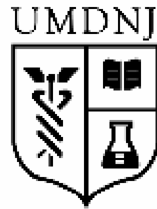
TOBACCO DEPENDENCE PROGRAM




SCHOOL OF PUBLIC HEALTH

University of Medicine & Dentistry of New Jersey

# UMDNJ-School of Public Health
# Tobacco Dependence Clinic

# Annual Report 2005

## January 1, 2005 – December 31, 2005

# Tobacco Dependence Clinic at UMDNJ-School of Public Health Annual Report 2005

**Summary**
The Tobacco Dependence Clinic at UMDNJ–School of Public Health saw 618 new patients for assessment in 2005, and 600 (97%) of those patients made an attempt to quit tobacco by setting a target quit date with the clinic. As in previous years, the majority of patients seen were female (57%), and the average age was 44 (range 15-86). Sixty-six percent of the clinic's patients identified themselves as white (non-Latino), 22% as African American and 8% as Hispanic/Latino. In keeping with previous years, the proportion of patients without health insurance continued to rise in 2005 (30%). The number one referral source among our patients is friends and family (36%), which suggests that "word-of-mouth" referral is a major contributor to our patient population. The average patient seen at the clinic in 2005 smoked a pack of cigarettes per day, smoked their first cigarette of the day 21 minutes after waking in the morning, had been smoking for 24 years, and had made at least seven quit attempts prior to attending the clinic.

Five-hundred sixty-four patients made a quit attempt and were eligible for follow-up in 2005, of which three-quarters were reached for follow-up after 4 weeks, and half were reached at 6 months. Assuming those not reached for follow-up continued to use tobacco at least as much as at assessment, the quit rates for 2005 were 43% at 4 weeks post-quit date and 19% at 6 months, and an additional 16% and 8% reduced their cigarette consumption by at least 50% at the 4-week and 6-month follow-up points. Patients who attended at least 6 appointments and used recommended pharmacotherapy had much higher 4 and 26-week quit rates of 80% and 66%, respectively.

Over 93% of the patients who were reached for 4-week follow-up used nicotine replacement therapy and/or cessation medications in 2005. Among patients reached for follow-up at 4 weeks post-quit date, abstinence rates were approximately three times as high in patients who used medications than in those who did not and were also more than twice as high among those attending at least six clinic appointments relative to those attending just one. Additionally, 98% of patients completing 4-week follow-up rated the service as excellent or good (81% and 17%, respectively).

Over the first five years of operation, the Tobacco Dependence Clinic at UMDNJ - School of Public Health has treated more than 2,300 patients, of whom 26.4% remained tobacco-free at 6 months post-quit date. This compares well with the quit rate of 22% in 55 trials of "high intensity" treatment reviewed in the Public Health Service Clinical Practice Guidelines. The clinic's thorough individual assessment, combined group and individual counseling, plus combination pharmacotherapy provides a highly effective treatment for tobacco dependence. The clinic aims to continue to provide state-of-the-art tobacco dependence treatment to the diverse population of New Jersey smokers who require specialist services to overcome their addiction to tobacco.

**Introduction**

The Tobacco Dependence Clinic at UMDNJ - School of Public Health is funded by the New Jersey Department of Health and Senior Services to provide a specialist tobacco dependence treatment service to the local community and also to provide a tertiary referral and consultation service to health professionals throughout New Jersey. The clinic is the clinical service component of the Tobacco Dependence Program at UMDNJ - School of Public Health, which has a wider role in education, treatment, research, and advocacy to reduce the harm to health caused by tobacco.

A multidisciplinary team of specialists in tobacco dependence treatment provided clinical services, including Donna Richardson LCSW LCADC CTTS (Clinic Coordinator), Stacey Zelenetz LCSW, Michael Steinberg MD MPH (Clinic Medical Director), Jill Williams MD, Michael Burke EdD, and Jonathan Foulds PhD (Director, Tobacco Dependence Program). The clinic has also benefited from input from other staff and faculty at the Tobacco Dependence Program including psychiatry residents from Robert Wood Johnson Medical School receiving specialist training in addiction psychiatry, public health graduate students from UMDNJ - School of Public Health, and social work trainees from Rutgers Graduate School of Social Work. The clinic provides a multidisciplinary approach to tobacco dependence treatment, based on the evidence-based assessment and treatment procedures outlined in the US Public Health Service Clinical Practice Guideline on Treating Tobacco Use and Dependence[1] and the New Jersey Guidelines for Tobacco Dependence Treatment[2]. The clinical staff is also involved in training and consulting to the network of tobacco dependence treatment clinics throughout New Jersey known as New Jersey Quitcenters, and to other providers of tobacco treatment.

Patients contact the clinic through referral from their health-care provider, or via self-referral. The clinic is centrally located in New Brunswick at 317 George Street, Suite 210. Parking is available and the clinic is easily accessible via public transportation. Patients typically call to set up an appointment (732-235-8222) and this is usually scheduled within a week of first telephone contact. Efforts are also made to see patients who may walk into the clinic without a scheduled appointment.

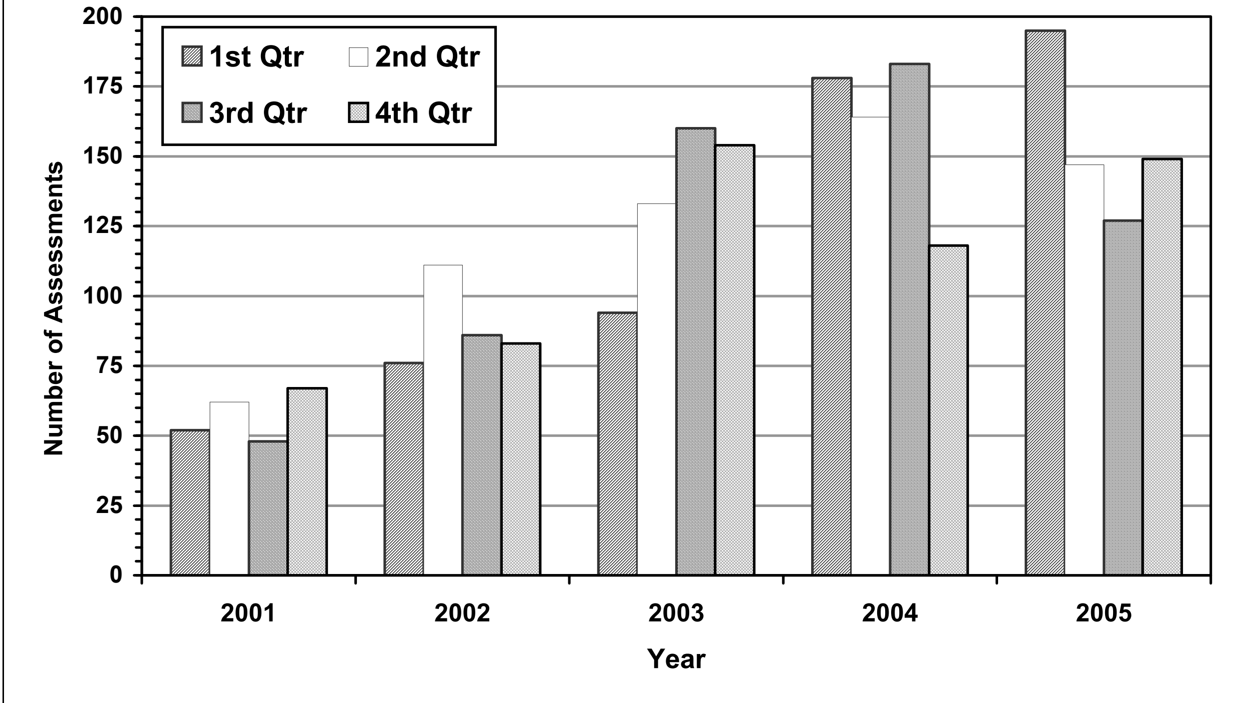
This report summarizes the direct clinical work carried out at the Tobacco Dependence Clinic from its launch in January, 2001 through to December, 2005. The report includes detailed descriptions of our patients as well as short-term and medium-term outcomes.

# Patient Volume

### Patient Intake Assessments

The Tobacco Dependence Clinic first started seeing patients in January, 2001, and by December 31, 2005 has conducted 2,391 intake assessments. As shown in **Figure 1** below, the number of patient intake assessments has increased consistently over time since the clinic opened, and although our number of patient assessments in 2005 (618) was about 4% lower than in 2004, our clinic population was far larger than the average number of patients seen each year (478).

**Figure 1:** Annual number of new patient intake assessments at the UMDNJ Tobacco Dependence Clinic by quarter, 2001 to 2005




### Total Patient Visits

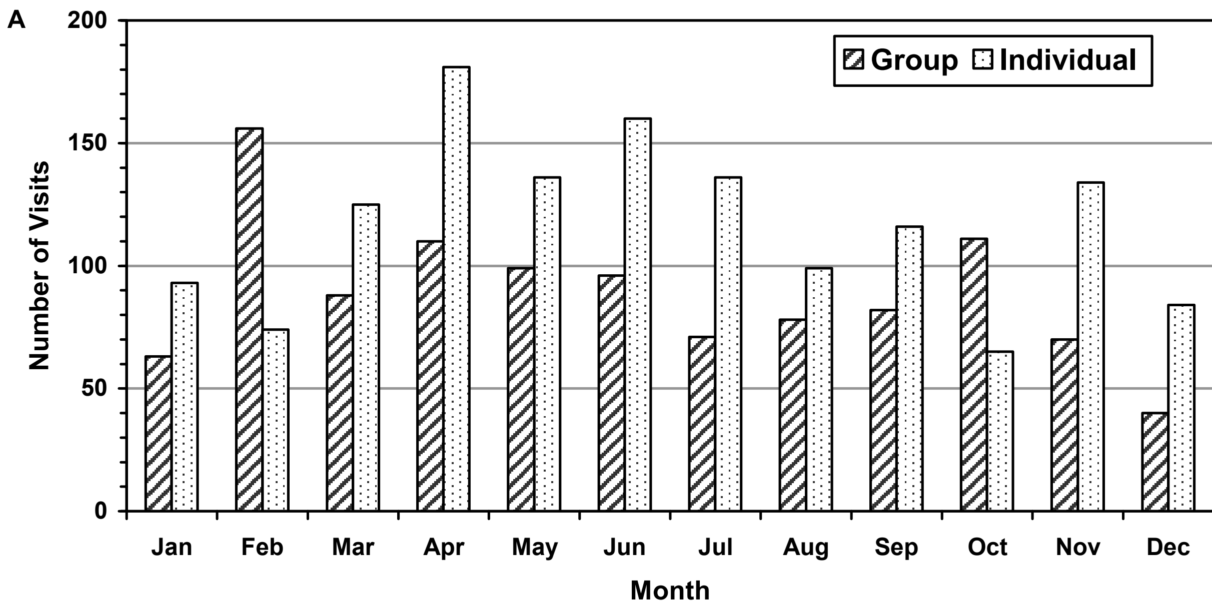
There were a total of 2,473 face-to-face patient contacts with the clinic from January 1, 2005 to December 31, 2005, a 25% increase from 2004 (**Table 1**). The majority of these contacts were individual one-on-one assessment or counseling sessions between patients and clinicians (57%), and there were 728 patient visits for group sessions (43%). **Figure 2** displays the overall breakdown of patient contacts by month and session type for 2005 and overall for all five clinic years.

