CANDICE TAYLOR LUCAS, MD, MPH

EDUCATION

2013	**M.S., Candidate, New York University School of Medicine;** Clinical Translational Science Institute, Clinical Investigation
2007	**M.D., University of Southern California, Keck School of Medicine**
2003	**M.P.H., University of California, Los Angeles, School of Public Health;** Community Health Sciences
2001	**B.S., University of California, Los Angeles;** Major Physiological Science, Minor Gerontology

POST-GRADUATE TRAINING

2011 - 2013	**Academic General Pediatrics and Primary Care Research Fellow, New York University School of Medicine, Bellevue Hospital Center**
2010 - 2011	**Chief Resident, University of California, Los Angeles;** Pediatric Residency Program
2007 - 2010	**Pediatric Resident, University of California, Los Angeles;** Community Health and Advocacy Tract

CERTIFICATION

2010	**American Board of Pediatrics**
2008	**United States Medical Licensing Exam, Step 3**
2007	**United States Medical Licensing Exam, Step 2 Clinical Skills**
2006	**United States Medical Licensing Exam, Step 2 Clinical Knowledge**
2005	**United States Medical Licensing Exam, Step 1**

AWARDS AND HONORS

2013 **Gold Humanism Honors Society, New York University School of Medicine Chapter**
- Acknowledges fellows and residents who are nominated by faculty for demonstrated humanism in medicine and elected by committee to serve as advocates and role models

2012 **Fellow Research Award - Best Abstract Submitted by a Fellow,** Academic Pediatric Association
- Recognizes pediatric fellows in training and their primary mentor, for research submitted to the Pediatric Academic Society Meeting 2012

2007 **Community Achievement Award,** University of Southern California, Keck School of Medicine
- Honors one graduating medical student who had an impact on the general population and medical community as a whole and served as an example of the effect that medical students can have on patient care.

2005 - 2007 **California Community Foundation Scholarship,** University of Southern California, Keck School of Medicine

- Recognizes service provided to the medical student body at the Keck School of Medicine and surrounding community of Los Angeles.

2005 **Oliver Goldsmith Award,** Kaiser Permanente

- Recognizes service provided for the promotion and advancement of culturally responsive care.

2001 **Chancellor's Service Award,** University of California, Los Angeles

- Highlights graduating undergraduate students who have provided exemplary service to the campus and surrounding Los Angeles community.

2000 **Charles E. Young Humanitarian Award,** University of California, Los Angeles

- Recognizes three undergraduates with a vision of service.

2000 **Women for Change, Student Leadership Award,** University of California, Los Angeles

- Honors women serving as campus and community leaders.

SERVICE AND ADVOCACY

2011- Present **Academic Pediatric Association**

- **Junior Mentor; New Century Scholars Program,** 2012-present
- **Co-Chair; Academic Fellows Special Interest Group,** 2012-present
- **Member**

2009 - 2011 **Pediatric Residency Program Diversity Committee;** University of California, Los Angeles

- **Co-founder and co-director,** 2009-2011

2008 - 2011 **Continuity Clinic Curriculum Committee;** University of California, Los Angeles

- **Member;** identified articles for journal club sessions at resident's weekly continuity clinic sessions.

2006 - Present **American Academy of Pediatrics (AAP)**

- **Residency Program Representative,** 2009 - 2011
- **AAP, National Conference, Advocacy Day, Washington D.C.,** 2009
- **AAP, UCLA Community Health and Advocacy Tract Advocacy Day, Sacramento, CA,** 2010
- **AAP, District 2 Advocacy Day, Albany, NY,** 2012

2004- 2007 **Latino Medical Student Association;** University of Southern California, Keck School of Medicine

- **Member**

2004- 2007 **Minority Health Conference;** Keck and David Geffen Schools of Medicine

- **Co-Director,** 2004-2005; served on the board of directors and coordinated diverse seminars with the goal of empowering participants to address health issues prevalent in minority and underserved communities through exposure and education.
- **Panelist,** 2006 and 2007

2004 **National Youth Leadership Forum (NYLF)**

- **Site Coordinator, University of Southern California;** organized visits for high school students participating in the NYLF, Los Angeles

2003 - 2010 **Annual Healthy Future Community Fair;** Tau Tau Omega Chapter, Alpha Kappa Alpha Sorority, Inc.

- **Coordinator;** developed and organized an annual health fair for residents of Turning Point, a transitional housing residence in Santa Monica, California providing support to homeless persons.

2003- 2007 **Student National Medical Association;** University of Southern California, Keck School of Medicine

- **President,** 2004-2005
- **Tom Bradley Mini-Medical School Volunteer,** 2003-2005; instructed monthly classes on health topics to a 3rd grade elementary school classroom in the inner city of Los Angeles

2001 - 2003 **Students of Color for Public Health,** University of California, Los Angeles, School of Public Health

- **Member;** advocated for issues pertinent to minority communities, and enacted community programs outreaching to inner city youth.

2001 - 2003 **Public Health Student Association,** University of California, Los Angeles, School of Public Health

- **Class Representative;** 2001 - 2002
- **External Vice President;** 2002 – 2003

1998 - 2000 **Community Outreach and Prevention through Education (COPE);** 1998 - 2000

- **Volunteer;** instructed weekly lessons on health and wellness and tutored youth between the ages of 5 - 18 years, living in a low-income housing project in Los Angeles.

1996 - 2001 **Black Pre-Health Organization;** 1996 - 2001

- **Student National Medical Association, Student Liaison;** 2000 - 2001
- **Director, Black Hypertension Project;** 1998 - 2000
- **Assistant Director, Black Hypertension Project;** 1997 - 1998

TEACHING

2011 - 2013 **Clinical Instructor;** New York University, School of Medicine / Bellevue Hospital Center

- Locations: NYU School of Medicine / Bellevue Hospital Center Pediatric Continuity Clinic, Inpatient Pediatric Ward and Nursery Bellevue Hospital Center

2011 **Course Co-Chair, Medical Student Selective; Rare Disease;** David Geffen School of Medicine, University of California, Los Angeles; January 2011 - February 2011

- Instructed and coordinated a lecture series on rare pediatric diseases, using cases taught through problem based learning.

