Cardiol Young 2003; 13: 551–558

ISSN 1047-9511

Original Article

Do paediatric cardiologists discuss cardiovascular risk factors with patients and their families?

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Abstract Atherosclerotic disease of the heart likely has its origins in childhood. The promotion of cardiovascular health in children, however, has been studied only for those practicing in general paediatrics. We hypothesised that paediatric cardiologists do not consistently discuss cardiovascular risk factors with patients and their families. We therefore, carried out a nationwide survey of paediatric cardiologists to determine how often they discussed atherosclerosis and 4 modifiable risk factors, specifically weight, smoking, diet and nutrition, and physical activity. Only two-fifths reported that they discussed atherosclerotic disease frequently to always. For patients with cardiovascular disease, weight was discussed frequently to always by 59%, smoking by 61%, diet and nutrition by 63%, and physical activity by 92%. In contrast, for patients without cardiovascular disease, weight was discussed frequently to always by 35%, smoking by 46%, diet and nutrition by 39%, and physical activity by 62%. These differences are statistically significant ($p < 0.003$ by χ^2 analysis). Cardiovascular risk factors were discussed more consistently as children grew older ($p < 0.0001$). Respondents stated that, in their opinion, the promotion of cardiovascular health was a role more appropriate for providers of primary care than for paediatric cardiologists ($p < 0.0001$). Constraints of time, and the perceived role of the cardiologist, were the most common barriers to anticipatory guidance. We suggest that these findings indicate that paediatric cardiologists can assume a more prominent role in preventive cardiology and education, although their precise role or roles, and the optimal methods of anticipatory guidance, remain controversial.

Keywords: Cardiovascular diseases; childhood; coronary arterial disease; health promotion; heart diseases; preventive medicine

CARDIOVASCULAR DISEASE REIGNS AS THE LEADING cause of death in the United States of America.[1–3] Coronary arterial disease, and other sequels of atherosclerosis, accounts for a large proportion of the deaths and morbidity due to cardiovascular disease.[1] Compelling evidence now supports the notion that the underlying pathological processes begin early in life.[2,4–6] The development of atherosclerosis and coronary arterial disease has been linked to several risk factors, some the result of behaviours that can be personally modified, including weight and obesity, smoking and tobacco, poor diet and nutrition, and physical inactivity.[1,2,7–13]

Despite roles for genetics and pharmaceuticals, primary prevention through the modification of lifestyle and behaviour remain the first approach for treatment.[3,14] Since risk factors, and their inciting behaviours, often begin in childhood, and are difficult to reverse once present, primary prevention early in life makes intuitive sense. In the United States of America, most of the efforts for promotion of cardiovascular health have fallen upon the providers of primary care, that is, paediatricians and family practitioners.[2,11,15,16] Paediatric cardiologists, as "heart specialists" for the children, are in a uniquely authoritative position to discuss cardiovascular health with patients and their families. Guidelines for primary prevention in childhood, aimed at both generalists and specialists, have recently been promulgated.[3] It is not known, however,

This work was supported in part by a grant from KiDS of NYU Foundation, Inc. (to CKL Phoon).

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Accepted for publication 14 July 2003

how frequently the paediatric cardiologists provide such discussion or counselling.

We hypothesised that paediatric cardiologists do not consistently provide anticipatory guidance on risk factors for coronary arterial disease or atherosclerosis. We sought, therefore, to establish, first, how often paediatric cardiologists discussed cardiovascular risk factors with patients and their families, and, second, to identify some of the factors that influenced the frequency of such discussions.

Materials and methods

Questionnaire

We designed a short questionnaire that addressed four modifiable cardiovascular risk factors, as well as several factors that influenced the decision to discuss cardiovascular risk factors with patients and their families (Table 1). The questionnaire did not address the issue of monitoring of blood pressure. Although hypertension is also a recognised risk factor for cardiovascular disease, blood pressure itself is not a behaviour that can be modified personally. Also, the questionnaire did not seek to differentiate where discussions took place along the spectrum from brief discussion of cardiovascular risk factors to in-depth counselling targetted at a patient with a clear problem, such as smoking. For the purposes of this study, "infrequently or never" was defined as less than 20% of the time, "sometimes" as 20 to 50% of the time, "frequently" as 50 to 80% of the time, and "usually or always" as 80 to 100% of the time. A "provider of primary care" was considered to be a general paediatrician, a family practitioner, or a nurse practitioner. We assumed that the age range of patients would be typical of the population seen by paediatric cardiologists, namely from the neonatal period through adolescence, and probably into young adulthood. Questions regarding habits of counselling as they related to age covered this typical range. Space was also allowed for individual comments.

