

DIABETES, DEPRESSION, AND HEALTHCARE UTILIZATION AMONG AFRICAN AMERICANS IN PRIMARY CARE

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Purpose: This study tested for an association between diabetes and depressive symptoms and assessed the effect of co-occurring diabetes and depressive symptoms on healthcare utilization outcomes among African-American patients.

Procedure: The sample consisted of 303 adult African-American patients age 40 and over from a primary care clinic serving the low-income population in Nashville, TN. Measures were based on self-reports during a structured interview. Multivariate analyses adjusted for age, gender, socioeconomic status, and comorbid chronic conditions.

Findings: African-American patients with and without diabetes did not differ on the presence or severity of depressive symptoms. However, the co-occurrence of major depressive symptoms with diabetes among African Americans was associated with nearly three times more reported emergency room visits and three times more inpatient days, but was only marginally associated with a lower number of physician visits.

Conclusions: In contrast to previous studies with predominantly white samples that found a positive association between diabetes and depression, no association was found in this African-American sample. Nevertheless, the results did concur with research findings based on other samples, in that the co-occurrence of depression with diabetes was associated with more acute care utilization, such as emergency room visits and inpatient hospitalizations. This pattern of utilization may lead to higher healthcare costs among patients with diabetes who are depressed, regardless of race. (*J Natl Med Assoc.* 2004;96:476-484.)

Key words: diabetes ♦ depression ♦ service utilization ♦ African Americans ♦ primary care

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Racial/ethnic minorities and the economically disadvantaged are at increased risk for diabetes.^{1,2} For example, 13% of African Americans have diabetes, compared to 6.2% of the general U.S. population³. Deaths from diabetes and certain types of diabetes complications are more common among African Americans than among whites.^{1,4} The association between low socioeconomic status and diabetes risk may be due to greater prevalence of unhealthy behaviors, environmental risk factors, and acute and chronic stress among this population.^{5,6} Low socioeconomic status is also associated with greater prevalence of depression.^{7,8} Findings of race differences in depression are less consistent, with various studies reporting either similar or lower rates of depression among

African Americans compared to whites⁹. However, given that African Americans are typically under-represented in national surveys and clinical studies on diabetes, little research has examined the relationship between diabetes and depression among African Americans or, to an even lesser extent, the effects of comorbid depression on healthcare utilization patterns among African Americans with diabetes.^{10,11}

Diabetes and Depression

Several possible explanations have been identified for diabetes-depression comorbidity. Diabetes may lead to depression due to biochemical changes caused by the illness or treatment of diabetes, or due to the psychosocial demands related to diabetes and/or its treatment.^{12,13} On the other hand, depression is linked to changes in physical activity and diet that may increase risk for diabetes, and depression may also produce physiological changes that increase risk for diabetes.^{14,15} At the same time, the causal relationship may be reciprocal or could even be spurious, due to some prior cause (e.g., genetic or environmental) raising the risk for both disorders in a subset of the population.¹⁶

Regardless of whether the relationship between depression and diabetes is causal, or in which direction, the association between diabetes and depression in the general population is well established,¹⁷⁻²¹ with studies estimating that on average individuals with diabetes have roughly two times higher odds of depression than those without diabetes.^{22,23} However, given the lack of research using African-American samples, it is not clear whether this association between diabetes and depression exists among African Americans.

According to a meta-analysis of existing studies,²² as many as one in every three individuals with diabetes may have depression at a level that impairs functioning and quality of life,^{24,25} adherence to medical treatment,^{26,27} and glycemic control.^{10,28} Among diabetics, depressive symptoms have been found to be associated with poor medication regimen adherence, less-regular monitoring of blood glucose, unhealthy diet, and less exercise.^{29,30} Depressed patients may also have a higher frequency of neuropathy and retinopathy, more problems with wound healing, and elevated levels of microalbumin and total LDL cholesterol.^{10,30,31}

Impact on Healthcare Utilization

Given the negative impact of depression on the functioning, self-care, and physical health of persons with diabetes, the co-occurrence of depression with

diabetes may contribute to poor management and delayed treatment of diabetes. In addition to the negative impact on individual health outcomes, existing evidence suggests that individuals with diabetes and comorbid depression may have higher levels of utilization of acute care and other services compared to nondepressed individuals with diabetes.

