Prescribing Nature for Health

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BEST CHILDREN'S HOSPITALS U.S.News & WORLD REPORT RANKED IN 8 SPECIALTIES 2013-14

MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

Children's Mercy KANSAS CITY

The Nature Prescription

- Goal: Partner parks and healthcare providers to create a bridge between medical advice to become more physically active and community based recreation systems that offer an outlet for activity
- To better engage children and youth in the Kansas City in healthy outdoor living
- Refer families to parks and that provide low to no cost methods to engage in physical activity

The Problem

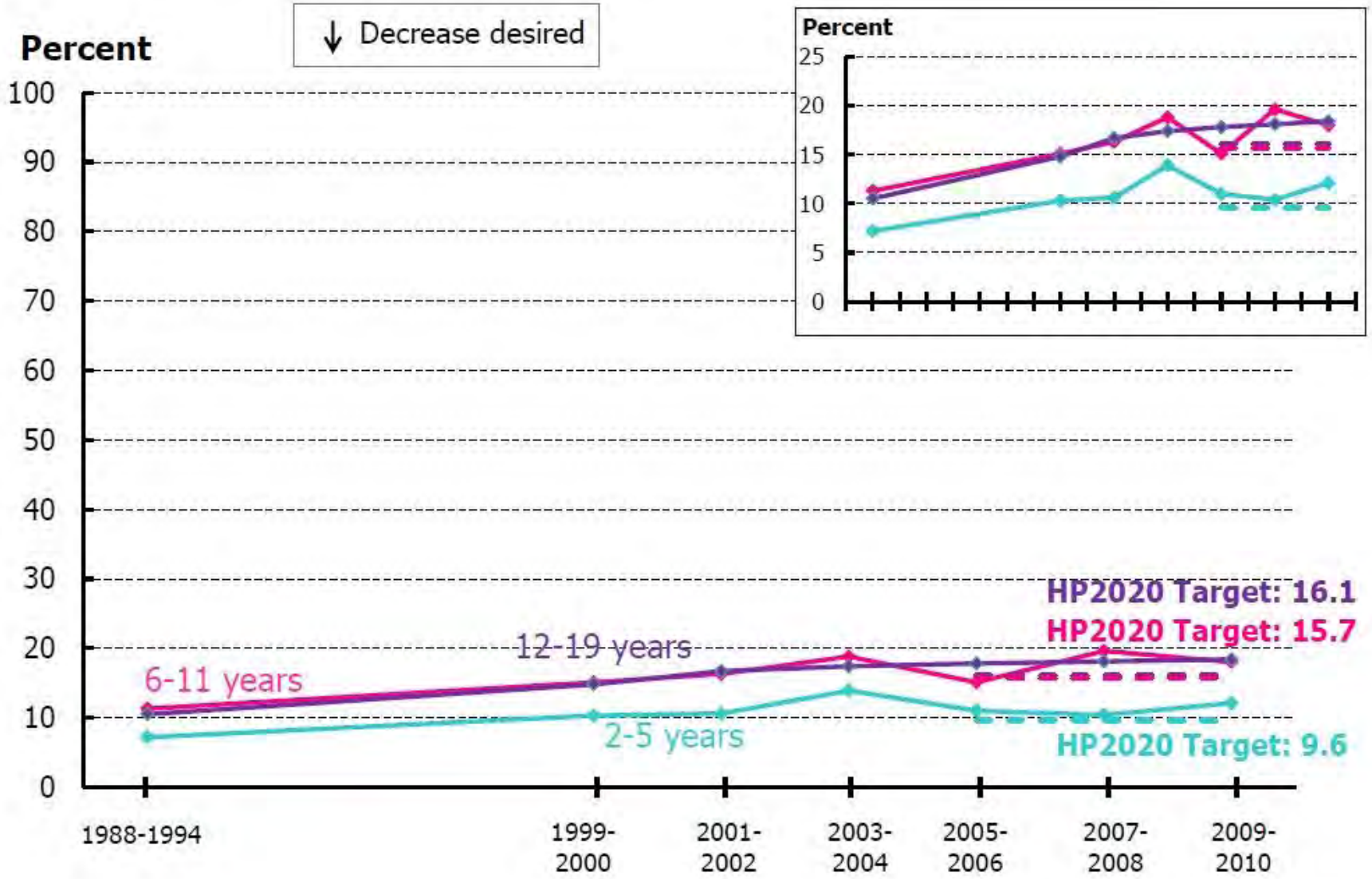
Obesity and ADHD in children

The Burden of Obesity

- Obesity
  - The rates of childhood and adolescent obesity in the United States have tripled over the past 40 years[1]
    - 16.9% of children aged 2-19 years are obese (≥95th BMI percentile)
    - 31.8 % overweight or obese (≥85th BMI percentile)[2]
- Childhood obesity predicts morbidity as an adult
  - 80% of obese youth become obese adults[3]
- Related conditions
  - Type II Diabetes
  - Hypertension

1. Ogden CL et al. JAMA, 2010, Vol. 303.
2. Ogden CL et al. JAMA, Vol. 307, pp. 483-490.
3. Whitaker RC et al. NEJM 1997;337:869-73.

