

# Physician Recommendations About Maternal Involvement in Adolescent Diabetes Management

DEBORAH J. WIEBE, PHD, MPH<sup>1</sup>  
 CYNTHIA A. BERG, PHD<sup>2</sup>  
 KATHERINE T. FORTENBERRY, MA<sup>2</sup>  
 JANET SIRSTINS, RN<sup>3</sup>

ROB LINDSAY, MD<sup>3</sup>  
 DAVID DONALDSON, MD<sup>3</sup>  
 MARY MURRAY, MD<sup>3</sup>

**OBJECTIVE** — The purpose of this study was to examine whether perceptions of physician recommendations about maternal involvement in adolescent diabetes management are associated with children's reports of mothers' involvement during the subsequent week.

**RESEARCH DESIGN AND METHODS** — Youth with type 1 diabetes (aged 10–15 years) and mothers completed scales measuring perceptions of physician recommendations about maternal involvement. At their appointment, and again 1 week later, children reported mothers' involvement in diabetes over the preceding week.

**RESULTS** — A total of 53 dyads provided usable data at both time points. Perceived recommendations to increase involvement were associated with children's reports of increased maternal collaboration during the subsequent week ( $B = 0.81, P < 0.05$ ), an effect that was stronger among boys ( $B = -1.21, P < 0.005$ ). Increased maternal collaboration correlated with better A1C ( $r = -0.39, P < 0.005$ ).

**CONCLUSIONS** — Physicians may facilitate adaptive forms of maternal involvement during adolescence by conveying messages about involvement to patients and families.

*Diabetes Care* 31:690–692, 2008

Parental involvement in diabetes care decreases throughout adolescence, and premature declines are associated with poor management (1–3). Nevertheless, sustained parental involvement during adolescence must be adjusted to support the child's autonomy and independent diabetes management skills. Parental collaboration has been identified as one way to facilitate diabetes management while supporting autonomy (4,5), but the factors predicting optimal involvement during adolescence are unknown. Physicians may facilitate optimal involvement, given their knowledge of the patient and an awareness that families need guidance to transition to independence. There has been no systematic examination of physician recommendations regarding parental involvement, and interventions to pro-

mote involvement have not previously focused on physicians. This preliminary study explored whether mothers' and children's reports of physician recommendations about maternal involvement were associated with shifts in mothers' involvement during the subsequent week.

## RESEARCH DESIGN AND METHODS

Children (20 male and 38 female) of mean  $\pm$  SD age  $13.39 \pm 1.69$  years (range 10–15) with type 1 diabetes duration  $\geq 1$  year ( $4.32 \pm 3.25$  years) and their mothers were recruited during a pediatric diabetes appointment. Fifty-eight of 67 eligible dyads who were approached participated (87%); 41% of the diabetic subjects were on an insulin pump, and the remainder were prescribed multiple daily injections. After the

visit, children and mothers independently reported physician recommendations about maternal involvement. At this time, and again 1–2 weeks later, children reported how mothers had been involved in helping them handle diabetes problems over the preceding week. A1C was indexed from medical records. Participants were compensated 10 USD for each assessment.

Mothers' involvement was measured via each child's categorization of how his or her mother was involved in handling ten diabetes management problems over the preceding week. The mother was categorized as one of the following: 1) uninvolved, 2) supportive (gave suggestions and provided encouragement), 3) collaborative (worked as a team and problem solved together), or 4) controlling (controlled the adolescent's actions and was too involved) (5). The ten problems were generated through content analyses of previously reported diabetes stressors (6). Frequencies for each form of involvement were computed; increased control was not analyzed because it occurred infrequently. Increased collaboration correlated with A1C ( $r = -0.39, P < 0.005$ ).