2010 - 2011 **Instructor, Pediatric Residency Program Morning Reports;** University of California, Los Angeles Pediatric Residency Program; August 2010, January - February 2011

- Instructed and coordinated morning report sessions on unique pediatric case presentations.

2010 - 2011 **Instructor, Medical Student Course; Fluids and Electrolytes;** David Geffen School of Medicine, University of California, Los Angeles; August 2010, January 2011, February 2011

- Instructed medical students in the assessment of hydration status and management of fluids administered to young children.

2010 - 2011 **Instructor, Pediatric Intern Course; Community Health and Advocacy Tract; Capacity Building;** University of California, Los Angeles Pediatric Residency Program

- Instructed interns in the use and application of capacity building in clinical and public health endeavors.

2010 - 2011 **Attending, Chief Resident;** University California, Los Angeles Pediatric Residency Program

- Locations: Cedars-Sinai Medical Center Inpatient Pediatric Ward; Venice Family Outpatient Pediatric Community Clinic; Olive View Medical Center Pediatric Urgent Care Clinic; University California, Los Angeles Pediatric Continuity Clinic

2010 **Moderator, Cedars-Sinai Pediatric Case Conference;** September 2010

- Coordinated and instructed a case conference on a patient with the diagnosis of annular pancreas.

INTERNATIONAL TRAINING

2010 **Child Family Health International**

- Lived with a host family in La Paz, Bolivia for one month, received tutoring in Spanish and participated in ward rounds and clinical care at Hospital del Nino in the departments of pediatric infectious disease, hematology and oncology, emergency medicine and general pediatrics.

2007 **Costa Rica, Adventure Education Program**

- Lived with a host family in Turrialba, Costa Rica for three weeks and attended daily Spanish classes and individual tutoring sessions.

LANGUAGES SPOKEN

Spanish; limited conversational and medical Spanish

RESEARCH

2011 - present **Starting Early: Randomized Control Trial Assessing the Effectiveness of an Early Obesity Prevention Program**

- **Research Fellow**; Assisted with IRB correspondence and the development of program curriculum and evaluations in my first year. Current responsibilities include assisting with quality improvement and analysis of data collected in this longitudinal primary care based intervention working with Latina mother-child dyads followed from the third trimester of pregnancy through child age of 36 months.

2004 - 2005 **Adolescent Latinas Adjusting Sugar**; **Student Researcher**; October 2004 - June 2005

- **Research Assistant**; Instructed overweight and obese mothers and teens in the preparation of healthier food options and evaluated health outcomes of those with type 2 diabetes.

2004 **American Society of Hematology, Minority Medical Student Award Program**; **Student Researcher**; July 2004 - September 2004

- **Summer Intern**; Studied the mechanism of hydroxyurea in treating sickle cell disease at Children's Hospital Los Angeles.

2002 **Centers for Disease Control and Prevention Association of Public Health Schools, Department of Nutrition and Physical Activity; Summer Intern**; July 2002 - September 2002

- **Summer Intern**; Assessed the cultural sensitivity of state based physical activity programs targeting African-American communities.

2001 **Community Steps to Minority Youth Fitness; Data Collector**; September 2001 - November 2001

- **Research Assistant**; Performed site visits, collected data and educated youth from two inner city middle schools in Los Angeles with high rates of obesity and increased risk of type 2 diabetes.

ABSTRACTS & PRESENTATIONS

2013 **Abstract, Poster Presentation;** Pediatric Academic Societies Meeting, May 2013

- **Lucas, CT**, Gross, R, Tomopoulos, S, Fierman, AH, Mendelsohn, A. Messito, M. Media Exposure and Maternal Perception of Healthy Toddler Weight.

2013 **Abstract, Platform Presentation;** Academic Pediatric Association, Region II and III Meeting, March 2013

- **Lucas, CT**, Gross, R, Tomopoulos, S, Fierman, AH, Mendelsohn, A. Messito, M. Media Exposure and Maternal Perception of Healthy Toddler Weight.

2012 **Abstract, Platform Presentation;** New York University, School of Medicine. Department of Pediatrics, Joseph M. Dancis Pediatric Research Day, May 2012

- **Lucas, CT**, Messito, M, Tomopoulos, S, Cates, CB, Berkule, S, Fierman, AH, Gross, R, Dreyer, B, Mendelsohn, A. Maternal and Infant Factors Associated with Adding Cereal in the Bottle.

2012 **Abstract, Platform Presentation;** Pediatric Academic Societies Meeting, April 2012

- **Lucas, CT**, Messito, M, Tomopoulos, S, Cates, CB, Berkule, S, Fierman, AH, Gross, R, Dreyer, B, Mendelsohn, A. Maternal and Infant Factors Associated with Adding Cereal in the Bottle.

2012 **Abstract, Platform Presentation;** Academic Pediatric Association, Region II and III Meeting, February 2012

- **Lucas, CT**, Messito, M, Tomopoulos, S, Cates, CB, Berkule, S, Fierman, AH, Gross, R, Dreyer, B, Mendelsohn, A. Maternal and Infant Factors Associated with Adding Cereal in the Bottle.

2004 **Summer Intern Research Summary, Platform Presentation;** American Society of Hematology, Annual Meeting, December 2004

- **Taylor, C,** Malik, P. The Effect of Hydroxyurea on PLGF Production in Erythroid Cells.

2002 **Summer Intern Research Summary, Division Meeting Presentation;** Centers for Disease Control and Prevention, Department of Nutrition and Physical Activity Division Meeting, September 2002

- **Taylor, C.**, Heath, G. Cultural Sensitivity of State Based Physical Activity Programs.