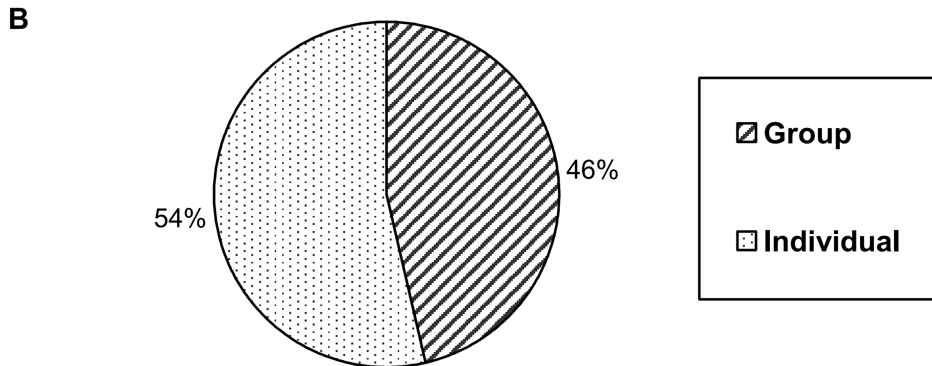
**Table 1:** Annual face-to-face patient contacts by session type at UMDNJ Tobacco Dependence Clinic, 2001-2005

| | **2001 (n=952)** | | **2002 (n=2,006)** | | **2003 (n=2,331)** | | **2004 (n=1,954)** | | **2005 (n=2,467)** | | **Total (n=9,712)** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Count** | **%** | **Count** | **%** | **Count** | **%** | **Count** | **%** | **Count** | **%** | **Count** | **%** |
| **Group** | 499 | 52% | 1066 | 51% | 1158 | 50% | 726 | 37% | 1064 | 43% | 4513 | 46% |
| **Individual** | 453 | 48% | 940 | 49% | 1173 | 50% | 1228 | 63% | 1403 | 57% | 5199 | 54% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

**Figure 2:** Patient contacts by session type at UMDNJ Tobacco Dependence Clinic (A) in 2005 by month, and (B) 2001-2005 overall.



## Demographic Characteristics of Patients

The demographic characteristics of patients seen at the Tobacco Dependence Clinic are shown in the tables and figures on the following pages.

### Age

The mean age of patients seen at the clinic in 2005 was 43.6 years, ranging from 15 to 86 years. As shown in **Table 2**, the mean age of patients has increased since 2004 and is higher than the overall 5-year average patient age

**Table 2:** Age characteristics of patients assessed at the UMDNJ Tobacco Dependence Clinic 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total (N = 2391) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (Years) | Mean | Range | Mean | Range | Mean | Range | Mean | Range | Mean | Range | Mean | Range |
| | 43.32 | 15 - 75 | 45.80 | 15 - 80 | 40.04 | 15 - 75 | 39.10 | 14 - 74 | 43.66 | 15 - 86 | 41.89 | 14 - 86 |

### Gender

As shown in **Table 3**, the clinic had seen an increasing proportion of male patients prior to 2005, but proportion of male patients decreased slightly from about 46% in 2004 to 43% in 2005. Consistent with previous years, females make up the majority of our clinic population (57%)

**Table 3:** Patients assessed at UMDNJ Tobacco Dependence Clinic by gender, 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total (N = 2391) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % | Count | % |
| **Female** | 147 | 64% | 216 | 61% | 304 | 56% | 351 | 54% | 348 | 57% | 1366 | 57% |
| **Male** | 82 | 36% | 140 | 39% | 238 | 44% | 294 | 46% | 265 | 43% | 1019 | 43% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

### Patients w/ Children

In 2005, more than half of the patients seen at the clinic had at least one child (62%), and 30% of patients (50% of those with children) reported having at least one child under the age of 19. As shown in **Table 4**, these proportions are generally consistent with previous years at the clinic.

**Table 4:** Patients with Children Assessed at UMDNJ Tobacco Dependence Clinic 2001-2005

| | 2001 (n = 229) | 2002 (n = 356) | 2003 (n = 542) | 2004 (n = 646) | 2005 (n = 618) | Total *(N = 2391)* |
|---|---|---|---|---|---|---|
| | Count (%) | Count (%) | Count (%) | Count (%) | Count (%) | Count (%) |
| **Patients with Children** | 135(60%) | 213 (62%) | 291 (55%) | 302 (51%) | 352 (62%) | 1,293 (57%) |
| **Patients with Children Under 19 Years of Age** | 71(31%) | 90 (25%) | 165 (30%) | 181 (28%) | 187 (30%) | 694 (29%) |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

**Race/Ethnicity**

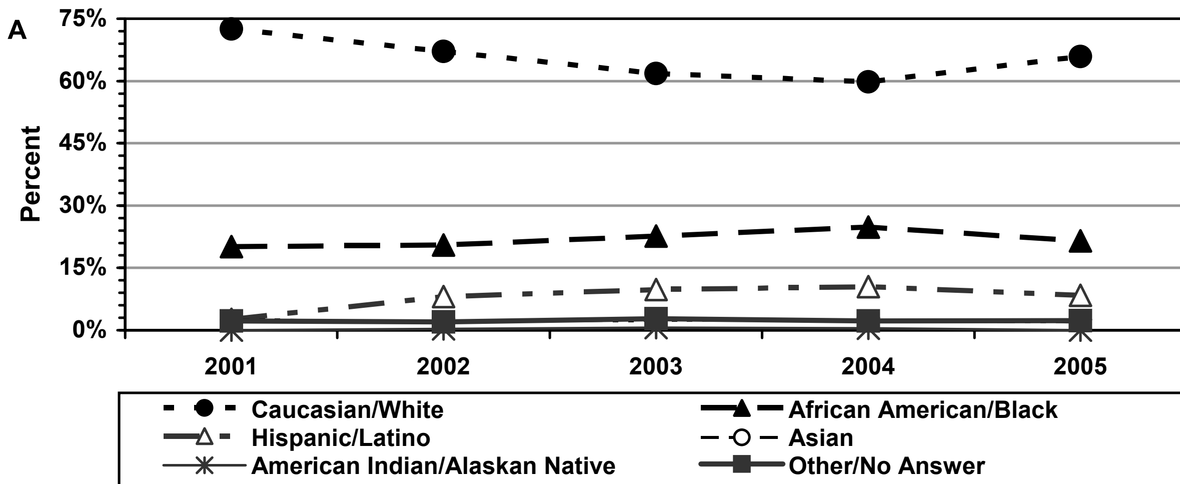
The clinic saw increasing diversity among its patient population from 2001 through 2004 and remained racially and ethnically diverse in 2005 (**Figure 3**Figure 3). As shown in **Table 5**, about 22% of patients seen in 2005 described themselves as African American or Black and more than 8% were Hispanic or Latino.

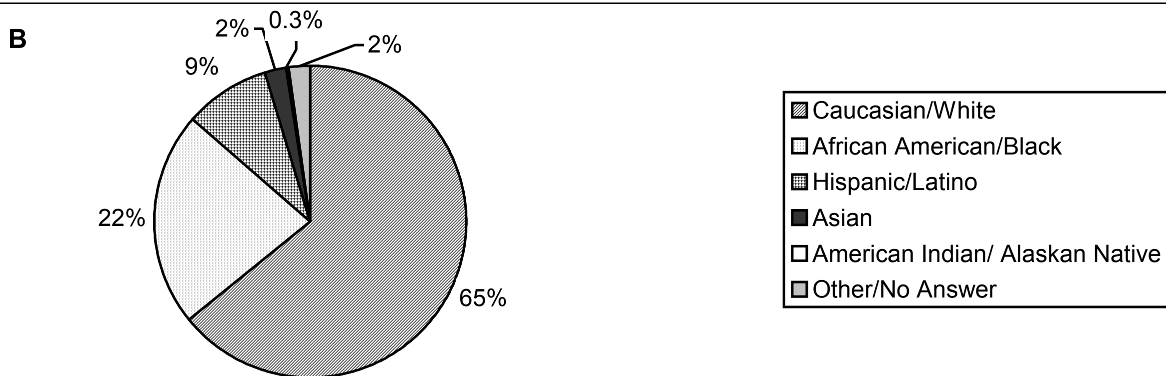
**Table 5:** Racial Characteristics of Patients Assessed at UMDNJ Tobacco Dependence Clinic 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total *(N = 2391)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| **Caucasian/White** | 166 | 73% | 239 | 67% | 335 | 62% | 386 | 60% | 407 | 66% | 1533 | 64% |
| **African American/ Black** | 46 | 20% | 73 | 21% | 123 | 23% | 160 | 25% | 133 | 22% | 535 | 22% |
| **Hispanic/Latino** | 6 | 3% | 29 | 8% | 53 | 10% | 68 | 11% | 52 | 8% | 208 | 9% |
| **Asian** | 6 | 3% | 7 | 2% | 13 | 2% | 15 | 2% | 12 | 2% | 53 | 2% |
| **American Indian/ Alaskan Native** | 0 | 0% | 1 | 0% | 3 | 1% | 3 | 1% | 0 | 0% | 7 | 0% |
| **Other/No Answer** | 5 | 2% | 7 | 2% | 15 | 3% | 14 | 2% | 14 | 2% | 55 | 2% |

NOTE: For simplicity, percentages have been rounded to the nearest whole number

**Figure 3:** Racial/ethnic characteristics of patients assessed at the UMDNJ Tobacco Dependence Clinic from 2001 to 2005 (A) annually and (B) overall (N=2391)



