHT LOSS

Despite the many potential drawbacks stemming from the use of RWL, some of these techniques can be used both safely and effectively in certain

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situations; for instance, adults seeking to lose weight quickly to attenuate cardiovascular disease risk factors stemming from obesity, such as, hypertension, hypercholesterolemia, and diabetes (17,40). However, if an individual chooses to engage in such a practice, they should do so under the guidance and supervision of a registered/licensed dietitian or other qualified medical professional.

RECOGNITION AND STRATEGIES FOR PREVENTION

Recognizing the signs and symptoms associated with RWL techniques and providing clients with healthy alternative strategies are the keys to long-term success. Personal trainers should monitor and be aware of any rapid fluctuations in weight from session to session and week to week. In addition, trainers should be aware of any unusual behaviors that may indicate RWL techniques are being used and document them both for their own liability protection and for the client's records. Clients may simply be following poor advice regarding rapid weight loss tactics; however, in some instances, these behaviors may be indicative of deeper psychological issues such as eating disorders. Documentation can assist trainers in making informed decisions regarding appropriate intervention strategies such as referral to a mental health professional and registered dietitian. Because many RWL techniques aim to reduce body weight through water loss, recognition of the many signs and symptoms associated with dehydration is essential. These may include significant reductions in performance, increased resting heart rate, dried cracked lips, headaches, dizziness, dark/foul smelling urine, muscle cramping, and gastrointestinal distress. The use of extreme fluid restriction, diuretics, laxatives, excessive training (especially in layers of clothing or sweat suits), and spending extended periods of time exercising in extreme heat or sitting in a sauna should be avoided.

CONCLUSIONS

Early detection and recognition is critical for reducing the likelihood of negative psychological, physiological, and performance effects of RWL methods. Furthermore, education regarding the dangers of engaging in these practices is essential for maintaining optimal health, thereby preventing serious injury/death, and for long-term weight management success. Clients should be encouraged to maintain consistent hydration and healthy feeding behaviors and aim for steady and consistent weight loss of approximately 0.5–2 lbs/wk for long-term weight management.

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REFERENCES

1. Artioli G, Franchini E, Nicastro H, Sterkowicz S, Solis MY, and Lancha A. The need of a weight control management program in judo: A proposal based on the successful case of wrestling. *J Int Soc Sports Nutr* 7: 15, 2010.
2. Artioli G, Gualano B, Franchini E, Scagliusi E, Takesian M, Fuchs M, and Lancha A. Prevalence, magnitude and methods of rapid weight loss among judo competitors. *Med Sci Sports Exerc* 42: 436–442, 2010.
3. Artioli G, Iglesias R, Franchini E, Gualano B, Kashiwagura D, Solis M, Benatti F, Fuchs M, and Lancha A. Rapid weight loss followed by recovery time does not affect judo-related performance. *J Sports Sci* 28: 21–32, 2010.
4. Artioli G, Scagliusi F, Kashiwagura D, Franchini E, Gualano B, and Junior A. Development, validity and reliability of a questionnaire designed to evaluate rapid weight loss patterns in judo players. *Scand J Med Sci Sports* 20: e117–e187, 2010.
5. Artioli G, Scagliusi F, Polacow V, Gualano B, and Lancha A. Magnitude and methods of rapid weight loss in elite judo athletes. *Braz J Nutr* 20: 307–315, 2007.
6. Baechle T and Earle R. *Essentials for Strength Training and Conditioning* (3rd ed). Champaign, IL:Human Kinetics, 2008. pp. 94.
7. Benardot D. *Advanced Sport Nutrition.* Champaign, IL: Human Kinetic, 2011. pp. 43–109, 231–255.
8. Brito C, Roas A, Brito I, Marins J, Córdova C, and Franchini E. Methods of body-mass reduction by combat sport athletes. *Int J Sport Nutr Exerc Metab* 22: 89–97, 2012.
9. Campbell B, La Bounty P, and Wilbourn C. Dietary supplements used in combat sports. *Strength Cond J* 33: 25–39, 2011.
10. Casa D, Armstrong L, Hillman S, Montain S, Reif R, Rich B, Roberts W, and Stone J. National athletic trainer's association position statement: Fluid replacement for athletes. *J Athl Train* 35: 212–224.
11. Casa DJ, Guskiewicz KM, Anderson SA, Courson RW, Heck JF, Jimenez CC, McDermott BP, Miller MG, Stearns RL, Swartz EE, and Walsh KM. National athletic trainers' association position statement: Preventing Sudden death in sports. *J Athl Train* 47: 96–118, 2012.
12. Davis S, Dwyer G, Reed K, Bopp C, Stosic J, and Shepanski M. Preliminary investigation: The impact of the NCAA wrestling weight certification program on

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cutting weight. *J Strength Cond Res* 16: 305–307, 2002.