MANUSCRIPTS IN PREPARATION

Lucas, CT, Messito, M, Tomopoulos, S, Cates, CB, Berkule, S, Fierman, AH, Gross, R, Dreyer, B, Mendelsohn, A. Maternal and Infant Factors Associated with Adding Cereal in the Bottle. March 2013

Dan Cooper, MD

Dan M. Cooper, M.D. is board certified in Pediatrics and Pediatric Pulmonology. He completed medical school at the University of California, San Francisco, and Pediatric Residency at New York University-Bellevue Medical Center. He went on to his postdoctoral Fellowship Training in Pediatric Pulmonology at Babies Hospital, Columbia University College of Physicians and Surgeons in New York. Dr. Cooper is a Professor of Pediatric sand Biomedical Engineering and Associate Dean for Clinical Translational Sciences at the UCI School of Medicine. He serves as the Director of the UCI Institutefor Clinical and Translational Science and the Pediatric Exercise Research Center.

Dan M. Cooper, M.D., is also the acting chair of the University of California, Irvine, Department of Pediatrics. Dr. Cooper is the founder and director of the UC Irvine Institute for Clinical & Translational Science, which was recently awarded a $20 million Clinical & Translational Science Award from the NIH. This prestigious award will support multidisciplinary research in a wide range of fields, including pediatrics, speeding the transformation of scientific discoveries into medical advances for patients.

Dr. Cooper is also founder and director of the UC Irvine Pediatric Exercise Research Center, which is studying how exercise may help prevent childhood asthma and obesity, and benefit children with chronic asthma, cystic fibrosis, heart disease and diabetes.

Board-certified in pediatric pulmonology, Dr. Cooper is a professor of pediatrics and bioengineering, and associate dean for clinical translational sciences at the UC Irvine School of Medicine. He also serves as a board member of the CHOC Children’s Pediatric Subspecialty Faculty.

Research

Dr. Cooper's research is focused on how exercise and physical activity can be used to benefit children with chronic conditions like asthma, cystic fibrosis, obesity, heart disease, and metabolic syndromes like diabetes.

Commission Obesity Prevention Investments

The Commission has invested in several strategies related to obesity prevention. The strategies are centered on early intervention and education related to healthy nutrition and physical exercise, as well as direct intervention for children identified with or at risk for obesity. The programs are intended to improve the knowledge and skills of parents, early care and educations providers, and other professionals that work directly with children.

Several currently funded programs that focus on strategies related to obesity are highlighted below:

- **LEAN Start** – Parent education program administered through the Boys & Girls Clubs throughout Orange County.
- **Professional Training and Technical Assistance** - Training and technical assistance is provided to childcare and preschool providers to increase physical exercise as part of the daily curriculum.
- **Dr. Riba's Health Club** - Diagnosis, treatment, and prevention of obesity with a multidisciplinary team providing direct patient care and individual treatment programs that are tailored to each child's needs.
- **Bridges Maternal Child Health Network/Breastfeeding Promotion and Education**- Breastfeeding support is provided to new mothers through the Bridges program.
- **YMCA Catalytic Agreement** - Capital investment made by the Commission in 2010 that was a one time investment to build the Santa Ana YMCA facility (including two pools and an arena soccer field) and support the initial launch of programs targeted at families with young children.
- **Round 2 Catalytic Investment** – Project focuses on support for breastfeeding support and community based nutrition and fitness strategies.

LEAN Start

The Children and Families Commission of Orange County has invested funds to support the development of the LEAN Start curriculum (in both Spanish and English), which teaches parents strategies to maximize their children's health through optimum nutrition and physical activity. The LEAN Start curriculum was authored by Dr. William Sears and the Commission has rights to use the curriculum through May 31, 2017. The LEAN Start program consists of six weekly sessions facilitated by a trained coach. The curriculum includes a DVD lecture, a Caregiver's Manual, a Family Fun Book, and a Coach's Manual. The intent of the LEAN Start curriculum was to make it user friendly so that community based organizations would have the ability to deliver program materials successfully to parents without the use of technical experts.

Piloting of the LEAN Start program and materials began in October 2007, at ten Boys & Girls Club (B&GC) locations in Orange County. Each B&GC site aimed to enroll 200 parents/caregivers in the class series (a total of 2,000 participants for the pilot). The pilot period ended in October 2009 when the goal of recruiting 2,000 participants was reached. An evaluation of the initial implementation was conducted and parents reported using the class information at home and making positive changes in their families' activities and nutritional choices. There were also significant barriers revealed including difficulty in recruitment and retention of families and relevancy of program materials to target populations.

In response to the evaluation results, adjustments were made including refinement of the program materials and adjusting the core message to align more closely with state and federal programs. This

includes the key messages of: eat more fruits and vegetables, drink water, increase physical activity and understand food labels. New in class activities, including physical activities, have been added to classes to give parents more hands-on experience with incorporating these messages into their daily lives.

Currently there are two Boys & Girls Clubs still implementing the LEAN Start classes with less than 100 families served annually. The remaining clubs have not been able to sustain the recruitment of families with children ages 5 or younger. A stipend is provided to the clubs on a per family completion basis. There is approximately $68,000 remaining in the agreement to cover the family stipends offered to the clubs.

Professional Training and Technical Assistance

Since 2005, the Commission has engaged the expertise of Arlene Turner to oversee the development and implementation of the LEAN Start program, as well as provide technical expertise to our partners (both funded and unfunded) on how to improve program implementation specifically around increasing healthy nutrition and physical activity. Arlene has a Master Degree in Kinesiology and has over 20 years experience of management of physical activities programs. Over the last 8 years, Arlene has become an increasingly valuable resource as there are few qualified physical activity experts available to support low income families and child care providers. Detailed below are ways in which Arlene has supported the efforts of Orange County partners.

Arlene has represented the Commission at the National Obesity Conference, statewide nutrition meetings and countywide collaborative. Specifically, she has presented her model of training and implementation support for no and low cost ways that caregivers can increase active play in young children. This formula proved to be so successful that countywide partners asked for staff and parent training to learn to use low and no-cost materials to create active play opportunities for young children. Some of the agencies that have received Arlene's assistance include Women, Infant and Child (WIC), Head Start, Children's Home Society, Orange County Health Care Agency, public preschools, center based child care providers, in-home child care providers, Motel Collaborative service providers and Family Resource Centers.