**Employment**

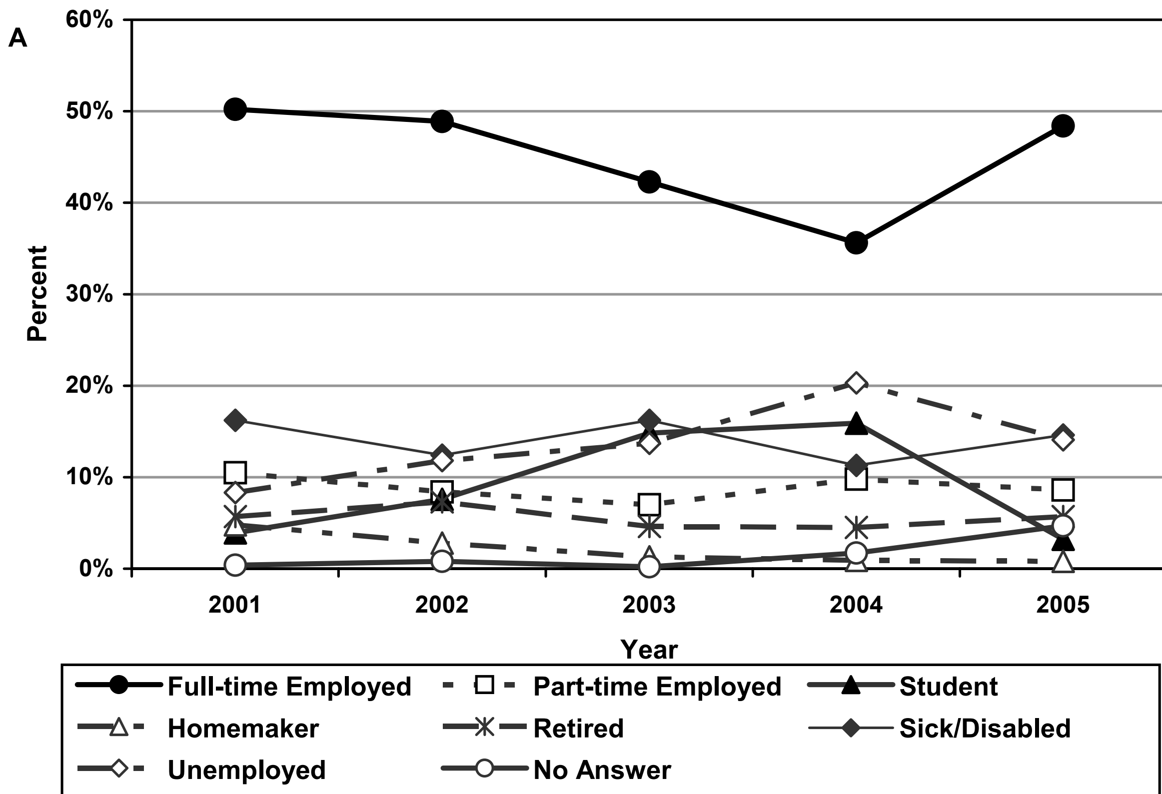
Nearly half of patients seen in 2005 were employed full-time (48%), an increase from 2003 and 2004. Concurrently, the clinic had seen a rise in the proportion of unemployed and student patients until this year when those proportions decreased to 14% and 3%, respectively (**Table 6**; **Figure 4**).

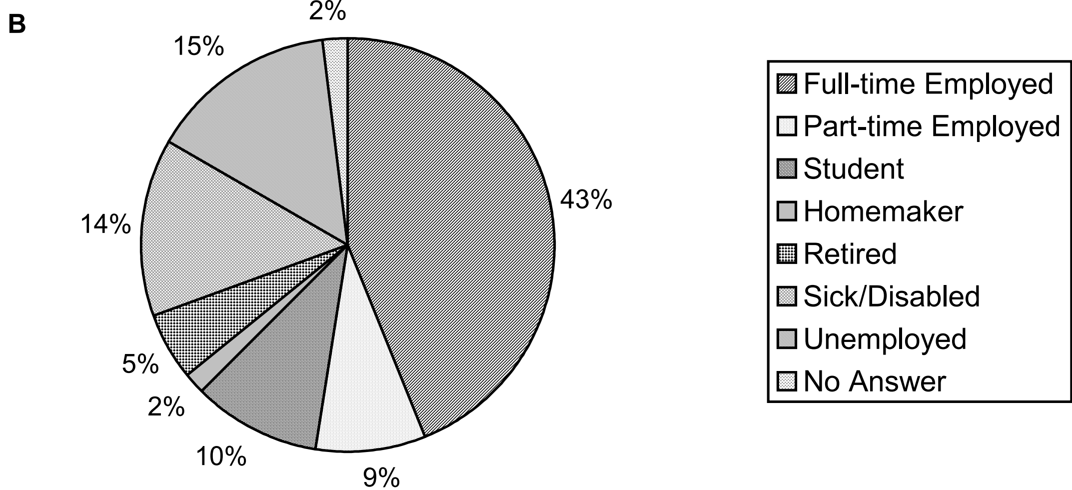
**Table 6:** Employment Characteristics of Patients Assessed at UMDNJ Tobacco Dependence Clinic, 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total *(N = 2391)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| **Full-time Employed** | 115 | 50% | 174 | 49% | 229 | 42% | 230 | 36% | 299 | 48% | 1047 | 44% |
| **Part-time Employed** | 24 | 11% | 30 | 8% | 38 | 7% | 63 | 10% | 53 | 9% | 208 | 9% |
| **Student** | 9 | 4% | 27 | 8% | 80 | 15% | 103 | 16% | 20 | 3% | 239 | 10% |
| **Homemaker** | 11 | 5% | 10 | 3% | 7 | 1% | 6 | 1% | 5 | 1% | 39 | 2% |
| **Retired** | 13 | 6% | 26 | 7% | 25 | 5% | 29 | 5% | 35 | 6% | 128 | 5% |
| **Sick/Disabled** | 37 | 16% | 44 | 12% | 88 | 16% | 73 | 11% | 90 | 15% | 332 | 14% |
| **Unemployed** | 19 | 8% | 42 | 12% | 74 | 14% | 131 | 20% | 87 | 14% | 353 | 15% |
| **No Answer** | 1 | 0% | 3 | 1% | 1 | 0% | 11 | 2% | 29 | 5% | 45 | 2% |

NOTE: For simplicity, percentages have been rounded to the nearest whole number

**Figure 4:** Employment characteristics of patients assessed at the Tobacco Dependence Clinic from 2001 to 2005 (A) annually and (B) overall (N=2391)



## Health Insurance

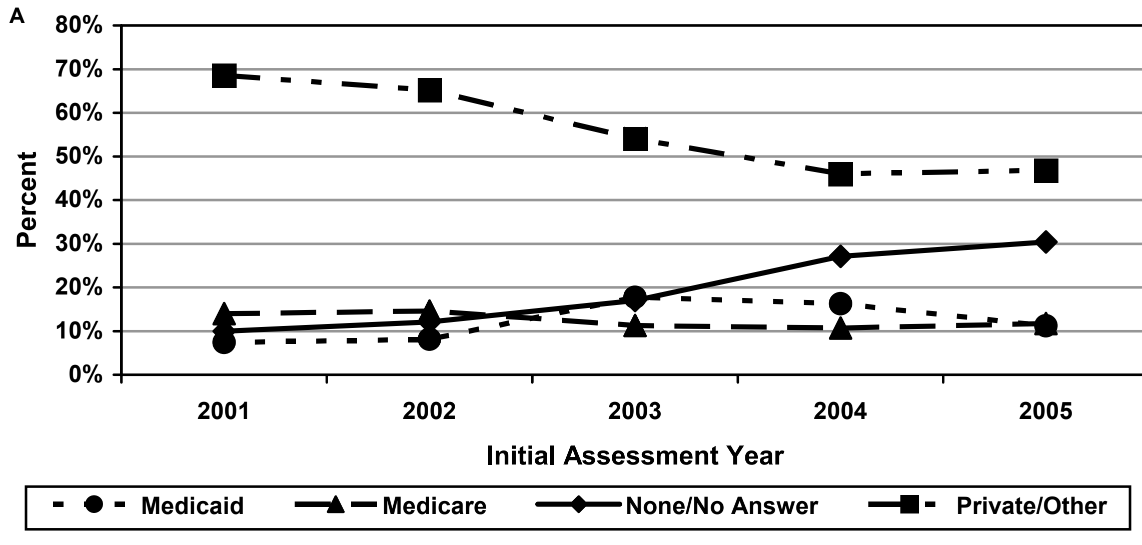
In 2005, almost one-third of patients seen reported having no health insurance coverage (30%), a nearly two-fold increase since 2003 (17%) and three-fold increase since 2001 (10%) (**Table 7; Figure 5**). The proportion of patients covered by Medicaid has also increased since 2001, from 7.4% to 11.2% in 2005, while the proportion of patients with private insurance has decreased markedly to again comprise less than half of the clinic patient population.

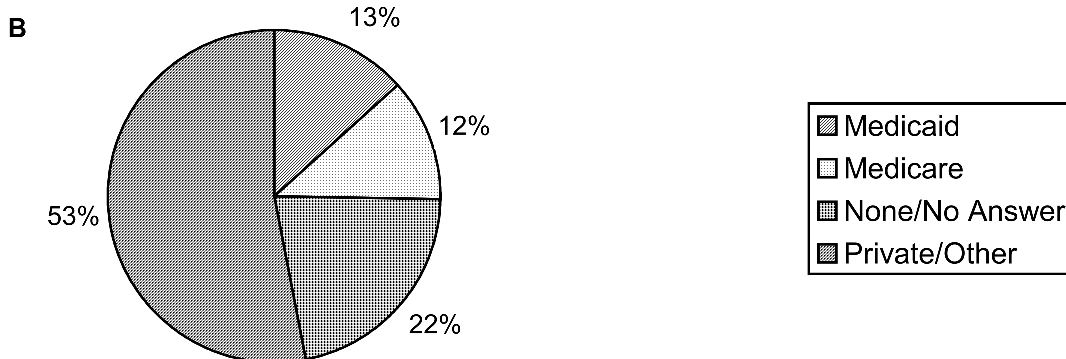
**Table 7:** Insurance Types among Patients Assessed at UMDNJ Tobacco Dependence Clinic, 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total *(N = 2391)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| **Medicaid** | 17 | 7% | 29 | 8% | 96 | 18% | 105 | 16% | 69 | 11% | 316 | 13% |
| **Medicare** | 32 | 14% | 52 | 15% | 61 | 11% | 69 | 11% | 72 | 12% | 286 | 12% |
| **None/No Answer** | 23 | 10% | 43 | 12% | 92 | 17% | 175 | 27% | 188 | 30% | 521 | 22% |
| **Private/Other** | 157 | 69% | 232 | 65% | 293 | 54% | 297 | 46% | 289 | 47% | 1268 | 53% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

**Figure 5:** Insurance coverage of patients assessed at the UMDNJ Tobacco Dependence Clinic (A) during 2001-2005 and (B) overall (N=2391).



## Educational Background

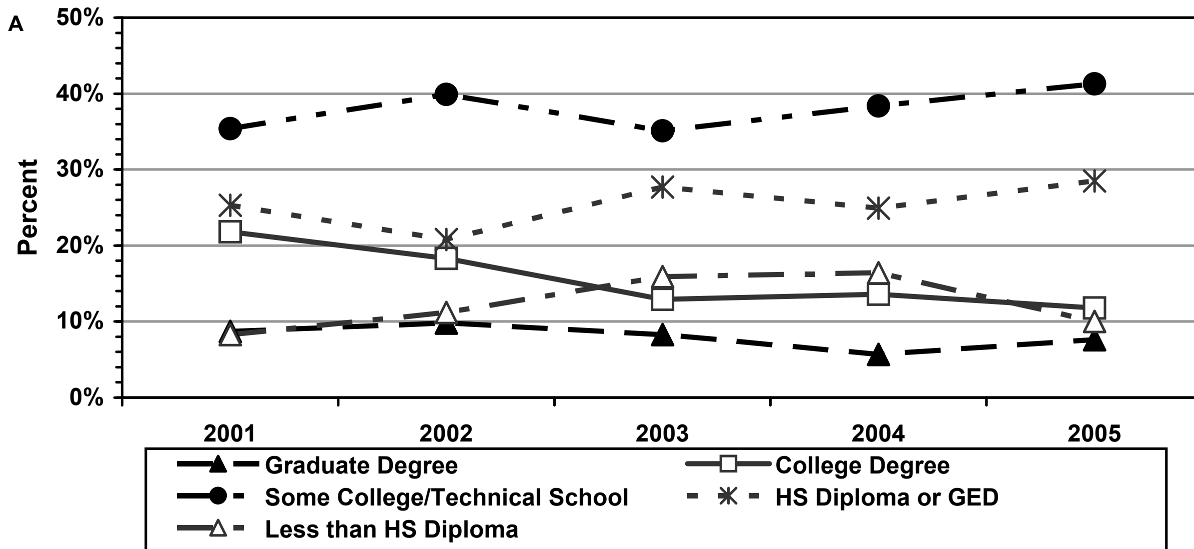
The proportion of patients seen at the clinic in 2005 who had not completed their high school education was 10%, a 38% decrease from 2004 (16%). The most common educational background of clinic patient is high school graduate having attended some college/technical school since high school. (**Table 8; Figure 6**).