Obesity among Children and Adolescents

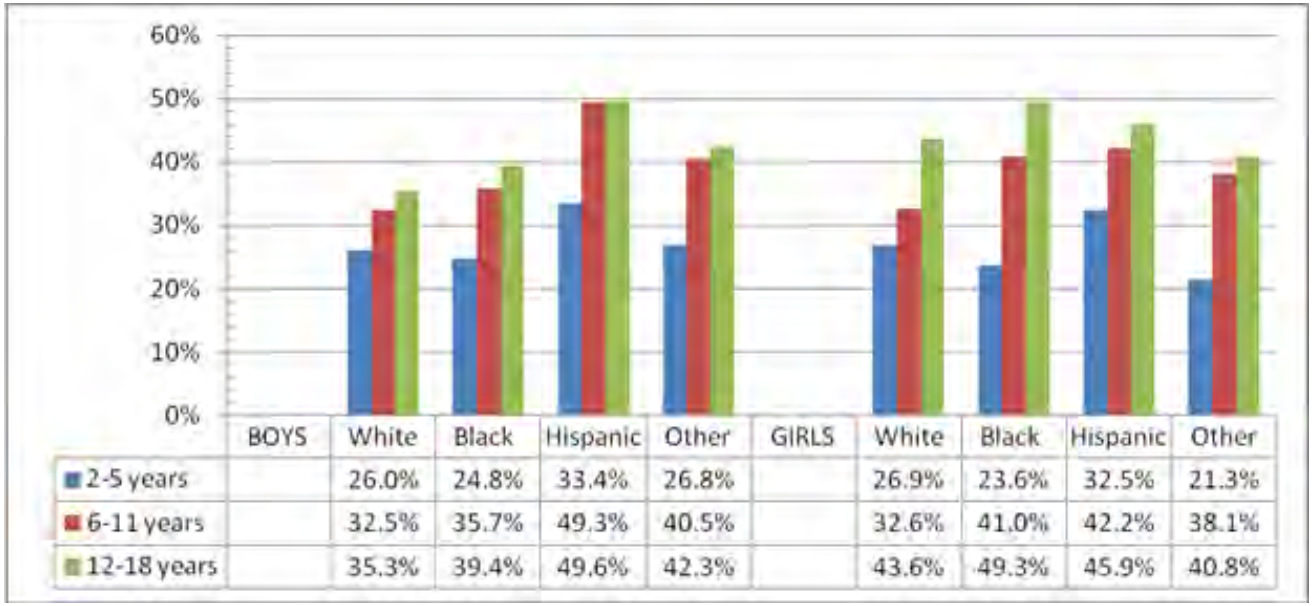


Note: Data are for the proportion of children and adolescents who are obese, defined as a BMI-for-age≥95th percentile on the sex specific 2000 CDC Growth Charts for 2-19 years. BMI is calculated based on measured height and weight.
Source: National Health and Nutrition Examination Surveys (NHANES), CDC/NCHS.

Obj. NWS-10.1-10.3

Data from Children's Mercy Clinics

- Data from 2011-2012 for 31,700 well-child visits at Children's Mercy's Clinics
- Alarmingly high rates of children overweight or obese



BOYS	White	Black	Hispanic	Other	GIRLS	White	Black	Hispanic	Other
2-5 years	26.0%	24.8%	33.4%	26.8%		26.9%	23.6%	32.5%	21.3%
6-11 years	32.5%	35.7%	49.3%	40.5%		32.6%	41.0%	42.2%	38.1%
12-18 years	35.3%	39.4%	49.6%	42.3%		43.6%	49.3%	45.9%	40.8%

FIGURE 1: Prevalence of Overweight/Obesity by Gender, Age, and Race/Ethnicity: Children's Mercy Well-Child Visits 2011-2012 (N=31,700 49.4% girls, 50.6% boys; 45.2% white, 46% Black, 30.0% Hispanic, 8.5% other; 43.7% 2-5 years, 32.8% 6-11 years, 23.6% 12-18 years)

Obesity Related Diseases

- Type 2 diabetes
  - Formerly know as adult-onset diabetes
  - ~ 25.6 million (11.3%) of all people under 20 have Type 1 or II DM[4]
  - 3,600 children under 20 were diagnosed with Type II DM yearly[5]
  - An estimated1 in 3 children born in 2000 will develop diabetes if obesity trends are not reversed[6]

4. American Diabetes Association fact sheet 2011
5. CDC national diabetes fact sheet 2011
6. Narayan KN et al. JAMA 2003: 290:1884-90

Obesity Related Diseases

- Hypertension
  - BMI <85th %ile: 2.6% of children with HTN
  - BMI ≥95th %ile: 10.7% of children with HTN[7]
- Cardiovascular disease
  - Most overweight children a risk factor for CV disease including:[8]
    - High cholesterol levels
    - Abnormal glucose tolerance
    - High blood pressure
    - High triglycerides
  - Overweight and obese children have an increased risk of coronary heart disease and early death[9]

7. Sorof J et al. *Pediatrics* 2004; 113:475-82.
8. Dietz WH. Pediatrics 1998;101:518-25.
9. McCurdy et al. *Current Problems in Pediatric and Adolescent Health Care* 2010;5:102-117.

Mental Health

- ADHD/ADD
  - Rates of ADD/ADHD in children ages 4-17[10]
    - Kansas: 10%
    - Missouri: 10.8%
  - In 2005, 5% of US children (ages 4-17) were prescribed medication for emotional or behavioral issues
    - 90% of these was treatment for ADHD symptoms[11]

10. Division of Human Developmental, State-based Prevalence Data of ADHD Diagnosis. 2012
11. Simpson et al. NCHS Data Brief 2008;8:1-8.

Mental Health

- Depression and Anxiety
  - Increasing number of medication prescriptions for children and adolescents for anxiety, depression, and behavioral issues.[12]
    - 6% of children 14-18 years diagnosed with depressive disorders
    - 3% of children younger than 13 years[13]
- Childhood Stress
  - Almost half of adolescents say their stress has increased from 2008-2009
  - 14% label their stress as extreme[14]

12. Thomas CP et al. Psychiatr Serv 2006:57:63-69
13. Costello EJ et al. J Child Psych Psyciatry 2006:47:1263-71.
14. American Psychological Assocation 2009.

Other Medical Issues

- Asthma
  - Overweight and obese children have an increased chance of developing asthma[15]
  - Link could be due to sedentary lifestyle
    - This includes links to watching TV[16] and lack of physical activity[17]
- Vitamin D Deficiency
  - 9% or 7.6 million children in the US are vitamin D deficient
  - 61% or 50.8 million children are insufficient[18]
  - Physical activity may be positively linked to vitamin D levels[19]

15. Schachter LM et al. Thorax 2001;56:4-8.
16. Rasmussen F et al. Eur Respir J 2000;16:866-70.
17. Sheriff A. Epidemiology 2008; 19:747-55.
18. Kumar J et al. NHANES 2001-04. Pediatrics 2009;124:e362-70.
19. Ohta H et al. J Bone Miner Metab 2009; 27:682-8.

