A Critical Review and Evaluation of Smoking Control Methods

JEROME L. SCHWARTZ, Dr.P.H.

MORE than 21 million persons in the United States have given up smoking. Millions of other smokers have attempted to stop, succeeded for varying periods of time, only to resume smoking again. The withdrawal methods they have tried range from gimmicks and self-devised techniques to highly organized medical programs such as Ejrup's Karolinska in Stockholm (*1–4*) and New York Hospital (*5*) clinics. The methods include educational programs; classes; fear-arousing lectures and communications; programed learning; role playing; positive thinking; books; movies; nicotine substitutes; medications in the form of pills, lozenges, chewing gum, and injections; mouthwashes and other drugstore remedies; mail-order techniques; sleep records; exercises; self-control; social pressure; bets; 5-day plans; stimulus satiation; aversion techniques and conditioning; personal counseling from physicians, psychologists, ministers, social workers, health educators, and others; discussion groups; hypnosis; group therapy; and psychoanalysis. Some programs have combined several of these approaches.

The highlights of numerous investigations of cessation methods are presented here. The listing beginning on page 486 contains initial and followup results (where available) for 62 studies of cessation programs, which used 100 methods as well as placebos and controls, conducted in the United States, Canada, Australia, England, Scandinavia, and other parts of Europe. The programs listed are by no means the only ones which have tried smoking "cures." Several hundred investigators have participated in organized cessation programs and untold numbers of physicians have recommended their own methods to help their patients stop smoking. For example, a survey conducted among a random sample of physicians in California showed that they used the following methods to help patients stop smoking: direct orders, 28 percent; impressing patients with hazards, 85 percent; suggestions or persuasion, 47 percent; tranquilizers, 17 percent; educational material, 16 percent; and five other methods, from 2 to 14 percent (*6*).

Measures of Success

Standardized criteria for measuring success in smoking cessation programs have not been established. Results of the Smoking Control Re-

Dr. Schwartz was project director for the Smoking Control Research Project, Institute for Health Research-Permanente Medical Group-Kaiser Foundation Health Plan, Berkeley, Calif. He is now research social scientist and coordinator, Health Services Research Program, Institute for Business and Economic Research, University of California, Berkeley.
This review was supported by Cancer Demonstration Grant No. 0515D67(S-68) from the Division of Chronic Diseases, Public Health Service, and U.S. Government Purchase Order No. D-280946-9 from the National Clearinghouse for Smoking and Health.

search Project indicate that complete or near-complete cessation is the best way to measure success in a smoking control program (*7, 8*). Although reduction of 50 percent in amount smoked may be beneficial, reducers generally relapse to their previous smoking habits. Lynch reported that relapse rates for persons who only reduced their cigarette consumption was 50 percent within 3 months, but just 9 percent for those who had completely stopped smoking (*9*). Results similar to Lynch's were reported in surveys by Hammond and Garfinkel (*10*).

A smoker will probably reduce his risk of illness if he smokes a brand low in nicotine and tar, smokes less of each cigarette, inhales slightly or not at all, and smokes fewer cigarettes per day. However, only a small number of pack or pack-and-a-half smokers who manage to reduce to one-half pack can remain at that level; moreover, few smokers who have inhaled for many years can stop inhaling.

Several possible measures of success could be used as standardized criteria. Two such measures are (*a*) percent reduction in amount smoked—100 percent, 50 percent, and 0 percent—and (*b*) smoking category at the end of the study and followups—occasional, one-half pack, one pack, and so on. If researchers generally followed these more precise criteria, rather than simply reporting "good" results, for example, their methods could be evaluated and compared more closely.

Discussion of the Listing

The listing groups cessation methods under six general headings and a miscellaneous category. The names of the investigators, location and year of the study, and a short description of subjects, methods, and initial and followup results are presented for each study where the information was available. The studies reviewed were conducted during the years 1957–68, and published or unpublished reports of their programs were available. Most of the studies were conducted during 1963–65 and about equal numbers between 1957–62 and 1966–68.

Obviously, other control programs could be added to the list. Some studies were excluded from the listing, however, because they reported only amount of decrease in smoking (overall mean reduction) rather than number or percent of subjects who actually stopped. For example, White (*11*) reported that 50 of his 109 subjects "showed some decrease in the number of cigarettes smoked," and there is no way to judge whether these subjects reduced their consumption 15 percent or 50 percent. In another study Janis and Mann (*12*) reported a 10.5 decrease in daily cigarette consumption for role-playing subjects and a 4.8 decrease for controls who listened to a taped message. The difference was significant, but the number of persons who actually quit was not mentioned. Studies such as these are inadequately evaluated as cessation techniques and cannot be compared with more thoroughly assessed withdrawal methods.

Other investigations were omitted from the listing because too few subjects were studied or because reported results were confusing or conflicting. However, letters were sent to some investigators requesting missing information, such as the number who actually quit and the proportion of subjects included in the followup, and recalculations based on all subjects were computed for some programs which reported data on only a portion of the original group. Based on all available data, each study is evaluated on four points: (*a*) whether placebos or controls were used, (*b*) whether the investigators, or in some instances other persons, conducted a followup based on at least three-fourths of the subjects, (*c*) whether a followup was conducted after at least 6 months, and (*d*) whether reported results are based on all subjects starting treatment.

Although a long term followup is often difficult and expensive, it is necessary for adequate evaluation of the effectiveness of the method. Of the 62 studies listed, 34 had a followup after at least 6 months, 15 had a followup after less than 6 months, and the balance did not have a followup.

Twenty studies reported followup results based on at least three-fourths of the subjects, and 12 of these included all subjects in their results (*4, 29, 30, 32, 41, 50, 52, 53, 60, 68, 71, 77*). Most investigators, however, calculated outcome rates only for subjects who completed treatment, thus biasing their results in a favorable direction—especially for methods (such as groups or aversive conditioning) with high dropout rates.

The potential magnitude of this bias is illustrated by an example from the Smoking Control Research Project: 27.8 percent of all the placebo subjects who received group counseling were successful at the 1-year followup, but 45 percent could be counted as successful if the rate were based only on persons who attended at least one-half of the sessions. Similarly, the end-of-treatment success rate for this procedure would be 70 percent instead of 47.2 percent if only subjects completing at least one-half of the treatment were counted (*7*, *69*, *70*).

Another factor which tends to bias outcome results is the practice of selective followup—counting only those subjects who respond to the followup. Incomplete followup also makes it difficult to compare the success rates of different programs and biases outcome results. For example, Ejrup reported a followup success rate of 61 percent for the Stockholm clinic (*1–3*), but this was based on the results of selected subjects. When the Norwegian Research Group followed up on the same study, it found only 23 percent had been successful (*4*).

The 20 programs which used controls or placebos are indicated in the listing. As is well known, the effectiveness of a technique cannot really be judged unless it is compared to a control. Drug research calls for the use of matched placebos, while other research requires the use of matched control subjects who do not receive the treatment but who have characteristics or environments similar to those of the treated subjects.

Loranger, Prout, and White conducted an experiment in which hospitalized psychiatric patients were given a "new tranquilizer" and a "new energizer"—both of which were placebos (*78*). The improvement rate among patients was high—53 to 80 percent—as judged by patients, psychiatrists, and nurses. These investigators concluded that their experiment "dramatically illustrates the dubious value of studies which do not employ double-blind and other controlled procedures in evaluating new psychopharmacological agents."

Higher success rates for a certain treatment as opposed to a control does not necessarily indicate the superiority of the method. In Whitehead and Davies' experiment, for example, two of five subjects given the drug, diazepam, were successful at the end of treatment and 3 months after treatment; 8-month results showed only one subject still successful (*32*). This person, however, had not taken any of the pills, and the other successful subject at the earlier followup had taken only two. The failures took the pills!

Of 13 drug trials in the listing (several run by one investigator), two showed better results, eight the same, and three worse results for the drug than for a placebo. In 18 experiments in which treated subjects were matched with controls, the method was better in eight, worse in seven, and similar to the control in three. The "better" results were not always statistically significant. Often, a method showed better initial results than the control, but also had high rates of recidivism so that placebos achieved equal or better long term results. Thus, after 3 months, Guilford's subjects showed 34 percent success and controls 23 percent, but at 1 year both groups had a 16 percent success rate (*38*).