In a sample of diabetic patients at two medical clinics, depressed diabetic patients had more frequent diabetes-related emergency room (ER) visits and hospitalizations than nondepressed diabetic patients.³⁰ In an analysis of nationally representative data from the 1996 Medical Expenditure Panel Survey (MEPS), among individuals with diabetes, those who were depressed had higher ambulatory care use and filled more prescriptions when compared to those who were not depressed.²³ In a nationally representative sample of Medicare claimants, elderly individuals with diabetes and major depression had more nonmental health-related physician services and inpatient days than those with diabetes alone.²⁰ However, research has not tested whether the co-occurrence of diabetes and depressive symptoms affects utilization patterns among African Americans.

Objectives

Given that African Americans have a higher risk of diabetes but a similar or lower risk of depression compared to whites, it is important to examine whether or not the psychosocial impact of diabetes and the effects of comorbid diabetes-depression among African Americans are similar to that of the general population. This study contributes to the existing literature by examining the relationships between diabetes, depression, and healthcare utilization among a currently understudied population, namely African-American patients in a low-income, urban primary-care population.

The objectives of this study were: to compare the presence and severity of depressive symptoms among African-American patients with and without diabetes in this sample, and to determine the effect of co-occurring diabetes and depressive symptoms on healthcare utilization outcomes among African-American patients in this sample.

RESEARCH DESIGN AND METHODS

Sample

The data were collected as part of a larger study on patients in family and internal medicine in the

Meharry Medical Practice Plan (MMPP) primary care clinic, at Meharry Medical College in Nashville, TN, which serves the local low-income, largely Medicaid-eligible population. The study enrolled new and existing patients who presented for primary care. Convenience sampling was used since logistics precluded random selection. The original sample was structured to yield equal proportions of persons aged 18–49, 50–64 and 65+ years. All participants were asked to complete a structured interview lasting about one hour. A subsample of African-American participants aged 40 years and older ($n=303$) was used for the present analysis. This African-American subsample was largely low-income, female, and served by TennCare (Tennessee's Medicaid-waiver program) (Table 1). Over one-fourth of the sample ($n=88$, 29%) reported that they had diabetes. Multivariate analyses were estimated, using listwise deletion, on the 298 participants with complete data for the variables included in models.

Measures

The presence or absence of diabetes (type 1 or type 2) and comorbid chronic conditions (hypertension and/or cardiovascular disease) were based on self-reports by the study participants during the structured interview. A condition was counted as present (=1) if the respondent reported having suffered from this condition during the past 12 months and having received treatment for it either currently or in the past. Since the data were collected as part of a larger study, it was not possible to confirm diagnoses with chart reviews. However, we feel confident that patients are very likely to know if they have been diagnosed and treated for diabetes, since this condition requires a relatively intensive treatment regimen. While self-reports of hypertension and cardiovascular disease could be less accurate, it is most likely that participants would err on the side of *not* reporting one of these conditions when they actually have been diagnosed and treated. We feel that this possibility does not seriously affect our analysis, since this type of error would bias the analysis toward the null hypothesis of no

Table 1. Background Characteristics and Utilization Levels of African-American Participants, Age 40 and Over (Meharry Medical Practice Plan, Nashville, TN; 2001)

	No Diabetes	Diabetes	P
<i>n</i>	215	88	
Age (mean number of years)	59.8	62.0	0.13
<i>Gender</i>			
Percent male	30.7	33.0	0.701
Percent female	69.3	67.0	
<i>Monthly Household Income</i>			
Percent under \$750	55.7	69.4	0.045
Percent \$751–\$1,250	22.4	20.0	
Percent Over \$1,250	21.9	10.6	
<i>Education</i>			
Percent less than high school	42.8	57.9	0.037
Percent high-school graduate	41.9	27.3	
Percent postsecondary degree	15.3	14.8	
<i>Insurance</i>			
Percent TennCare (Medicaid)	59.3	63.2	0.533
<i>Comorbid Chronic Conditions</i>			
% with hypertension and/or cardiovascular disease	73.5	86.4	0.015
Physician Visits (last six months)	3.2	3.5	0.436
ER Visits (last 12 months)	0.7	0.7	0.902
Inpatient Days (last 12 months)	1.7	2.2	0.418

effect and lead to more conservative estimates.

