



**Fuel Up
Lift Off!**
LA



UCLA SCHOOL of PUBLIC HEALTH
CEHD
CENTER TO ELIMINATE
HEALTH DISPARITIES



Lift Off! 10-Minute Physical Activity Breaks

Lift Offs Work!: the rapidly growing evidence base

The inordinately high levels of sedentary behavior observed in population-based studies, e.g., the average adults engages in only 6-10 minutes per day of at least moderate intensity physical activity (Troiano et al., 2008) and more than 40% of Los Angeles County adults getting less than 10 minutes per week of continuous moderate-to-vigorous physical activity (Yancey et al., 2004a). These data are commensurate with an overweight rate of nearly two-thirds of US adults overall (Flegal et al., 2002) and one-third of children of color (Ogden et al., 2002), underscoring the critical need for incremental behavior change approaches, targeting the sedentary and overweight, while engaging everyone.

At least 20 demonstration projects, university or corporate research studies, or public health department service programs support the feasibility and efficacy of the concept of incorporating brief (usually 10-minute) structured group exercise breaks into daily organizational routine, as a major intervention component or as a singular approach. The most common settings for these interventions have been schools and workplaces. Many are described briefly below in an annotated bibliography. This evidence demonstrates that:

- (1) There is considerable receptivity to physical activity integration into the conduct of “business,” both at the individual and organizational levels (Pronk et al., 1995; Lloyd et al., 2004; Yancey et al., 2004d; Lobstein, 2006; Wilcox et al., 2006; Zahner et al., 2006);
- (2) These sessions contribute meaningfully to daily accumulation of moderate-to-vigorous physical activity (Cardon et al., 2004; Stewart et al., 2004; Andreyev & Sturm, 2006; Mahar et al., 2006; Naylor et al., 2008);
- (3) Exercise breaks serve as a motivational “teachable moment” linking sedentary behavior to health/fitness status for inactive individuals (Yancey et al., 2004c);
- (4) Improvements in clinical outcomes from as little as one 10-minute break/day (e.g., blood pressure, waist circumference, mood states, cumulative trauma disorders, attention span, on-task behavior; bone mineral density or architecture) have been demonstrated (Pronk et al., 1995; Mackelvie et al., 2001; 2002; 2003; 2004; Petit et al., 2002; Elley et al., 2006; Jurg et al., 2006; Metzler & Williams, 2006; Sibley et al., 2006; Yancey et al., 2006a; Liu et al., 2007; Verstraete et al., 2007; Lara et al., 2008; Naylor et al., 2008);
- (5) Organizational benefits have been documented, such as increased productivity (CA DHS, 2004) and decreased classroom disruptiveness (Sibley et al., 2006);
- (6) Provider counseling behavior is positively influenced (Crawford et al., 2004); and
- (7) Spill-over (generalization) to increase active leisure may occur (Yancey et al., 2006a).

LIFT OFF! or Instant Recess™ 10-Minute Physical Activity Breaks

*A Service of the UCLA School of Public Health
Center to Eliminate Health Disparities (CEHD)*

Such “push” or “opt-out” interventions, e.g., non-discretionary time structured group exercise breaks, walking meetings, and nearby parking and elevator restrictions, that rely less on (and potentially constructively influence) individual initiative and motivation to be active, particularly in ethnically diverse populations with numerous barriers to active leisure, may have greater organizational and societal impact (increased productivity, medical care cost savings) than past efforts (King et al., 1995; Kumanyika, 2001; Yancey et al., 2005; Yancey et al., 2004b; Taylor et al., 2005; Zimring et al., 2005; Kumanyika & Grier, 2006; Marcus et al., 2006; Sloane et al., 2006; Yancey et al., 2006a).