Results at the end of treatment varied among the studies in the listing, with a reported high of 89 percent for Arvidsson (*4*, *31*), 85 percent for Bjartveit (*4*)—both withdrawal clinics—and 84 percent for Elliott and Tighe, who used the threat of monetary loss as the method among a group of college students (*77*). No success was recorded with aversion therapy by Greene (*43*), 10 percent for McGuire and Vallance using electric shock (*45*), and 4.3 percent for tranquilizers used by Turle (*28*). The low number of successes recorded in some studies forced investigators to analyze their results in terms of total cigarette reduction rather than number of successes. Pyke, Agnew, and Kopperud reported a significant reduction at the end of treatment (*44*), but followup correspondence in 1966 with Pyke revealed that complete cessation had occurred for only a few subjects.

A number of studies achieved between 20 and 35 percent success. This rate was also obtained in the seven methods used by the Smoking Control Research Project. Here, results varied from 8.3 to 27.8 percent, with an overall 20.2 percent success rate after 1 year (*7*, *71*). Ross, using a variety of methods, achieved from 6 to 27 percent success with an overall rate of 16.6 percent

(Continued page 494)

Review of 62 smoking cessation programs which used 100 methods, 1957–68

LOBELINE

Ejrup and Wikander, Stockholm, Sweden, 1957–58 (*1–3*)

Subjects: 1,012 volunteers (616 males, 396 females), 12–70 years old. Most were patients with clinical symptoms.

Methods: 10-day course of injections, lectures, pamphlets, physician counseling, lobeline hydrochloride, meprobamate, and anticholinergics.

Results: End of treatment success rate reported was 69–76 percent. Partial followup of subjects who completed treatment showed a success rate of 44 to 61 percent. Norwegian Research Group (*4*) analyzed followup success rates and found them to be 36 percent at 3 months, 23 percent at 6 months.

Evaluation: Followup of at least 6 months was reported, but followup was not scientific and was not based on at least three-fourths of the subjects. Reported results were not based on all subjects starting treatment. Placebos or controls were not used.

Ejrup, New York City, 1965–67 (*5*)

Subjects: 189 subjects; 34 dropped out of treatment.

Methods: Daily injections of lobeline hydrochloride for 2 weeks, then 1 per week for 2 months, and then 2 per month for "a reasonable length of time" (6 months to 2 years). Physician counseling, tranquilizers, and amphetamines were given when needed. Subjects paid $75.

Results: End of treatment success rate was 53.9 percent, based on 154 subjects who completed treatment, and 43.9 percent, based on all subjects. Followups based on subjects completing treatment were reported in terms of "good" results (reduced and quit) as 75 percent at 3 months, 54 percent at 6 months, and 40 percent at 1 year. If it is assumed that 60 percent of the subjects with "good" results were quitters, the 1-year success rate based on all subjects was 20 percent.

Evaluation: Followup of at least 6 months was reported but results were not based on all subjects starting treatment and were not reported in terms of the number who quit smoking. Placebos or controls were not used.

Rosenberg, Copenhagen, Denmark, 1958–59 (*13, 14*)

Subjects: 250 volunteers in two 10-day courses; 144 and 106 subjects.

Methods: (*a*) Ejrup's 10-day lobeline treatment, (*b*) Restinil, silver acetate, and auto-suggestion exercises, and (*c*) placebos.

Results: End of treatment success rate was 36.1 percent for lobeline, 36 percent for Restinil, and 35.7 percent for placebos. Followup based on 48.9 percent of subjects showed a success rate of 21.3 percent at 4 months and 9 percent at 6 months. If results were based on all subjects, success rates were 14 percent at 4 months and 4.4 percent at 6 months.

Evaluation: Placebos were used. Followup of at least 6 months was reported. Followups were not based on at least three-fourths of the subjects. Reported results were not based on all subjects starting treatment.

British Tuberculosis Association, London, England, 1963 (*15*)

Subjects: 101 persons referred from 11 different chest clinics.

Methods: Lobeline with quinine sulfate (Lobidan) and matching placebos for 6 weeks.

Results: End of treatment success rates for 80 percent of subjects were 11.6 percent for lobeline and 10.5 percent for placebos. Followup based on 80 percent of the subjects showed success rates of 7 percent for lobeline and 10.5 percent for placebos at 6 weeks.

Evaluation: Placebos were used. Followup was based on at least three-fourths of the subjects. Followup of at least 6 months was not reported, and results were not based on all subjects starting treatment.

Jost, Jochum, and Tuba, Germany, 1959–61 (*16–18*)

Subjects: 247 volunteers.

Methods: (*a*) lobeline, lectures, discussion, suggestions (143 subjects) and (*b*) psychotherapy (104 subjects).

Results: End of treatment success rates were 25.8 percent for lobeline and 30 percent for psychotherapy.

Evaluation: Placebos or controls were not used. No followup was reported.

London, Berkowitz, and Chapman, Philadelphia, Pa., and Glen Cove, N.Y., 1962 (*19*)

Subjects: 74 volunteers (35 males and 39 females).

Methods: (*a*) lobeline pastilles (42 subjects) and (*b*) matching placebos. Treatment period was 4 weeks.

Results: End of treatment success rate for 84 percent of the subjects was 13.9 percent for lobeline and 0 percent for placebo. If results were based on all lobeline subjects, success rate was 11.9 percent.

Evaluation: Placebos were used. No followup was reported. Results were not based on all subjects starting treatment.

Edwards, London, England, 1962 (*20*)

Subjects: 40 males; 60 percent completed treatment.

Methods: (*a*) physician counseling and lobeline and (*b*) physician counseling and hypnosis. 1 visit for 4 weeks and daily record cards.

Results: End of treatment success rate was not clearly stated; success rate for both methods was 30 percent. Followup success rate at 3 months for both methods combined averaged 13 percent.

Evaluation: Followup of at least 6 months was not

reported. Placebos or controls were not used. Followup was based on at least three-fourths of the subjects, but about one-third of the subjects did not respond to followup.

Edwards, London, England, 1964 (*21*)

Subjects: 50 females.

Methods: Buffered lobeline sulfate and placebos. 1 visit weekly for 4 weeks. Dangers of smoking stressed in interviews. Diary cards used.

Results: End of treatment success rate was 20 percent. There was no difference between experimental and control groups. Followup success rate was 10 percent at 4 months, with similar results for treated and untreated groups.

Evaluation: Placebos were used. Followup was based on all subjects but less than three-fourths of the subjects replied. Followup of at least 6 months was not reported. Reported results were based on all subjects starting treatment.

Merry and Preston, Epsom, England, 1962 (*22*)

Subjects: 90 volunteers (63 percent male); 76 completed treatment.

Methods: Lobeline sulfate (Lobidan) and placebos. Total treatment period was 4 weeks.

Results: End of treatment success rates were 13 percent for lobeline and 17 percent for placebos. Based on the 76 subjects who completed treatment, 30 percent success was claimed.

Evaluation: Placebos were used. No followup was reported. Results were not based on all subjects starting treatment.

Hoffstaedt, Newcastle upon Tyne, England, 1963 (*23*)

Subjects: 125 volunteers (70 percent male); 61 percent completed treatment.

Methods: Discussion, lobeline, and hydroxyzine.

Results: End of treatment success rate was 58.8 percent based on subjects completing treatment; if based on all subjects, success rate was 29 percent. Followup success rate after 3–8 months was 31.1 percent based on subjects completing treatment. If based on all subjects, success rate was 15.2 percent.

Evaluation: Followup of at least 6 months for some subjects. Followup based on at least three-fourths of the subjects was not reported. Results were not based on all subjects starting treatment. Placebos or controls were not used.

Hoffstaedt, Newcastle upon Tyne, England, 1964 (*24*)

Subjects: 80 volunteers; 77.6 percent completed treatment.

Methods: Discussion, lobeline, and hydroxyzine.