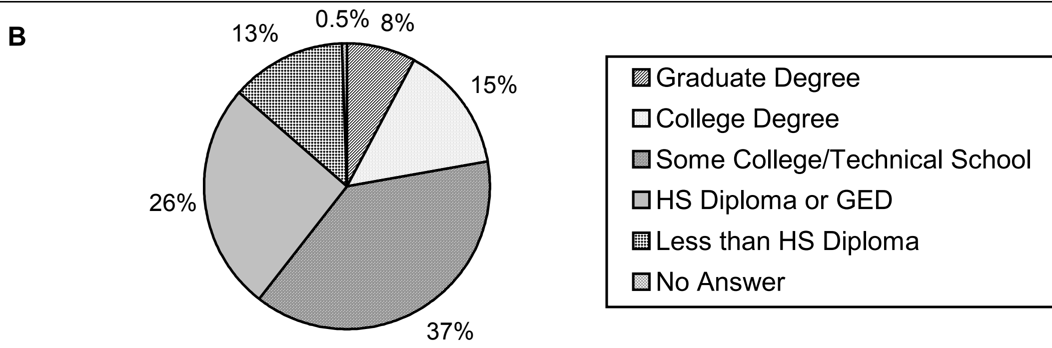
**Table 8:** Education Levels among Patients Assessed at UMDNJ Tobacco Dependence Clinic, 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total (N = 2391) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| **Graduate Degree** | 20 | 9% | 35 | 10% | 45 | 8% | 37 | 6% | 47 | 8% | 184 | 8% |
| **College Degree** | 50 | 22% | 65 | 18% | 70 | 13% | 88 | 14% | 73 | 12% | 346 | 15% |
| **Some College/ Technical School** | 81 | 35% | 142 | 40% | 190 | 35% | 248 | 39% | 255 | 41% | 916 | 38% |
| **HS Diploma or GED** | 58 | 25% | 74 | 21% | 150 | 28% | 161 | 25% | 176 | 29% | 619 | 26% |
| **Less than HS Diploma** | 19 | 8% | 40 | 11% | 86 | 16% | 106 | 16% | 62 | 10% | 313 | 13% |
| **No Answer** | 1 | 0% | 0 | 0% | 1 | 0% | 6 | 1% | 5 | 1% | 13 | 1% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

**Figure 6:** Educational background of patients assessed at the UMDNJ Tobacco Dependence Clinic from 2001-2005 (A) annually and (B) overall (N=2391)



## Referral Source

Family/friends, health care providers, and other (E.g., Self/former patient, pharmaceutical company, shelter) referral sources remain the top three sources of referral to the clinic for patients in 2005 (**Table 9**). Health care provider (including physicians, nurses, and dentists) referrals have decreased, while family/friends referrals continued to increase (**Figure 7**). This is largely a result of previous patients encouraging their family and friends to attend. NJ Quitline and NJ Quitnet, two major smoking cessation resources in the state, remained insignificant referral sources for the clinic in 2005 (2.5% together).

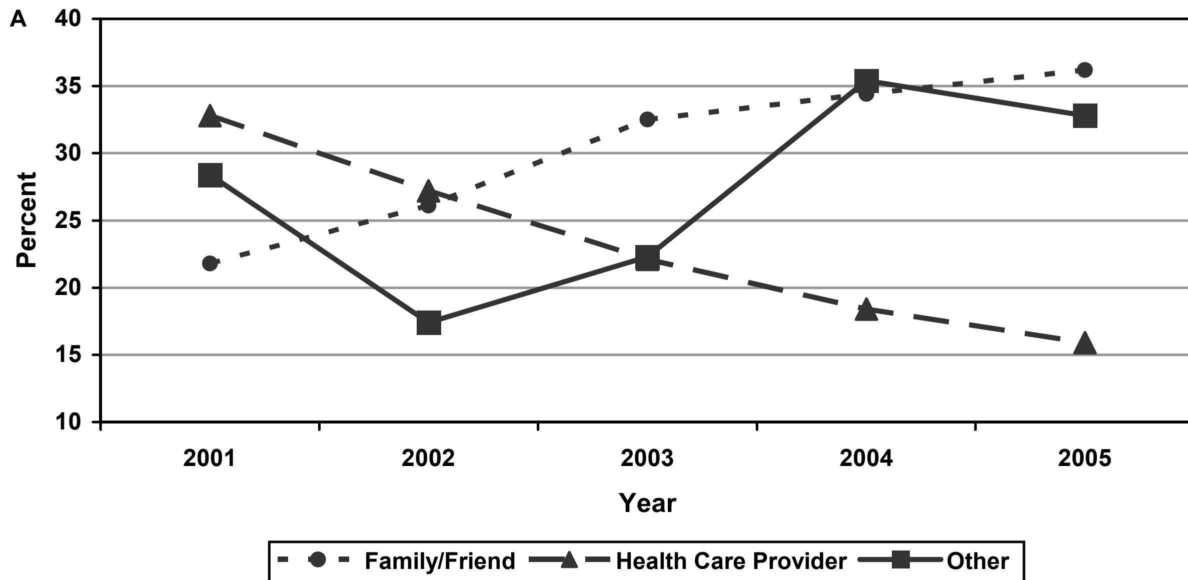
**Table 9:** Referral Source of Patients Assessed at UMDNJ Tobacco Dependence Clinic, 2001-2005

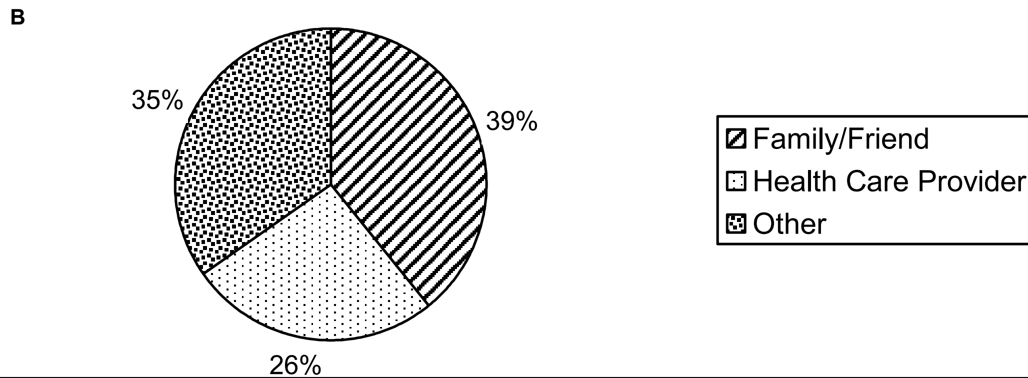
| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| **Family/ Friend** | 50 | 22% | 93 | 26% | 176 | 33% | 222 | 34% | 224 | 36% | 765 | 32% |
| **Health Care Provider** | 75 | 33% | 97 | 27% | 120 | 22% | 119 | 18% | 98 | 16% | 509 | 21% |
| **Other**[a] | 65 | 28% | 62 | 17% | 121 | 22% | 229 | 35% | 203 | 33% | 680 | 28% |
| **Brochure/ Pamphlet** | 1 | 0% | 21 | 6% | 39 | 7% | 20 | 3% | 11 | 2% | 92 | 4% |
| **Employer** | 0 | 0% | 15 | 4% | 35 | 7% | 5 | 1% | 17 | 3% | 72 | 3% |
| **Newspaper/ Magazine** | 16 | 7% | 20 | 6% | 4 | 1% | 10 | 2% | 7 | 1% | 57 | 2% |
| **NJ QuitNet** | 6 | 3% | 15 | 4% | 11 | 2% | 8 | 1% | 14 | 2% | 54 | 2% |
| **School** | 1 | 0% | 10 | 3% | 14 | 3% | 7 | 1% | 7 | 1% | 39 | 2% |
| **Internet (not QuitNet)** | 0 | 0% | 3 | 1% | 4 | 1% | 5 | 1% | 5 | 1% | 17 | 1% |
| **NJ Quitline** | 6 | 3% | 1 | 1% | 6 | 1% | 2 | 0% | 1 | 0% | 16 | 1% |
| **American Cancer Society** | 0 | 0% | 4 | 1% | 0 | 0% | 0 | 0% | 1 | 0% | 5 | 0% |
| **Radio** | 1 | 0% | 1 | 0% | 2 | 0% | 0 | 0% | 1 | 0% | 5 | 0% |
| **American Lung Association** | 0 | 0% | 1 | 0% | 2 | 0% | 1 | 0% | 0 | 0% | 4 | 0% |
| **Member Newsletter** | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 3 | 1% | 4 | 0% |
| **Coalition Against Tobacco (CAT)** | 0 | 0% | 3 | 1% | 0 | 0% | 0 | 0% | 0 | 0% | 3 | 0% |
| **Insurance Company** | 0 | 0% | 0 | 0% | 2 | 0% | 1 | 0% | 0 | 0% | 3 | 0% |
| **Library** | 0 | 0% | 0 | 0% | 1 | 0% | 1 | 0% | 0 | 0% | 2 | 0% |
| **Newspaper** | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 0% |
| **Television** | 0 | 0% | 1 | 0% | 0 | 0% | 0 | 0% | 0 | 0% | 1 | 0% |
| **No Answer** | 7 | 3% | 9 | 3% | 5 | 1% | 15 | 2% | 26 | 4% | 62 | 3% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

a. The most commonly reported “Other” referral sources in 2005 were Self/Former Patient (30%), Pfizer (12%), American Legacy (4%), and Elijah’s Promise (4%)

**Figure 7:** Top three referral sources of patients assessed at the UMDNJ Tobacco Dependence Clinic from 2001 to 2005 (A) annually and (B) overall (N=2391)



## Clinical Indicators Of Tobacco Dependence

The following data summarize the characteristics and clinical indicators of tobacco use in patients seen at the Tobacco Dependence Clinic.

**Tobacco Use Characteristics**

The average patient assessed in 2005 was a pack-a-day (about 20 cigarettes per day) smoker who smokes about 21 minutes after waking in the morning, has smoked regularly for about 24 years, has a baseline expired carbon monoxide rate of about 17 parts per million, and has tried to quit at least 7 times prior to assessment. As shown in **Table 10** below, the patterns of tobacco use among the clinic's patients have remained fairly consistent since 2001. However, the mean number of prior quit attempts in our patients dropped dramatically in 2004, before rising again in 2005.