The questionnaire was not designed to be comprehensive in scope, but rather, to take only 1 to 2 min to complete, in order to achieve a reasonable response rate after only one mailing. The questionnaire underwent additional review and revision after pilot testing within the Pediatric Cardiology Program at New York University Hospitals Center. It was coded purely for the purposes of keeping track of responders, but the survey was otherwise anonymous.

Study population

The questionnaire, with a cover letter and a stamped return envelope, was sent to each of the 540 Fellows of the American Academy of Pediatrics listed as members of the Section on Cardiology, at the time of a single mass mailing in April 2001. At this time, members of the Section had achieved board certification in Paediatrics, with subboard certification in Paediatric Cardiology. Cardiothoracic surgeons were not included among the membership.

Statistics

Chi square analysis was performed for categorical data, using Sigma Stat v1.0 (Jandel Corporation, San Rafael, CA). Not all respondents answered every question, so denominators used to calculate data varied slightly. We achieved denominators of at least 200 in all cases. All data presented are rounded to the nearest whole number, so that not all values add up to 100%. A p value of less than 0.05 was considered statistically significant.

Results

We received responses from 214 paediatric cardiologists, two-fifths of those mailed. Only 40% of those

Table 1. The survey questionnaire.

Anticipatory guidance questionnaire

(1) How often do you discuss atherosclerosis with your patients and their families?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

(2) Regarding your patients **with** significant cardiovascular problems (structural heart anomalies, arrhythmias, etc.), how often do you discuss:

– WEIGHT?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– SMOKING/TOBACCO?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– DIET and NUTRITION?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

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Table 1. Continued.

– PHYSICAL ACTIVITY?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

(3) Regarding your patients **without** significant cardiovascular problems (innocent murmurs, non-cardiac chest pain, non-cardiac syncope, etc.), how often do you discuss:

– WEIGHT?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– SMOKING/TOBACCO?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– DIET and NUTRITION?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– PHYSICAL ACTIVITY?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

(4) How often do you provide anticipatory guidance for risk factors of atherosclerosis to:

– FAMILIES of BABIES/TODDLERS?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– SCHOOL AGE CHILDREN?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

– ADOLESCENTS?

a. infrequently or never (<20%)	b. sometimes (20–50%)	c. frequently (50–80%)	d. usually or always (>80%)

(5) How important do you think it is for a *pediatric cardiologist* to discuss with their patients:

– WEIGHT?

a. not important	b. somewhat important	c. very important	d. extremely important

– SMOKING/TOBACCO?

a. not important	b. somewhat important	c. very important	d. extremely important

– DIET and NUTRITION?

a. not important	b. somewhat important	c. very important	d. extremely important

– PHYSICAL ACTIVITY?

a. not important	b. somewhat important	c. very important	d. extremely important

(6) How important do you think it is for a *primary care provider* (pediatrician, family practitioner, nurse practitioner) to discuss with their patients:

– WEIGHT?

a. not important	b. somewhat important	c. very important	d. extremely important

– SMOKING/TOBACCO?

a. not important	b. somewhat important	c. very important	d. extremely important

– DIET and NUTRITION?

a. not important	b. somewhat important	c. very important	d. extremely important

– PHYSICAL ACTIVITY?

a. not important	b. somewhat important	c. very important	d. extremely important

(7) With what mode(s) of communication do you use to discuss anticipatory guidance?

a. verbal	b. audio	c. video	d. literature/pamphlet
e. other_____	f. none		

(8) If you do not consistently discuss atherosclerotic risk factors, why not? (circle all that apply)

a. this is not a primary/important role of the pediatric cardiologist
b. time constraints
c. my knowledge base of risk factors would not provide for effective counselling
d. never considered providing anticipatory guidance
e. other (specify)

(9) If a pamphlet were readily available to you at low/no cost to help with counselling, would you use it?

a. not likely	b. somewhat	c. very likely

(10) Additional comments:

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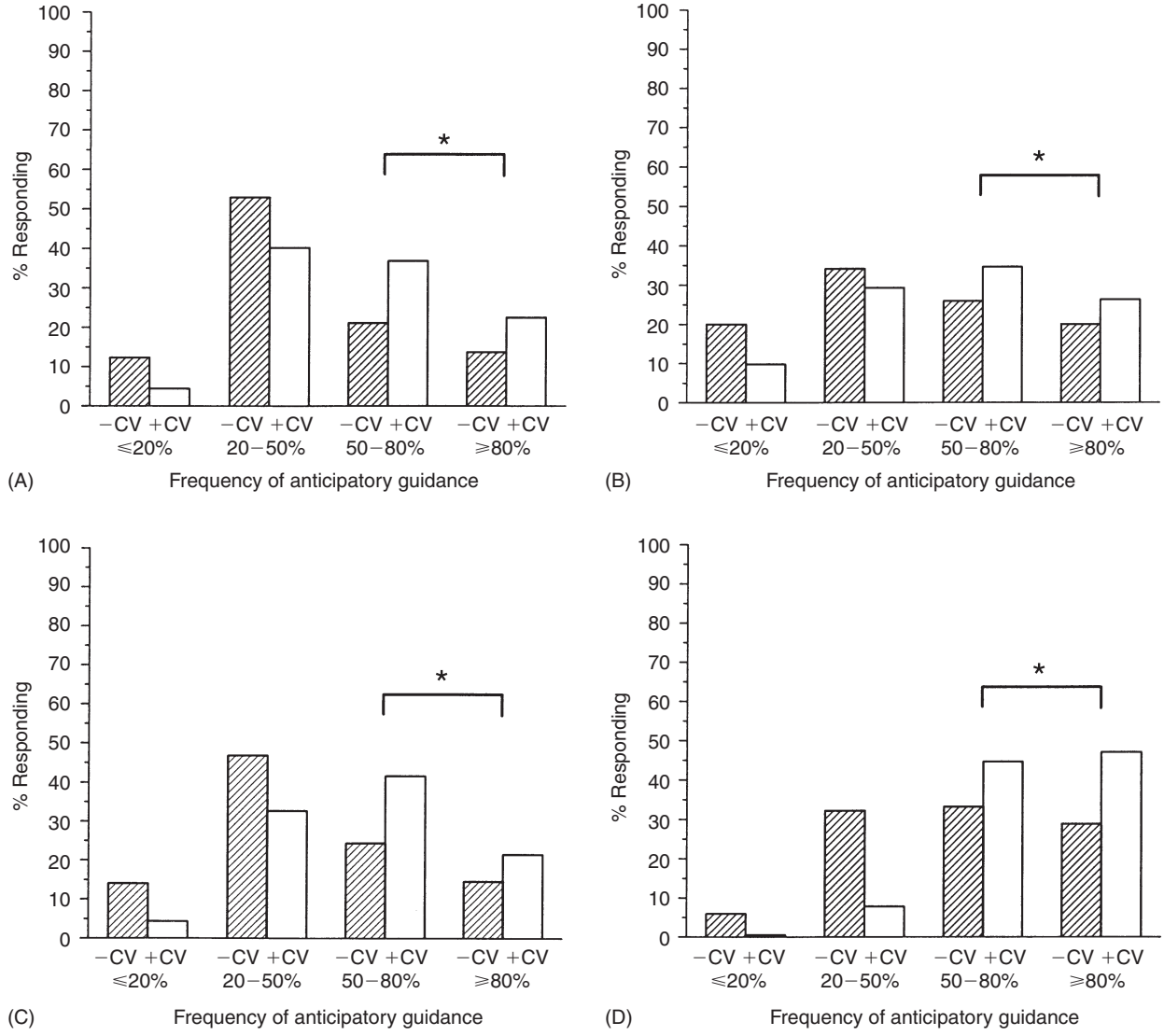

Figure 1.
*The proportion of paediatric cardiologists providing anticipatory guidance on different cardiovascular risk factors. The x-axes depict whether or not the patients had a cardiovascular problem (+CV, −CV), as well as the frequency of counselling. We deemed counselling to be infrequently or absent when the response was less than or equal to 20%; sometimes from 20 to 50%; frequently from 50 to 80%; and usually or always when the response was at least 80% of the time. Panel A: counselling about weight; Panel B: smoking; Panel C: diet and/or nutrition; Panel D: physical activity. *Paediatric cardiologists more often discussed cardiovascular risk factors frequently or always when a patient had a cardiovascular problem ($p < 0.005$, +CV versus −CV for combined data in 50–80% and ⩾80% columns).*

responding reported discussing atherosclerotic risk factors frequently or always, that is more than half of the time, with patients and their families.