Results: End of treatment success rate was 76.3 percent for subjects completing treatment. If based on all subjects, success rate was 58.5 percent. Followup success rate after 10 months was 61 percent for subjects completing treatment. If based on all subjects, success rate was 47.5 percent.

Evaluation: Followup of at least 6 months was reported for some subjects. Followup based on at least three-fourths of the subjects was not reported. Results were not based on all subjects starting treatment. Placebos or controls were not used.

Perlstein, Louisville, Ky., 1963 (*25*)

Subjects: 77 volunteers.

Methods: Lobeline (45 subjects) and placebos (32 subjects).

Results: End of treatment success rates were 26 percent for lobeline subjects and 0 percent for placebo subjects.

Evaluation: Placebos were used. No followup results were reported.

Swartz and Cohen, New York City, 1963 (*26*)

Subjects: 49 volunteers (22 males, 27 females), ages ranged from 20 to 60 years.

Methods: "Smokurb" (peppermint-flavored chewing gum), lobeline sulfate and benzocaine, and use of the diary card. 1 visit weekly for 4 weeks.

Results: End of treatment success rate was 32.6 percent.

Evaluation: No followup was reported. Placebos or controls were not used.

Leone, Musiker, Albala, and McGurk, Providence, R.I., 1964 (*27*)

Subjects: 312 men and women 20 to 68 years old (mean age 40.8 years) attended 9 series of clinics; 82 percent attended at least 3 out of 8 sessions.

Methods: Lobeline in the form of pastilles, lozenges, and pills were intermixed with placebos in four methods: (*a*) educative, consisting of physician lectures and discussion, (*b*) psychotherapy conducted by a psychiatrist, (*c*) repressive-inspirational group led by psychologist, and (*d*) combination lecture and discussion group conducted by physician and psychologist. Eight meetings were held in 6 to 8 weeks, and for 7 clinics an additional session was held 1 month later.

Results: End of treatment success rates were 40 percent based on 255 nondropouts and 32.7 percent based on all subjects. Results by method were not reported. Lobeline proved ineffective. Partial results indicate that group led by psychologist had slightly better success rates than groups led by physician or psychiatrist. Followup success rates were 32.7 percent at 9 months based on nondropouts, and 18.3 percent based on all subjects. In the long run, groups jointly led by psychologist and physician did as well as groups led by psychologist.

Evaluation: Placebos were used but results were not reported. Followup was based on at least three-fourths of the subjects. Results were not reported on all subjects starting treatment. Followup of at least 6 months was reported.

OTHER MEDICATION AND CLINICS

Turle, Chartham Down, Kent, England, 1957 (*28*)

Subjects: 50 nurses or their relatives; 23 completed treatment.

Method: Tranquilizer (hydroxyzine hydrochloride) for 4 weeks; treatment extended to 8 weeks for some subjects.

Results: End of treatment success rate based on the 23 subjects who completed treatment was 4.3 percent. Only one subject stopped smoking. No followup was reported.

Evaluation: No placebos or controls were used. Results were not based on all subjects starting treatment. Followup based on at least three-fourths of the subjects after at least 6 months was not reported.

Ross, Buffalo, N.Y., 1963–65 (*29*)

Subjects: 1,473 volunteers (728 males, 745 females) attended 24 clinics of from 38 to 95 persons. (Actual initial attendance was higher but there was a high dropout rate after the first session.)

Methods: Medication in various combinations as follows: (*a*) lobeline, (*b*) lobeline and amphetamine, (*c*) amphetamine, (*d*) nicotine and amphetamine, (*e*) methamphetamine and pentobarbital, and (*f*) methamphetamine. There were 5 placebo combinations. In combination with medication, educational techniques were used which consisted of lectures and literature about the harmful effects of smoking, withdrawal reactions to quitting, and discussion; 3 clinics did not discuss harmful effects of smoking. Time period varied: 2 sessions over 2 weeks; 5 consecutive sessions with 1 session per week for 3 more weeks; 1 session per week for 4 weeks, then indefinite monthly meetings.

Results: End of treatment success rates: total, 34.2 percent, method *a* 34 percent, method *b* 39.3 percent, method *c* 41.5 percent, method *d* 19.4 percent, method *e* 46.7 percent, and method *f* 37.2 percent. For the placebo combinations the rates were 26.8, 30, 31.6, 31.7, and 33.8 percent. Followups varying from 10 to 57 weeks showed a total success rate of 16.6 percent. Success rates for clinics varied from 6 to 27 percent. Placebo was generally better than lobeline; nicotine showed poor results.

Evaluation: Placebos were used throughout. Excellent scientific followup was reported on all subjects attending second session. (Actually, many others attended a first session.) Followup of at least 6 months was reported.

Yllo, Stockholm, Sweden, 1959 (*4, 30*)

Subjects: 68 volunteers.

Methods: Withdrawal clinic consisting of lobeline medication, lectures, and pamphlets.

Results: End of treatment success rate was 53 percent. Followup success rates were 25 percent at 1 month and 15 percent at 6 months.

Evaluation: Followup was based on at least three-fourths of the subjects and followup of at least 6 months was reported. Results were based on all subjects starting treatment. No placebos or controls were used.

Arvidsson, Stockholm, Sweden, 1964 (*31*)

Subjects: 69 volunteers; 78 percent completed treatment.

Methods: Lectures on effects of nicotine and psychology of smoking; medication, primarily lobeline.

Results: End of treatment success rate was 89 percent. Not known if result was based on all subjects or just those completing treatment. Followup success rates not clearly stated whether they were based on all subjects or those completing treatment or those reached at followup. Success rates varied from 36 to 57 percent after 1 month, 21 to 44 percent after 3 months; 31 percent was success rate claimed after 1 year.

Evaluation: Followup of at least 6 months was reported. Not known if results were based on all subjects starting treatment. Placebos or controls were not used.

Bjartveit, Oslo, Norway, 1965 (*4*)

Subjects: 994 volunteers.

Methods: Withdrawal clinic consisting of lectures, pamphlets, medication, and discussion groups.

Results: End of treatment success rate was 85 percent. Followup success rates were 56 percent at 1 month, 37 percent at 3 months, 32 percent at 4 months, 27 percent at 6 months, 25 percent at 9 months, and 20 percent at 12 months.

Evaluation: Followup of at least 6 months was reported, and was based on at least three-fourths of the subjects. Reported results were based on all subjects starting treatment. Placebos or controls were not used.

Whitehead and Davies, Denver, Colo., 1962 (*32*)

Subjects: 16 employees and students of a medical center.

Methods: 4 weeks total time including 2 weeks for controls, 1 week for placebos, and 1 week for methylphenidate.

Results: End of treatment success rate was 6.3 percent. Followup success rate at 16 months was 6.3 percent.

Evaluation: Followup of at least 6 months was reported, based on at least three-fourths of the subjects. Reported results were based on all subjects starting treatment. Placebos were not used to evaluate medication.

Whitehead and Davies, Denver, Colo., 1963 (*32*)

Subjects: 16 employees and students of a medical center (10 males, 6 females).

Methods: 1–9 days (median was 7 days) of medication: (*a*) methylphenidate, 6 subjects, (*b*) diazepam, 5 subjects, and (*c*) placebo, 5 subjects.

Results: End of treatment success rates (stopped smoking for 1 week) were: methylphenidate, 33 percent; diazepam, 40 percent (1 subject took no pill, other took only 2 pills); and placebo, 60 percent. Followup success rates were: 0 percent, methylphenidate; 40 percent, diazepam; and 0 percent, placebos at 3 months. At 8 months, success rate was 20 percent for the diazepam method (the one person who did not take the pill was the only success).

Evaluation: Followup was based on at least three-fourths of the subjects; followup of at least 6 months was reported. Results were based on all subjects starting treatment. Placebos were used.

FIVE-DAY PLAN

McFarland, Gimbel, Donald, and Folkenberg, Calgary, Alberta, Canada, 1963 (*33*)

Subjects: 192 volunteers of whom 144 completed treatment (74 males, 70 females).

Methods: 5-day plan with 90-minute sessions ("group therapy") consisting of lectures, fear-arousing films, specimens, questions, literature, special diets, and physical fitness.