**Table 10:** Tobacco Use Characteristics among UMDNJ Tobacco Dependence Clinic Patients 2001-2005

| | 2001 (n = 229) | 2002 (n = 356) | 2003 (n = 542) | 2004 (n = 646) | 2005 (n = 618) | Total (N = 2391) |
|---|---|---|---|---|---|---|
| **Mean Years of Regular Use** | 23.05 | 27.71 | 21.95 | 21.22 | 23.91 | 23.22 |
| **Mean Baseline Cigarettes/Day** | 23.33 | 22.15 | 21.25 | 20.32 | 19.65 | 20.93 |
| **Mean Time to 1st AM Use (min)** | 26.50 | 27.01 | 29.02 | 24.50 | 21.19 | 25.27 |
| **Mean # Prior Quit Attempts** | 8.54 | 12.66 | 7.90 | 4.63 | 7.07 | 7.60 |
| **Mean Baseline Expired CO (ppm)** | 18.79 | 18.83 | 15.97 | 16.12 | 16.83 | 16.90 |

**Clinical Indicators**

Several key clinical indicators shown in **Table 10**, **Table 11** and **Figure 8** below have changed among clients seen at the clinic from 2001 to 2005. The percentage of pack-a-day or more smokers has steadily declined, but the proportion of patients waking at night to smoke has remained relatively constant, and the average time-to-first morning cigarette has been decreasing. One possible explanation for this is that as the price of cigarettes has increased (including significant increases in state excise tax), people are buying and smoking fewer cigarettes, but are just as addicted, as evidenced by the large proportion of patients waking at night to smoke and smoking within 30 minutes after waking in the morning.

There has been a steady decline in the proportion of patients with prior mental health treatment, from 58.5% in 2001 to 45% in 2005. Likewise, a smaller percentage of patients at the clinic are smoking "light" cigarettes in 2005 (44.5%) than in 2001 (58%). However, the percentage of patients smoking menthol cigarettes grew continuously from 37% in 2001 to 52% in 2004 and then declined to 37% in 2005. This trend mirrors that of the proportions of African Americans and Hispanic/Latino patients seen at the clinic, because menthol cigarette use is predominant in these populations (**Table 12, Figure 9**)

**Table 11:** Clinical Indicators of Tobacco Dependence among UMDNJ Tobacco Dependence Clinic Patients, 2001-2005

| | 2001 (n = 229) | | 2002 (n = 356) | | 2003 (n = 542) | | 2004 (n = 646) | | 2005 (n = 618) | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| **Smoking ≥ Pack/Day** | 150 | 66% | 232 | 65% | 356 | 66% | 388 | 60% | 364 | 59% | 1490 | 62% |
| **Smoking ≤ 30 Min After Waking** | 185 | 81% | 298 | 84% | 424 | 78% | 526 | 81% | 492 | 80% | 1925 | 81% |
| **Waking at Night to Use Tobacco** | 106 | 46% | 167 | 47% | 258 | 48% | 351 | 54% | 285 | 46% | 1167 | 49% |
| **Tobacco-Related Health Problem** | 143 | 64% | 206 | 59% | 301 | 57% | 362 | 58% | 360 | 62% | 1372 | 59% |
| **Prior Mental Health Treatment** | 131 | 59% | 182 | 55% | 274 | 52% | 288 | 48% | 249 | 45% | 1124 | 50% |
| **Prior Addiction Treatment** | 63 | 28% | 84 | 25% | 164 | 31% | 168 | 28% | 170 | 33% | 649 | 29% |
| **Light/Low Tar Brand** | 133 | 58% | 208 | 58% | 264 | 49% | 312 | 48% | 275 | 45% | 1192 | 50% |
| **Menthol Brand** | 86 | 38% | 116 | 33% | 256 | 47% | 336 | 52% | 231 | 37% | 1025 | 43% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

**Figure 8**: Clinical Indicators of Tobacco Dependence among UMDNJ Tobacco Dependence Clinic Patients, 2001-2005 (N=2391)

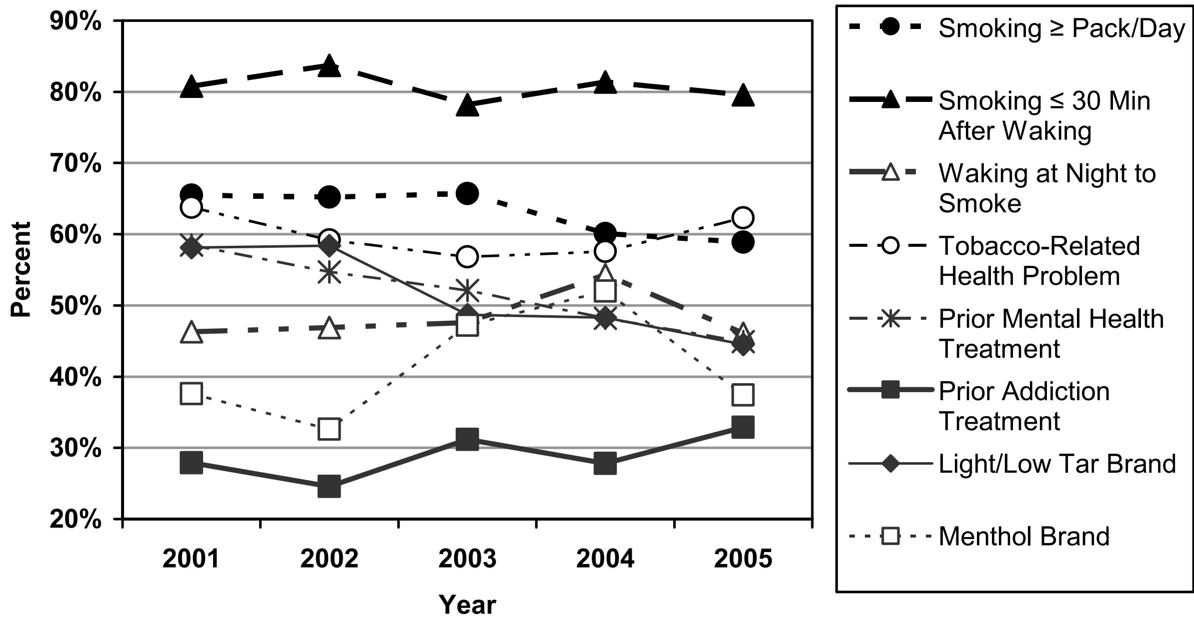
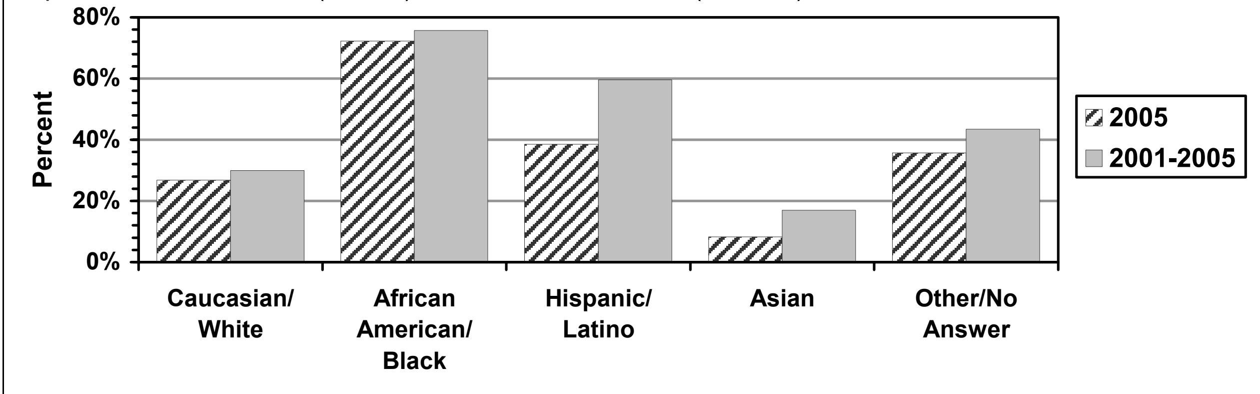


**Table 12:** Menthol Use by Race/Ethnicity among UMDNJ Tobacco Dependence Clinic Patients assessed in 2005 (n = 618) and overall 2001-2005 (N=2391)

| | 2005 | | | 2001 - 2005 | | |
|---|---|---|---|---|---|---|
| | Count | n | Percent | Count | n | Percent |
| **Caucasian/White** | 109 | 407 | 27% | 460 | 1533 | 30% |
| **African American/Black** | 96 | 133 | 72% | 405 | 535 | 76% |
| **Hispanic/Latino** | 20 | 52 | 39% | 124 | 208 | 60% |
| **Asian** | 1 | 12 | 8% | 9 | 53 | 17% |
| **Other/No Answer** | 5 | 14 | 36% | 27 | 62 | 44% |

NOTE: For table simplicity, percentages have been rounded to nearest whole number

**Figure 9:** Race/Ethnicity breakdown of patients smoking menthol cigarettes at UMDNJ Tobacco Dependence Clinic, 2005 (N=618) and overall 2001-2005 (N=2391)



## Treatment and Outcomes

### Group Sessions and Pharmacotherapy

All patients at the clinic receive a comprehensive assessment, usually consisting of a 60 to 90 minute appointment. Most patients are then treated with a combination of individual or group counseling, plus pharmacotherapy (nicotine replacement therapy and/or nicotine cessation medications). Patients who cannot attend groups are seen individually at hours to suit their needs, and where there is sufficient demand, assessments and treatments can be provided on-site at workplaces or educational institutions.

Abstinence rates at the clinic are strongly and positively related to the number of treatment sessions attended and the number of medications used. Patients who use multiple medications and use them for longer periods of time have significantly higher success rates in quitting[3]. The clinic continues to encourage patients to make use of group treatment (typically a 6-week Stop Smoking Group on Tuesday evenings), our relapse prevention group (typically every Thursday evening), and an appropriate combination of nicotine replacement therapy (NRT)/cessation medications. The outcomes of our 6-week group treatment are described in detail in our 2002 annual report, and the analyses of our 2001-2003 data[4] found that patients participating in group treatment have significantly better 6-month outcomes than those receiving only individual treatment (41.3% vs. 28.7%).

In 2005, 93% of the patients reached for follow-up after 4 weeks (n=430) reported use of NRT/cessation medications, and 91% of patients assessed from 2001-2005 reported use of pharmacotherapy (n=1709) at 4-week follow-up (**Table 13**). Of these, the most used medications were nicotine patch (43%) and nicotine inhaler (34%). As shown in **Table 14**, more than 40% of patients reached for 4-week follow-up used combination pharmacotherapy (two or more medications together).