Two measures of depressive symptoms were used:

a) The presence of major depressive symptoms was measured using a nine-item symptom checklist from the mood module of the PRIME-MD Clinician Evaluation Guide.³² While the checklist does not provide a medical diagnosis of depression, it permits the classification of respondents who exhibit symptoms of major depressive disorder based on DSM-IV criteria and would likely receive a diagnosis if evaluated by a clinician. Symptoms of major depression are considered present (depressed=1) if respondents indicate that they have experienced five or more of the nine symptoms a lot during the past two weeks (with one of the symptoms being either “little interest of pleasure in doing things” or “feeling down, depressed, or hopeless”).

b) The Center for Epidemiologic Studies Depression Scale (CES-D) was also used as a general measure of severity of depressive symptomology.³³ The CES-D is a 20-item scale that measures the frequency of symptoms during the preceding week (each item ranges from 0=none to 3=5–7 days). The 20 items are summed (with positive items reversed), resulting in a total score ranging from 0 to 60. Higher scores indicate greater number and frequency of depressive symptoms. A standard cut-off score of 16 was also used to categorize participants with elevated depressive symptoms, as an additional measure of the presence of depressive symptoms.

Levels of healthcare utilization were also based on self-reports from the structured interviews. The three types of healthcare utilization examined were: 1) physician visits—the number of visits to a physician in the last six months; 2) ER visits—the number of ER visits due to a medical problem during the last 12 months; and 3) inpatient days—the number of inpatient hospital days during the last 12 months. Self-report measures of utilization of services were preferred rather than using clinic or hospital records, since the patients may have used physician, ER, or

inpatients services at other locations as well.

The following demographic characteristics were used as control variables in analyses: age (in years), gender (1=female, 0=male), and socioeconomic status (a standardized index of educational attainment and monthly household income).

Statistical Procedures

First, bivariate group differences between African-American patients with and without diabetes were assessed using *t* and χ^2 tests. Second, African-American patients with and without diabetes were compared on their level of depressive symptoms (using the mean CES-D score for severity of symptomology, the percentage with CES-D ≥ 16 for presence of elevated depressive symptoms, and the percentage with PRIME-MD major depressive symptoms) using *t* and χ^2 tests. Third, we estimated the effects of diabetes, major depressive symptoms, and the combination of diabetes and depressive symptoms (using a multiplicative interaction term) on the utilization of three types of healthcare services (physician visits, ER visits, and inpatient days). These analyses were estimated using Poisson regression for count variables while controlling for demographic characteristics and comorbid chronic conditions.

RESULTS

Differences Between Individuals with and Without Diabetes

Table 1 compares African-American patients with and without diabetes in this sample. The two groups did not differ significantly on age, gender, or TennCare (Medicaid) enrollment. However, group differences in income and education were observed, with lower levels of income and lower rates of high-school graduation among individuals with diabetes ($p < 0.05$). Further, diabetic patients (86.4%) were more likely to have another chronic medical condition (hypertension and/or cardiovas-

Table 2. Level of Depressive Symptoms Among African-American Primary Care Patients with and Without Diabetes (Meharry Medical Practice Plan, Nashville, TN; 2001)

	No Diabetes	Diabetes	P
Mean CES-D score	8.4	9.4	0.441
Percent elevated symptoms (CES-D ≥ 16)	15.0	21.6	0.167
Percent major depressive symptoms (PRIME-MD criteria)	13.0	17.2	0.342

cular disease) compared to nondiabetic patients (73.5%, $p < 0.05$). Nevertheless, African-American patients with and without diabetes did not differ significantly in their mean levels of reported physician visits (3.5 and 3.2), ER visits (both 0.7), or inpatient days (2.2. and 1.7).

Diabetes and Depressive Symptoms

In this sample of African-American primary care patients, diabetes was not significantly associated with depressive symptoms (Table 2). First, diabetic patients had only a slightly greater number and/or frequency of depressive symptoms compared to nondiabetic patients, with mean CES-D scores of 9.4 and 8.4, respectively. Second, only a slightly higher percentage of patients with diabetes exhibited elevated depressive symptoms or major depressive symptoms compared to those without diabetes (21.6% versus 15% with CESD ≥ 16 ; 17.2% versus 13.0% classified as "depressed" based on PRIME-MD criteria). These differences remained insignificant even when controlling for age, gender, SES, and comorbid chronic conditions (results not shown).