Sedentary Lifestyle

- Sedentary activities that do not allow for energy expenditure have increased such as[20]:
  - watching TV
  - playing video games
  - using a computer
  - talking on the phone

20. Byun W, et al. *Pediatrics 2011*; 128(5), 937-945

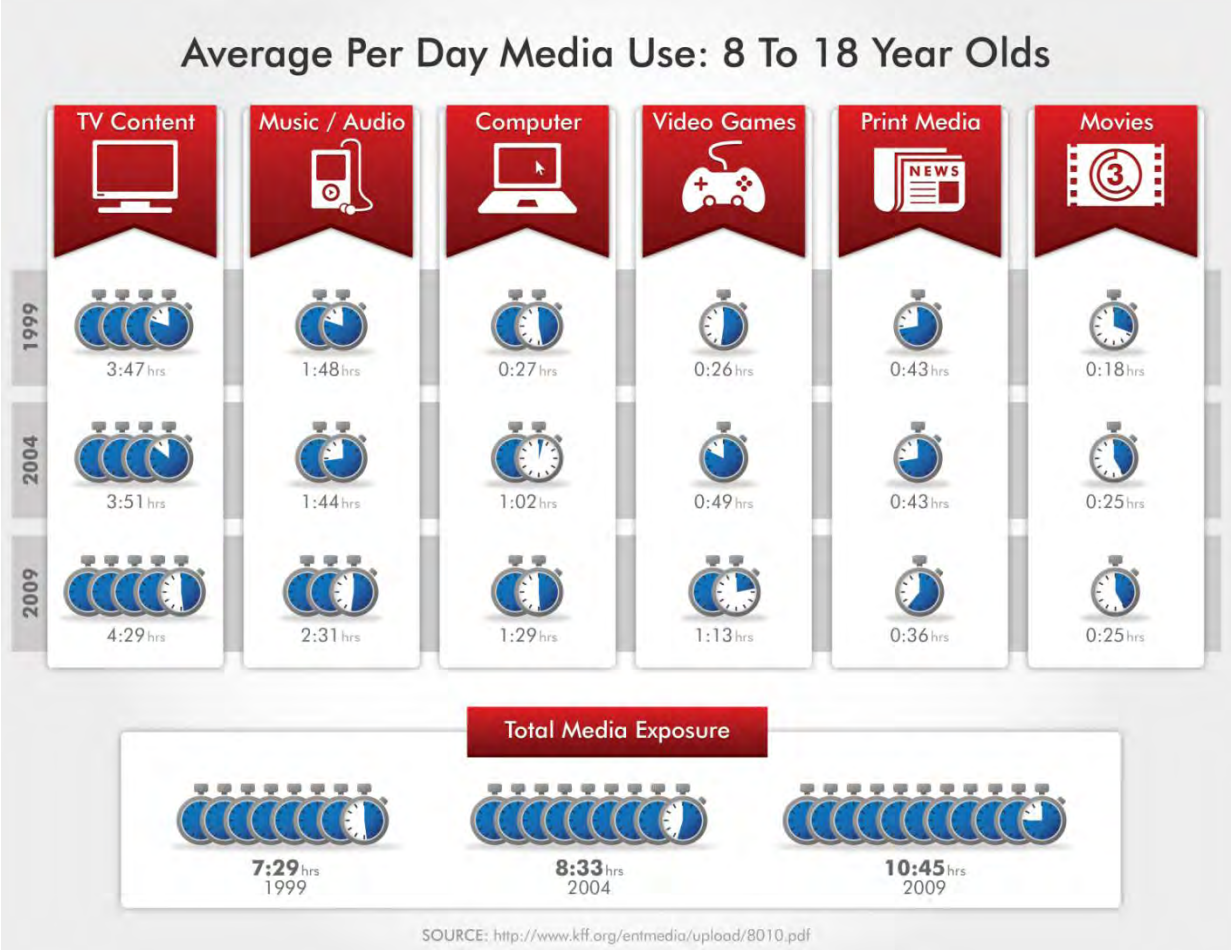
Lack of Physical Activity

- National shift in physical activity
  - Less than 3 out of 10 high school students meet the recommended 60 minutes of physical activity daily.[21]
  - In adults, 40% do not perform any physical activity during leisure time[22]
    - Children learn their habits from their parents

21. Division of Nutrition. Facts about Physical Activity 2012.
22. Center for Health Statistics. Health, United States, 2007 with Chartbook on Trends in the Health of Americans 2007.

Growth in electronic media

The use of media in children has increased roughly 44% in the past decade.



Growth in Electronic Media

- Children now have TVs in their bedroom[23]
  - 32% of 2-7 year olds
  - 65% of 8-18 years old
- Time spent in front of the TV means less time outside
- Outdoor activities have decreased 50% in children from 1981 to 2003[24]

23. Roberts DF et al. The Henry J Kaiser Family Foundation Report, 1999.
24. Juster FT et al. Un Changing Times of AmericanYouth: 1981-2003. Ann Arbor, MI: Institute for Social Research, University of Michigan, 2004

The Evidence

The health benefits of nature

Part 1: Physical Health

Time Outdoors and Physical Activity

- Time outdoors generally means more physical activity.[25]
- GPS and accelerometer study in the UK
  - Children are two to three times more likely to be physically active outdoors than indoors[26]
- Children engage in more vigorous activity outdoors than indoors[27]

25. Burdette HI, et al. Arch pediatr Adol Med 2004; 159:46-50.
26. Cooper, A. R et al. Int J Behav Nutr PhysAct 2010; 7: 31.
27. Dolinsky DH et al. PrevChronic Dis,2011; 8(6): A131.