**Table 13:** Medication Use among patients providing complete medication information at 4-week follow-up at UMDNJ Tobacco Dependence Clinic Patients, 2001-2005 (n = 1709)

| | Number of Patients | % of Patients [a] |
|---|---|---|
| **Nicotine Patch** | 754 | 44.1% |
| **Nicotine Gum** | 215 | 12.6% |
| **Nicotine Lozenges** | 112 | 6.6% |
| **Nicotine Inhaler** | 594 | 34.8% |
| **Nicotine Nasal Spray** | 33 | 1.9% |
| **Bupropion (Zyban, Wellbutrin)** | 308 | 18% |

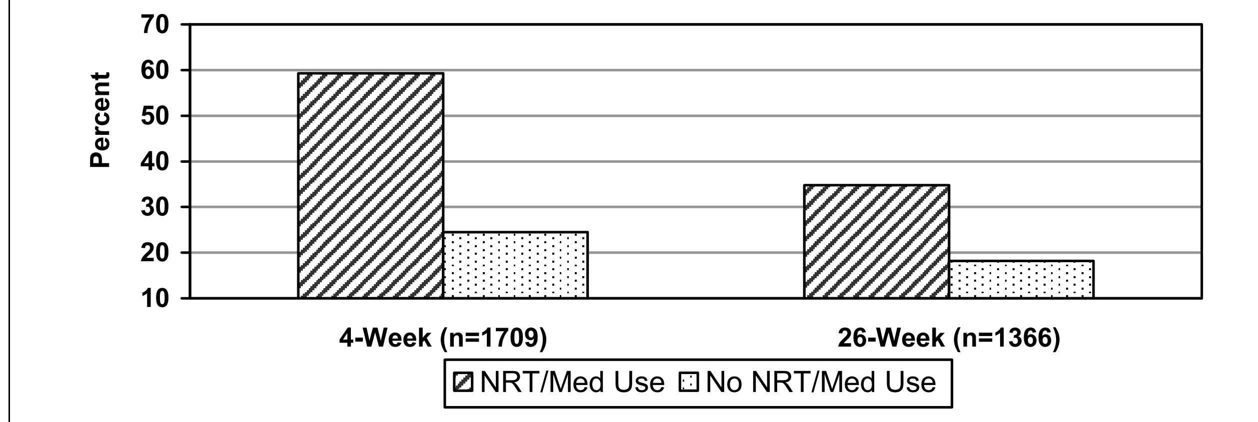
a. Total percentages > 100% due to use of multiple medications in patients

**Table 14:** Use of combination pharmacotherapy among patients providing complete medication information at 4-week follow-up at UMDNJ Tobacco Dependence Clinic Patients, 2001-2005 (n = 1709)

| | Number of Patients | % of Patients* |
|---|---|---|
| **0** | 159 | 9.3% |
| **1** | 825 | 48.3% |
| **2** | 463 | 27.1% |
| **3 or More** | 262 | 15.3% |

As **Figure 10** shows, among a subset of patients who were successfully followed-up and provided complete medication information (2001 through 2005), those who used NRT/cessation medications during their quit attempt were two and a half times as successful (59% vs. 24%; p=0.001, Pearson Chi Square) in being abstinent at 4 weeks than those patients who didn't and were nearly twice as successful (35% vs. 18%; p<0.001, Pearson Chi Square) at 6 months post quit date. This data supports previous findings regarding the effectiveness of NRT/cessation medications, and the clinic continues to integrate medications as an important part of treatment.

**Figure 10:** Quit rates at the UMDNJ Tobacco Dependence Clinic based on use of nicotine replacement therapy/cessation medications, 2001 - 2005




In addition to findings of increased abstinence rates among patients using NRT and/or cessation medications and increased abstinence rates associated with combination pharmacotherapy, we also found patients who continued their NRT/medication(s) through 6 months post-quit date were more likely to be abstinent at 6 months. Among patients that were reached for 26-week follow-up that used NRT/medications during their quit attempt (n=1249, 2001-2005), 207 (17%) reported that they were still using at least one of their NRT/medications, of which 65% reported that they were abstinent from tobacco. When compared to patients who discontinued NRT/medication use prior to 6-month follow-up, who had a quit rate of 43%, patients that continue pharmacotherapy through 6 months after quit date are significantly more likely to be abstinent at 6 months. It should be noted, however, that these rates are true among those that were reached for follow-up and complied with pharmacotherapy recommendations; therefore, they may inherently different than and not generalizable to the entire clinic population.

**Outcomes**

Of the 618 patients assessed at the clinic in 2005, 600 chose a quit date and planned to attempt to stop smoking at the clinic (97%), of which 564 (94% of those with a quit date; 91% of total) were eligible for standard follow-up protocol[*] (**Table 15**). Seventy-four percent of patients were followed-up at 4 weeks post quit date, and 49% were followed-up at 6 months post quit date. **Figure 11** depicts follow-up rates over time since clinic inception in 2001. While 4-week follow-up rates are slightly higher than in 2003 and 2004, 26-week follow-up rates have decreased since 2004. This decline is likely due to staffing changes that took place at the clinic.

[*] 36 (6% of total) patients were assessed as part of a combination pharmacotherapy study headed by Michael Steinberg, MD and did not qualify for standard clinic follow-up procedures. These patients were excluded from all follow-up analyses in this report.

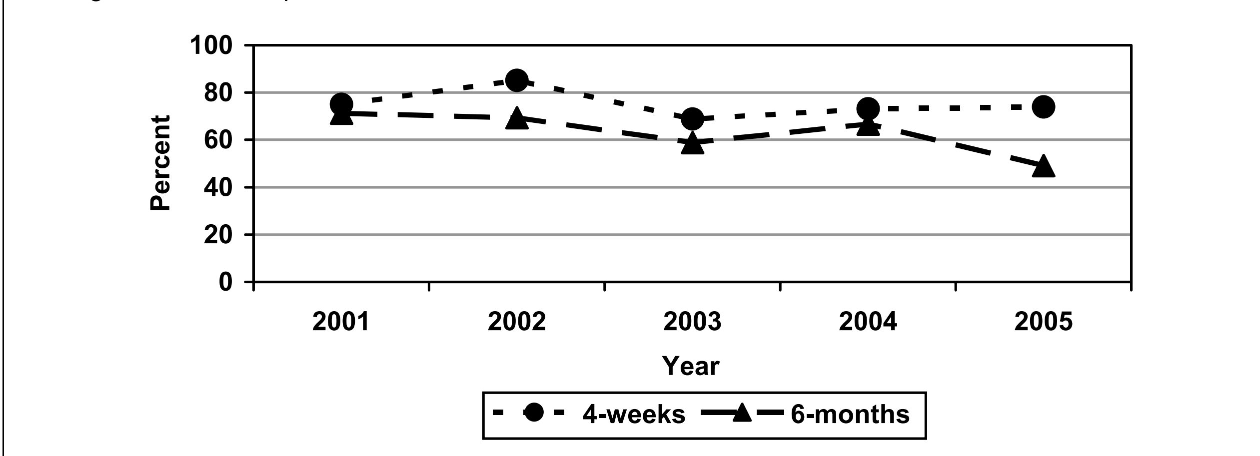
The following data were compiled from those patients who were reached for follow-up. Any patient who set a quit date and was eligible for follow-up that could not be reached for follow-up was assumed to be smoking at least as many cigarettes per day as s/he was smoking at assessment.

**Table 15:** Quit Date and Follow-Up Statistics at UMDNJ Tobacco Dependence Clinic, 2005

| | Count | % |
|---|---|---|
| **Total Patients Assessed** | 618 | ------ |
| **Eligible for Standard Follow-Up Protocol** | 582 | 94.2%[a] |
| **Declared a Target Quit Date** | 564 | 96.9%[b] |
| **Completed 4-Week Follow-Up** | 430 | 76.2%[b] |
| **Completed 26-Week Follow-Up** | 286 | 50.7%[b] |

a. Percent of total patients assessed in 2005 (n=618)
b. Percent of total patients assessed in 2005 that declared a quit date and qualified for standard follow-up procedure (n=564)

**Figure 11:** Annual percentage of follow-ups successfully completed among patients that set a quit date and eligible for follow-up, 2001-2005




The clinic defines abstinence/quitting as a self-report of "no use of tobacco" during the previous seven days. In cases where follow-up was completed in person, reported abstinence was confirmed by an expired Carbon Monoxide (CO) reading of less than ten parts per million (ppm)[5]. As shown in **Table 16**, among the 91 patients that reported abstinence and provided a CO measurement at 4 week follow-up, 100% confirmed their report with an expired CO rate of less than 10 parts per million. Of further note, the mean expired CO was 1 ppm (ranging 0 to 6, n=91) among patients reporting abstinence and 9.4 ppm (ranging 0 to 32, n=34) among patients reporting smoking.

Significant reduction in cigarette use at follow-up is defined as smoking half or less than half of the number of cigarettes per day as were smoked prior to treatment. The validity of self-reported "significant reduction in cigarette use" is also supported by biochemical verification when available. Among patients providing CO measurements at both assessment and 4-week follow-up that reported smoking half or less-than-half as many cigarettes per day as at assessment (n=21), the mean CO at 4-week follow-up was 58% lower than at assessment (6.8 ppm vs. 16 ppm).

**Table 16:** Mean CO measurements and percent with CO less than 10 ppm at 4 weeks by reported cigarette consumption among patients providing CO rates at 4-week follow-up in 2005 (n=125)

| | n | Mean | Minimum | Maximum | % < 10ppm |
|---|---|---|---|---|---|
| **Quit** | 91 | 1 | 0 | 8 | 100% |
| **Significantly Less (≤50%)** | 21 | 7 | 0 | 32 | 76.2% |
| **Less (51-99%)** | 2 | 21 | 15 | 26 | 0% |
| **Same or More (≥100%)** | 11 | 13 | 1 | 26 | 27.3% |
| **TOTAL** | 125 | 3 | 0 | 32 | 88% |

### Outcomes 4 and 26 Weeks Post Quit Date

As shown in **Table 17** below, 244 patients reported short-term abstinence from tobacco after 4 weeks (43%) and 109 (19.3%) reported abstinence at 26 weeks. An additional 91(16%) and 44 (8%) patients reported smoking significantly less (50% or less) than before treatment after 4 and 26 weeks, respectively.

**Table 17:** 4-week and 26-week follow-up data for patients who set a quit date, 2005

| | 4-Week | | 26-Week | |
|---|---|---|---|---|
| | Count | % | Count | % |
| **Patients that Declared a Quit Date** | 564 | ------ | 564 | ------ |
| **Patients Successfully Followed Up** | 430 | 76.2% [a] | 286 | 50.7% [a] |
| **Quit** | **244** | **43.3%** | **109** | **19.3%** |
| **Significantly Less (≤50%)** | 91 | 16.1% | 44 | 7.8% |
| **Less (51-99%)** | 29 | 5.1% | 49 | 8.7% |
| **Same or More (≥100%) [b]** | 200 | 35.5% | 362 | 64.2% |

a. Percent of total patients that declared a quit date that qualified for standard follow-up protocol (n=564)
b. Includes patients not reached for follow-up and assumed to be smoking at least as much relative to intake

The pie charts in **Figure 12** display the proportions of patients reached for 4 and 26 week follow-up that reported smoking zero, 50% or less, 51-99% less, or at least as much cigarette consumption relative to assessment. **Figure 13** displays abstinence reports at 4 and 26 weeks over time since the clinic's inception in 2001. While 4-week abstinence rates have been rising since 2003, 26-week abstinence rates have decreased markedly since 2004. This decline can more-than-likely be explained by the uncharacteristically low 26-week follow-up rates during 2005, since patients lost-to-follow-up are assumed to be smoking. Furthermore, since 4-week outcomes are very similar to previous years, it is unlikely that the quality of treatment at the clinic is responsible for the lower 26-week abstinence rates.