Paediatric cardiologists discussed all four modifiable aspects of lifestyle more consistently when a patient had some form of cardiovascular problem (Fig. 1). In the presence of cardiovascular disease, weight was discussed frequently or always by 59% of respondents, as opposed to 35% in the absence of cardiovascular disease ($p < 0.0001$). Smoking, or the use of tobacco, was discussed by 61%, as opposed to 46% ($p < 0.005$). The comparable figures for diet and nutrition were 63% versus 39% ($p < 0.0001$), and for physical activity were 92% versus 62% ($p < 0.0001$).

Paediatric cardiologists discussed risk factors least with families of infants or toddlers, with increasing time spent with older children and adolescents ($p < 0.0001$; Fig. 2).

Overall, respondents stated that they considered the promotion of cardiovascular health to be a more important role for providers of primary care than for paediatric cardiologists (Fig. 3). Only 17% of respondents thought that it was "extremely" important for paediatric cardiologists to discuss weight, 38% for smoking and tobacco, 19% for diet and nutrition,

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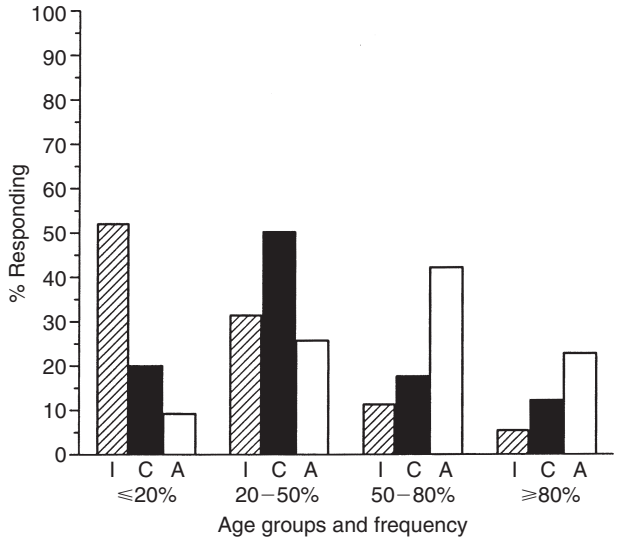

Figure 2.
The influence of age on anticipatory guidance. The hatched columns ("I") represent infants; black columns ("C") represent school-aged children; and white columns ("A") represent adolescents. There was a significant ($p < 0.0001$) difference in anticipatory guidance with respect to age; most families of infants were counselled infrequently, and the frequency of counselling increased with increasing age. Frequency of counselling on x-axis is as in Figure 1.

and 36% for physical activity. In contrast, 59% of respondents thought that it was "extremely" important for providers of primary care to discuss weight, 72% for smoking and tobacco, 59% for diet and nutrition, and 59% for physical activity. For all four of the risk factors, these differences are statistically significant ($p < 0.0001$). Even when we combined the categories of responses, significantly fewer respondents felt that it was "very" or "extremely" important for the paediatric cardiologist rather than the provider of primary care to discuss these cardiovascular risk factors ($p < 0.0001$). The only exception was for physical activity, for which the gap narrowed to 90% for paediatric cardiologists and 95% for providers of primary care ($p = 0.095$).

When citing reasons for not consistently discussing risk factors for coronary arterial disease or atherosclerosis, 35% of respondents reported constraints of time, while 17% of respondents did not feel that such anticipatory guidance was an important role for paediatric cardiologists. An insufficient base of knowledge was cited by 5%, while 4% never considered anticipatory guidance on cardiovascular disease. An additional 7% of the respondents listed "other" reasons (see below).

General categories of specific comments, and representative comments, mirrored the responses above, but provided additional insight into habits of counselling (Table 2). Clinical practices, and interests, varied widely. Whereas some respondents provided very little anticipatory guidance, others undertook universal screening and counselling, or ran lipid clinics. Several respondents felt the questionnaire was misleading with regards to the willingness to discuss cardiovascular risk factors, since our survey did not account for differences based on family history, or the presence of risk factors such as obesity. Several respondents raised the lack of reimbursement for preventive efforts as a barrier to anticipatory guidance. Some paediatric cardiologists were further subspecialised in their practices, such as critical care cardiology or invasive electrophysiology, for which anticipatory guidance on cardiovascular risk factors was not felt to be appropriate.

Of those responding, 93% claimed that they would be "somewhat likely" (39%) or "very likely" (53%) to use a free or inexpensive pamphlet for counselling, if such a resource were made available.

Discussion

Our results suggest that paediatric cardiologists do not consistently promote the benefits of cardiovascular health to their patients and their families. These findings raise some interesting issues, since it is now felt that a concerted effort by the healthcare profession must be made early in life to help stem the epidemic of diseases related to atherosclerosis.[2,3,16] To our knowledge, our study is the first to explore the preventive practices of paediatric cardiologists regarding atherosclerosis and coronary arterial disease.