Key findings across studies include: (1) role models utilized (study and site staff, video subjects) must reflect the spectrum of characteristics of the target population—ethnicity, gender, age, weight; (2) experiential learning enhances sustainability and salience; (3) organizational leadership commitment is critical and must be secured at the outset and reinforced repeatedly; (4) organizations, and their staff members, are at different points on the change continuum, and intervention strategies must accommodate these difference, i.e. including both approaches that require active choice and passive structural ones; (5) intervention components linked to existing organizational structures/vehicles (e.g., staff meetings, newsletters) enhance exposure levels and sustainability; and (6) culturally salient music selection is an essential ingredient in engaging groups in movement. This concept is built on social cognitive theory, social ecological models; and social marketing approaches which incorporate the economic concerns of both organizational leaders/employers and individuals (Grier & Bryant, 2005; Bandura, 2004; 1989; Stokols, 2003; 1996; Sturm, 2004; 2002; Yancey et al., 2006c;d).

Westinghouse Strength & Flexibility Program. In a group-randomized, controlled, pre-test/post-test, intervention trial, employees who assembled computer boards performed a set of 23 flexibility and strength exercises, designed to prevent lower back and carpal tunnel injury, for 10 minutes each day on company time under supervision (Pronk et al., 1995). No study sample demographics were provided. Daily employee participation rates were 97-100%. After 6 months of program implementation, significant improvements were observed in wrist flexion, wrist extension, low-back flexibility, fatigue, anger, and mood state.

LAC DHS Lift Off Feasibility Study. A randomized, controlled, post-test only, intervention trial tested the effect of incorporating a 10-minute exercise break (*Lift Off*) into longer (≥ 1 hour) staff meetings and training seminars: (a) in engaging sedentary, “pre-contemplators” in physical activity; and (b) on self-reported mood/well-being indicators (Yancey, 2004c). The study was implemented in 26 meetings with 449 employees, predominantly overweight, middle-aged women of color. More than 90% of meeting attendees participated in the exercises. Results showed that captive audiences may be engaged in brief exercise bouts as a part of the workday, regardless of physical activity stage of change or weight status. Furthermore, participation in the breaks may produce at least short-term motivational benefit, by appropriately eroding complacent self-perceived good health and fitness status among the sedentary. Being confronted experientially with one’s own sub-optimal fitness level (a common refrain is “are you sure it’s only been 5 minutes?!”) may provide a teachable moment/reality check, potentially increasing motivation to be active by assisting them in making the link between good health status and a physically active lifestyle. Importantly, while most interventions operate psychologically to motivate behavior change, the social conformity-influenced exercise participation by sedentary individuals here adds physiological synergy to the psychological impetus—enjoyment/enhanced feelings of well-being complemented by a reminder of her/his unfit state.

LIFT OFF! or Instant Recess™ 10-Minute Physical Activity Breaks

*A Service of the UCLA School of Public Health
Center to Eliminate Health Disparities (CEHD)*

Steppin' Up to Better Health/AABLH Organizational Wellness Program. AABLH adapted and implemented the Los Angeles County organizational wellness intervention, providing training in incorporating physical activity and healthy food choices into the routine “conduct of business” in a variety of predominantly public and private, non-profit sector agencies. A total of 35 organizational units, with more than 700 individuals as staff, members or clients (mostly overweight/obese African-American women), completed the 12-, or shortened and retooled 6-week curriculum. Attendance and retention rates between baseline and post-intervention assessment were quite low for the 12-week curriculum (37% retention), but substantially higher for the 6-week offering (66% attendance, 92% retention). Feelings of sadness or depression decreased significantly among 12-week participants ($p=0.00$), fruit/vegetable intake increased significantly (+0.5 servings/day, $p=0.00$), and BMI decreased marginally (-0.5 kg/m^2 , $p=0.08$), with no significant changes in these outcomes in the 6-week group. However, the #s of days on which individuals participated in vigorous physical activity increased significantly among 6-week (not 12-week) participants (+0.3, $p=0.00$) (Yancey et al., 2006a).