Results: End of treatment success rate was 72.2 percent for subjects who completed treatment. If based on all subjects, success rate was 54.1 percent. Followup success rate was 33.9 percent at 3 months for subjects who had completed treatment. If based on all subjects, success rate was 25 percent.

Evaluation: Results were not based on all subjects starting treatment. Followup of at least 6 months was not reported. No controls or placebos were used.

Campbell and Spalding, Paisley, England, 1963 (*34, 35*)

Subjects: 73 volunteers (sex distribution about equal).

Methods: 90-minute sessions for 1 week consisting of clinic lectures, booklets, films, and general discussions.

Results: End of treatment success rate was 42.4 percent. Followup success rates based on 80.8 percent of subjects were 38.3 percent at 1 month and 16 percent at 1 year. If based on all subjects, success rate was 12.3 percent at 1 year.

Evaluation: Followup was based on at least three-fourths of the subjects. Results were not based on all subjects starting treatment. Followup of at least 6 months was reported. No controls were used.

Seventh-day Adventist Church, Philadelphia, Pa., 1964 (*36*)

Subjects: 70 volunteers (sex distribution equal); 35 completed treatment.

Methods: Lectures, buddies, films, and pamphlets; 5-day plan.

Results: End of treatment success rate was 47 percent, based on subjects who completed treatment. If based on all subjects, success rate was 24 percent. Followup success rates for subjects completing treatment were 31.1 percent at 2 months, 29 percent at 7 months, and 27 percent at 15 months. If based on all subjects, success rate was 18.6 percent at 15 months.

Evaluation: Followup was not based on at least three-fourths of the subjects. Reported results were not based on all subjects starting treatment. Controls were not used. Followup of at least 6 months was reported.

Seventh-day Adventist Church, Berkeley, Calif., 1964 (personal communication from J. M. Switzer and J. R. Loonie, City of Berkeley Health Department.)

Subjects: 92 volunteers; 54 percent completed treatment.

Methods: Lectures, films, and information; 5-day plan.

Results: End of treatment success rate was 42.4 percent, based on 72 percent of subjects. Followup success rates were 25.7 percent at 1 month, 10.6 percent at 2 months, and 3 percent at 4 months.

Evaluation: Results were not based on all subjects starting treatment. Followup of at least 6 months was not reported and followups were not based on three-fourths of the subjects. No controls were used.

Thompson and Wilson, Pittsburgh, Pa., 1966 (*37*)

Subjects: 328 volunteers (38 percent males); 201 completed treatment.

Methods: Buddies and lectures; 5-day plan.

Results: End of treatment success rate was 72.6 percent. Followup success rates were 29.4 percent at 10 weeks and 16 percent at 10 months. The success rates were based on a sample of those who completed treatment.

Evaluation: Followup of at least 6 months was reported. Followup based on at least three-fourths of the subjects was not reported. Results on all subjects starting treatment were not reported. Controls were not used.

Mills, Hartford, Conn., 1965 (*37*)

Subjects: 124 volunteers.

Methods: Lectures and buddies; 5-day plan.

Results: End of treatment success rate was not reported. Followup success rate was 28 percent at 1 year.

Evaluation: Followup of at least 6 months was reported. No controls were used. Unknown whether results were based on all subjects.

Guilford, Los Angeles, Calif., 1964 (*38*)

Subjects: 173 experimental subjects and 175 controls.

Methods: Seventh-day Adventist 5-day plan which consisted of lectures, films, information, buddy system, diet information, and decision card. Controls were unaided but signed decision card.

Results: End of treatment success rate for experimental subjects completing treatment was 47 percent. Followup success rates for experimental subjects were 34 percent total, 32 percent males, 35 percent females (at 3 months); 28 percent total, 27 percent males, 29 percent females (at 6 months); and 16 percent total (at 1 year). Followup success rates for controls were 23 percent total, 33 percent males, 15 percent females (at 3 months); 21 percent total, 33 percent males, 12 percent females (at 6 months); and 16 percent total (at 1 year).

Evaluation: Followup of at least 6 months was reported. Controls were used. Results were not based on all subjects starting treatment. Followup was not based on at least three-fourths of the subjects.

Evans, Brisbane, Australia, 1966 (*39*)

Subjects: 80 volunteers (two-thirds male), 16 to 70 years of age.

Methods: "Group therapy" consisting of films, lectures by physicians, social worker, psychologist, minister, and discussions; 5-day plan.

Results: End of treatment success rate was 69 percent. Success was based on the "belief that they had overcome the habit," not on actual success. Followup success rate was 40 percent at 3 months, based on 48.7 percent of subjects. If based on all subjects, success rate was 32 percent. Not known if "successful" subjects stopped smoking.

Evaluation: Followup was not based on at least three-fourths of the subjects, and followup of at least 6 months was not reported. Results based on all subjects starting treatment were not reported. Controls were not used.

Seventh-day Adventist Church, Eugene, Oreg., 1967 (*40*)

Subjects: 45 volunteers.

Methods: Lectures and pamphlets. 5-day plan.

Results: End of treatment success rate was not reported. Followup success rate was 23.3 percent at 6 months, based on partial followup of 66 percent of subjects. If based on all subjects, success rate was 15.5 percent.

Evaluation: Followup was not based on at least three-fourths of the subjects. Followup of at least 6 months was reported. Results were not based on all subjects starting treatment. Controls were not used.

Hess and James, New York City, 1964 (*41*)

Subjects: 63 volunteers; 80 percent completed treatment.

Methods: Nutrition assistance, buddy system, literature, and self-monitoring, with emphasis on physical fitness. Treatment period was 5 days.

Results: End of treatment success rate was 40 percent. Followup success rate was 22.2 percent at 6 weeks.

Evaluation: Reported results were based on all subjects starting treatment. Followup of at least 6 months was not reported. Controls were not used.

Dale, Graves, Beck, and Lau, Hinsdale, Ill., 1963–65 (*42*)

Subjects: 1,100 volunteers in 20 clinics of from 9 to 146 persons; 10 clinics had more than 50 subjects. Slightly more females.

Methods: Five 90-minute sessions including films, lectures by clergymen and physicians, exercise, diet and fluid instruction, buddy system, and trust in divine power.

Results: End of treatment success rate was 55.2 percent. Success rates for single clinics varied from 28.6 to 81.7 percent. Followups were based on about two-thirds of the subjects. Based on all subjects, the followup success rates were 40.6 percent at 3 months, 22.8 percent at 6 months, and 18.6 percent at 1 year. Males had a higher success rate.

Evaluation: Controls were not used. Followup based on at least three-fourths of the subjects was not conducted. Results were not reported on all subjects starting treatment. Followup of at least 6 months was reported.

DESENSITIZATION-AVERSION THERAPY

Greene, Bordentown, N.J., 1963 (*43*)

Subjects: 10 experimental subjects, 11 control subjects (16- to 25-year-old retarded students).

Methods: 5 trials of white noise superimposed upon continuous music.

Results: End of treatment success rate was 0 percent.

Evaluation: Controls were used. There was no followup.

Pyke, Agnew, and Kopperud, Saskatchewan, Canada, 1965 (*44*)

Subjects: 55 volunteers consisting of 22 experimental subjects and 2 control groups of 17 and 16 subjects.

Methods: 1 meeting for 10 to 11 weeks of desensitization training, group sessions, daily records, films, and pamphlets. Subjects were paid to participate. Controls kept records.

Results: End of treatment success rate was not stated; but it was reported that there was a significant reduction at the end of treatment. Followup success rate was 13 percent at 4 months (followup was only partial). Treatment group was almost back to pretreatment consumption.

Evaluation: Controls were used. Followup was not based on at least three-fourths of the subjects. Followup of at least 6 months was not reported. Results were not based on all subjects starting treatment.

Mees, Springfield, Oreg., 1966 (*40*)

Subjects: 43 college students.

Methods: Breath holding, electric shock, and subliminal shock. $20 deposit posted.

Results: Followup success rate was 11.1 percent at 6 months, based on followup of 77 percent of subjects. If based on all subjects, success rate was 7 percent.

Evaluation: Followup of at least 6 months was reported. Results were not based on all subjects starting treatment. Control results were not reported.

