WHAT IS THE EVIDENCE TO SUPPORT A PARTICULAR MEAL TIMING, CALORIC INTAKE AND MACRONUTRIENT INTAKE FOR OPTIMAL ATHLETIC PERFORMANCE DURING RECOVERY? : A REVIEW OF THE LITERATURE

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Objective: To update the Academy of Nutrition and Dietetics Evidence Analysis Library information on this topic from February 2006 to present.

Data Sources: EBSCOhost and Pubmed were searched from February 2006 to January 2013 for English-language studies with RCT or clinical controlled, large nonrandomized observational or, cohort, case-control. Those studies that met the inclusion criteria were selected.

Review Methods: A total of 18 studies were reviewed. Inclusion criteria included peer reviewed articles in the English language with a publication date after February 2006, studies using human subjects of adults (≥ 18 yrs), trained athletes, athletes in training, or regularly exercising, a dropout rate of less than 20%, and all sample sizes were included.

Results: Of the eighteen studies evaluated, eleven articles focused on supplementation post-workout, four articles looked at supplementation pre- and post-workout, while three articles had supplementation during workouts. Of the eleven post-workout supplementations, nine showed a significant increase in recovery. Both the pre-/post-workout and during workout articles demonstrated a significant benefit for recovery. Seventeen of the articles investigated carbohydrate and protein supplementation versus a placebo, and fifteen found that there was a significant benefit with the addition of protein to aid recovery. One article focused on carbohydrate supplementation only and showed significant improvement of fat oxidation in a fasting state, regardless of glycemic load. These results suggest that there is a recovery advantage to macronutrient supplementation with workouts, regardless of timing.

Conclusion: These results suggest that there is a recovery advantage to macronutrient supplementation with workouts, regardless of timing. A combination of protein and carbohydrate ingestion appears to provide a greater benefit than carbohydrate ingestion alone. Whole food or supplementation appeared to offer similar benefit to aid in athletic recovery.

SHARED MEDICAL APPOINTMENTS AND CHILDREN WITH TYPE 1 DIABETES: FACTORS INFLUENCING GLYCEMIC CONTROL

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Background: Shared Medical Appointments (SMAs) have been proposed as a new strategy in the management of many chronic diseases. SMAs include components of a traditional
physician appointment with the addition of a group discussion and education. Results from SMAs in the management of type 2 diabetes include improved self-management skills, stable HbA1c levels, decreased blood glucose levels, decreased emergency department visits, increased patient satisfaction, and increased quality of life. Literature for SMAs in patients with type 1 diabetes is limited.

**Purpose:** The purpose of this study is to assess whether attending four SMAs is effective in lowering HbA1c concentrations of children age 8-12 years with type 1 diabetes and to identify specific concepts from the Social Cognitive Theory (SCT) that may have influenced the change.

**Methods:** This study used a mixed method design including both quantitative and qualitative components. A total of nine children with type 1 diabetes and their parents attended four consecutive SMAs, each 10 weeks apart, at a diabetes center located in Southeast Idaho. HbA1c concentrations were measured at each appointment. Individual phone interviews were conducted with parents of the children after the four SMAs were completed to identify common themes that influenced a change in HbA1c concentrations of the children. Multiple linear regression with random effects was used to analyze change in HbA1c concentrations over the course of the 4 SMAs. A phenomenological approach was used to transcribe and analyze qualitative data.

**Results:** Mean HbA1c concentrations decreased from 8.95% at appointment one to 7.63% at appointment four. On average, a statistically significant reduction of 0.35% in HbA1c concentrations per SMA was observed (p=<0.001). Six of the nine parents participated in individual interviews. Forty-three, non-overlapping statements were recognized through analysis of qualitative data. Four themes were identified; 1) Support for children, 2) Support for parents, 3) Openness about Having Diabetes, and 4) HbA1c Goals.

**Conclusions:** SMAs for children 8-12 years-old with type 1 diabetes were effective in lowering HbA1c concentrations. The SCT successfully explained this change. Components of the SCT which influenced this change include environment, situation, expectancies, emotional coping responses, observational learning, self-control, reinforcements, and self-efficacy. These findings suggest the need to include social support for both children with type 1 diabetes and their parents as well as regular HbA1c testing in the management of type 1 diabetes.