African Americans Building a Legacy of Health (AABLH). As a part of this project of the CDC's REACH 2010 initiative (Yancey et al., 2004d), community-based organizations serving targeted areas of Los Angeles participated in one or more interventions originally developed by the LAC DHS to incorporate physical activity into routine organizational practice. These interventions centered on leadership cultivation to model the behaviors promoted. Level of organizational support for physical activity integration was assessed, as reflected in the extent of organizational commitment associated with each intervention: participation in exercise breaks at REACH meetings and events (lowest level); inviting REACH staff to lead exercise breaks at their organizational functions (low intermediate level); hosting an organizational wellness training series on these types of practical strategies to increase physical activity and healthy food access (high intermediate level); and subcontracting with REACH to provide physical activity-related programs and services (high level). Individual-level data characterizing the socio-demography, health status and health behaviors of organization staff/members/clients underscored the risk burden in the targeted population: 66% overweight, 30% obese; >40% completely sedentary (<10 minutes of physical activity weekly); 33% hypertensive, 26% hypercholesterolemic; 86% female, 73% African-American, 22% college-educated. Nearly half of the ~240 participating organizations actively embraced physical activity integration (intermediate-high level), with >25% committed at the highest level of support. Broad capacity and support for organizational integration of physical activity was demonstrated, with level of commitment varying by organization type.

FitWIC Wellness Programs. Six WIC sites (3 intervention, 3 control) at three California agencies participated in a pilot staff wellness intervention program to improve staff effectiveness in preventing childhood obesity (Crawford et al., 2004). Compared to control site staff, intervention site staff perceived greater workplace environmental support for their efforts to make healthy food choices and be physically active, and reported changes in the types of foods served during meetings and the priority placed on physical activity in the workplace. Intervention staff was also more likely to encourage WIC participants to engage in physical activities with their children and reported greater sensitivity in handling weight-related issues. This study has important implications for the potential reach of internal fitness promotion in organizations serving high risk populations, given this “multiplier effect” (positive influence) of healthy provider behavior on clients.

Pausa para tu salud! project (Lara et al., 2007). In the first year of implementation (January 2003), 335 employees of the Mexican Ministry of Health (national department of health and social services) (population statistics: 24% overweight/non-obese, 38% obese, 81% of women with abdominal obesity or waist circumference > 80 cm) participated in daily 10-minute mid-day exercise breaks during work time. 271 were evaluated after one year of intervention, and, on average, weight decreased by 1 kg and waist circumference decreased by 1.6 cm.

LIFT OFF! or Instant Recess™ 10-Minute Physical Activity Breaks

*A Service of the UCLA School of Public Health
Center to Eliminate Health Disparities (CEHD)*

Health-e-AME Faith-Based Physical Activity initiative. This 3-year, CDC-funded, statewide faith-based physical activity promotion initiative of University of South Carolina's/Medical University of South Carolina's (Wilcox et al., 2006; 2006) built upon a nutrition promotion program featuring a website in which nutritionists adapted recipes submitted by church members to increase fiber and decrease fat. This project trained 215 representatives from 98 African Methodist Episcopal churches. A menu of passive and active strategies are offered, and 54% are implementing at least one program component—66% of these are implementing their adaptation of the 10-minute *Lift Off, Exercise your Faith for 10*, one of the top 3 components selected. Exercise breaks are also conducted by project staff at all annual AME pastors' conferences and post-conference meetings. Baseline data on a random sample of 571 members, all African-American, show that 29% are regularly active and 18% are sedentary, 71% women, 75% overweight/obese, 56% 50+ years of age, 50% with <high school education.

L.L. Bean Manufacturing Worker In-House Studies. Maine sporting goods manufacturer L.L. Bean has been incorporating stretch breaks into its workday for the past 14 years. On manufacturing floors, three formalized 5-minute stretch periods are led each day by a trained co-worker, in addition to regular breaks. Participation is mandatory for everyone on the floor, including management and visitors. In-house studies have demonstrated that productivity gains offset the time devoted to stretching by 100%, i.e. a return on investment of 30 minutes of productivity for the 15 minutes of stretch time, and the program also contributes to reduced injuries and sick days. L.L. Bean's wellness coordinator refers to these stretching breaks as the equivalent of "safety glasses" (California Department of Health Services, 2004; Simon, 2006).