One example that has led to numerous trainings on ways to increase physical activity in families with young children is Arlene's work with a public health nurse. Arlene helped create a play environment for children living in a high density apartment complex in Santa Ana where there were no parks within safe walking distance. Arlene worked with the public health nurse and families living in the apartment complex, and developed a parking lot playground that was designed to get kids of all abilities/ages moving. The playground program still exists today.

Arlene has also directly targeted preschool teachers and child care providers focusing on creating fun physical activity for young children. The goal of theses workshops is to provide research based information on the importance of active play for healthy growth and development of children ages 3-5 and to provide opportunities for the adults to experience and create movement activities. The participants in these trainings report higher confidence in implementation, the ability to access tools and ways to integrate learning and skill building within active play. Arlene has used this training approach to the direct benefit of Commission funded programs such as Pretend City, Early Learning Coordinators, and Readiness on the Road.

Dr. Riba's Health Club
The Commission has support Dr. Riba's Health Club (DrRHC) since 2004 when it was a program out of the Community Care Health Centers. DrRHC approaches diagnosis, treatment, and prevention of obesity with a multidisciplinary team providing direct patient care and individual treatment programs that are tailored to each child's needs. The multidisciplinary team is comprised of a Pediatrician, Fitness Instructors, and Registered Dietitian. They have developed the reputation of treating the most severe cases of obesity and "Failure to Thrive", a condition referring to children with delayed growth and development due to improper nutrition and an inability to maintain a healthy weight.

DrRHC works to address the root causes of overweight and obesity, rather than just the symptoms, to ensure that the entire family is stronger and healthier. The overall intervention is the same for both overweight children and those with Failure to Thrive and includes: discussing the psychology of feeding, teaching families how to improve their nutrition, and promoting increased physical activity.

DrRHC currently provides services to over 100 children ages 0-5 annually with outreach and education efforts reaching over 2,500 people. Within the last two years, DrRHC has become a Cal Optima provider and is continuing to pursue opportunities to increase sustainability through insurance payers. Additionally, DrRHC also has been working in partnership with Child Guidance Center on a Harvard University research project that is reviewing the effectiveness of using Parent Child Interactive Therapy (PCIT) to address obesity and Failure to Thrive in children.

Bridges Maternal Child Health Network/Breastfeeding Promotion and Education
The Commission's approach has been to ensure that mothers have access to breastfeeding information and support. The primary delivery of this information and support is through the Bridges Maternal Child Health Network. The Bridges Network is comprised of ten hospitals, three community-based providers and specialized public health nursing programs that provide home based services to promote healthy early child development for young children from the prenatal period through age five (0-5) with an emphasis on prenatal through the first three (3) years of life.

In Fiscal Year 2012/13, Commission grantees supported 16,085 new mothers in receiving breastfeeding education and support through our Bridges Maternal Child Health Network providers. In terms of home visitation program outcomes, 93% of the babies participating in the MOMS Orange County home visitation program were breastfeed.

The Commission has made additional one time allocations to support breastfeeding promotion through the Bridges Network. For example in 2004, the Commission invested funding to train staff from the high birth hospitals and home visitation programs to promote breastfeeding. The Commission also committed additional dollars for breastfeeding in 2006 to further promote activities to improve breastfeeding rates in Orange County. Activities included supporting breastfeeding workshops for staff, providing for an advanced training course for staff to become Certified Lactation Educators, and supporting three local hospitals in pursuing implementation of the 10 Steps toward obtaining "Baby Friendly" status. Coastal, St Joseph's and St Jude participated, and later Garden Grove Hospital was added (Orange County now has 5 of Baby Friendly Hospitals).

YMCA Santa Ana
In 2010, the Commission provided $8.5 million of funding for the development of a YMCA facility in Santa Ana. The facility includes; three pools (Splash pool targeted at children ages 6 months to 3 years,

Lap Pool, Olympic Pool (shared with High School), arena soccer field, and modular structures that house YMCA administrative offices, and Dr. Riba's Health Club.

The Commission's funding award included $5.5 million to support the construction of the facilities and $3 million in operational support for the onsite health and fitness programs. The Commission's agreement with the YMCA has a 10 year service payback provision for $2,900,000 that includes a credit for the dedicated space to Dr. Riba's Health Club and a minimum of 133 (0-5 children) receiving multi-disciplinary obesity treatment and prevention services, and a minimum of 390 children ages 0-5 access water safety/ swim instruction annually.

The facility has over 9500 unique members that have access the facilities, which according to the YMCA is the largest number of users of any other Orange County YMCA facility. YMCA facility runs afterschool programs on site during the school year that includes soccer and basketball and expends May through September to include swimming. Commission staff is working with the YMCA to verify the membership, frequency of use and ensure the service totals are being met each year. In addition, staff will be meeting with YMCA leadership to assess the plan for the site build out per original concepts submitted to the Commission.

Catalytic Investment

In March 2012, the Commission approved implementing actions for Round 2 catalytic investments. The Round 2 projects required additional planning and were anticipated to have longer term revenue realizations, provide potential for out-year revenue support, and, reduce reliance on Commission funding. These investments include: Partnership for Children's Health, Community Based Prevention Programs, Capacity Building funding cycle, and Nutrition and Fitness. $500,000 in funding was allocated for the Nutrition and Fitness Program; $150,000 for breastfeeding promotion and $350,000 for community-based nutrition and fitness. To date, $15,000 of the breastfeeding promotion funds were authorized February 2013 to support community breastfeeding promotion planning. Funds have been contracted through Orangewood Children's Foundation, program manager for the Bridges Maternal Child Health Network. Stakeholder interviews and focus group strategies are being conducted with a report update scheduled at an upcoming Commission meeting.