13. Donnely JE, Blair SN, Manore MM, and Smith BK. American College of Sports Medicine position stand. Appropriate intervention strategies for weight loss and prevention of weight regain for adults. *Med Sci Sports Exerc* 41: 459–471, 2009.
14. Flemming S and Costarelli V. Eating behaviors and general practices used by Taekwondo players in order to make weight before competition. *Nutr Food Sci* 1: 16–23, 2009.
15. Fogelholm G, Koskinen R, Laakso J, Rankinen T, and Roukonen I. Gradual and rapid weight loss: Effects on nutrition and performance in male athletes. *Med Sci Sports Exerc* 25: 371–377, 1993.
16. Fong TL, Klontz KC, Canas-Coto A, Casper S, Durazo F, Davern II T, Hayashi P, Lee W, and Seeff L. Hepatotoxicity due to hydroxycut: A case series. *Am J Gastroenterol* 105: 1561–1566, 2010.
17. Forte R, Precoma-Neto D, Neto N, Maia E, and Faria-Neto J. Myocardial infarction associated with the use of a dietary supplement rich in ephedrine in a young athlete. *Arq Bras Cardiol* 87: e179–e181, 2006.
18. Garthe I, Raastad T, Refsnes P, Koivisto A, and Sundgot-Borgen J. Effect of two different weight-loss rates on body composition and strength and power-related performance in elite athletes. *Int J Sport Nutr Exerc Metab* 21: 97–104, 2011.
19. Horswill C, Hickner R, Scott J, Costill D, and Gould D. Weight loss, dietary carbohydrate modifications, and high intensity, physical performance. *Med Sci Sports Exerc* 22: 470–476, 1990.
20. Kalman D and Lepeley A. A review of hydration. *Strength Cond J* 22: 56–63, 2010.
21. Kazemi M, Rahman A, and De Ciantis M. Weight cycling in adolescent taekwondo athletes. *J Can Chiropr Assoc* 55: 318–324, 2011.
22. Kinningham RB and Gorenflo DW. Weight loss methods of high school wrestlers. *Med Sci Sports Exerc* 33: 810–813, 2001.
23. Klinzing J and Karpowicz W. The effects of rapid weight loss and rehydration on a wrestling performance test. *J Sports Med Phys Fitness* 26: 149–156, 1986.
24. Koral J and Dosseville F. Combination of gradual and rapid weight loss: Effects on physical performance and psychological state of elite judo athletes. *J Sports Sci* 27: 115–120, 2008.
25. Koutedakis Y, Pacy P, Quevedo R, Millward D, Hesp R, Boreham C, and Sharp N. The effects of two different periods of weight-reduction on selected performance parameters. *Int J Sports Med* 15: 472–477, 1994.
26. Kreider R, Wilborn C, Taylor L, Campbell B, Almada A, Collins R, Cooke M, Earnest C, Greenwood M, Kalman D, Kerksick C, Kleiner S, Leutholtz B, Lopez H, Lowery L, Mendel R, Smith A, Spano M, Wildman R, Willoughby D, Ziegenfuss T, and Antonio J. International society of sports nutrition review: Research and recommendations. *J Int Soc Sports Nutr* 7: 1–43, 2010.
27. Kukidome T, Shirai K, Kubo J, Matsushima Y, Yanagisawa O, Homma T, and Aizawa K. MRI evaluation of body composition changes in wrestlers undergoing rapid weight loss. *Br J Sports Med* 42: 814–818, 2008.
28. Landers D, Arent S, and Lutz R. Affect and cognitive performance in high school wrestlers undergoing rapid weight loss. *J Sport Exerc Psychol* 23: 307–316, 2001.
29. Langan-Evans C, Close G, and Morton P. Making weight in combat sports. *Strength Cond J* 33: 5–39, 2011.
30. Lion A, Bosser G, Gauchard GC, Djaballah K, Malli J, and Perrin R. Exercise and dehydration: A possible role of inner ear in balance control disorder. *J Electromyogr Kinesiol* 20: 1196–1202, 2010.
31. Lopez R. Exercise and hydration: Individualizing fluid replacement guidelines. *Strength Cond J* 34: 49–54, 2012.
32. Morton J, Robertson C, Sutton L, and MacLaren D. Making the weight: A case study from professional boxing. *Int J Sport Nutr Exerc Metab* 20: 80–85, 2010.
33. Oppliger R, Case H, Horswill C, Landry G, and Shelter A. American college of sports medicine position stand: Weight loss in wrestlers. *Med Sci Sports Exerc* 28: 9–12, 1996.
34. Oppliger R, Steen S, and Scott J. Weight loss practices of college wrestlers. *Int J Sport Nutr Exerc Metab* 13: 9–46, 2003.
35. Ransone J and Hughes B. Body-weight fluctuation in collegiate wrestlers: Implications of the National Collegiate Athletic Association weight certification program. *J Athl Train* 38: 162–165, 2004.
36. Sansone R and Sawyer R. Weight loss pressure on 5 year old wrestlers. *Br J Sports Med* 39: 1–2, 2005.
37. Schoenfeld B. Does cardio after an overnight fast maximize fat loss? *Strength Cond J* 33: 23–25, 2011.
38. Sharp R. Role of sodium in fluid homeostasis with exercise. *J Am Coll Nutr* 25: 231–239, 2006.
39. Smith M, Dyson R, Hale T, Hamilton M, Kelly J, and Wellington P. The effects of restricted energy and fluid intake on simulated amateur boxing performance. *Int J Sport Nutr Exerc Metab* 11: 238–247, 2001.
40. Timpmann S, Ööpik V, Pääsuke M, Medijainen L, and Ereline J. Acute effects of self-selected regimen of rapid body mass loss in combat sports athletes. *J Sports Sci Med* 7: 210–217, 2008.
41. Tipton C and Tcheng T. Iowa wrestling study: Weight loss in high school students. *JAMA* 214: 1269–1274, 1970.
42. Turocy P, DePalma B, Horswill C, Laquale K, Martin T, Perry A, Somova M, and Utter A. National athletic trainers' association position stand: Safe weight loss and maintenance practices in sport and exercise. *J Athl Train* 46: 322–336, 2011.
43. Volek S, Sharman MJ, and Forsythe CE. Modification of lipoproteins by very low-carbohydrate diets. *J Nutr* 135: 1339–1342, 2005.

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