Review of PA intervention effectiveness in children: activity breaks. The aim of this narrative review was to summarize the evidence of the effectiveness of interventions that report physical activity outcomes in children aged 4–12 years and adolescents aged 13–19 years. A systematic search of electronic databases identified 76 interventions. Most interventions were delivered via the school setting (57 interventions), nine through the family setting, six via primary care, and four in community- or Internet-based settings. Children's physical activity interventions that were most effective in the school setting included some focus on physical education, **activity breaks**, and family strategies. Two studies have investigated the effectiveness of activity breaks on children's physical activity (Ernst & Pangrazi, 1999; Pangrazi et al., 2003). The intervention termed "Promoting Lifetime Activity in Youth" (PLAY) included the introduction of 15-minute play breaks during class time among children. In the first evaluation, intervention class teachers taught games and activities during the breaks for 4 weeks, and children self-monitored their physical activity for the next 8 weeks (Ernst & Pangrazi, 1999). The comparison classes also had activity breaks but without prompting to be active, and the children recorded their television viewing rather than physical activity. After 12 weeks, boys and girls in the intervention group had significantly higher self-reported physical activity (10 percent and 7 percent increases, respectively) than did those in the control group (no change). The second evaluation assessed the effectiveness of PLAY in schools that did or did not have a physical education program (Pangrazi et al., 2003). Of the four groups (PLAY and physical education schools, PLAY-only schools, physical education only schools, and no treatment control schools), children in the PLAY-only and PLAY and physical education schools recorded significantly higher steps/day at post-intervention than did children in the control schools, and girls in the PLAY and physical education and physical education-only schools recorded significantly higher steps/day than did girls in the control schools. Although this latter study did not collect baseline physical activity data, it is notable that both studies found that the PLAY intervention had a significant effect on children's overall physical activity, by using either self-report or objective measures."

LIFT OFF! or Instant Recess™ 10-Minute Physical Activity Breaks

*A Service of the UCLA School of Public Health
Center to Eliminate Health Disparities (CEHD)*

Take 10! or Physical Activity Across the Curriculum (DuBose et al., 2008; Honas et al., 2008; Gibson et al., 2008). This 3-year, NIH-funded University of Kansas study has successfully engaged 60-80% of elementary school non-physical education teachers in conducting 10-minute exercise breaks in 14 low-income K-12 intervention schools in 3 Kansas cities—Kansas City, Topeka and Lawrence (Donnelly, 2005; Koplan et al., 2006). One 6-hour, off-site in-service training session is provided at the beginning of each year, which teachers are paid \$100 to attend. At the end of each school year, they attend a follow-up session for which they're paid \$50, a sort of focus group in which teachers discuss barriers, facilitators, etc. Music to use in leading the exercise sessions was requested in the staff training sessions, has been provided in the form of several oldies tapes/CDs popular with both teachers and students. The gradual increase in the number of teachers engaged each year and the number of minutes provided (average of 70 minutes/wk provided and nearly 50% of teachers achieving the 90-100 minute/wk goal after two years) is evidence of promulgation of a social/cultural norm change. Mean energy expenditure of 3.1 ± 1.0 Cal/min (3.4 METs) was measured by accelerometry. Earlier studies of *Take 10!* by ILSI (a Georgia non-profit) have demonstrated the feasibility and utility of this approach in regularly engaging students and teachers in exercise of at least moderate intensity in 10-minute bouts of sufficient length to count toward the minimum 30-minute/day CDC daily recommendation (Metzler & Williams, 2006; Lloyd et al., 2005; Stewart et al., 2004), e.g., average MET levels of 5-7 for first, third and fifth graders, with commensurate caloric expenditures of 27-36 kcal and step counts of 800-1000 per 10-minute session.

Medical University of Ohio Study. A study of a different model to *Take 10!*, using a similar strategy, implemented three basic physical activity and nutrition school environmental changes: (1) restructuring the school day to provide 15 minutes of teacher-led PA each morning, (2) access to a free breakfast program for all students to promote nutritionally sound practices, and (3) reversal of the order of lunch and recess. Adopting these changes produced a 67% decline in nurse visits, a 58% decrease in disciplinary referrals, and an increase in academic performance such that the school improved from passing two of the state achievement tests to passing all five after 4 years (Sibley et al., 2006). A similar concept has been implemented in Cyprus, a 15-minute work-out for school staff and students every morning (Lobstein, 2006).