Resources for Primary Care Pediatric Practitioners Addressing Nutrition and Physical Activity Intervention Programs for Children 0-5 years

Prepared for the AAP SOEECC by Abbey Alkon, PNP PhD and Candice T. Lucas, MD, MPH; Jan. 2013

Literature Review:

Table 1. Evidence Based Results of Nutrition and Physical Activity Intervention Programs for Preschool-Age Children in Child Care Settings

Program	Reference	Age	Study Design And Sample	Intervention	Outcomes	Comments
Cochrane Review	(Waters E, de Silva-Sanigorski A et al. 2011)	0-5 Years	• RCT • 8 publications; 7 studies	• 12+ week interventions	• zBMI change for 0-5 year olds • Effect size of -0.26 (CI -0.53, 0.00) • Nutrition – NS in longitudinal studies • Significant increase in activity in 1 study	
MEND = Mind Exercise Nutrition Do It!	(Skouteris, McCabe et al. 2010)	2-4 Years	• RCT • 200 parents and their 2-4 year olds	• 90 min group workshops in community	• F/u 6 to 12 month post-intervention	• Study in Australia • Description of study • No outcomes
Eat Healthy, Stay Active	(Herman, Nelson et al. 2012)	3-5 Years	• Quasi-experimental • 6 large Head Start sites in LA; 496 Staff, 438 parents	• 6 month educational intervention for staff, parents, children • Core trainings and	• Decreased BMI in staff and children	• BMI categories were based on std. ages • No age data • BMI collected at each site- no

			and 112 preschool children	reinforcing activities		inter-rater reliability • Family measures were new and not validated
Hip Hop to Health	(Fitzgibbon, Stolley et al. 2005; Fitzgibbon, Stolley et al. 2011)	3-5 Years	• RCT • African American preschool children	• 14 week educational intervention in child care centers • 20 min lessons on healthy eating and exercise with parent involvement	• Decrease in BMI • No change in physical activity or nutrition • Nutrition changes at year one but not year two	• Intervention was more successful with trained persons providing the intervention compared to training the child care providers
Miranos! Look at Us, We are Healthy!	(Yin, Parra-Medina et al. 2012)	3-5 Years	• Quasi-experimental study with 2 intervention groups and one comparison group • 423 Mexican American preschool-age children	• 18 weeks: Culturally tailored strategies • Gross motor skills program • Structured outdoor play • Health literacy • Staff development and wellness • Parent engagement	• zBMI: Not significant change • Nutrition: plate waste and NDSR; positive change • Gross motor skills: LAP-3: standardized measure • Physical activity measured with Pedometry for 3 days • Positive results • Process evaluation of program	• Head Start program • Used Sesame Street characters • Included staff and parents

Resources

Physical Activity Guidelines (Children 0-5 years):

- United States Guidelines:
  - National Association for Sport and Physical Education (NASPE):
    - Website: http://www.aahperd.org/naspe/standards/nationalGuidelines/ActiveStart.cfm
      - NASPE is a non-profit professional membership association that sets the standard for best practices in quality physical education and sport. This website provides physical activity guidelines for children from birth to 5 years of age. The guidelines were developed to "address the developing child's unique characteristics and needs" and reflect the "best thinking of specialists in motor development, movement and exercise about the physical activity needs of young children during the first years of life."

- **International Guidelines:**
  - Canada:
    - Website: http://www.csep.ca/CMFiles/Guidelines/CSEP-InfoSheets-early-years-ENG.pdf
      - The Canadian Society for Exercise Physiology (CSEP) developed this fact sheet to support the promotion of physical activity for children 0 to 4 years old.

  - Australia:
    - Website: http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines#rec_0_5
      - The Australian Department of Health and Ageing developed physical activity guidelines for children 0 to 5 years that are available via this website.

Online Resources:

- **Research Support:**
  - Active Living Research
    - Website: www.activelivingresearch.org
      - This resource is sponsored by the Robert Wood Johnson Foundation which provides resources for advocates, practitioners, policy-makers, educators and media.

  - National Resource Center for Out-of-Home Child Care
    - Website: www.nrckids.org

        - This website includes the 3rd Edition of *Caring for our Children* and *Stepping Stones*. In addition, every state's child care regulations are available on the website in recognition of a new focus on developing and disseminating obesity prevention materials and videos for child care providers, parents and health professionals.

    - United States Department of Agriculture (USDA)
        - Website: http://www.nal.usda.gov/wicworks/Topics/FG/Chapter7_PhysicalActivity.pdf
            - This chapter on physical activity in infancy is available via the WIC works resource system. The chapter provides information about equipment, resources and guidelines regarding safe play positions and environments.

- **Community Programs and Resources:**
    - American Academy of Pediatrics (AAP):
        - Website: http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/HALF-Implementation-Guide/Age-Specific-Content/Pages/Infant-Physical-Activity.aspx
            - This website provides access to information about active play in comparison to sedentary time and promotes regular engagement of children as early as infancy.

    - Head Start Body Start Website:
        - Website: http://www.aahperd.org/headstartbodystart/activityresources/
            - This resource is sponsored by the Head Start program and provides fact sheets for children 0 to 5. The fact sheets outline specific movement activities.

    - Nutrition and Physical Activity Self-Assessment for Child Care(NAP SACC):
        - http://www.hpdp.unc.edu/research/current-projects/napsacc
            - This website provides a description of the NAP SACC program which is an intervention promoting healthy living and active lifestyles via preschool and child care settings.

    - MealTime Memo:
        - Website: http://www.nfsmi.org/documentlibraryfiles/PDF/20120501081030.pdf
            - This fact sheet was developed by the National Food Service Management Institute, which is a part of the School of Applied Science at the University of Mississippi and provides activities for preschool students and toddlers.

Additional Resources in Literature:

- Larson, N., Ward, D. et al. (2011). What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts. *Journal of the American Dietetic Association*. 111(9): 1343-1362
    - This is a review article summarizing 11 studies identifying healthy eating practices and policies and 10 studies of physical environmental factors influencing physical activity in child care programs.