McGuire and Vallance, Glasgow, Scotland, 1963 (*45*)

Subjects: 10 volunteers.

Methods: Electric shock. Several treatments per day for 2 weeks and then weekly indefinitely.

Results: End of treatment success rate was 10 percent. 1 subject was still successful 6 months later.

Evaluation: Controls were not used. Only the successful subject was followed up.

Lubin and Schmahl, Los Angeles, Calif., 1967 (*46*)

Subjects: 50 volunteers; 36 completed treatment.

Methods: Aversion conditioning; puffing and inhaling rapidly on machine that blows stale smoke.

Results: End of treatment success rate was 44 percent, based on subjects completing treatment. If based on all subjects, success rate was 32 percent.

Evaluation: Controls were not used. No followup was reported. Results were not based on all subjects starting treatment.

Koenig, Palo Alto, Calif., 1966 (*47, 48*)

Subjects: 42 college students 19–25 years of age.

Methods: 10 sessions in about 6 weeks of desensitization-relaxation, aversion therapy, and counseling.

Results: End of treatment success rate was 19 percent based on all subjects. Results were stated in terms of decrease in smoking. Followup success rate was 9.5 percent at 6 months if based on all subjects.

Evaluation: Followup was based on at least three-fourths of the subjects. Followup of at least 6 months was reported. Controls were not used.

Keutzer, Eugene, Oreg., 1967 (*40, 49*)

Subjects: 164 college students and 31 controls.

Methods: (*a*) breath holding (35 subjects), (*b*) coverant therapy (35 subjects), (*c*) negative practice (36 subjects), (*d*) attention-placebo (40 subjects), (*e*) combined treatment (18 subjects), and (*f*) controls (31 subjects). Treatment also consisted of behavior modification, records, and literature and lasted for 5 weeks. $20 deposit posted.

Results: Success rates stated in terms of percent reduction in smoking. End of treatment success rates based on cessation were 23 percent, total, method *a* 17 percent, method *b* 29 percent, method *c* 33 percent, method *d* 12 percent, method *e* 1 percent, and method *f* 3 percent. Followup success rates based on 85 percent of the subjects at 6 months were 12 percent total; method *a* 0 percent, method *b* 20 percent, method *c* 10 percent, method *d* 18 percent, method *e* 19 percent, and method *f* 6 percent. If results were based on all subjects, success rates were 10.3 percent total, method *a* 0 percent, method *b* 17.1 percent, method *c* 8.3 percent, method *d* 15 percent, method *e* 16.6 percent, and method *f* 6.1 percent.

Evaluation: Followup was based on at least three-fourths of the subjects. Followup of at least 6 months was reported. Controls were used.

Grimaldi, Eugene, Oreg., 1968 (*40*)

Subjects: 29 subjects.

Methods: (*a*) contingent punishment (10 subjects), (*b*) noncontingent punishment (9 subjects), and (*c*) no punishment (10 subjects). Punishment was intense, hot, smoky air. 7 treatment sessions over 3 weeks. $20 deposit was returned to nondropouts.

Results: End of treatment success rate was 6.9 percent. 69 percent of the subjects reduced their smoking by 50 percent. 1-month followup success rate not stated; 22 percent had reduced their smoking by 50 percent.

Evaluation: Controls were used. Success rates were not reported by treatment. Results were not reported by all subjects.

Rutner, Wichita, Kans., 1967 (*50*)

Subjects: 40 psychology students at Wichita State University received credit for participation in study.

Methods: Five experimental conditions: (*a*) covert sensitization, (*b*) contingency management, (*c*) response substitution, (*d*) contract management, and (*e*) self-monitoring. Treatment lasted 3 weeks.

Results: Mean percentage reduction in smoking ranged from 42.6 percent for contingency management to 76.4 percent for contract management. In terms of at least 85 percent reduction of smoking, success rates were 25 percent for response substitution and contract management and 12.5 for the other three methods; the overall success rate for the 5 methods was 17.5 percent.

Evaluation: Results were reported on all subjects; controls were not used and no followup was conducted.

PHYSICIAN COUNSELING

Mausner, Mausner, and Rial, Philadelphia, Pa., 1965 (*51*)

Subjects: 93 patients.

Methods: Physician advice and questionnaires.

Results: Followup success rate was 0 percent at 6 months.

Evaluation: Followup of at least 6 months was reported. Controls were not used.

Mausner, Philadelphia, Pa., 1964 (*52*)

Subjects: 19 experimental subjects and 16 controls, females aged 18–22 years.

Methods: Discussion meetings, buddy system, nondirective group therapy, and controls.

Results: End of treatment success rate was 10.5 percent for experimental subjects. Followup success rates were 5.2 percent for experimental subjects and 18.7 percent for control subjects.

Evaluation: Followup of at least three-fourths of the subjects was reported. Results were based on all subjects starting treatment. Controls were used.

Cruickshank, London, England, 1963 (*53*)

Subjects: 32 volunteers, 20 men and 12 women.

Methods: Physician counseling, interview, smoking records, and weekly checks.

Results: End of treatment success rate was 33 percent. Followup success rate was 30 percent at 3 months.

Evaluation: Followup was based on at least three-fourths of the subjects. Results were based on all subjects starting treatment. Followup of at least 6 months was not reported. Controls were not used.

Poussaint, Bergman, and Lichtenstein, Los Angeles, Calif., 1965 (*54, 55*)

Subjects: 97 subjects began treatment; 63 completed treatment (sex distribution about equal). Subjects were 21 to 54 years of age.

Methods: (*a*) effect of physician smoking versus (*b*) physician not smoking, using placebos. Methods lasted 4 to 6 weeks with 1 visit per week.

Results: End of treatment success rates, based on

the 63 subjects completing treatment, were 26 percent for method *a* and 21 percent for method *b*. Followup success rates at 6 months were 21 percent based on 53 percent of the subjects, and 22.7 percent based on subjects completing treatment. If based on all subjects, success rate was 11 percent.

Evaluation: Followup of at least 6 months was reported. Followup was not based on at least three-fourths of the subjects. Results were not based on all subjects starting treatment.

GROUP DISCUSSION AND THERAPY

Lawton, Philadelphia, Pa., 1961 (*36, 56*)

Subjects: 19 volunteers; 17 completed treatment.

Methods: Group meetings consisting of 9 sessions in 6 weeks (2 sessions per week for 3 weeks followed by 1 session per week for 3 weeks).

Results: End of treatment success rate based on subjects completing treatment was 70.6 percent. Followup success rates based on all subjects were 42.1 percent at 3 months, 15.8 percent at 28 months, and 15.8 percent at 4 years. Followup success rates based on subjects completing treatment were 47 percent at 3 months, 17.6 percent at 28 months, and 17.6 percent at 4 years.

Evaluation: Followup was based on at least three-fourths of the subjects. Followup of at least 6 months was reported. Controls were not used.

Lawton, Philadelphia, Pa., 1964 (*36, 57*)

Subjects: 73 volunteers (21 males, 52 females); 51 completed treatment.

Methods: (*a*) educative (12 subjects), (*b*) nondirective verbal superficial therapy, (*c*) combination educative and group therapy (10 subjects), (*d*) group therapy (19 subjects), which consisted of 5 consecutive daily sessions and 2 followup sessions, and (*e*) control waiting list (41 subjects). Except for method *d*, there were 8 weekly sessions, 6 by a physician and 2 by a psychologist.

Results: End of treatment success rates based on subjects completing treatment were 26 percent total, method *a* 25 percent, method *b* 30 percent, method *c* 10 percent, method *d* 33 percent, and method *e* 2 percent. Followup success rates at 7 months and 15 months based on subjects completing treatment were reported as the same: 18 percent total, method *a* 17 percent, method *b* 20 percent, method *c* 20 percent, and method *d* 11 percent. If followup was based on all subjects, success rates were 12 percent total, method *a* 10 percent, method *b* 17 percent, method *c* 10 percent, and method *d* 10 percent.

Evaluation: Followup was based on at least three-fourths of the subjects. Followups of at least 6 months were reported. Controls were used. Results were not based on all subjects starting treatment.