Moving School Study. “Moving school” principles aimed at early back pain prevention have been implemented in elementary schools in Hannover, Germany, structuring movement into lessons through organizational changes and furniture re-design, to decrease sitting time, improve sitting posture and increase PA during the school day. Increased time spent in moderate-to-vigorous physical activity has been demonstrated (Cardon et al., 2004).

East Carolina University Energizers Study. A 12-week RCT of 10-minute *Energizer* PA breaks in a sample of 243 3rd and 4th grade students at an eastern NC public school (Mahar et al., 2006). Breaks integrated grade-appropriate learning materials, involved no equipment, and required little teacher preparation (one 45-minute training session). In-school steps were higher in intervention (5587 ± 1633) vs. control (4805 ± 1543) conditions ($p < 0.05$). Pre-/post- *Energizer* on-task behavior improved by 8% overall ($p < 0.017$) and by 20% among the least on-task students (those who were on-task less than 50% of the time before intervention onset).

JUMP-in. A quasi-experimental pre-test/post-test intervention trial conducted during one school year and involving 4th-6th graders in 4 intervention and 2 control schools in Amsterdam (Jurg et al., 2006). The Class Moves® offered regular physical activity breaks during normal lessons one of several program components, including a card game that worked with assignments done in the class and at home, a parent information service and school sports activities (designed to acquaint students with a variety of sports in order to prompt them to join a sports club outside of school hours). The activity levels of children in the control group

decreased while those of intervention group children remained stable (corrected overall odds ratio of 1.63, mostly attributable to a 4.33 OR among 6th graders).

Happy 10. An 8-month controlled trial of an intervention modeled on *Take 10!* in two comparable schools in urban Beijing, 14 intervention classes and 12, control (Liu et al., 2008). Average energy expenditure of Happy 10 sessions was measured in 80 students in the intervention school over 5 days at baseline, using objective physical activity monitoring, demonstrating small but significant differences in physical activity energy expenditure before and after intervention. A total of 753 students, fairly evenly divided between schools and between boys and girls, participated in the trial. There were modest but significant differences in the changes between the intervention and control school after intervention in physical activity expenditure (+12.7 Cal/kg/d) and physical activity (+ 2 hr/d), but not in BMI overall. However, there was a small significant difference between changes in intervention girls vs. control girls in weight (-2 kg), BMI (-1.01 kg/m²). There were only non-significant trends in changes in overweight and obese children, decreasing by 3.3% (girls) and 3.8% (boys), and 0.4% (girls) and 5.6% (boys), respectively among in the intervention school, while increasing among controls by 3.7% (girls) and 4.5% (boys), and 0.7% (girls) and 0.6% (boys).