Time Outdoors and Physical Activity

- Study among 10-12 year olds[28]
  - Every hour outdoors equates to 27 min/wk of additional physical activity in girls and 20 min/wk in boys
  - 27-41% less likely to be overweight among those who spent more time outdoors

28. Cleland HL et. Int J Obesity 2008;32:1685-93.

Parks and Physical Activity

- Higher amounts of physical activity in people who live close to a park they feel is safe[29]
- Southern California five year study
  - Children who live within 500 m of a Parks and Recreation site are less likely to be overweight or obese at age 18[30]

29. Mowen, A. J. Active Living Research, Research Synthesis
30. Wolch, J et al. Health Place, 2011; 17(1): 207-214.

Parks and Physical Activity

- Study measured moderate to vigorous physical activity over 6 days in 1556 sixth grade girls from 7 different cities[31]
  - Girls who lived ½ mile from at least one park had much higher non-school activity levels that those who did not
  - Some park features are associated with higher levels of physical activity
    - Walking paths
    - Running tracks
    - Playgrounds
    - Basketball courts
    - Street and Flood lights

31. Cohen DA et al. Pediatrics 2006. 118, 1381-89.

Natural Surroundings and Physical Activity

- Some say that outdoor play with natural elements involved, such as a hiking trail or large rocks, may have added benefits
  - May be associated with better balance, coordination, and motor strength in children[32]
- When both asphalt and green areas are provided active play changes as opposed to just asphalt[33]
  - Active play now includes imaginative and cooperative play
  - Less children are sidelined and more are involved in active play

32. Fjørtoft, I. Early childhood education journal, 2001; 29(2): 111-117.
33. Dyment, J. E., and Bell, A. C. Health Educ Res ,2008; 23(6): 952-962.

American Academy of Pediatrics

- For sustained weight loss, lifestyle-related physical activity, as opposed to calisthenics or aerobic exercise is important
- Infants, toddlers, and preschoolers should engage in unstructured outdoor play
- Children should be encouraged to play outside as much as possible[34]

34. AAP Council on Sports Medicine and Fitness and Council on School Health. Pediatrics 2006; 117:1834-42

The Evidence

The health benefits of nature

Part 2: Mental Health

Nature as a Restorative Mechanism

- Nature can influence surgery recovery[35]
  - Study compared 23 pairs of patients who had a cholecsytectomy
  - Post-surgery rooms either faced a brick wall or had a view of nature
  - Patients in a room facing natural landscapes had shorter hospitals stays post-op, took less analgesics, and had fewer negative comments from nurses

35. Ulrich RS. Science, 1984;224:420-21.

Nature's effect on Mental Wellbeing

- When compared to indoor exercise, outdoor exercise has more positive effects on wellbeing[36]
  - 11 trials compared mental wellbeing after walking outdoors and walking indoors
  - 9 of the 11 trials found improved mental wellbeing after outdoor walk
  - Revitalization, decreased tension, anger, depression, and confusion, and increased energy were all associated with outdoor exercise
  - Participants were more likely to repeat outdoor exercise

36. Thompson Coon J et al. Environ Sci Technol. 2011; **45(5):1761-72.**

Mood and Blood Pressure

- Study where subjects ran on treadmill while viewing four pictures:[37]
  - Rural pleasant, urban pleasant, rural unpleasant, and urban unpleasant
- Rural and Urban pleasant pictures led to a decrease in blood pressure and an increase in mood than just exercise alone
- Rural pleasant group had the largest decrease in blood pressure

37. Pretty J et al. Int J Environ Health Res 2005;15:319-37

Reduce Childhood Stress

- Study in 337 NY children in grades 3-5 living in rural communities[38]
  - Nature acted as an outlet to decrease stress in rural children
  - Increased exposure to natural environments equated with lower levels of stress in children
    - Also associated with a more positive self worth
  - Results even more pronounced in children who underwent the most stressful events or had the highest levels of stress

38. Wells NM, Evans GW. Environ Behav 2003;35:311-30.

Depression and Anxiety

- Study in 1,895 Australian residents[39]
  - Respondents who reported their surroundings as highly green were twice as likely to report better mental health
- Study in 345,000 resident in the Netherlands[40]
  - Lower rates of physician-diagnosed anxiety disorders in areas with more parks, agricultural lands, and other green spaces.
- Annual prevalence of physician classified depression in areas with 10% green space is 31 in 1,000 while in areas with 90% green spaces its 24 in 1,000[41]

39. Sugiyama, T et al. Epidemiol Community Health, 2008; 62(5): e9
40. Maas, J et al. Epidemiol Community Health, 2009;63(12): 967-973.
41. Ulrich, R. S et al. . Journal of environmental psychology, 1991;11(3): 201-230.

ADD/ADHD

- Study with seven 11 year olds with ADHD took walks in a neighborhood, downtown, and urban park and then took a test measuring concentration[42]
  - Concentration was better after walk through park
  - Improvement comparable to that of some ADHD medications

42. Taylor AF, Kuo FE. J Atten Disord 2009;12:402-09.

ADD/ADHD

- In a nationwide survey of 450 parents, parents rated children's ADHD level after activities as well as the greenness of the setting[43]
  - Relatively green settings had helpful effects on symptoms
  - More helpful effects than indoor settings or outdoor settings with no vegetation

43.Kuo FE, Taylor AF. Am J Public Health 2004;94:1580-6.

Nature Aiding Child Development

- Outdoor time contributes to the development of children cognitively, socially, emotionally, and educationally regardless of socio-economic status or race[44]
- AAP Clinical Report echoes these findings[45]
  - Benefits of play in children: develop healthier cognition, imagination, dexterity, and both emotional and physical strength

44. Strife, S. and Downey, L. Organ Environ, 2009;22(1): 99-122.
45. Ginsberg KR et al. Pediatrics 2007;119:182-91.

Our Solution

Prescribing the Nature Prescription

Prescribing Nature

- Ample evidence supporting nature as a way to better mental and physical health
- Children should be encouraged to play outside
- “Prescribe” nature and outdoor play for physical and mental health benefits

Who needs a nature prescription?