Diabetes, Depression, and Healthcare Utilization

Table 3 reports Poisson regression estimates of the additive effects of diabetes and major depressive symptoms ("depressed" by PRIME-MD criteria), as well as the interactive effect of co-occurring diabetes and depression, on each of the three health

service utilization outcomes. These results are from the sample of African-American patients age 40 and over, and models control for demographic variables and comorbid chronic conditions. The presence of diabetes only (without depression) had a marginal but insignificant effect on the number of physician visits and ER visits but was significantly associated with lower inpatient days ($B = -0.231$, $\text{Exp}(B) = 0.79$, $p < 0.05$). In other words, nondepressed diabetics patients reported 21% lower inpatient days than patients with neither diabetes nor depression, controlling for other factors. The presence of depressive symptoms only (without diabetes) was significantly associated with a greater number of physician visits ($B = 0.567$, $\text{Exp}(B) = 1.76$, $p < 0.01$) but was not associated with a higher number of ER visits or inpatient days. In other words, nondiabetic depressed patients reported 76% greater number of physician visits than patients with neither diabetes nor depression.

The concurrent presence of diabetes and major depressive symptoms (the interaction of diabetes • depression) had a marginal but insignificant effect on physician visits but was significantly associated with a higher number of ER visits ($B = 1.012$, $\text{Exp}(B) = 2.75$, $p < 0.01$) and with greater numbers of inpatient days ($B = 1.104$, $\text{Exp}(B) = 3.02$, $p < 0.01$). In other words, depressed diabetics reported 2.75 times (or nearly three times) more ER visits than patients with neither diabetes nor depression. Further, depressed diabetics reported three times more inpatient days than patients

Table 3. Poisson Regression Estimates of the Effect of Diabetes and PRIME-MD Major Depressive Symptoms on Healthcare Utilization Outcomes Among African-American Patients, n=298 (Meharry Medical Practice Plan, Nashville, TN; 2001)

	Physician Visits		ER Visits		Inpatient Days	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
Age	-0.006	0.99*	-0.029	0.97**	0.007	1.01+
Female	-0.046	0.96	-0.200	0.82	-0.603	0.55**
SES	0.098	1.10**	-0.326	0.72**	-0.248	0.78**
Other chronic	0.430	1.54**	0.083	1.09	1.355	3.88**
Diabetes	0.149	1.16+	-0.354	0.70+	-0.231	0.79*
Depressed	0.567	1.76**	0.221	1.25	0.017	1.02
Diabetes* depressed	-0.319	0.73+	1.012	2.75**	1.104	3.02**
Constant	1.115	3.05	1.307	3.70	-0.729	0.48

Levels of significance: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$

with neither diabetes nor depression. Notably, the presence of other chronic conditions (hypertension and/or cardiovascular disease) also impacted utilization, but in a different way than diabetes and depression. African-American patients with these chronic conditions visited the doctor more and had more inpatient days than patients without these chronic conditions, but they did not differ in terms of numbers of ER visits. Specifically, African-American patients with hypertension and/or cardiovascular disease had 54% greater number of physician visits ($B=0.430$, $\text{Exp}(B)=1.54$, $p<0.01$) and nearly four times the number of inpatient days ($B=1.355$, $\text{Exp}(B)=3.88$, $p<0.01$) than African-American patients without these conditions, while controlling for the presence of diabetes, major depressive symptoms, and demographic factors.

DISCUSSION

This study contributes valuable information to the growing body of literature on diabetes, depression, and healthcare utilization by examining these relationships in a currently understudied population, namely African-American primary care patients. In contrast to many previous studies with predominantly white samples that found a positive association between diabetes and depression, no association was found in this African-American sample. African-American patients with and without diabetes did not differ on the severity of depressive symptomology or on the presence of major depressive symptoms. However, the results do concur with research findings based on other samples, which report that the co-occurrence of depression with diabetes is associated with more acute care utilization, such as ER visits and inpatient hospitalizations. Specifically, the co-occurrence of major depressive symptoms with diabetes among African Americans was associated with nearly three times more reported ER visits and three times as many inpatient days but was only marginally associated with lower physician visits.