- The National Academies Press. Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation (2012)
    - This is a review article summarizing 11 studies identifying healthy eating practices and policies and 10 studies of physical environmental factors influencing physical activity in child care programs.

- Ritchie, L., Ho, J., et al. Intervening in early childhood to prevent obesity: Best practices for home and child care settings, Center for Weight & Health, University of California, Berkeley. (2009).
    - This is a report on best practices for obesity prevention in both home and center-based child care programs.

References

Fitzgibbon, M., M. Stolley, et al. (2011). "Hip-Hop to Health Jr. obesity prevention effectiveness trial: Postintervention results." Obesity **19** (5): 994-999.

Fitzgibbon, M., M. Stolley, et al. (2005). "Two-year follow-up results for Hip-Hop to Health Jr: A randomized controlled trial for overweight prevention in preschool minority children." J of Pediatrics **146**: 618-625.

Herman, A., B. Nelson, et al. (2012). ""Eat Healthy, Stay Active!": A coordinated intervention to improve nutrition and physical activity among Head Start parents, staff, and children." American Journal of Health Promotion **27**(1): e27-e36.

Skouteris, H., M. McCabe, et al. (2010). "Healthy eating and obesity prevention for preschoolers: a randomised controlled trial." BMC Public Health **10**: 220-.

Waters E, de Silva-Sanigorski A, et al. (2011). "Interventions for preventing obesity in children." Cochrane Database of Systematic Reviews(12).

Yin, Z., D. Parra-Medina, et al. (2012). "Miranos! Look at us, we are healthy! An environmental approach to early childhood obesity prevention." Child Obes **8**(5): 429-439.

ORANGE COUNTY ALLIANCE FOR COMMUNITY HEALTH RESEARCH

Overweight and Obesity Literature Review
Healthier OC Collaborative Workshops

Defining overweight and obesity: Overweight and obesity among children and adolescents are defined as a Body Mass Index (BMI) between the 85th and 95th percentile and greater than the 95th percentile on the pediatric growth chart, respectively.[1] For adults, overweight and obesity are defined as a BMI of 25 to 29.9 and 30 or above, respectively. Obesity has been associated with morbidity and social disadvantages in children, adolescents, and adults. Overweight children are more likely to become overweight or obese adults and have an increased risk for chronic diseases such as sleep apnea, hypertension, musculoskeletal problems, diabetes and cardiovascular disease.[2] The social burden of childhood obesity, especially during middle childhood and adolescence, may have lasting effects on self-esteem, body image and economic mobility.[3] Adult overweight and obesity are associated with increased risk of serious chronic health conditions as well as premature death.[4]

Table 1: Obesity prevalence by race/ethnicity, gender, and age, 2001-2009, Orange County

	Obesity Prevalence (%)				
	2001	2003	2005	2007	2009
Total	14.8	15.0	17.3	18.5	17.3
Race/Ethnicity					
White, Non-Hispanic	14.9	15.5	17.9	16.0	17.7
Hispanic or Latino	22.1	21.2	22.7	23.6	31.5
Asian	*2.8*	*3.1*	5.7	7.8	*5.1*
Gender					
Male	15.0	16.9	18.4	19.2	19.9
Female	14.5	13.1	16.2	17.9	14.8
Age					
18-24 Years	6.6	11.0	8.5	10.0	14.3
25-39 Years	12.6	13.6	15.4	17.5	11.9
40-64 Years	18.8	17.4	22.0	22.9	21.7
65-79 Years	16.3	19.8	16.8	18.4	11.9
80 Years and Older	11.4	2.1	11.7	5.0	10.1

Source: California Health Interview Survey

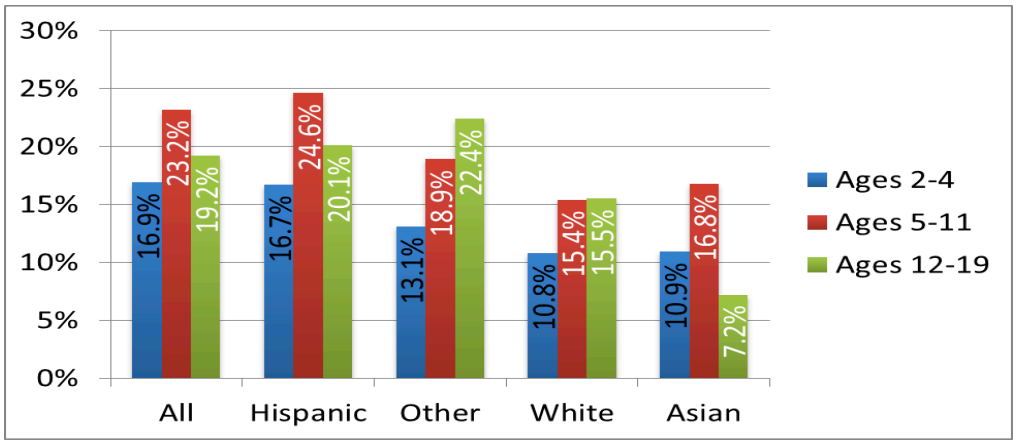
Current trends in overweight and obesity: Over the past decade, there has continued to be a gradual increase in the national prevalence of overweight and obesity; in 2010 nearly 70% of the adult population had a BMI of 25 or greater.[5] According to the 2009 California Health Interview Survey, 33.1% of Orange County adults were overweight and 17.3% were obese. Significant disparities exist in Orange County's obesity prevalence; Hispanic adults have the highest rate of obesity (31.5%), compared with non-Hispanic whites (17.7%), and Asians (5.1%). Due to low sample population, estimates among Black or African American adults were generally unreliable and thus not included in Table 1 above. Disparities also exist amongst geographical regions of Orange County. According to the Gallup-Healthways Wellbeing Index, Congressional Area 44, which includes San Juan Capistrano,

[1] BMI is calculated as weight in kilograms divided by the square of height in meters.
[2] Must A, Strauss RA. Risks and consequences of childhood and adolescent obesity. International Journal of Obesity and Related Metabolic Disorders; Journal of International Association for the Study of Obesity 1999; 23 Suppl2: S2-11.
[3] *Ibid*
[4] National Institutes of Health - National Heart Lung and Blood Institute. Obesity Education Initiative. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. Available online: http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf. Accessed 10/17/2012
[5] Center for Disease Control. Prevalence of obesity in the United States, 2009–2010. National Center for Health Statistics – Data Brief 2012 Jan; 26:1-6.