- It can be recommended to all patients to encourage healthy, active living
- Specific child populations may benefit including children who:
  - Are obese or are at risk for obesity
  - Spend more that 2 hours on electronics
  - Have ADD/ADHD
  - Have depression or anxiety
  - Have increased amounts of stress
  - Could benefit from outdoor activity

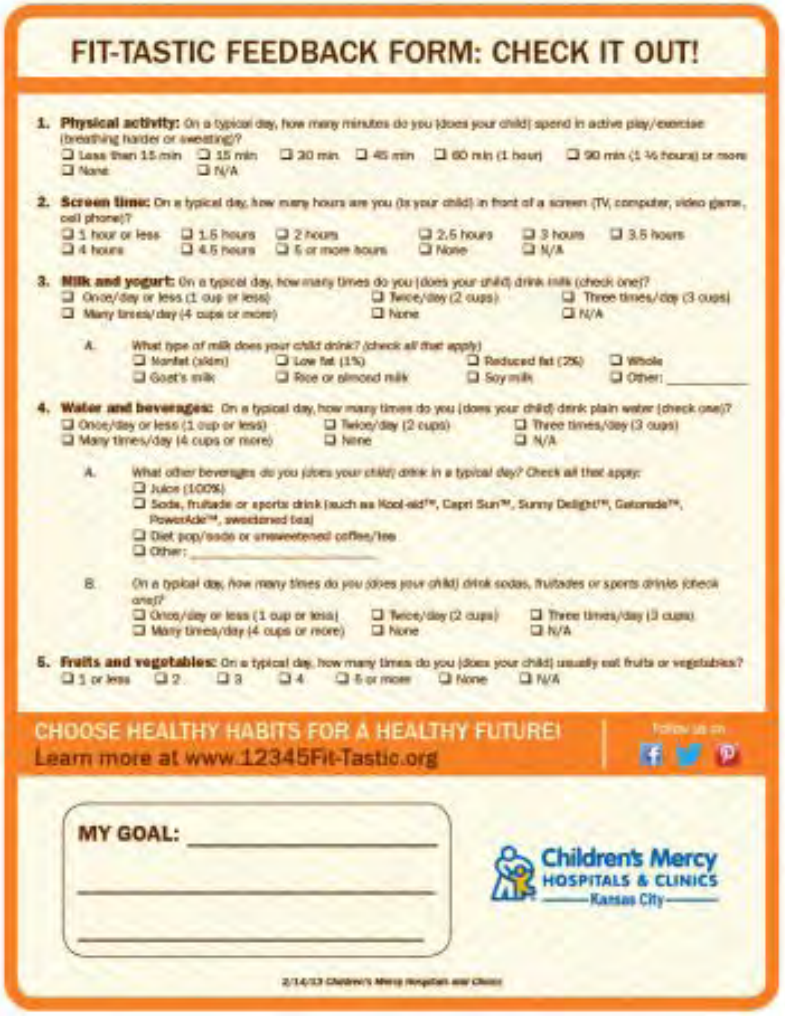
Easily added to existing practices

Easily added to existing practices

FIT-TASTIC!

CHOOSE HEALTHY HABITS FOR A HEALTHY FUTURE!

HEALTHY HABIT	BENEFITS	TIPS
1	Be active 60 minutes or more each day. Staying active can help you keep your energy up and reach or stay at a healthy weight.	• You don't have to get 60 minutes in all at once. Break it up into shorter chunks throughout the day. • Anything that makes you breathe harder and your heart beat faster is a great activity. • Plan active family time like going to the park or the zoo. • Be active with a friend.
2	Limit how much time spent watching TV, playing video games or texting means more time being active. Keep screen time to less than two hours a day.	• Start by cutting out 15 minutes a day each week to get down to less than 2 hours. • Come up with fun activities to do as a family instead of screen time. • Start a family game night or go to a nearby park or playground. • Make screen time a reward, not a daily routine.
3	Drinking milk helps make bones and teeth strong. Serve low or nonfat milk or yogurt to have with meals. Include these servings each day.	• Serve milk to drink at each meal. • Keep milk ice cold. Kids are more likely to drink it. • Use nonfat fruit flavored yogurt as dip for fruit. • Make your own smoothies by blending your favorite frozen fruit with yogurt and nonfat milk. • Layer fruit and yogurt in a tall glass to make your own parfait! Top with a sprinkle of whole grain cereal.
4	Water is best to keep your body running well and for when you are thirsty. Drink at least four glasses of water a day. Be sure to check the label on flavored waters. Many are full of added sugars.	• Serve water between meals instead of sugary drinks. • Fill reusable water bottles to bring in the car or on the go. • Drink a cup when you brush your teeth in the morning. • Keep a pitcher of water in the fridge. • Put in a slice of orange, lemon or lime to add flavor.
5	Fresh, frozen or canned fruits and vegetables are full of important vitamins, minerals, water and fiber that help keep your body healthy! Be sure to include five or more servings each day.	• Keep fruits and vegetables in sight in the refrigerator or on the counter. • Plan your meals to include fruits and vegetables. Use them to fill half your plate. • Wash and cut fruits and vegetables ahead of time for a quick snack. • Keep canned, frozen, and dried fruit on hand.



FIT-TASTIC FEEDBACK FORM: CHECK IT OUT!

1. **Physical activity:** On a typical day, how many minutes do you (does your child) spend in active play/exercise (breathing harder or sweating)?
   ❑ Less than 15 min ❑ 15 min ❑ 30 min ❑ 45 min ❑ 60 min (1 hour) ❑ 90 min (1 ½ hours) or more
   ❑ None ❑ N/A

2. **Screen time:** On a typical day, how many hours are you (is your child) in front of a screen (TV, computer, video game, cell phone)?
   ❑ 1 hour or less ❑ 1.5 hours ❑ 2 hours ❑ 2.5 hours ❑ 3 hours ❑ 3.5 hours
   ❑ 4 hours ❑ 4.5 hours ❑ 5 or more hours ❑ None ❑ N/A

3. **Milk and yogurt:** On a typical day, how many times do you (does your child) drink milk (check one)?
   ❑ Once/day or less (1 cup or less) ❑ Twice/day (2 cups) ❑ Three times/day (3 cups)
   ❑ Many times/day (4 cups or more) ❑ None ❑ N/A

   A. What type of milk does your child drink? (check all that apply)
   ❑ Nonfat (skim) ❑ Low fat (1%) ❑ Reduced fat (2%) ❑ Whole
   ❑ Goat's milk ❑ Rice or almond milk ❑ Soy milk ❑ Other: _____