References

- Andreyeva T, Sturm R. Physical activity and changes in health care costs in late middle age. *J Phys Activ Health* 2006;3:S6-19.
- Bandura A. Human agency in social cognitive theory. *Am Psychol*. Sep 1989;44(9):1175-84.
- Bandura A. Health promotion by social cognitive means. *Health Educ Behav*. Apr 2004;31(2):143-64.
- California Department of Health Services. California Nutrition Network and California 5 a Day Campaign *Issue Brief: Workplace Nutrition and Physical Activity*. 2004;1(1):1-8.
- Cardon G, De Clercq D, De Bourdeaudhuij I, Breithecker D. Sitting habits in elementary schoolchildren: a traditional vs. a "Moving school." *Patient Educ Counseling* 2004;54:133-42.
- Crawford PB, Gosliner W, Strode M, Samuels S, Craypo L, Yancey AK. Walking the talk: Using staff Fit WIC wellness programs to increase pediatric obesity counseling behavior. *American Journal of Public Health* 2004;94:1480-1485.
- Donnelly JE. *Physical Activity Across the Curriculum/Take 10!* Presentation at the Institute of Medicine Symposium Progress in Preventing Childhood Obesity: Focus on Schools, Wichita, Kansas, June 29, 2005.
- DuBose KD, Mayo MS, Gibson CA, Green JL, Hill JO, Jacobsen DJ et al. Physical activity across the curriculum (PAAC): rationale and design. *Contemp Clin Trials* 2008;29:83-93.
- Elley R, Bagrie E, Arroll B. Do snacks of exercise lower blood pressure? A randomised crossover trial. *N Z Med J*. 2006 Jun 2;119(1235):U1996.
- Ernst MP, Pangrazi RP. Effects of a physical activity program on children's activity levels and attraction to physical activity. *Pediatr Exerc Sci* 1999;11:393-405.
- Flegal KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among US adults, 1999-2000. *Jama*. Oct 9 2002;288(14):1723-1727.
- Gibson CA, Smith BK, DuBose KD, Greene JL, Bailey BW, Williams SL et al. Physical activity across the curriculum: year one process evaluation results. *Int J Behav Nutr Phys Activ* 2008;5:5868-5-36.
- Grier S, Bryant CA. Social marketing in public health. *Ann Rev Public Health* 2005;26:319-39.
- Honas JJ, Washburn RA, Smith BK, Green JL, Donnelly JE. Energy expenditure of the physical activity across the curriculum intervention. *Med Sci Sports Exerc* 2008;40:1501-5.
- Jurg ME, Kremers SPJ, Candel MJJM, Van Der Wal MF, De Meij JSB. A controlled trial of a school-based environmental intervention to improve physical activity in Dutch children: JUMP-in, kids in motion. *Health Prom Intl* 2006;21(4):320-330.
- King AC, Jeffery RW, Fridinger F, Dusenbury L, Provence S, Hedlund SA, Spangler K. Environmental and policy approaches to CVD prevention through physical activity: issues and opportunities. *Health Educ Q* 1995;22:499-511.