INCREASING PARTICIPATION IN THE NATIONAL SCHOOL LUNCH PROGRAM AT LEWISTON HIGH SCHOOL

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**Learning Outcome:** To identify ways to increase participation in the National School Lunch Program at Lewiston High School in Lewiston, Idaho

**Background:** In fall 2012, The Healthy, Hunger-Free Kids Act of 2010 was enacted by the United States Department of Agriculture (USDA) to update the National School Lunch Program’s meal pattern and nutrition standards based on the latest Dietary Guidelines for Americans. This was to increase the availability of fruits, vegetables, and whole grains in school menus. Also, new dietary specifications were set in place for specific calorie limits for K-5, 6-8, and 9-12 grades. Other guidelines included a gradual reduction in the sodium content of the meals. According to the USDA, school lunches must meet Federal meal
requirements, but decisions about what specific foods to serve and their preparation process were to be made by the specific school districts. The Lewiston High School (LHS), which is located in Lewiston, Idaho, has a total enrollment of 1,116 students between two high schools. The LHS foodservice kitchen serves two lunch periods in which students can choose from three different lines including a sub sandwich line, a choices line, and an ala carte line. The National School Lunch Program guidelines are upheld at each line, which includes students take a minimal of 3 components including at least a ½ cup of a fruit or vegetable. In Fall 2011, an average of 553 students participated in the Lewiston High School lunch program on a daily basis, but in Fall 2012, only an average of 498 students participated in the program, which was a 10% decrease in participation since the Healthy, Hunger-Free Kids Act of 2010 was enacted. To identify ways to increase school lunch participation, a performance improvement project took place in January and February of 2013.

**Methods:** The performance improvement project was considered a preexperimental design. Data was based and conducted at Lewiston High School and at the Lewiston School District Office. This included personal observations of the foodservice preparation and service, the distribution of food questionnaire surveys to 12% of the total student population, and the collection of quantitative data from the kitchen staff’s lunch count from the fall semesters of 2009, 2010, 2011, and 2012.

**Results:** According to the data collected, the sub line contributed the most to the decrease of participation in the program due to the new guidelines of the National School Lunch Program. Also the surveys showed that the quality of certain meal requirements such as the cheese rippers served at the ala carte line, needed to be removed from the menu or improved. Students prefer home-style cooking such as chicken fried steak as well as Mexican-based dishes.

**Conclusion:** To increase school lunch participation, recommendations and suggestions were made based on the results of the data collected. This included adding a taco bar once a week to the sub line, researching new low sodium toppings for the sub line, adding a student helper to the choice line to increase the rate of meals served, removing the cheese ripper from the Ala Carte line and displaying menu options around the school as well as before students enter the lines to increase National School Lunch Program marketing.

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**PILOTING A HEALTH AND FITNESS INTERVENTION FOR OVERWEIGHT TEENAGERS IN A NORTH IDAHO COMMUNITY**

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**Learning Outcome:** Participants will be able to evaluate the feasibility and impact of a program designed to promote health, fitness, and knowledge for overweight teens.
Background: Adolescent obesity is increasing and expected to impact future population health. Obese youth suffer from poor self-esteem with lifelong consequences. No consensus has been reached on most effective ways to assist adolescents who are overweight. 

Objective: To determine the feasibility and impact of a program designed to promote health, fitness, and knowledge for overweight teens. 

Methods: This prospective study recruited participants from grade 10-12 from a public high school. A 12 week program intervention included use of a web-based device, the bodybugg®, to track caloric expenditures, weekly planned physical activities led by a personal trainer, nutrition education classes led by a registered dietitian, and weekly goal setting sessions with volunteer mentors. Rewards were earned for attending program activities. Pre and post-program measurements of weight, fitness, and health attitudes were analyzed using paired t tests.

Results: N=20 participants enrolled, 15 completed the post-test measurements. Nine lost weight ranging from 0.4-14.6 pounds. Statistically significant improvements were seen for weight, stability, and number of sit-ups and push-ups completed (p<.05). Health self-report surveys indicated improved knowledge about healthy food choices and increased frequency of eating healthy foods. High satisfaction was reported with the program.

Conclusion: The intervention was feasible using community resources of school nurse, college students and faculty, medical center personnel, community volunteers, and small grant funding. Ongoing resources will be needed to sustain the program. Suggestions from participants for improvements include more time with mentors, a longer program duration, and increased support in time management and food logs.

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