San Clemente, Coto de Caza and Las Flores has an obesity prevalence of 26.8%, significantly higher than the County (17.3%) and state (23.2%).

Childhood obesity has followed a similar upward trajectory as adult obesity—leveling off over the past few years. Today there are more than three times as many obese children and adolescents in the U.S. as there were in 1980 (5.5% compared to 17.9%). In 2010, among low-income children in Orange County, 16.9% of children ages 2 to 4 and 21.1% of children ages 5-19 were obese. Racial and ethnic disparities also exist amongst low-income children in Orange County; Latino children have the highest obesity prevalence rates across all age groups (16.7% for children aged 2-4, 24.6% for children aged 5 to 11, and 20.1% for children aged 12 to 19), followed by non-Hispanic White (10.8%, 15.4%, 15.5%, respectively) and Asian American (12.4%, 16.8%, 7.2%, respectively) children (Figure 1).

Figure 1: Obesity prevalence among low-income children by race/ethnicity and age, 2010, Orange County



Source: PedNSS

Causes of overweight and obesity: Overweight and obesity are complex multifactorial diseases that develop from the interactive influences of numerous factors— environmental, genetic, metabolic, behavioral, cultural and societal. Monasta *et al.* found a number of early life (conception to five years of age) determinants that had significant associations with overweight and obesity: maternal diabetes, maternal smoking, rapid infant growth, no or short breastfeeding, obesity in infancy, short sleep duration, less than 30 minutes of daily physical activity, high consumption of sugar-sweetened beverages, and television viewing.[6] According to the Surgeon General, the current high rates of overweight and obesity among children and adults in the U.S. are primarily a result of behavioral and environmental factors, which lead to excess caloric intake and inadequate amounts of physical activity.[7]

The main behavioral and environmental factors contributing to excess caloric intake include: increased snacking, larger portion sizes, higher food calorie-density, more meals consumed away from home, higher consumption of sugar-sweetened beverages, more exposure to advertisements promoting unhealthy food and value sizing of less nutritious foods.[8,9,10] According to the California

[6] Monasta L, et al. Early-life determinants of overweight and obesity: a review of systematic reviews. Obesity Reviews 2010; 11(10): 695-708.
[7] U.S. Department of Health and Human Services. The Surgeon General's call to action to prevent and decrease overweight and obesity. U.S. Department of Health and Human Services, Public Health Service, Office of the Surgeon General, 2001. Available from: U.S. GPO, Washington.
[8] Duffey KJ, Popkin BM. Energy Density, Portion Size, and Eating Occasions: Contributions to Increased Energy Intake in the United States, 1977–2006. PLoS Med 2011; 8(6).
[9] Kant AK & Graubard BI. Eating out in America, 1987-2000: Trends and Nutritional Correlates. Preventive Medicine 2004;38:243-249

Health Interview Survey, on average 73.2% of children, 82.1% of adolescents and 66.8% of adults in Orange County eat fast food at least once a week weekly and 13.1% of adults and children eat fast food more than four times per week. In comparison, only 38.7% of children and 46.9% of adults eat the recommended 5 servings of fruits and vegetables four times a week or more.

Behavioral and environmental contributors to inadequate amounts of physical activity include: limited time for daily physical education or recess in schools, limited access to safe areas for physical activity, increased media use and increased reliance on motorized transportation.[11,12] In 2009, only 65.0% of children in Orange County engaged in vigorous physical activity at least 3 days a week and 52.6% of adults exercised the recommended 30 minutes at least 3 times per week. In addition, only 58.1% of 5th graders, 61.3% of 7th graders and 67.3% of 9th graders met their respective Healthy Fitness Zone (HFZ) requirements– a level of fitness that offers some degree of protection against disease resulting from sedentary living. Once again, significant disparities are seen throughout Orange County, 89.9% of fifth grade students in one beach community yet only 56.6% of fifth graders in a central Orange County community were within the HFZ in 2009-2010.

Consequences of overweight and obesity: Overweight and obesity in adulthood is associated with an increased risk of death. Adams *et al.* estimated the risk of death in a prospective cohort of more than 500,000 U.S. men and women after 10 years of follow-up; among patients who had never smoked, the risk of death was increased by 20% to 40% in overweight patients and by 2- to 3-fold in obese patients compared with those of normal weight. Overweight and obesity are also associated with many serious physiological, psychological, and social consequences as listed below. Beyond the multitude of health and social disadvantages, it is estimated that in 2008 the U.S. spent $147 billion (in 2008 dollars) on obesity –$1,429 higher costs for obese persons than those of normal weight.[13]

Physiological consequences of adult overweight and obesity:[14,15, 16, 17]

- Diabetes
- Heart disease
- Stroke
- Dyslipidemia (e.g., high blood cholesterol and triglycerides)
- High blood pressure
- Metabolic syndrome
- Liver disease
- Gallbladder disease

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[10] French SA, et al. Fast-food restaurant use among adolescents: associations with nutrient intake, food choices and behavioral and psychosocial variables. International Journal of Obesity 2001; 25:1823-1833.

[11] *Ibid.*

[12] Sallis JF, Glanz K. Physical activity and food environments: solutions to the obesity epidemic. Millbank Quarterly 2009; 87(1):123-54.

[13] Finkelstein E. Estimates annual medical spending attributable to obesity: payer-and service-specific. Health Affairs 2009; 28(5):822-831

[14] Nguyen NT, Magno CP, Lane KT, Hinojosa MW, Lane JS. Association of hypertension, diabetes, dyslipidemia, and metabolic syndrome with obesity: findings from the National Health and Nutrition Examination Survey, 1999 to 2004. Jrnl of the American College of Surgeons. 2008 Dec; 207(6):928-34.