- Koplan JP, Liverman CT, Kraak VI, Wishan SL. *Progress in Preventing Childhood Obesity: How do we measure up?* Washington, DC: Institute of Medicine of The National Academies Press, 2006.
- Kumanyika SK. Minisymposium on obesity: overview and some strategic considerations. *Ann Rev Public Health* 2001;22:293-308.
- Kumanyika SK, Grier S. Targeting interventions for ethnic minority and low-income populations. *Future Child* 2006;16(1):187-207.
- Lara A, Yancey AK, Tapia-Conyer R, Flores Y, Kuri-Morales P, Mistry R, Subirats E, McCarthy WJ. *Pausa para tu salud*: Reduction of weight and waistlines by integrating exercise breaks into workplace organizational routine. *Preventing Chronic Disease* 2008:A12 [E-pub].
- Liu AL, Hu XQ, Ma GS, Cui ZH, Pan YP, Chang SY, Zhao WH, Chen CM. Report on childhood obesity in China (6) evaluation of a classroom-based physical activity promotion program. *Biomed Environ Sci*. 2007 Feb;20(1):19-23.
- Liu A, Hu X, Ma G, Cui Z, Pan Y, Chang S et al. Evaluation of a classroom-based physical activity promoting programme. *Obes Rev* 2008;9 (Suppl 1):130-134.
- Lloyd LK, Cook CL, Kohl HW. A pilot study of teachers' acceptance of a classroom-based physical activity curriculum tool: Take 10! *Texas Assoc Health Phys Educ Rec Dance J* 2005;spr:8-11.
- Lobstein T. Comment: Preventing child obesity—an art and a science. *Obesity reviews* 2006;7(Suppl 1):1-5.
- Mahar MT, Murphy SK, Rowe DA, Golden J, Shields AT, Raedeke TD. Effects of a classroom-based program on physical activity and on-task behavior. *Med Sci Sports Exerc* 2006;38(12):2086-94.
- Macdonald HM, Kontulainen SA, Khan KM, McKay HA. Is a school-based physical activity intervention effective for increasing tibial bone strength in boys and girls? *J Bone Miner Res*. 2007 Mar;22(3):434-46.
- MacKelvie KJ, McKay HA, Khan KM, Crocker PR. A school-based exercise intervention augments bone mineral accrual in early pubertal girls. *J Pediatr*. 2001 Oct;139(4):501-8.
- MacKelvie KJ, McKay HA, Petit MA, Moran O, Khan KM. Bone mineral response to a 7-month randomized controlled, school-based jumping intervention in 121 prepubertal boys: associations with ethnicity and body mass index. *J Bone Miner Res*. 2002 May;17(5):834-44.
- MacKelvie KJ, Khan KM, Petit MA, Janssen PA, McKay HA. A school-based exercise intervention elicits substantial bone health benefits: a 2-year randomized controlled trial in girls. *Pediatrics*. 2003 Dec;112(6 Pt 1):e447.
- MacKelvie KJ, Petit MA, Khan KM, Beck TJ, McKay HA. Bone mass and structure are enhanced following a 2-year randomized controlled trial of exercise in prepubertal boys. *Bone*. 2004 Apr;34(4):755-64.
- Marcus B, Williams D, Dubbert PM, Sallis JF, King AC, Yancey AK, Franklin BA, Buchner D, Daniels S, Claytor R. Physical activity interventions: what we know and what we need to know. A statement from the Council on Clinical Cardiology (Subcommittee on Exercise, Rehabilitation, and Prevention) and the Council on Nutrition, Physical Activity, and Metabolism (Subcommittee on Physical Activity) of the American Heart Association. *Circulation*. In press, 2006.
- Metzler MW, Williams S. A classroom-based physical activity and academic content program: more than a "pause that refreshes"? A report to the International Life Sciences Institute. Atlanta, GA. www.ilsa.org.
- Miyashita M, Burns SF, Stensel DJ. Exercise and postprandial lipemia: effect of continuous compared with intermittent activity patterns. *Am J Clin Nutr* 2006;83:24-9.
- Naylor PJ, Macdonald HM, Warburton DE, Reed KE, McKay HA. An active school model to promote physical activity in elementary schools: action schools! BC. *Br J Sports Med*. 2008 May;42(5):338-43.
- Ogden CL, Flegal KM, Carroll MD, Johnson CL. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *Jama*. Oct 9 2002;288(14):1728-1732.
- O'Hagan CM, Smith DM, Pileggi KL. Exercise classes in rest homes: effect on physical function. *N Z Med J*. 1994 Feb 9;107(971):39-40.
- Pangrazi RP, Beighle A, Vehige T, et al. Impact of Promoting Lifestyle Activity for Youth (PLAY) on children's physical activity. *J Sch Health* 2003;73:317-21.
- Petit MA, McKay HA, MacKelvie KJ, Heinonen A, Khan KM, Beck TJ. A randomized school-based jumping intervention confers site and maturity-specific benefits on bone structural properties in girls: a hip structural analysis study. *J Bone Miner Res*. 2002 Mar;17(3):363-72.