**Figure 12:** Smoking Status among patients assessed in 2005 at UMDNJ Tobacco Dependence Clinic (A) at 4-week follow-up and (B) at 26-week follow-up (n=564)

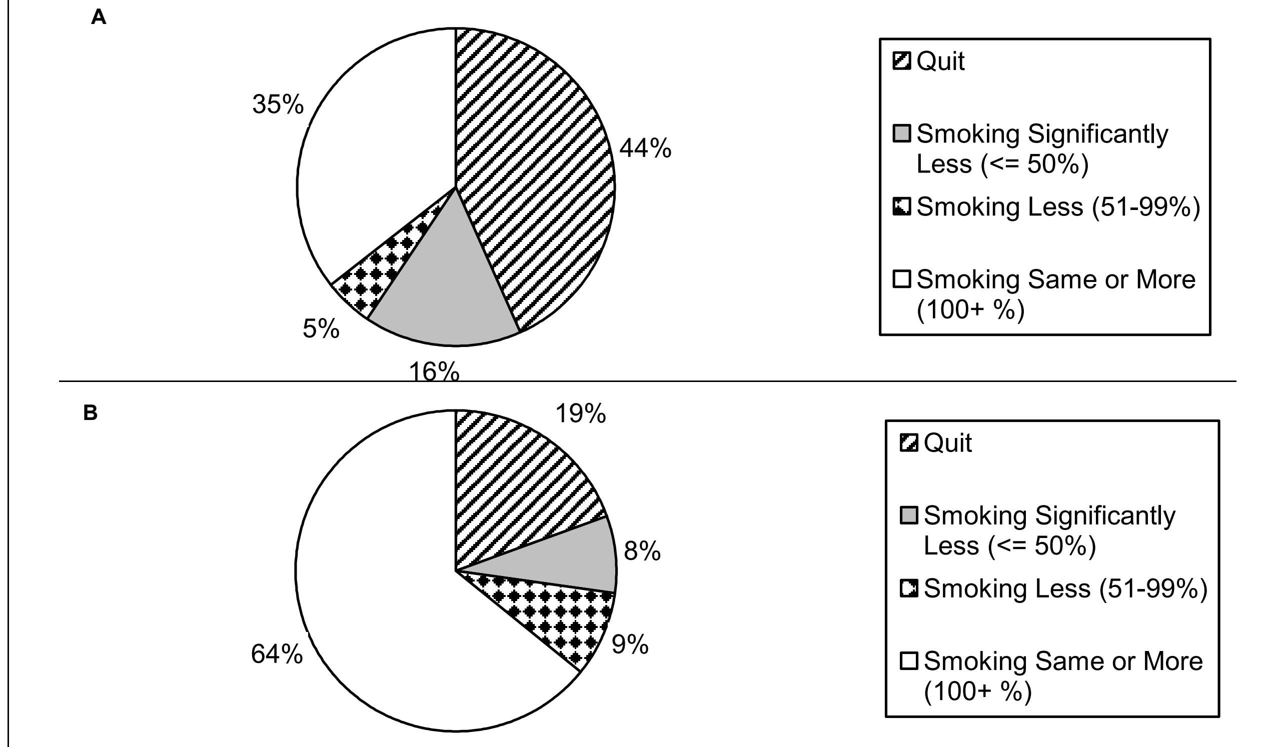
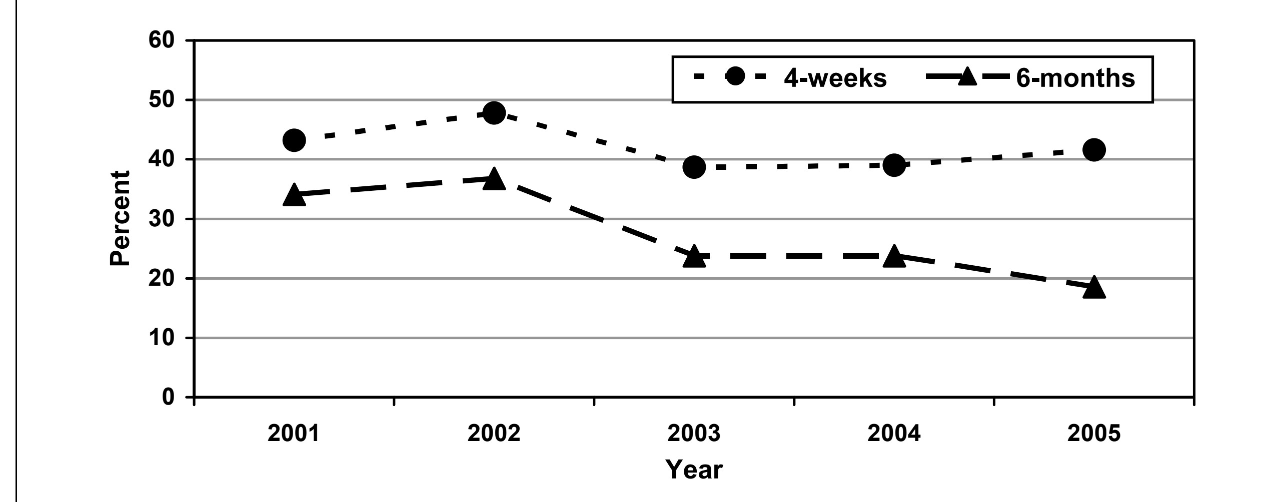



**Figure 13:** Abstinence rates at 4 and 26 weeks post-quit date among patients assessed at UMDNJ Tobacco Dependence Clinic who declared a quit date and were eligible for follow-up, 2001-2005




Four and 26-week follow-up data are summarized for 2001 through 2004, 2005 and overall in **Table 18** and **Table 19** .

**Table 18:** Summary of patients' follow-up and smoking outcomes at 4-weeks post quit date for patients assessed 2001-2004, 2005, and all 5 years

| | | 2001-2004 | | | 2005 | | | 2001-2005 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Assessed | Set Quit Date | Completed Follow-Up | Assessed+ | Set Quit Date | Completed Follow-Up | Assessed+ | Set Quit Date | Completed Follow-Up |
| **Total Patients** | # | 1773 | **1652** | 1320 | 582 | **564** | 430 | 2355 | **2216** | 1750 |
| | % | ------ | **93.2%*** | 80%** | ------ | **96.9%*** | 76.2%** | ------ | **94.1%*** | 79%** |
| **Patients Quit** | # | 728 | **722** | 722 | 243 | **243** | 243 | 971 | **965** | 965 |
| | % | 41.1% | **43.7%** | 56.5% | 41.8% | **43.1%** | 56.5% | 41.2% | **43.5%** | 56.5% |
| **Patients Smoking Significantly Less (≤ 50% vs. Intake)** | # | 259 | **248** | 248 | 91 | **91** | 91 | 350 | **339** | 339 |
| | % | 14.6% | **15.0%** | 19.4% | 15.6% | **16.1%** | 21.2% | 14.9% | **15.3%** | 19.9% |
| **Patients Smoking Less (51-99% vs. Intake)** | # | 125 | **119** | 119 | 29 | **29** | 29 | 154 | **148** | 148 |
| | % | 7.1% | **7.2%** | 9.3% | 5.0% | **5.1%** | 6.7% | 6.5% | **6.7%** | 8.7% |
| **Patients Smoking Same or More (100+ % vs. Intake)** | # | 661 | **563** | 188 | 219 | **201** | 67 | 880 | **764** | 255 |
| | % | 37.3%++ | **34.1%++** | 14.7% | 37.6%++ | **35.6%++** | 15.6% | 37.4%++ | **34.5%++** | 14.9% |

* Percent of total patients assessed
** Percent of total patients that declared a quit date (intent-to-treat)
\+ Excludes 36 (1.5%) patients from Dr. Michael Steinberg's study (not eligible for standard clinic follow-up)
++ Includes patients that were unable to be reached for follow-up (assumed to be smoking as much or more vs. intake)

**Table 19:** Summary of patients' follow-up and smoking outcomes at 26-weeks post quit date for patients assessed 2001-2004, 2005, and all 5 years

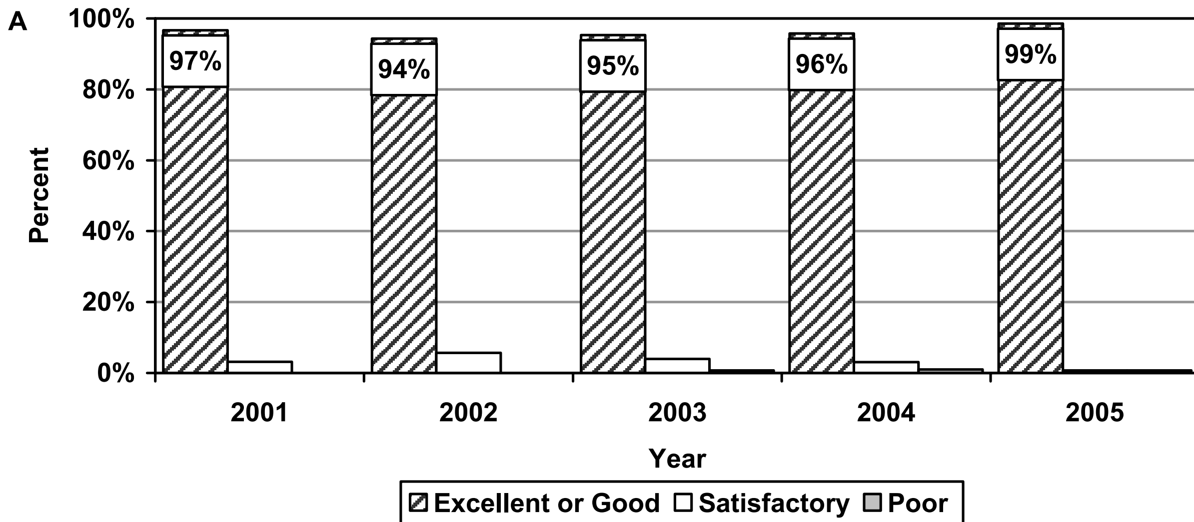
| | | 2001-2004 | | | 2005 | | | 2001-2005 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Assessed | Set Quit Date | Completed Follow-Up | Assessed [+] | Set Quit Date | Completed Follow-Up | Assessed [+] | Set Quit Date | Completed Follow-Up |
| **Total Patients** | # | 1773 | **1652** | 1159 | 582 | **564** | 286 | 2355 | **2216** | 1445 |
| | % | ------ | **93.2%**[*] | 70.2%[**] | ------ | **96.9%**[*] | 50.7%[**] | ------ | **94.1%**[*] | 65.2%[**] |
| **Patients Quit** | # | 489 | **476** | 475 | 108 | **108** | 108 | 597 | **584** | 583 |
| | % | 27.6% | **28.8%** | 42.4% | 18.6% | **19.1%** | 37.8% | 25.4% | **26.4%** | 41.5% |
| **Patients Smoking Significantly Less (≤ 50% vs. Intake)** | # | 231 | **225** | 225 | 44 | **44** | 44 | 275 | **269** | 269 |
| | % | 13.0% | **13.6%** | 20.1% | 7.6% | **7.8%** | 15.4% | 11.7% | **12.1%** | 19.1% |
| **Patients Smoking Less (51-99% vs. Intake)** | # | 186 | **181** | 181 | 49 | **49** | 49 | 235 | **230** | 230 |
| | % | 10.5% | **11.0%** | 16.2% | 8.4% | **8.7%** | 17.1% | 10.0% | **10.4%** | 16.4% |
| **Patients Smoking Same or More (≥100% vs. Intake)** | # | 867 | **770** | 239 | 381 | **363** | 85 | 1248 | **1133** | 324 |
| | % | 48.9%[++] | **46.6%**[++] | 21.3% | 65.5%[++] | **64.4%**[++] | 29.7% | 53.0%[++] | **51.1%**[++] | 23.0% |