[15] Guh DP, Zhang W, Bansback N, Amarsi Z, Birginham L, Anis AH. The incidence of co-morbidities related to obesity and overweight: A systematic review and meta-analysis. Bio Med Central Public Health. 2009; 9:88.

[16] Houston DK, Jingzhong D, Nicklas B, Harris T, Lee JS, NEvitt M, Rubin S, Tylavsky F, Kritchevsky S. Overweight and Obesity Over the Adult Life Course and Incident Mobility Limitation in Older Adults. American Journal of Epidemiology. 2009 April 15; 169(8): 927–936.

[17] Berrington de Gonzalez A, et al. Body-Mass Index and Mortality among 1.46 Million White Adults. New England Journal of Medicine. N Engl J Med 2010;363:2211-9.

- Asthma
- Sleep apnea
- Arthritis
- Chronic back pain
- Mobility limitations
- Cancer
- Reproductive complications (e.g., irregular menses, infertility)
- Pregnancy-related complications (e.g., birth defects, gestational diabetes, preeclampsia)
- Poor health-related quality of life
- Increased all-cause mortality
- Decreased life expectancy
- Increased risk of hospitalization

Psychological and social consequences of adult overweight and obesity:[18,19, 20]

- Depression
- Anxiety
- Substance use disorders
- Social discrimination and stigmatization
- Employer discrimination
- Work impairment
- Time away from work
- Disruption of work, family, and social life

Overweight and obesity in childhood is associated with many of the same serious physiological and psychological consequences as adults including: diabetes, atherosclerosis, dyslipidemia, high blood pressure, metabolic syndromes, liver diseases, asthma, sleep apnea, depression, anxiety and premature death later in life.[21] Many of these consequences manifest during childhood while others manifest later in life. Obesity-related health conditions once thought applicable only to adults are now being seen in children with increasing frequency.[22] For example, childhood overweight and obesity can accelerate the development of heart disease leading to a heart attack or stroke at a young age. As a result of increasing prevalence of childhood obesity today's youth may even have a shorter life expectancy than their parents. [23]

There are also severe social and economic consequences of childhood obesity. Childhood obesity is associated with low self-esteem, behavior problems, peer victimization, school absenteeism and poor

[18] Petry N, Barry D, Pietrzak R, Wagner J. Overweight and Obesity Are Associated With Psychiatric Disorders: Results From the National Epidemiologic Survey on Alcohol and Related Conditions. Psychosomatic Medicine. 2009; 70(3): 288-297.
[19] Rodbard HW, Fox K, Grandy S. Impact of obesity on work productivity and role disability in individuals with and at risk for Diabetes Mellitus. American Journal of Health Promotion. 2009; 23(5):353-360.
[20] Puhl R, Heuer C. The Stigma of Obesity: A Review and Update. Obesity. 2009: 17 (5): 941-964.
[21] Daniels SR. Complications of obesity in children and adolescents. International Journal of Obesity 2009 Apr: 33 Suppl 1:S60-5.
[22] Must A, Strauss RA. Risks and consequences of childhood and adolescent obesity. International Journal of Obesity and Related Metabolic Disorders; Journal of International Association for the Study of Obesity 1999; 23 Suppl2: S2-11.
[23] Olshansky SJ, Passaro D, Hershow R, Layden J et al. A Potential Decline in Life Expectancy in the United States in the 21st Century. New England Journal of Medicine 2005 Mar; 352:1138-1145.

academic performance affecting a child's ability to succeed later in life.[24 25,26] One study estimates annual costs at $11 billion for children with private insurance and $3 billion for children enrolled in Medicaid, which translates to $6,700 per child treated for obesity with Medicaid and $3,700 with private insurance.[27]

Overweight and obesity interventions: The Centers for Disease Control and Prevention has made a number of evidence-based recommendations and community-based obesity prevention strategies that focus on supporting healthy eating and active living in many settings. Such strategies include: increasing access to supermarkets, parks, recreational facilities, and public transportation; providing incentives for local markets that sell healthy foods in underserved areas; enhancing walking and biking infrastructure; zoning for mixed use development; enhancing areas for personal and traffic safety in areas where individuals can be physically active; and locating new schools near residential areas.[28]

Addressing overweight and obesity in Orange County: The Orange County Alliance for Community Health Research (Healthier OC) is a collaboration of California State University-Fullerton, Children and Families Commission of Orange County, Orange County Health Care Agency, University of California-Irvine, and Orange County Asian Pacific Islander Community Alliance. Healthier OC represents an exciting academic-community partnership opportunity that will build upon strong collaborative relationships to improve the way health research is conducted in Orange County. One of the primary activities is a series of team-building workshops focused on the topic of overweight and obesity—both by identifying causes for disparities and effective interventions to mitigate the problem. The workshops will bring together experts in overweight and obesity—who are invested in seeing improvements in the rates of appropriate weight children and adults in Orange County—to participate and advance the knowledge and experience in community-based participatory research.

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[24] Mustillo S et al. Obesity and psychiatric disorder: developmental trajectories. Pediatrics 2003; 111(4):851-859.
[25] Bethell C et al. National, state, and local disparities in childhood obesity. Health Affairs 2010 Mar; 29 (3): 347-356.
[26] Neumark-Sztainer D, Falkner N, Story M, Perry C, Hannan P, Mulert S. Weight-teasing among adolescents: Correlations with weight status and disordered eating behaviors. International Journal of Obesity 2002 Jan; 26(1): 123-13.
[27] Marder WD, Chang S. Childhood obesity: costs, treatment patterns, disparities in care, and prevalent medical conditions. Thomson Medstat Research Brief. 2005 Retrieved at: http://www.medstat.com/pdfs/childhood_obesity.pdf
[28] Centers for Disease Control and Prevention. Recommended Community Strategies and Measurements to Prevent Obesity in the United States MMWR 2009;58(RR-7): 1-29.