Given that this is a primary care sample, all the African-American patients had accessed primary care services at least once during the time period of consideration. Nevertheless, the depressed diabetic patients still had higher ER and inpatient utilization. This utilization pattern concurs with the finding in another clinical sample,³⁰ while an HMO sample demonstrated a greater probability of any primary care, ER, or inpatient use by depressed diabetic patients.²⁹ However, the only published study using a nationally representative sample found differences

only in ambulatory care and prescriptions filled, with no difference in ER or inpatient utilization.²³ While some of the variation in findings among these studies may be due to differences in methodology, it is important to consider that all of these samples were composed of predominantly white respondents. The pattern of utilization exhibited by the depressed diabetic patients in this African-American sample also parallels a pattern of disproportionate use of the ER that has been found in previous studies among African Americans, even when access to care is controlled.^{34,35}

Limitations and Future Research

The limitations of this study include the generalizability of the sample, the self-report nature of the data, and the lack of data on diabetes-related complications. First, since this is a convenience sample drawn from a primary care clinic, we cannot be sure that the sample is completely representative of this primary care population. While the use of multivariate analysis with controls for demographic characteristics and comorbid chronic conditions helps to adjust for compositional effects of the sample while examining the relationship between the variables of interest, the findings are not conclusive. However, since a negligible amount of research has examined the relationship between diabetes and depression among African Americans—especially in terms of the effect of comorbid diabetes and depression on utilization outcomes—this study contributes important information toward a better understanding of the psychosocial impacts of diabetes on one of the groups most affected by this disease. Future prospective studies with a randomized design focusing on African Americans and other racial/ethnic minority groups—who are typically under-represented in national surveys—are needed.

Second, the data collected were exclusively based on self-reports of the respondents, without corroboration from medical or billing records. Medical confirmation of diagnoses for type-2 diabetes and comorbid chronic conditions would be ideal, although self-reports of these conditions are most likely accurate enough that they would not substantially bias the conclusions of the analyses. While some studies measure depression based on clinical diagnosis, it is also useful to consider self-reported symptoms because many depressed individuals are not diagnosed and because subclinical symptoms may also affect diabetes self-management and healthcare utilization. Self-reports of healthcare utilization were preferred for this sample since it would be logistically difficult and probably not

possible to obtain utilization data from all of the health service providers that each clinic patient would have used during the prior six months or year. Complete utilization data on some individuals exist in the form of billing records for private insurance companies and for Medicaid or Medicare; however, only two-thirds of the patients in this sample were on TennCare (Tennessee's Medicaid waiver-program). Indeed, some studies draw samples from Medicaid or Medicare beneficiary files, which is also a valid and useful approach to studying these issues. The drawback to using billing record data, though, is the lack of valuable data that can be obtained in a personal interview, such as complete demographic data, current level of depressive symptoms, and other psychosocial variables.

Third, the study from which these data were drawn did not collect information on the number or types of diabetes complications experienced by respondents. This is another area in which little is known about African Americans and is important to consider since African Americans are disproportionately affected by certain diabetes complications, such as retinopathy, end-stage renal disease, and lower-extremity amputations.^{1,4} We theorized that depression would hinder diabetics' self-care (e.g., diet, exercise, monitoring blood glucose levels, foot care), adherence to the recommended medical regime (e.g., medication, insulin shots), and regular check-ups with their physicians. This hindered disease management is expected to lead to greater diabetes complications and, in turn, greater acute care utilization. At the same time, however, diabetics who have high acute care utilization could be more depressed as a result of their more advanced diabetes disease process and related complications. Therefore, future prospective, longitudinal studies are needed in order to tease out the impact of depression on diabetes disease management, diabetes complications, and utilization patterns.

Implications

First, the findings of this study suggest that the combined burden of diabetes and concurrent major depressive symptoms may have negative impacts on health outcomes for the African Americans in this sample, as indicated by patterns of increased acute care utilization (ER visits and inpatient hospital days) without a similar increase in regular physician care. Because comorbid patients likely have a need to visit the doctor more often to effectively manage their multiple conditions, this lack of a significant effect

for depression among diabetic patients could suggest that depression is hindering such individuals from seeking more frequent routine healthcare. This pattern of utilization could also be indicative of greater diabetes complications due to impaired self-care and medical adherence.³⁰ Perhaps depressed individuals are less likely to control blood sugar levels and have more diabetes complications, or they are more likely to delay care until complications become severe. Further research tracking diabetic patients over time, including self-care behaviors and adherence to the recommended medical regimen, is needed to clarify this possible link between depression and utilization patterns among individuals with diabetes.