Bachman, Allentown, Pa., 1962 (*58*)

Subjects: 110 volunteers of whom 80 percent had chronic illnesses; subjects were 22–65 years of age.

Methods: Medical lectures and group discussions, with medication lobeline in the form of pastilles. There were 8 weekly 90-minute sessions.

Results: End of treatment success rates were 51.8 percent for all subjects, 69.8 percent for subjects completing treatment, and 18.6 percent for subjects not completing treatment. Followup success rates were 67.9 percent for subjects completing treatment and 25 percent for subjects not completing treatment (followup period varied from 2 months to 1 year, with no time separation). Selective followups with varying results reported—18.6, 25, and 46.5 percent.

Evaluation: Followup of at least 6 months was reported. Followup was not based on at least three-fourths of the subjects. Placebos or controls were not used. Reported results were not based on all subjects starting treatment.

Smyth, Edmonton, England, 1963 (*59*)

Subjects: "About" 60 volunteers.

Methods: 3 months of group sessions, films, and feedback.

Results: End of treatment success rate was "about" 18 percent.

Evaluation: There was no followup. Placebos or controls were not used. Not known if results were based on all subjects starting treatment.

Smyth, Edmonton, England, 1964–65 (*59*)

Subjects: 187 volunteers; 99 completed treatment (55 males, 44 females).

Methods: 6 weekly visits of group sessions, films, questionnaires, group psychotherapy, and medication pastilles.

Results: End of treatment success rate for subjects completing treatment was 55 percent. If based on all subjects, success rate was 33.6 percent.

Evaluation: There was no followup. Placebos or controls were not used. Reported results were not based on all subjects starting treatment.

Horn, Washington, D.C., 1964 (*60, 61*)

Subjects: 165 adults and 164 Government employees.

Methods: 5 weeks of insightful educational instructions. Slow reduction was stressed.

Results: End of treatment success rate was 5 percent. Followup success rate at 3 months was 9 percent.

Evaluation: Followup was based on at least three-fourths of the subjects. Results were based on all subjects starting treatment. Followup of at least 6 months was not reported. Placebos or controls were not used.

Nugent and O'Keeffe, England, 1964 (*62*)

Subjects: 19 volunteers (4 males, 15 females).

Methods: 6 weekly 75-minute sessions of group therapy with medication—methylamphetamine hydrochloride.

Results: End of treatment success rate was 84.2 percent. Followup success rate was 57.8 percent.

Evaluation: Followup period unknown. Placebos or controls were not used.

Ball, London, England, 1965 (*63, 64*)

Subjects: 109 subjects of whom three-fourths were chronically ill patients. 92 completed treatment.

Methods: 7 weekly 90-minute sessions of group discussions, physician lectures, films, and specimen demonstrations.

Results: End of treatment success rate based on subjects completing treatment was 67 percent. If results were based on all subjects, success rate was 57 percent. Followup success rates based on subjects completing treatment were 51 percent at 3 months (88 subjects), 45 percent at 6 months (82 subjects), 38 percent at 9 months (77 subjects), and 33 percent at 12 months (75 subjects). Followup success rates as reported by Norwegian analysts (*4*) were 49 percent at 3 months, 40 percent at 6 months, 32 percent at 9 months, and 27 percent at 12 months.

Evaluation: Followup was based on at least three-fourths of the subjects. Followup of at least 6 months was reported. Results were not based on all subjects starting treatment. Controls were not used.

Wood and Meadows, London, England, 1964 (*65*)

Subjects: 77 volunteers at an antibronchitis clinic.

Methods: Group discussions, films, talks, and demonstration of pathological specimens.

Results: End of treatment success rate was 36 percent.

Evaluation: No followup was reported. Controls were not used.

Filbey, Reed, and Lloyd, Indianapolis, Ind., 1965 (*66, 67*)

Subjects: 102 hospital patients.

Methods: Smoking history interview, information, literature, and group meetings.

Results: End of treatment success rate for those attending groups was 27 percent. Success rate for those not attending was 26 percent. Followup success rate for those attending groups was 30 percent at 1 month; based on 42 percent of the subjects 41 percent were successful at 2 months. Followup success rate for those not attending groups was 27 percent at 1 month; based on 68 percent of the subjects 21 percent were successful at 2 months. If results were based on all subjects, success rates at 2 months were 17.5 percent for those attending groups and 14.5 percent for those not attending groups.

Evaluation: Followup was not based on at least three-fourths of the subjects. Followup of at least 6 months was not reported. Controls were not used. Reported results were not based on all subjects starting treatment.

Allen and Fackler, Philadelphia, Pa., 1965 (*68*)

Subjects: 150 volunteers (77 males, 73 females).

Methods: 10 weeks of group discussions. Control group composed of persons not registering.

Results: End of treatment success rate was 42.7 percent. Followup success rates were 37.3 percent at 6 months and 23.3 percent at 18 months for groups and 18 percent at 18 months for control subjects.

Evaluation: Followup was based on at least three-fourths of the subjects. Results were based on all subjects starting treatment. Followup of at least 6 months was reported. Controls were used.

Schwartz and Dubitzky, Walnut Creek, Calif., 1966 (*7, 69–71*)

Subjects: 252 experimental subjects and 72 controls randomly assigned by computer. Males, 25–44 years. Control subjects were unaware that they were in study.

Methods: 8-week program with 7 experimental and 2 control combinations, 36 subjects in each—72 prescription, 72 individual counseling, 108 group counseling, and 72 controls. Daily record cards, quitting dates, "tips," nutrition advice, and questionnaires. Psychologists conducted individual and group counseling. (Specific methods are listed under "results.")

Results: End of treatment success rates based on all subjects assigned to treatment were total experimental subjects, 32.9 percent; (*a*) prescription-placebo, 27.8 percent, (*b*) prescription-tranquilizer (meprobamate), 16.7 percent, (*c*) individual counseling and placebo, 50 percent, (*d*) individual counseling and tranquilizer, 33.3 percent, (*e*) group counseling and placebo, 47.2 percent, (*f*) group counseling and tranquilizer, 33.3 percent, (*g*) group counseling, no pill, 22.2 percent, (*h*) control I, 11.1 percent, and (*i*) control II, 11.1 percent. Success rates based on subjects attending at least one-half of the counseling sessions were all counseling subjects, 53.9 percent, method *c* 58.6 percent, method *d* 39.3 percent, method *e* 70 percent, method *f* 66.7 percent, and method *g* 40 percent.

Followup based on all subjects showed 4-month success rates for all subjects, 20.6 percent, method *a* 25 percent, method *b* 11.1 percent, method *c* 27.8 percent, method *d* 19.4 percent, method *e* 33.3 percent, method *f* 13.9 percent, method *g* 13.9 percent, method *h* 11.1 percent, and method *i* 8.3 percent. Four-month success rates for counseling subjects attending one-half the sessions, were method *c* 31 percent, method *d* 21.4 percent, method *e* 55 percent, method *f* 27.8 percent, and method *g* 25 percent—all counseling subjects, 31.3 percent.

Followup based on all subjects showed 1-year success rates for all subjects, 20.2 percent, method *a* 25 percent, method *b* 8.3 percent, method *c* 30.6 percent, method *d* 13.9 percent, method *e* 27.8 percent, method *f* 19.4 percent, method *g* 16.7 percent, method *h* 16.7 percent, and method *i* 19.4 percent. 1-year success rates for counseling subjects attending one-half the sessions were: method *c* 34.5 percent, method *d* 14.3 percent, method *e* 45 percent, method *f* 33.3 percent, and method *g* 25 percent—all counseling subjects, 30.4 percent.

Evaluation: Placebos and controls were used. Scientific followup and results were based on all subjects assigned to treatment. Followup of at least 6 months was reported.

Fredrickson, New York City, 1967 (*72*)

Subjects: 350 subjects in 28 groups.

Methods: Subjects met weekly for 10–12 weeks then 2 times a month for 6 months generally. Method consisted of lectures by physicians, instructions, daily records, use of lay ex-smokers as leaders, and mutual support.