Factors influencing provision of counselling

Cardiovascular risk factors were more often discussed when patients had cardiovascular problems. Patients with significant cardiac disease, or the sequels of surgical treatment, are restricted in their activity, are intolerant to exercise, or obese, all factors that draw attention to aspects of lifestyle such as activity and weight. It is also possible that atherosclerosis is still not considered to represent a "disease" in children who are healthy. Still, even in the presence of cardiovascular disease, the rates of anticipatory guidance among paediatric cardiologists appeared lower than those reported among general paediatricians.[17,18] This is disturbing, since the combination of atherosclerotic cardiac disease with structural heart disease is likely to result in higher rates of complication. Specific comments also suggested that, consistent with prior recommendations, paediatric cardiologists discussed risk factors more often when the family history suggested the patient was at added risk.[19] Our study, however, was not designed specifically to assess this influence.

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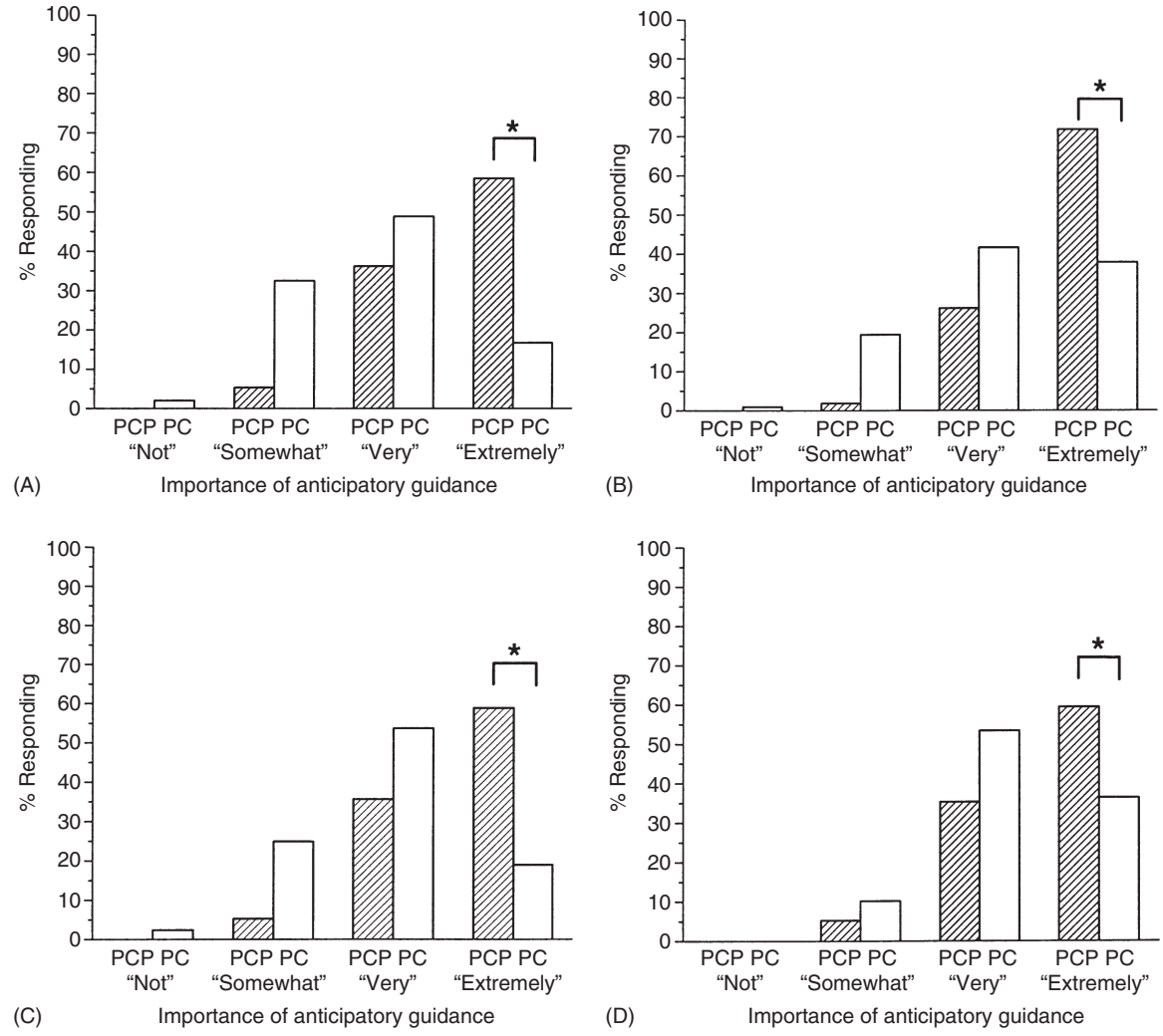