- Pronk SJ, Pronk NP, Sisco A, Ingalls DS, Ochoa C. Impact of a daily 10-minute strength and flexibility program in a manufacturing plant. *Am J Health Promot* 1995;9(3):175-8.
- Sibley BA, Ward RM, Zullig KJ, Yazvac TS, Pottiger JA. Effects of an environmental intervention to improve diet and increase physical activity on school performance. American College of Sports Medicine annual meeting, May 31, 2006.
- Simon E (AP). Companies are promoting better lifestyles. 6 December 2006.
- Sloane D, Nascimento L, Yancey AK, Flynn G, Lewis LB, Guinyard JJ, Diamant A, Galloway-Gilliam L. Assessing resource environments to target prevention interventions in community chronic disease control. *J Health Care Poor & Underserved*. 2006 May;17(2 Suppl):146-58.
- Stewart JA, Dennison DA, Kohl HW, Doyle A. Exercise level and energy expenditure in the Take 10! In-class physical activity program. *J Sch Health* 2004;74(10):397-400.
- Stokols D, Allen J, Bellingham RL. The social ecology of health promotion: implications for research and practice. *Am J Health Promot*. Mar-Apr 1996;10(4):247-251.
- Stokols D, Grzywacz JG, McMahan S, Phillips K. Increasing the health promotive capacity of human environments. *Am J Health Promotion* 2003;18:4-13.
- Sturm R. The economics of physical activity: societal trends and rationales for intervention. *Am J Prev Med* 2004;27(3S):126-35.
- Sturm R. The effects of obesity, smoking, and drinking on medical problems and costs. *Health Affairs* 2002;21:245-253.
- Lara A. Obesity and diabetes: taking responsibility for health. Board of Directors Meeting, Public Health Institute, Puerto Vallarta, Jalisco, Mexico, December 5, 2004.
- Taylor W. Transforming work breaks to promote health. *Am J Prev Med* 2005;29(5):461-5.
- Wang F, McDonald T, Champagne IJ, Edington DW. Relationship of BMI and physical activity to health care costs among employees. *J Occup Environ Med* 2004;46:428-36.
- Wilcox S, Laken M, Anderson T, Bopp M, Bryant D, Gethers O, Jordan J, McClorin L, O'Rourke K, Parrott A, Swinton R, Yancey A. The Health-e-AME faith-based physical activity initiative: program description and baseline findings. *Health Promotion Practice*. In press, 2005.
- Yancey A, Wold C, McCarthy W, Weber M, Lee B, Simon P, Fielding J. Physical inactivity and overweight among Los Angeles County adults. *American Journal of Preventive Medicine* 2004a;27:146-152.
- Yancey AK, Kumanyika, SK, Ponce N, McCarthy WJ, Fielding JE, Leslie JP. Population-based interventions engaging communities of color in healthy eating and active living: a review. *Preventing Chronic Disease* 2004b Jan;1(1):A09. Epub 2003 Dec 15. [serial online].
- Yancey AK, McCarthy WJ, Taylor W, Raines AM, Gewa C, Weber M, Fielding JE. The *Los Angeles Lift Off*: a sociocultural environmental change intervention to increase workplace physical activity. *Preventive Medicine* 2004c;38:848-856.
- Yancey AK, Lewis LB, Sloane DC, Guinyard JG, Diamant AL, Nascimento LM, McCarthy WJ, REACH Coalition. Leading by example: Process evaluation of a local health department-community collaboration to change organizational practice to incorporate physical activity. *Journal of Public Health Management and Practice* 2004d;10(2):116-123.
- Yancey A, Robinson R, Ross R, Washington R, Goodell H, Goodwin NJ, Benjamin ER, Langie RG, Galloway JM, Carroll LN, Kong BW, Leggett CJWB, Williams RA, Wong MJ. Discovering the full spectrum of cardiovascular disease: Minority Health Summit 2003: report of the Advocacy Writing Group. *Circulation*. 2005a Mar 15;111(10):e140-9.
- Yancey AK, Lewis LB, Guinyard JJ, Sloan DC, Nascimento LM, Galloway-Gilliam L, Diamant A, McCarthy WJ. Putting promotion into practice: the African Americans Building a Legacy of Health organizational wellness program. *Health Prom Prac*. 2006a; 7(3):233S-246S.
- Yancey A, McCarthy W, Leslie J, Wong WK, Siegel JM, Harrison GH. Results of a randomized, controlled lifestyle change intervention: *African-American Women Fight Cancer with Fitness*. *J Women's Health*. 2006b;15(4):412-29.
- Yancey AK, Ory M, Davis SM. Dissemination of physical activity promotion interventions in underserved populations. *Am J Prev Med*. 2006c; 31(4S):82-91.

Yancey AK, Simon PA, McCarthy WJ, Lightstone AS, Wold C, Fielding JE. Ethnic and gender differences in overweight self-perception and their relationship to sedentariness. *Obes.* 2006d;14:980-8.

Zahner L, Puder JJ, Roth R, Schmid M, Guldemann R, Pushe U et al. A school –based PA program to improve health and fitness in children aged 6-13 years. *BMC Pub Health* 2006;6:147 (E-pub).

Zimring C, Joseph A, Nicoll GL, Tsepas S: Influences of building design and site design on physical activity: Research and Intervention Opportunities. *Am J Prev Med.* 2005; 28(2 Suppl 2): 186-93.