4. **Water and beverages:** On a typical day, how many times do you (does your child) drink plain water (check one)?
   ❑ Once/day or less (1 cup or less) ❑ Twice/day (2 cups) ❑ Three times/day (3 cups)
   ❑ Many times/day (4 cups or more) ❑ None ❑ N/A

   A. What other beverages do you (does your child) drink in a typical day? Check all that apply:
   ❑ Juice (100%)
   ❑ Soda, fruitade or sports drink (such as Kool-aid™, Capri Sun™, Sunny Delight™, Gatorade™, PowerAde™, sweetened tea)
   ❑ Diet pop/soda or unsweetened coffee/tea
   ❑ Other: _____

   B. On a typical day, how many times do you (does your child) drink sodas, fruitades or sports drinks (check one)?
   ❑ Once/day or less (1 cup or less) ❑ Twice/day (2 cups) ❑ Three times/day (3 cups)
   ❑ Many times/day (4 cups or more) ❑ None ❑ N/A

5. **Fruits and vegetables:** On a typical day, how many times do you (does your child) usually eat fruits or vegetables?
   ❑ 1 or less ❑ 2 ❑ 3 ❑ 4 ❑ 5 or more ❑ None ❑ N/A

CHOOSE HEALTHY HABITS FOR A HEALTHY FUTURE!
Learn more at www.12345Fit-Tastic.org

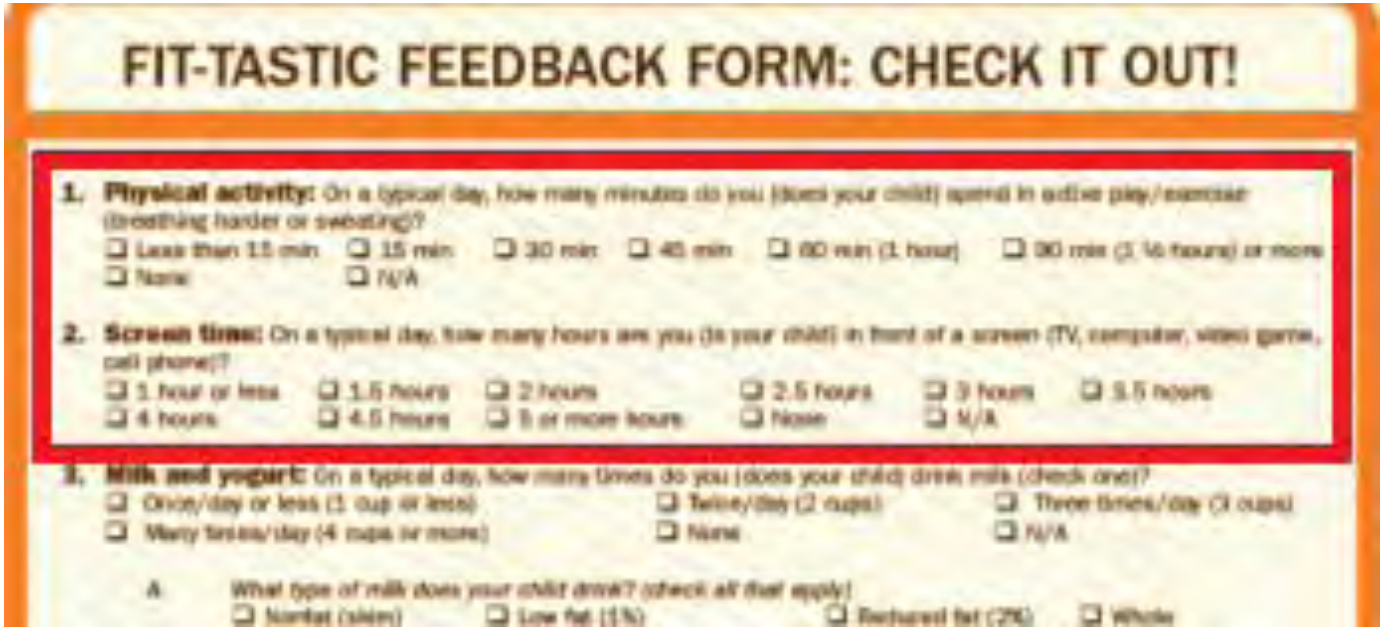
Follow us on

MY GOAL: _____

Children's Mercy HOSPITALS & CLINICS Kansas City

2/14/13 Children's Mercy Hospitals and Clinics

Prescribe the Nature Prescription when asking about Physical Activity or Screen Time