Figure 3.
The perceived role of providers of primary care ("PCP") versus paediatric cardiologists ("PC") in promoting cardiovascular health. The x-axes depict how important respondents felt it was for either the provider of primary care or the paediatric cardiologist to provide counselling ("Not", "Somewhat", "Very", or "Extremely" important). Panel A: counselling about weight; Panel B: smoking; Panel C: diet and/or nutrition; Panel D: physical activity. $^{*}p < 0.0001$ *between the groups in the "extremely important" category. It can be seen from the shifts in the graph across all categories, however, that more respondents felt that it was a more important role for providers of primary care to promote cardiovascular health than for paediatric cardiologists so to do.*

Table 2. Specific and representative comments of respondents.

General category	Representative comment(s)
Selective counselling	"When I see children with risk factors, I focus on those. However, I rely on primary care providers to do more anticipatory guidance."
Questionable value at a single visit	"A single visit of an infant or child with innocent murmur or chest pain provides no useful opportunity." "For patients with one time encounters, … there is no opportunity for reinforcing the message."
Questionable preventive value	"The question remains, does intervention at this age have a significant impact." "Patients and families are influenced by the media and peers and minimally by their doctor, I believe." "… Many of the parents are overweight, smoke, drink, and fast foods are a way of life. … Many of the issues addressed in this survey are not going to be relevant to change."
Complicates/clouds main issues	"Sometimes the other cardiac issues are very important. … There is no room for bombarding patients and families with additional info." "Parents referred for evaluation of infant with murmur are often very stressed about visit and probably not interested in discussing atherosclerotic risk factors."

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Our data also indicated that younger patients, and families with young children, received anticipatory guidance far less frequently, a finding consistent with previous surveys of general paediatricians[17,18] and nurse practitioners.[20] Practitioners apparently feel that it is inappropriate to initiate such discussion in this age group. Mounting evidence suggests otherwise. Although long-term efficacy is unproven, even a brief intervention of less than 5 min during a paediatric ambulatory visit may impact positively on smoking by mothers[21] or adolescents.[16] Given the influence of parental smoking on the initiation of smoking by children and adolescents, some investigators now feel that advice to parents against smoking should be provided early in the life of the child.[3,12] Moreover, it takes time, and substantial effort, for parents to modify their own behaviours.[16,22] Thus, it should be appreciated that repetitive, universal, age-blind anticipatory guidance is directed not only toward the child, but importantly, also toward the parents and the rest of the family.

Barriers to cardiovascular anticipatory guidance discovered in our study included the constraints of time, and the lack of reimbursement for preventive services, findings also reported by others.[15,23,24] Many respondents felt that cardiovascular anticipatory guidance was more in keeping with the role of the generalist. Notably, some one-tenth of respondents either felt they possessed an inadequate base of knowledge, or else did not think to provide anticipatory guidance concerning cardiovascular health. Others have also recognised that specialists perceive their role as being limited to addressing the chief complaint.[25] Contributing to such perceptions may be the minimal emphasis during training on preventive cardiology, as evidenced by the outline of content for the subspecialty certifying examination of the American Board of Pediatrics.[26] Paediatric cardiologists deal mostly with congenital cardiac malformations. We agree that the focus of a visit should be directed appropriately, and that the main issue should not be clouded when dealing with a child with cardiac disease. In such cases, nonetheless, we will typically defer discussion of cardiovascular risk factors to a subsequent, routine follow-up visit, so as not to "overload" families with information. Our anecdotal experience does indicate that families are very receptive to discussions about cardiovascular risk factors, even at a single visit for, say, an innocent cardiac murmur.

Our results suggest that, if it were available, most cardiologists would provide simple, concise self-help literature to patients and their families. Studies suggest that even simple advice appears consistently to help people stop smoking.[22] We should note that we do not advocate a "zealot" approach, a concern raised by some respondents, but rather believe that the modification of risk factors is an achievable goal in at least some patients and their families, while at the same time "keeping kids kids", as we were urged by one respondent.

What is the role of the paediatric cardiologist?