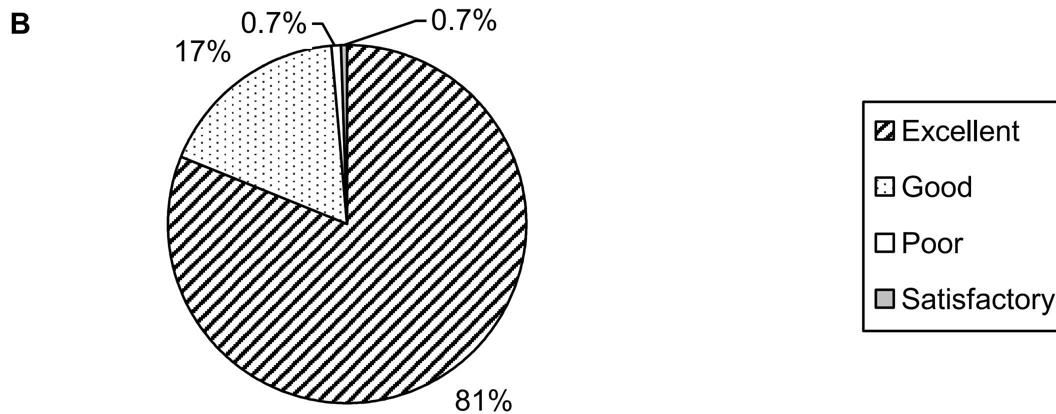
* Percent of total patients assessed
** Percent of total patients that declared a quit date (intent-to-treat)
\+ Excludes 36 (1.5%) patients from Dr. Michael Steinberg's study (not eligible for standard clinic follow-up)
++ Includes patients that were unable to be reached for follow-up (assumed to be smoking as much ore more vs. intake)

**Patient Satisfaction**

A patient satisfaction question is administered to each patient at follow-up. Of the 430 patients assessed in 2005 that completed 4-week follow-up, 293 (50.3%) answered the patient satisfaction question. As shown in **Figure 14** below, over 98% of those patients rated the clinic's services as good or excellent in 2005, and satisfaction rates have consistently improved each year since 2001.

**Figure 14:** Patient Satisfaction reports among patients reached for 4-week follow-up (A) over time, 2001-2005 (n=1162) and (B) overall in 2005 (n=430)



## Discussion and Conclusions

### Factors Associated w/ Treatment Outcome

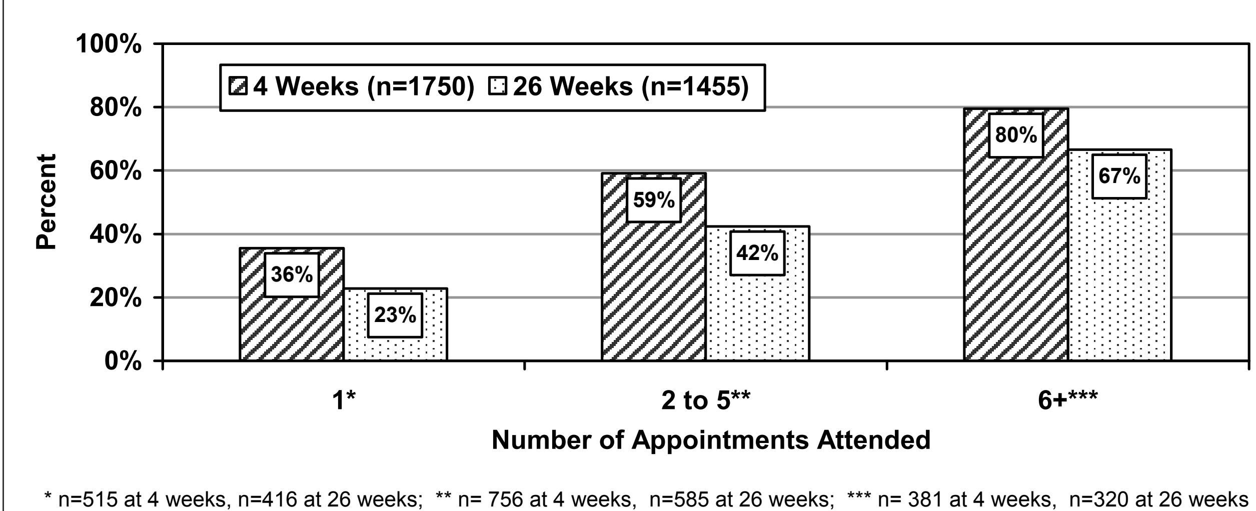
Several detailed analyses of baseline and treatment factors have been performed on data from this clinic in order to identify predictors of treatment outcome (i.e., which factors appear to influence who succeeds in quitting smoking[4]).

In analyses of all the patients who made a quit attempt at the clinic during the first three years, 19 baseline and treatment variables were statistically related to outcome in univariate (one-way) analyses. When we conducted multivariate analyses (i.e. controlling for other variables that are related to outcome) we found that those who were unemployed, had less education, had no private health insurance, smoked within 5 minutes of waking in the morning, and woke up at night to smoke, were less likely to be abstinent 6 months after their target quit date. However, those who used smoking cessation medications, attended more individual and group appointments, had two or more children, and were of older age (65 or over) were more likely to be abstinent from tobacco six months later.

In another detailed analysis of the effects of medication use in a subset of patients (n=790) in whom we had complete data on medication use, we found that the more medications patients used, the better their outcomes were at 4-week follow-up, although this relationship was less strong by 6 months[3]. Twenty-seven percent of the patients continued to use medications at 6 months, and they had significantly higher 6-month abstinence rates (65%) than those who stopped their medications prior to the 6-month point (27%).

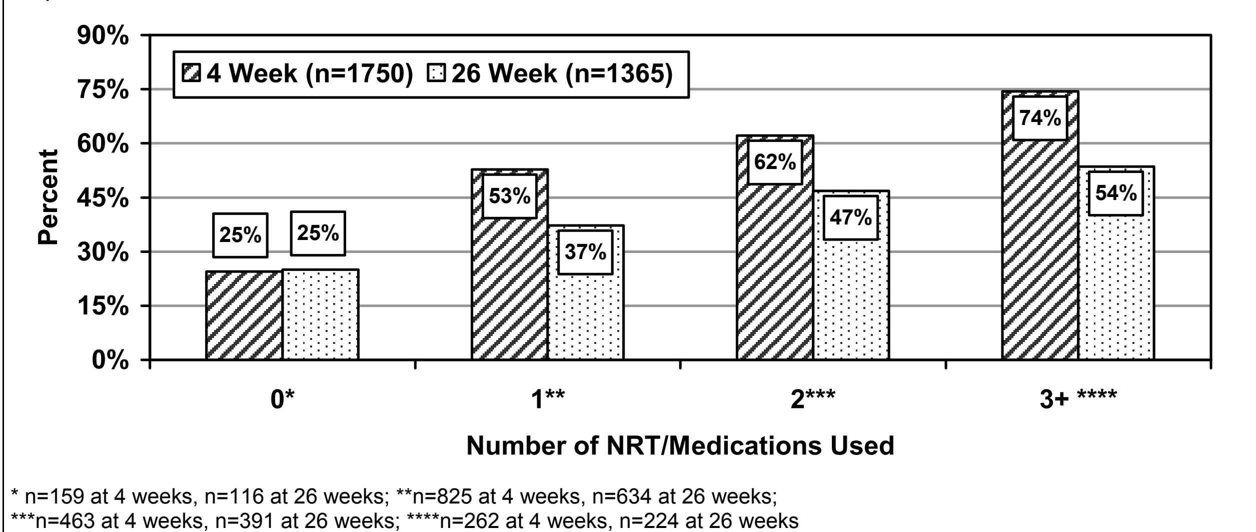
The 4-week and 6-month outcomes by number of appointments attended at the clinic from 2001 to 2005 are shown in Error! Reference source not found. below. It is important to note that these quit rates were derived from a subpopulation that participated in follow-up and provided information about number of face-to-face contacts. Additionally, it is possible that the high quit rates among patients attending more appointments are due in part to patient self-selection into the "6+ appointments" category. For example, a patient that is finding benefit at the clinic is more likely to continue attending follow-up sessions.

**Figure 15:** 4 and 26 week quit rates based on number of face-to-face clinic contacts among patients that were reached for follow-up at UMDNJ Tobacco Dependence Clinic, 2001-2005




The quit rates by medication use for 2001 to 2005 are shown in Error! Reference source not found. below. Again, it is important to note that these quit rates were calculated among a subset of patients that participated in follow-up and provided complete medication information. These rates, therefore, may not apply to the general clinic population.

**Figure 16:** 4 and 26-week quit rates based on number of nicotine replacement therapies (NRT) and/or cessation medications used among patients that were reached for follow-up at UMDNJ Tobacco Dependence Clinic, 2001-2005




As findings from this report and prior analyses (discussed above) have shown, higher quit rates tend to be associated with use of pharmacotherapy, combination pharmacotherapy, and increased number of follow-up sessions. Therefore, advising patients to continue use of their medications until they have experienced fourteen consecutive days without significant cravings, withdrawal symptoms, or near lapses to smoking is characteristic of treatment at the Tobacco Dependence Clinic. This allows duration of pharmacotherapy to be tailored to individual patient need. Additionally, patients are encouraged to attend at least six follow-up sessions at the clinic.

As mentioned earlier, the clinic saw a larger proportion of patients from underserved populations (I.e., Patients without health insurance, younger patients) and highly addicted patients (I.e., Patients smoking soon after waking, patients that wake at night to smoke) in 2005. Given that such factors are associated with lower chances of long-term tobacco abstinence, treating more patients with these factors will naturally cause a decline in the clinic's overall quit rates. Additionally, the low 6-month quit rate is likely due to low 6-month follow-up rates and not due to an issue with clinic treatment, since the abstinence rates at 4 weeks are similar to previous years and patient satisfaction rates are at an all-time high.

It is also worth noting that over the five years covered by this report, the number of clients treated has increased while the annual funding for the Tobacco Dependence Program has been cut significantly. Due to these budget restrictions, the clinic is no longer able to distribute free NRT, which reduces both patient incentives to initially come to the clinic and patient compliance with respect to pharmacotherapy and follow-up session recommendations. In knowing that cessation rates increase with number of NRT/medications used and number of clinic appointments attended, the clinic will strive to devise new and creative ways to improve compliance with behavioral and pharmacological treatments, as well as follow-up.

## Acknowledgements

This report was compiled by Michelle T. Bover, MPH, Jonathan Foulds PhD (jonathan.foulds@umdnj.edu), and Michael Steinberg MD MPH, with assistance from the faculty and staff at the Tobacco Dependence Program at UMDNJ-School of Public Health.

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Date: July 5, 2007

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