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   ❑ 1 hour or less ❑ 1.5 hours ❑ 2 hours ❑ 2.5 hours ❑ 3 hours ❑ 3.5 hours
   ❑ 4 hours ❑ 4.5 hours ❑ 5 or more hours ❑ None ❑ N/A
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   ❑ Many times/day (4 cups or more) ❑ None ❑ N/A
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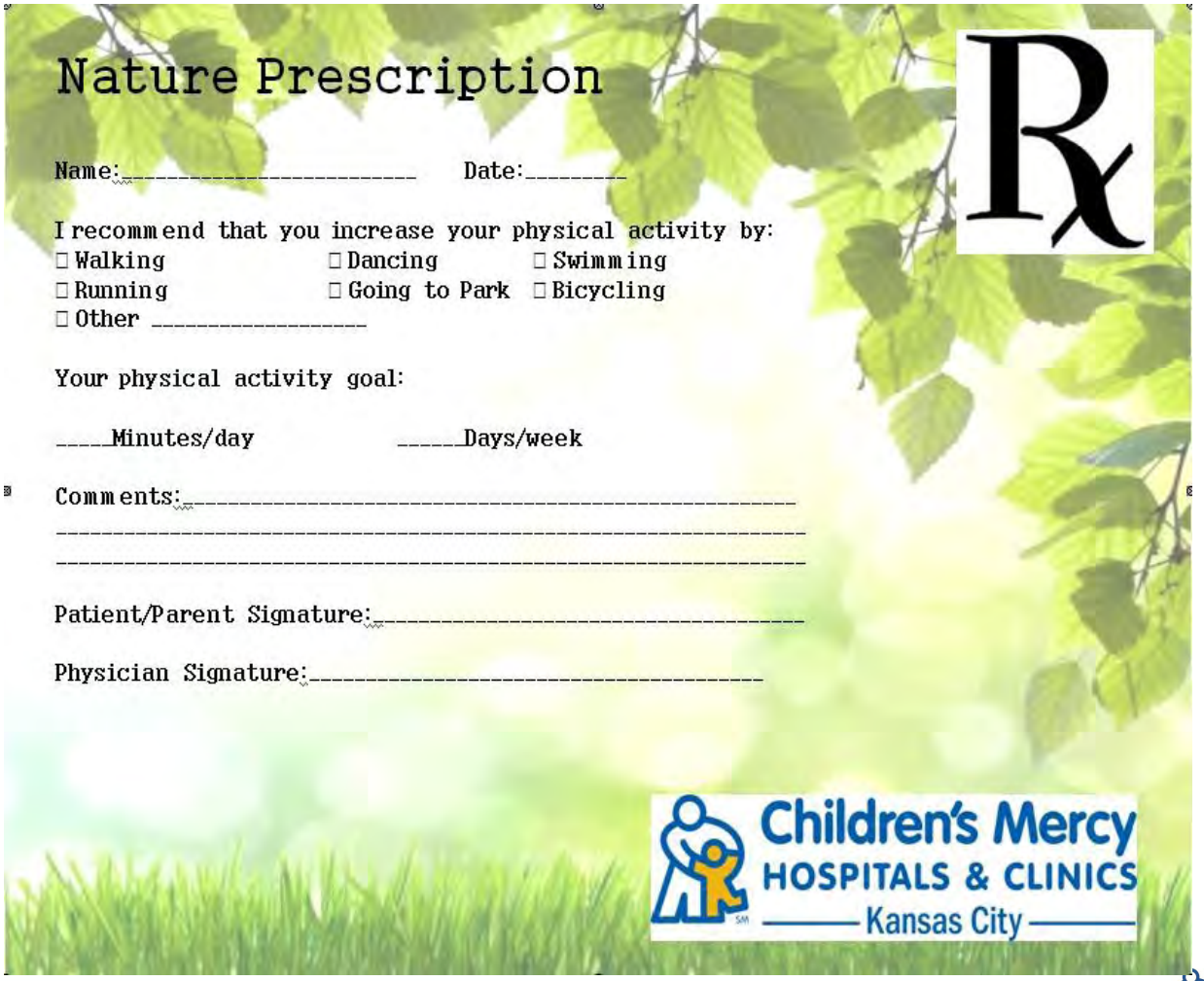
The Nature Prescription



Children's Mercy KANSAS CITY

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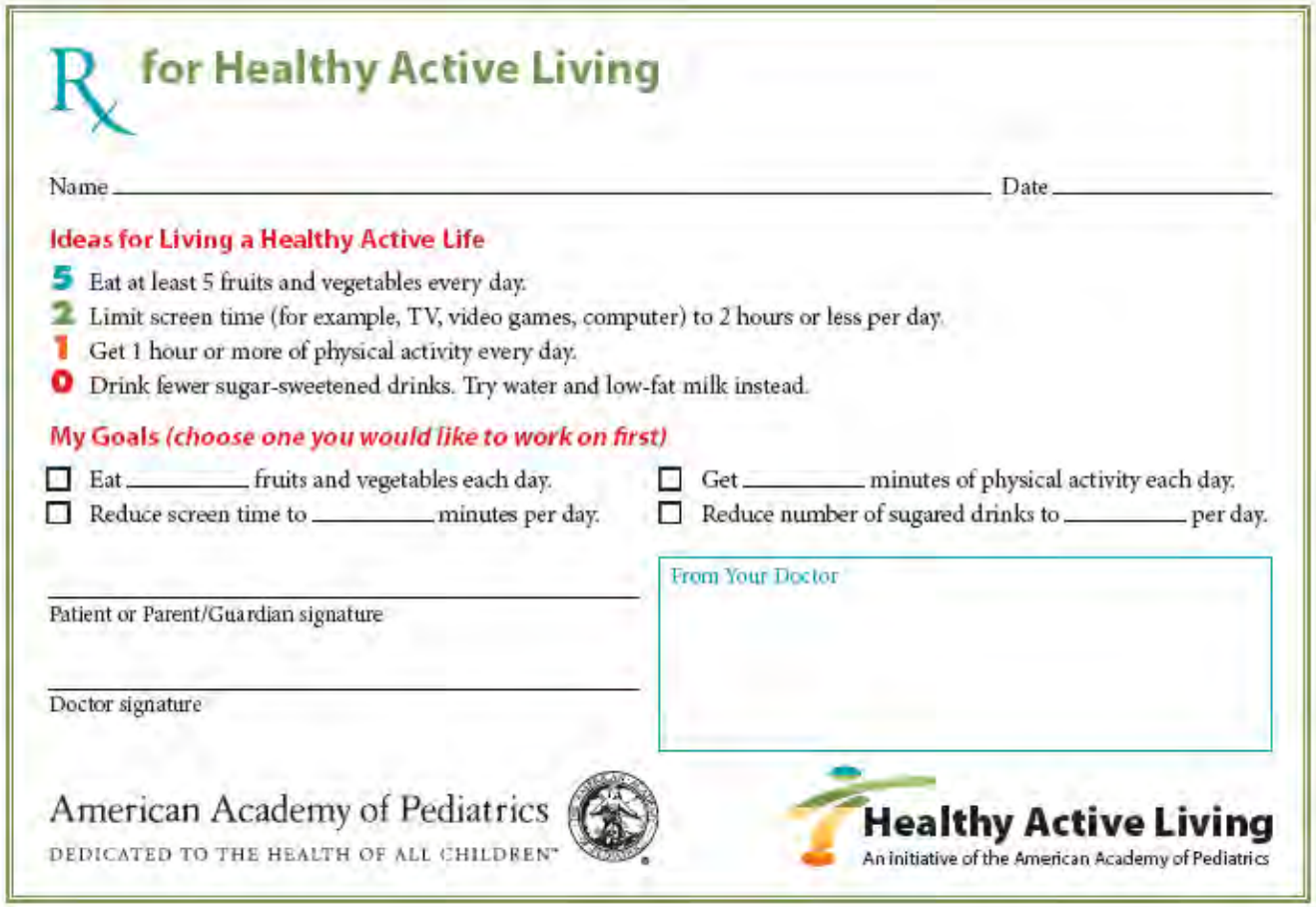


℞ for Healthy Active Living

Name _____ Date _____

Ideas for Living a Healthy Active Life

5 Eat at least 5 fruits and vegetables every day.
2 Limit screen time (for example, TV, video games, computer) to 2 hours or less per day.
1 Get 1 hour or more of physical activity every day.
0 Drink fewer sugar-sweetened drinks. Try water and low-fat milk instead.