The role of a paediatric cardiologist in the promotion of general cardiovascular health is controversial and ill-defined. It is not known whether primary prevention early in life will reduce the toll later in life from atherosclerosis and coronary arterial disease. In part, we hope that our data will stimulate more discussion about the role of the paediatric cardiologist in preventive cardiology. Our bias is that it is highly appropriate for the paediatric cardiologist to embrace the role of a "champion" of preventive cardiology, as advocated recently for adult cardiologists at the 33rd Bethesda Conference on Preventive Cardiology,[25] even when adults are overtly free of cardiovascular disease.[16]

Clearly, the extent of any such role may vary in different practices. For example, a brief discussion of cardiovascular risk factors, or simple anticipatory guidance, requires far less time, involvement, and resources than does directed counselling.

Limitations

Although in the typical range for published surveys of physicians,[27–29] our response rate of 40% raises the possibility of selection bias, so that the results should be interpreted with caution. We feel, nonetheless, that the number of responses was adequate to address our hypothesis. A low response rate does not necessarily indicate bias, nor does a high rate of response ensure against bias.[27] Recent studies have shown that the demographic variables of nonresponders do not differ significantly from those of responders.[28,30] Moreover, a similar previous survey of general paediatricians showed that those responding early and late did not differ in their responses.[17] Furthermore, nonresponders likely provide less anticipatory guidance on cardiovascular risk factors, and responders typically overestimate the frequency of preventive counselling.[30,31] Significant bias towards nonresponders, therefore, should skew the data toward arguing against our hypothesis.

Our sample pool may not accurately represent the entire cohort of approximately 1500 practicing paediatric cardiologists in the United States of America. It is also the case that we are unjustified in extrapolating these results to the global community of paediatric cardiologists. Our results are also based on responses, which have not been validated as real practice. Still, our findings are entirely consistent with personal impressions from the community at large.

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Conclusion

We conclude, therefore, that paediatric cardiologists can assume a more prominent role in promoting "heart-healthy" lifestyles in their patients and families. The challenges that lie ahead include more clearly defining their role in prevention, improving the training in preventive cardiology, facilitating the education of patients, and assessing the impact of early promotion of cardiovascular health on future cardiovascular morbidity.

Acknowledgements

We thank all of the respondents for their input and insights. We also thank Ms Lynn Colegrove of the American Academy of Pediatrics, Section on Cardiology (now the Section on Cardiology and Cardiac Surgery), for her help with contacting the Fellows of the Section and with the mailing. We thank Dr Michael Artman for his critical review of the manuscript. This paper was presented in part at the Pediatric Academic Societies/Society for Pediatric Research Annual Meeting, May, 2002, in Baltimore, Maryland, United States of America.