Results: End of treatment success rate based on 57 percent of subjects completing phase III (200 subjects) was 65 percent. 91 percent of subjects were followed up after 2 months and 90 percent answered; 53 percent of these subjects were successful. Based on all subjects, 44 percent were not smoking after 2 months.

Evaluation: Controls were not used. Reported results were not based on all subjects starting treatment. Followup of at least 6 months was not reported.

MISCELLANEOUS

Moses, Jamaica Plains, Mass., 1959–62 (*73*)

Subjects: 70 volunteers (about two-thirds males), 20 to 65 years of age.

Method: 1 treatment of hypnosis.

Results: Results known on 50 subjects who showed success rate of 70 percent (80 percent males and 45 percent females). If based on all subjects, success rate was 41 percent. Followup (1–4 years) success rates based on 50 subjects were 18 percent total, 26 percent males, and 0 percent females. If based on all subjects, success rate was 13 percent.

Evaluation: Followup of at least 6 months was reported, but was not based on at least three-fourths of the subjects. Controls were not used. Reported results were not based on all subjects starting treatment.

Hammett, Graff, Bash, Fackler, Goldman, and Yanovski, Philadelphia, Pa., 1964 (*74, 75*)

Subjects: 37 subjects assigned to treatment; 34 started and 24 completed treatment; 28 control subjects.

Methods: 10 weekly visits, 4 treatments: (*a*) group psychotherapy, (*b*) hypnotherapy, (*c*) lobeline, and (*d*) Librium. Cost of treatment was $25.

Results: End of treatment success rates based on subjects completing treatment were 79 percent total, method *a* 55 percent, method *b* 100 percent, method *c* 29 percent, and method *d* 33 percent. If based on all experimental subjects, success rate was 51 percent. Followup success rates at 3 months based only on subjects completing treatment were 58 percent total; method *a* 44 percent, method *b* 89 percent, method *c* 0 percent, method *d* 22 percent, and controls 11 percent. If based on all experimental subjects, success rate was 38 percent. Results based on all subjects assigned to each method were not available.

Evaluation: Controls were used. Followup was not based on at least three-fourths of the subjects. Followup of at least 6 months was not reported. Results were not based on all subjects starting treatment.

Pumroy and March, College Park, Md., 1965 (*76*)

Subjects: 30 volunteers (14 males, 16 females); 10 completed treatment.

Methods: Gradual withdrawal and reduction of smoking instead of abrupt quitting. Weekly ratings by professor with suggestions. Treatment lasted 5 weeks.

Results: End of treatment success rate was not reported in terms of cessation. Followup success rate was 11 percent at 6 months based on 18 subjects.

Evaluation: Followup of at least 6 months was reported. Controls were not used. Reported results were not based on all subjects starting treatment.

Elliott and Tighe, Hanover, N.H., 1966–67 (*77*)

Subjects: 14 college students in 1966 and 11 college students in 1967.

Methods: 12 weeks of treatment which consisted of threat of monetary loss ($50), lectures, and pledges to quit. (16 weeks of treatment in 1967, $65 posted.)

Results: End of treatment success rate was 84 percent. Followup success rate for 1966 was 38.4 percent at 15 months and for 1967 was 36.3 percent at 4 months.

Evaluation: Followup was based on at least three-fourths of the subjects. Results were based on all subjects starting treatment. Followup of at least 6 months was reported. Controls were not used.

(*29*). In his study, males achieved 21.2 percent and females 12.2 percent success. Lawton tried combinations of four methods, with final success rates ranging from 11 to 20 percent after 15 months (*36*).

Generally, initial success rates decline rapidly during the first month, continue to decrease sharply until the third month, and then the rate of decline diminishes. Yllo showed 53 percent success at the end of treatment in his withdrawal clinic, 25 percent at 1 month, and 15 percent at 6 months (*4, 30*). Arvidsson and Bjartveit reported comparable results: 89 and 85 percent at end of treatment, respectively, 57 and 56 percent at 1 month, 44 and 37 percent at 3 months, 35 and 27 percent at 6 months, and 31 and 20 percent at the 1-year followup (*4, 31*). Results of the Rhode Island Hospital clinic revealed 40 percent success during the various kinds of clincs used, most of which combined medication, counseling, and educational material (*27*). An additional 5 percent of the subjects stopped smoking after the end of the program, but 44 percent of the quitters returned to smoking within 9 months (*79*).

Types of Methods

Withdrawal clinics. In the United States, the National Interagency Council on Smoking and Health has assisted local inter-agency councils to sponsor smoking cessation activities (*80*). Some councils have conducted quitting programs, and the national council has sponsored a series of workshops on smoking and a world conference in New York City in September 1967. The U.S. National Clearinghouse for Smoking and Health, under the directorship of Dr. Daniel Horn, has sponsored research as well as community antismoking campaigns in Syracuse, N.Y., and San Diego, Calif. The Seventh-day Adventist Church conducts highly structured and intensive 5-day programs, and local cancer, tuberculosis, and heart units have sponsored a scattering of programs. The American Cancer Society has developed a manual for withdrawal clinics based on a work conference attended by scientists experienced with cessation methods (*81*). Roswell Park Memorial Institute conducted a withdrawal program in Buffalo for several years (*29*). This program was significant because of the large number of persons who were treated and its excellent followup procedures. Community health agencies (*68*), health departments (*72*), hospitals (*27*, *66*), sanitariums (*42*), and group health plans (*82*) have also conducted cessation programs.

In Europe, withdrawal clinics were started in Sweden in 1955 by Ejrup (*1*, *2*). About 24 antismoking clinics were held in England, Wales, and Northern Ireland in 1962 by local units of the Ministry of Health (*83*). In Scotland, the Presbyterian Church has sponsored control programs and the National Society of Non-Smokers has also established cessation clinics. Local hospital groups in England and elsewhere have also conducted cessation programs and some of these are in the listing. Clinic programs have also been sponsored in Denmark (*14*), Norway (*4*), England (*15*, *22*, *23*, *53*, *59*, *63*), Sweden (*1*, *30*, *31*), Germany (*16*), Switzerland (*84*), France (*85*, *86*), Hungary (*87*), Czechoslovakia (*88*, *89*), Canada (*33*), Australia (*39*), and other countries.

The following section discusses the various techniques according to their classification in the listing.

Lobeline and other nicotine substitutes. Methods to help smokers quit have multiplied in recent years, but smoking deterrents have been available since before 1900. Early deterrents consisted of herbs, spices, and mouthwashes which produced a disagreeable taste for the smoker. Edmunds began experimenting with lobeline in the early 1900's (*90*, *91*), and Dorsey developed lobeline sulfate capsules in 1936 to minimize the craving for tobacco and help the patient stop the habit (*92*). Wright and Littauer found in 1937 that the sulfate produced annoying side effects and recommended that it not be used (*93*). In 1955 Rapp and Olen added antacids to lobeline sulfate and reduced some of its toxic effects (*94*).

Many physicians still prescribe lobeline mainly because it contains medicinal properties related to nicotine and can be used as a nicotine "substitute." According to Ejrup, a nicotine derivative such as lobeline hydrochloride eliminates the physiological withdrawal symptoms, but he recommends subcutaneous injections rather than pills (*95*). Other varieties of lobeline have been marketed (Nikoban, Bantron, Lobidan) and are generally given to subjects in the form of tablets, but they are available also in lozenges and chewing gum (Smokurb).

Lobeline injection therapy was introduced by Ejrup, who is presently conducting clinics with this method in New York City (*5*). Injections have been used by Lokander (*96*) and Yllo (*30*) in Sweden, Rosenberg in Denmark (*13*, *14*), and Henke (*97*) and Jochum and Jost (*16*) in Germany. Lobeline tablets also have been widely used by withdrawal programs (*15–27*, *29–31*, *58*, *75*). Most clinics give out literature, present movies and lectures, and require subjects to complete record cards. Some hold discussion groups, provide other medication (tranquilizers, amphetamines), or offer counseling. Treatment periods vary from a week to many months.