Second, in addition to the problem of poor health outcomes, this pattern of costly acute care utilization ultimately leads to increased healthcare costs among individuals with comorbid diabetes and depressive symptoms, regardless of race. In an HMO primary care study, Ciechanowski and colleagues²⁹ found that among individuals with diabetes, those who were depressed had a greater probability of having any primary care, specialty care, emergency department, medical inpatient, and mental health costs than those who were not depressed. In another HMO study, Nichols and colleagues³⁶ estimated that annual healthcare costs for patients with diabetes and depression averaged \$6,787, while nondepressed diabetic patients had significantly lower costs of \$4,233. In their analysis of MEPS data, Egede and colleagues²³ estimated that individuals with diabetes and depression had 4.5 times higher total healthcare expenditures than those with diabetes who were not depressed, while adjusting for other factors. In addition, among elderly Medicare claimants with diabetes, those with major depression had 21% higher total annual payments and 7% higher inpatient payments (both nonmental health-related) than those without major depression in 1997, after adjusting for other factors.²⁰ Again, all of these existing studies involve samples composed of mostly white respondents, and little is known about whether cost impacts are similar for African Americans with diabetes and depression.

Finally, the findings of this study point to the need to incorporate mental health screening and support into the treatment and management of diabetes in primary care settings. The primary care setting represents a crucial point of possible intervention to diagnose and treat patients with comorbid diabetes and depression, particularly among high-risk, low-income and minority populations. In fact, most patients with

diabetes are seen by primary care physicians³⁷, and nearly half of patients who receive treatment for depression are only seen by a physician in a primary care setting.^{38,39} Indeed, many depressed diabetic patients who are seen in primary care may not be diagnosed or treated for their depression, which could potentially interfere with the effective treatment of their diabetes. While the amount of available evidence is still limited, some studies suggest that interventions targeted at reducing symptoms of depression among patients with diabetes may produce benefits in terms of glycemic control.^{40,41} Future research should examine whether psychosocial interventions can also be effective among African-American populations.

CONCLUSION

In contrast to previous studies with predominantly white samples, no association between diabetes and depressive symptoms was found in this African-American sample. Similar to findings based on other samples, the co-occurrence of depression with diabetes was associated with more acute care utilization, namely ER visits and inpatient hospitalizations. This pattern of utilization could be indicative of greater diabetes complications among depressed diabetics due to impaired self-care and medical adherence. This pattern of utilization also likely leads to higher healthcare costs among patients with diabetes who are depressed. The findings suggest the need to incorporate mental health screening and support into the treatment and management of diabetes in primary care settings, particularly among high-risk, low-income and minority populations.

ACKNOWLEDGEMENT

This research was supported by funding from the Agency for Healthcare Research and Quality (Grant No. AHRQ 1U18HS11131); RS Levine, principal investigator; and BA Husaini, coprincipal investigator).

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C A R E E R O P P O R T U N I T I E S

Wright State University • Dayton, Ohio

The Wright State University Department of Internal Medicine Section of Dermatology is seeking a board eligible/certified Dermatologist at the Instructor, Assistant, or Associate Professor level interested in a career in an academic/clinical teaching setting and a preferred interest in clinical research.

The successful candidate must have a record of excellence in clinical care and prior teaching experience. This position combines the opportunity to practice, participate in the education of students and residents, and involve oneself in basic/ clinical research. Opportunity exists for part-time employment.

Candidates must have a M.D. or D.O. degree and be able to obtain an Ohio license. For position description and requirements, please visit <http://www.wright.edu/hr/job>.

Interested applicants should submit their curriculum vitae and names of three references to: Barbara Schuster, M.D., M.A.C.P., Attn: Pam Berry, Department of Internal Medicine, Wright State University, PO Box 927, Dayton, OH 45401-0927. Review of applications will begin April 15, 2004 and continue until the position is filled. Wright State University is an AA/EO employer and promotes diversity in its workforce.

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The Department of Pediatrics at the University of Chicago is recruiting qualified, board certified/board eligible candidates for faculty and other academic positions in the Section of General Pediatrics. Duties will include ambulatory and inpatient care as well as supervision and teaching of medical students and housestaff. Opportunities to pursue other academic interests are available. Screening of applications will continue until all positions are filled. Letter of inquiry and curriculum vitae should be sent to:

John Lantos, M.D.,
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