Physician recommendations were measured by child and mother ratings (from 1 [strongly disagree] to 5 [strongly agree]) of whether physicians made six suggestions regarding the mother's involvement. Principal components analyses revealed two factors for child-reported messages and a single factor for mother reports. The first factor for each reporter was analyzed given its reliability and its focus on increasing mother's involvement. For children, this factor included three items: the physician suggested that the mother 1) be more involved, 2) watch the child, and 3) take charge ( $\alpha = 0.71$ ). For mothers, these and the remaining three items (suggestions that the mother provide support, collaborate, and explore independence) loaded positively on a single factor labeled "alter involvement" ( $\alpha = 0.84$ ). Scores were computed by averaging ratings across relevant items; child ( $2.24 \pm 1.05$ ) and mother ( $2.75 \pm 1.06$ ) reports regarding increase or alteration in involvement were normally dis-

From the <sup>1</sup>Department of Psychiatry, University of Texas Southwestern Medical Center, Dallas, Texas; the <sup>2</sup>Department of Psychology, University of Utah, Salt Lake City, Utah; and the <sup>3</sup>Department of Pediatrics, University of Utah School of Medicine, Salt Lake City, Utah.

Address correspondence and reprint requests to Deborah Wiebe, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX 75390. E-mail: deborah.wiebe@utsouthwestern.edu.

Received for publication 15 August 2007 and accepted in revised form 29 December 2007.

Published ahead of print at <http://care.diabetesjournals.org> on 9 January 2008. DOI: 10.2337/dc07-1618.

© 2008 by the American Diabetes Association.

The costs of publication of this article were defrayed in part by the payment of page charges. This article must therefore be hereby marked "advertisement" in accordance with 18 U.S.C. Section 1734 solely to indicate this fact.

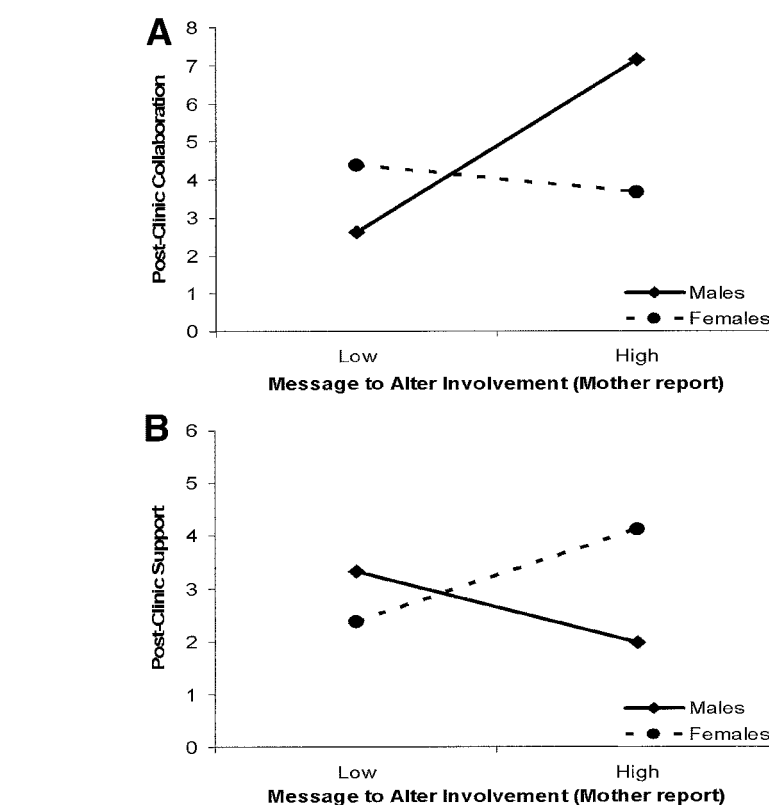
tributed and converged ( $r = 0.55$ ,  $P < 0.001$ ).

**RESULTS**— Two dyads identified as outliers were excluded from analyses ( $n = 56$ ). Perceived recommendations to increase or alter involvement were correlated with poorer A1C ( $r > 0.40$ ,  $P < 0.005$ ) but were unrelated to age, pump status, and illness duration ( $-0.23 < r < 0.02$ ,  $P > 0.08$ ).

We performed regression analyses to examine whether perceived recommendations were associated with postclinic maternal involvement while covarying preclinic involvement. Preliminary analyses suggested sex and age differences but showed no effects of A1C, duration, or pump status. Thus, preclinic involvement was entered on step 1 without other covariates; main effects for child sex, age, and physician recommendations were centered (7) and entered on step 2; and all two-way interactions were entered on step 3. Unstandardized regression weights ( $B$ ) for significant ( $P < 0.05$ , two tailed) physician recommendation effects are reported. Three participants without complete follow-up measures were excluded from these analyses ( $n = 53$ ).