References

1. American Heart Association. 2002 Heart and Stroke Statistical Update. American Heart Association, Dallas, TX, 2001.
2. Williams CL, Hayman LL, Daniels SR, et al. Cardiovascular health in childhood. A statement for health professionals from the Committee on Atherosclerosis, Hypertension, and Obesity in the Young (AHOY) of the Council on Cardiovascular Disease in the Young, American Heart Association. Circulation 2002; 106: 143–160.
3. Kavey R-EW, Daniels SR, Lauer RM, Atkins DL, Hayman LL, Taubert K. American Heart Association guidelines for primary prevention of atherosclerotic cardiovascular disease beginning in childhood. Circulation 2003; 107: 1562–1566.
4. Strong JP, Malcolm GT, McMahan CA, et al. Prevalence and extent of atherosclerosis in adolescents and young adults: implications for prevention from the Pathobiological Determinants of Atherosclerosis in Youth Study. JAMA 1999; 281: 727–735.
5. Owen CG, Whincup PH, Odoki K, Gilg JA, Cook DG. Infant feeding and blood cholesterol: a study in adolescents and a systematic review. Pediatrics 2002; 110: 597–608.
6. McGill HC Jr, McMahan CA, Herderick EE, Malcolm GT, Tracy RE, Strong JP, for the Pathobiological Determinants of Atherosclerosis in Youth (PDAY) Research Group. Origin of atherosclerosis in childhood and adolescence. Am J Clin Nutr 2000; 72 (Suppl): 1307S–1315S.
7. Deckelbaum RJ, Fisher EA, Winston M, et al. Summary of a scientific conference on preventive nutrition: pediatrics to geriatrics. Circulation 1999; 100: 450–456.
8. Berenson GS, Srinivasan SR. Emergence of obesity and cardiovascular risk for coronary artery disease: The Bogalusa Heart Study. Prev Cardiol 2001; 4: 116–121.
9. Livingstone MBE. Childhood obesity in Europe: a growing concern. Publ Health Nutr 2001; 4(1A): 109–116.
10. Kromhout D, Menotti A, Kesteloot H, Sans S. Prevention of coronary heart disease by diet and lifestyle. Evidence from prospective cross-cultural, cohort, and intervention studies. Circulation 2002; 105: 893–898.
11. Van Horn L, Greenland P. Prevention of coronary artery disease is a pediatric problem. JAMA 1997; 278: 1779–1781.
12. Jackson CL, Henriksen L, Dickinson D, Messer L, Robertson SB. A longitudinal study predicting patterns of cigarette smoking in late childhood. Health Educ Behav 1998; 25: 436–447.
13. Bauman KE, Carver K, Gleiter K. Trends in parent and friend influence during adolescence. The case of adolescent cigarette smoking. Addict Behav 2001; 26: 349–361.
14. Meininger JC, Hayman LL, Coates PM, Gallagher PR. Genetic and environmental influences on cardiovascular disease risk factors in adolescents. Nurs Res 1998; 47: 11–18.
15. Barlow SE, Dietz WH. Management of child and adolescent obesity: summary and recommendations based on reports from pediatricians, pediatric nurse practitioners, and registered dieticians. Pediatrics 2002; 110: 236–238.
16. Pearson TA, Blair SN, Daniels SR, et al. AHA guidelines for primary prevention of cardiovascular disease and stroke: 2002 update. Consensus panel guide to comprehensive risk reduction for adult patients without coronary or other atherosclerotic vascular diseases. Circulation 2002; 106: 388–391.
17. Nader PR, Taras HL, Sallis JF, Patterson TL. Adult heart disease prevention in childhood: a national survey of pediatricians' practices and attitudes. Pediatrics 1987; 79: 843–850.
18. Galuska DA, Fulton JE, Powell KE, et al. Pediatrician counseling about preventive health topics: results from the Physicians' Practices Survey, 1998–1999. Pediatrics 2002; 109: e83. URL: http://www.pediatrics.org/cgi/content/full/109/5/e83.
19. Lauer RM. Role of family history and family testing in cardiovascular risk assessment. Am J Med 1999; 107(2A): 14S–15S.
20. Jessup AN, Harrell JS. Promotion of cardiovascular health in children by nurse practitioners and physicians in family practice. J Am Acad Nurse Pract 1996; 8: 467–475.
21. Wall MA, Severson HH, Andrews JA, Lichtenstein E, Zoref L. Pediatric office-based smoking intervention: impact on maternal smoking and relapse. Pediatrics 1995; 96 (4 Pt 1): 622–628.
22. Lancaster T, Stead L, Shepperd S. Helping parents to stop smoking: which interventions are effective? Paediatr Resp Rev 2001; 2: 222–226.
23. Williams RG, Kennedy TL, Moller JH. Pediatric cardiology in the 1990s. J Am Coll Cardiol 1994; 23: 977–980.
24. Story MT, Neumark-Stzainer DR, Sherwood NE, et al. Management of child and adolescent obesity: attitudes, barriers, skills, and training needs among health care professionals. Pediatrics 2002; 110: 210–214.
25. Merz CNB, Mensah GA, Fuster V, Greenland P, Thompson PD. Task Force #5 – The role of cardiovascular specialists as leaders in prevention: from training to champion. J Am Coll Cardiol 2002; 40: 641–651.
26. The American Board of Pediatrics, Subspecialty Certifying Examination Content Outline, Subboard of Pediatric Cardiology. http://www.abp.org/frsubpol.htm, accessed 7/9/2003.
27. Asch DA, Jedrziewski MK, Christakis NA. Response rates to mail surveys published in medical journals. J Clin Epidemiol 1997; 50: 1129–1136.
28. Kellerman SE, Herold J. Physician response to surveys. A review of the literature. Am J Prev Med 2001; 20: 61–67.
29. Trowbridge FL, Sofka D, Holt K, Barlow SE. Management of child and adolescent obesity: study design and practitioner characteristics. Pediatrics 2002; 110: 205–209.
30. Pérez-Stable EJ, Juarez-Reyes M, Kaplan CP, Fuentes-Afflick E, Gildengorin V, Millstein SG. Counseling smoking parents of young children. Arch Pediatr Adolesc Med 2001; 155: 25–31.
31. Christakis DA. Parental smoking cessation counseling. It's about time. Arch Pediatr Adolesc Med 2001; 155: 15–16.