My Goals *(choose one you would like to work on first)*

☐ Eat _____ fruits and vegetables each day.
☐ Reduce screen time to _____ minutes per day.
☐ Get _____ minutes of physical activity each day.
☐ Reduce number of sugared drinks to _____ per day.

_____
Patient or Parent/Guardian signature

_____
Doctor signature

From Your Doctor

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

Healthy Active Living
An initiative of the American Academy of Pediatrics

Physical Activity

- If the child is performing less than 60 minutes of physical activity daily, respond by asking about their barriers to physical activity, their ideas, and their motivation.
- Listen to their ideas
- Prescribe the Nature Prescription

Screen Time

- If the child spends more than two hours in front of a screen on a daily basis, you could suggest being outside in nature as an alternative.
- Listen to their ideas
- Prescribe the Nature Prescription

The Nature Prescription: A Clinical View

- See The Nature Prescription: A Clinical View for more information on how to talk to your patients about the nature prescription

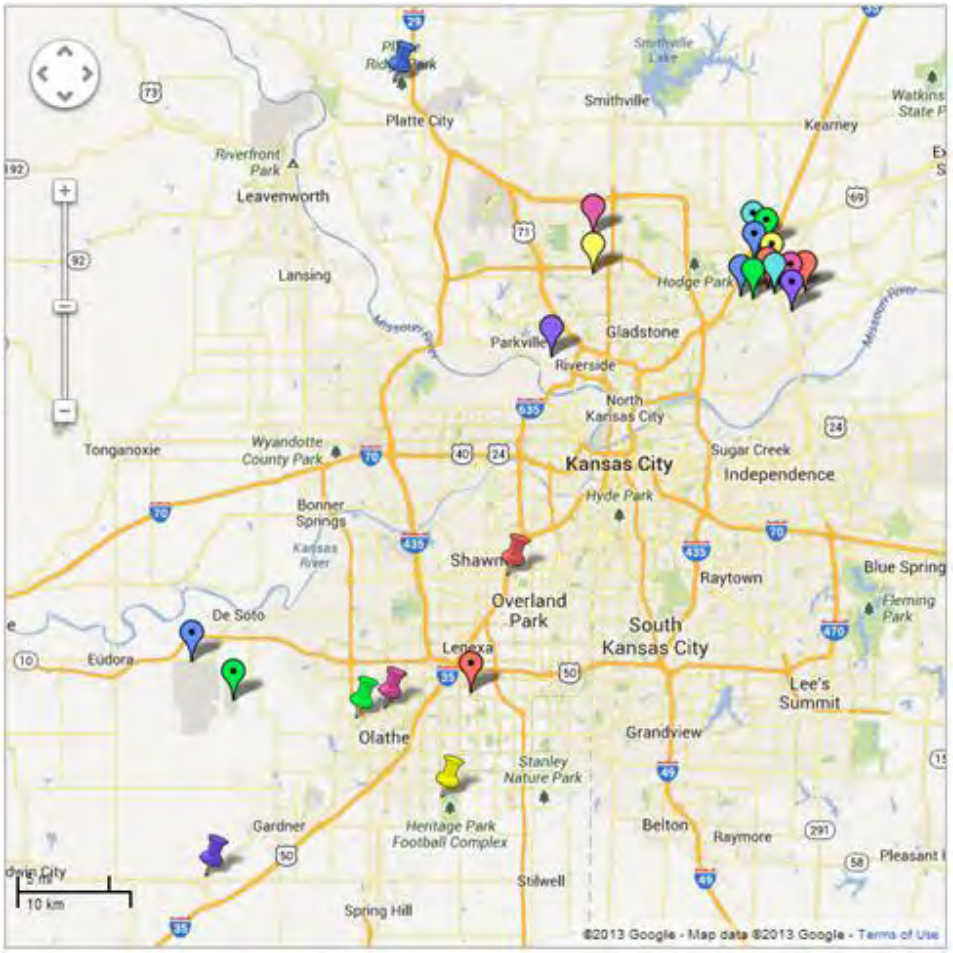
Site in Development

The Nature Prescription: A Guide for Parents and children

- See The Nature Prescription: A Guide for Parents and Children
- This will be given to patients when a nature prescription is prescribed
- It includes:
  - A list of participating park locations
  - Activity ideas
  - Safety Tips
  - A map

The Map

- Bennett Park
- City Park
- Northwyck Park
- Place Liberte Park
- Moore Park
- Clay Ridge Park
- Clay Woods and Clay Meadows Park
- Wilshire Park
- Ruth Stocksdale Park
- Westboro-Canterbury Greenway
- Jefferson Park
- Barry-Platte Park
- Green Hills of Platte Wildlife Preserve
- Platte Purchase Park
- Platte Ridge Park
- Antioch Park
- Ernie Miller Nature Park
- Heritage Park
- Mildale Farm
- Mill Creek Streamway Park
- Sunflower Nature Park
- Thomas S. Stoll Memorial Park
- Timber Ridge Adventure Center



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• American Diabetes Association. (2011, January 26). *Diabetes Statistics*. Retrieved from http://www.diabetes.org/diabetes-basics/diabetes-statistics/

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• Simpson GA, Cohen RA, Pastor PN, Reuben CA. *Use of mental health services in the past 12 months by children aged 4-17 years: United States*, 2005-2006. NCHS Data Brief 2008;8:1-8.

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