Child-reported recommendations were associated with perceptions of increased collaboration in the postclinic week, regardless of age or sex ( $B = 0.81$ ,  $t(48) = 2.09$ ,  $P < 0.05$ ). Mother-reported recommendations interacted with sex to predict children's appraised collaboration ( $B = -1.205$ ,  $t(45) = -3.02$ ,  $P < 0.005$ ) and support ( $B = 0.717$ ,  $t(45) = 2.40$ ,  $P < 0.05$ ). When mothers perceived suggestions to alter involvement, sons reported that mothers became more collaborative (Fig. 1A), whereas daughters reported that mothers became more supportive (Fig. 1B).

**CONCLUSIONS**— Our findings suggest that physicians may facilitate mothers' involvement in diabetes management throughout adolescence. Children and mothers reported that physicians made recommendations to increase or alter maternal involvement when the child had poorer A1C; these recommendations were associated with heightened perception of increases in maternal collaboration during the subsequent week. Associations with perceptions of increased collaboration appeared stronger for boys, perhaps because mothers expect less independence in diabetes care in sons relative to that in daughters (8). Results are notable



**Figure 1**— Predicted means for the interaction between sex and mother-reported recommendations predicting appraisals of maternal collaboration (A) and support (B). Postclinic levels of collaboration and support were analyzed with preclinic levels covaried.

because collaboration may promote parental involvement while supporting adolescent autonomy and is associated in this study with better A1C.

Limitations include the small sample of mostly white (92%), college-educated (68%) families, which restricted power to detect reliable effects. Additional limitations include the use of self-report scales that were not previously validated, the possibility that knowledge of study objectives altered physician-patient interactions, and the brevity of follow-up, which may not reflect stable shifts in maternal involvement.

Results highlight the potential importance of physician recommendations in facilitating optimal maternal involvement in diabetes management. Research that addresses current limitations is indicated, particularly given the significant challenge of maintaining parental involvement in diabetes during adolescence.

**Acknowledgments**— This study was funded by a grant from the Primary Children's Medical Center Research Foundation.

Parts of this study were presented at a meeting of the Society of Behavioral Medicine, Boston, Massachusetts, 13–16 April 2005.

We acknowledge the families and staff at the Utah Diabetes Center and Kathy Free and Valerie Blalock for their data collection efforts.

## References

- Anderson BJ, Ho J, Brackett J, Finkelstein D, Laffel L: Parental involvement in diabetes management tasks: relationships to blood-glucose monitoring, adherence, and metabolic control in young adolescents with insulin-dependent diabetes mellitus. *J Pediatr* 130: 257–265, 1997
- Palmer D, Berg CA, Wiebe DJ, Beveridge RM, Korbel CD, Upchurch R, Swinyard MT, Lindsay R, Donaldson DL: The role of autonomy and pubertal status in understanding age differences in maternal involvement in diabetes responsibility across adolescence. *J Pediatr Psychol* 29: 35–46, 2004
- Wysocki T, Taylor A, Hough BS, Linschied TR, Yeates KO, Naglieri JA: Deviation from developmentally appropriate self-care autonomy: association with diabetes outcomes. *Diabetes Care* 19:119–125, 1996
- Anderson BJ, Brackett J, Ho J, Laffel LM: An office-based intervention to maintain parent-adolescent teamwork in diabetes management: impact on parent involvement, family conflict, and subsequent gly-

## Physician recommendations

- cemic control. *Diabetes Care* 22:713–721, 1999
5. Wiebe DJ, Berg CA, Korbel C, Palmer D, Beveridge RM, Upchurch R, Swinyard MT, Lindsay R, Donaldson DL: Children's appraisals of maternal involvement in coping with diabetes: enhancing our understanding of adherence, metabolic control, and quality of life across adolescence. *J Pediatr Psychol* 30:167–178, 2005
  6. Beveridge RM, Berg CA, Wiebe DJ, Palmer D: Mother and adolescent representations of illness ownership and stressful events surrounding diabetes. *J Pediatr Psychol* 31: 818–827, 2006
  7. Aiken LS, West SG: *Multiple Regression: Testing and Interpreting Interactions*. Thousand Oaks, CA, Sage Publications, 1991
  8. Williams C: Gender, adolescence and the management of diabetes. *J Adv Nurs* 30: 1160–1166, 1999