Results with lobeline at the end of the particular treatment period have varied from about 12 percent (*15*) to a reported 76 percent (*1–3*), with median results around 30 percent. No lobeline study for which at least a 6-month followup based on all subjects was reported had results better than 31 percent. Of eight studies in

the listing which used placebos (and reported findings), only two showed better results for lobeline (*19*, *25*); in three others, results were about the same (*13*, *21*, *27*), and in three the placebo subjects actually did better (*15*, *22*, *29*). Other studies not in the listing have also reported no difference in outcome between lobeline and control subjects (*98*, *99*).

Other drugs. Medication, mainly tranquilizers, stimulants, amphetamines, anticholinergics, astringents, and local anesthetics have been used to help smokers quit. Ejrup and others used meprobamate, anticholinergics, and amphetamine in combination with lobeline (*1–3*). The purpose of the medicine is to aid the subject during the withdrawal period and help overcome the anxiety, irritability, dizziness, tiredness, and hunger brought on by his attempt to quit.

Tranquilizers have not proved successful in curtailing smoking. Findings of the Smoking Control Research Project showed that subjects assigned to placebos did better than those using meprobamate in each of three different methods: prescription alone, individual counseling, and group counseling (*69*, *71*). Ross (*29*) and others in the listing who used various drugs showed similar results.

Regarding the use of drugs to assist smokers to quit, Ochsner (*100*) stated:

> Whereas many believe that anti-smoking drugs, such as lobeline, are helpful in breaking the habit, it has been my experience that these are primarily gimmicks! Obviously, anything that helps a person to break the habit is desirable but I do not believe that the medicaments that have been used have been of real value. In fact, I have a number of patients who were unable to stop smoking with the aid of these drugs but subsequently stopped without their use.

The 5-day plan. The 5-day plan was developed by McFarland and Folkenberg and has been used throughout the United States, Canada, England, and Australia (*33–42*, *101*, *102*). Groups vary from 15 to several hundred persons. The program consists of 5 evenings of about 90 to 120 minutes each. Usually the meetings are well advertised and are held in a convenient auditorium of a school, hotel, or civic hall.

The main elements of the program are lectures, group meetings, "inspirational" messages, special tips, diets, movies, and scare techniques such as lung cancer specimens and a film showing the surgical removal of a cancerous lung.

Details of the program consist of (*a*) "force fluids"—six to eight or more glasses of water between meals, (*b*) liberal use of fruit and fruit juices, (*c*) hydrotherapy—hot and cold showers, warm or neutral baths, morning and night, (*d*) all alcoholic and caffeine-containing beverages are eliminated, (*e*) daily physical fitness exercises are instituted, (*f*) deep breathing and walking after eating is encouraged, (*g*) avoidance of smoking companions and any unusual tension, (*h*) adequate sleep, (*i*) daily personal control booklet, and (*j*) paired buddies.

The 5-day plan is sponsored by the Seventh-day Adventist Church and the National Health Foundation, but is also administered in modified form by many other groups and individual physicians. Werner reported that he modified the 5-day plan and has used it with about 2,000 persons in Germany (personal communication, T. Werner, Munich, Germany, July 21, 1968). Followups have been conducted, but the usual followup includes only persons who attend all meetings; sometimes results are reported on selected groups of attendees. Success rates, therefore, have actually been lower than those reported by using the previously mentioned methods, as shown by three studies which used scientific followup methods: Guilford in Los Angeles (*38*) reported 16 percent success at 1 year, and Thompson and Wilson in Pittsburgh (*37*) reported the same rate at 10 months. In Berkeley, Calif., a followup of a Seventh-day Adventist clinic revealed that only 3 percent had stopped smoking 4 months after the program, although 42.4 percent had reported they stopped at the end of treatment (personal communication, J. Switzer, 1964). Thompson and Wilson's end of treatment result declined sharply from 72.6 to 29.4 percent at 10 weeks (*37*).

Conditioning techniques. A number of investigators consider the smoking habit a specific form of behavior disorder which can be treated by techniques designed to eliminate the undesired behavior—without regard for the psychosocial context of the habit, its origin, dynamics, or significance for the individual smoker. Such

techniques generally are based on stimulus-response learning theory, which holds that smoking is a learned pattern of behavior, valued out of proportion through association of cigarettes with various important functions, such as pleasure and tension-reduction, and that these functions may or may not actually be performed. Since smoking is learned, theoretically it ought to be amenable to "un-learning," or deconditioning, that is, systematic breaking of the stimulus-response bonds so that certain situations (or internal feelings) no longer trigger the act of lighting a cigarette. This may be accomplished directly or indirectly. Many techniques involve one or a combination of the following: associating cigarettes with unpleasant feelings (aversion conditioning) or associating the lack of cigarettes with an increase in pleasurable feelings or a reduction of negative feelings. The "reinforcements" of these new associations may be tangible or simply consist of thoughts or ideas.

Aversion therapy has been used in treating a wide assortment of disorders (alcoholism, fetishism, obesity, drugs, homosexuality). For smoking, special conditioning procedures (including electric shock) and special apparatus have been developed. Many of these are described in a review of behavior modification studies by Keutzer, Lichtenstein, and Mees (*49*).

As shown in the listing, electric shock was used in two studies (*40*, *45*), while other investigators have applied desensitization training in the form of group sessions, breath holding, overexposure to stale smoke, coverant therapy, and supportive counseling. In one study, as the subject puffed a cigarette the investigator fired a .22-caliber rifle 50 times from 2 feet behind the subject's head twice a week for 5 weeks. In 4 weeks the subject reduced his smoking from 18 to 14 cigarettes daily and in the final week to 10 cigarettes daily. The investigator claimed the experiment a success (personal communication, College of San Mateo, Calif., 1964).

Results of aversion therapy techniques generally have been poor. Koenig and Masters (*48*) evaluated systematic desensitization, aversion therapy, and supportive counseling. Results for this study were not reported in terms of cessation, but all three methods were "successful" in terms of reducing the number of cigarettes smoked by 42 subjects who were consuming more than a pack of cigarettes per day at the start of treatment. However, 6 months later the majority of subjects had increased their cigarette consumption. Keutzer and associates' careful study evaluated several techniques. They revealed a 23 percent success rate at the end of treatment and 12 percent at the 6-month followup; coverant therapy was the most successful technique (20 percent success) and breath holding the least successful—no success (*40*, *49*).

Wilde attempted to induce a dislike for the taste of cigarettes without shock (which may create undue anxiety or fear in the subject) by a combination of satiation, and aversive, avoidance, and instrumental conditioning and substitute learning for some smokers (*103*). He administered blasts of heated, smoke-filled air whenever the smoker lit a cigarette. The subject was instructed to keep smoking until he could no longer tolerate both the cigarette and the aversive stimulus together. The subject then put the cigarette out, while stating "I want to give up smoking" (or some such phrase), whereupon the unpleasant air was replaced by a stream of fresh, mildly mentholated air. Wilde reported that two daily sessions of 25 minutes each were sufficient to eliminate the smoking habit for three of seven subjects, with marked improvement for two others. However, these five eventually returned to smoking.

Homme described a method of "coverant conditioning," in which thoughts or ideas, rather than external stimuli, were used as reinforcers (*104*). In this technique, the subject was instructed to think of things which, for him, were incompatible with smoking whenever he wanted a cigarette. Facts about the health dangers of smoking, for example, may serve as incompatible coverants. The next step was to associate a commonly performed daily behavior (not smoking, however) with the coverant in order to strengthen the latter. An ideal "high-probability behavior" would be one which removes the subject from whatever stimuli caused him to want a cigarette in the first place.

The techniques used by Pyke, Agnew, and Kopperud are based on Wolpe's desensitization method (*44*). Desensitization is similar to the

process described by Homme (*104*) in that it involves conditioning a response other than smoking to cues which habitually trigger the act of lighting a cigarette. Since many people report that they smoke in order to relieve anxiety, relaxation responses are commonly used as substitutes in such instances. During treatment sessions, the subject rehearses self-induced relaxation while imagining himself to be in situations normally conducive to smoking. He proceeds through a "hierarchy," starting with situations not strongly associated with cigarettes and ending with those that are. Kraft and Al-Issa used a similar technique (with relaxation induced by hypnosis or injections), and they reviewed six case histories in each of which smoking was one of several behavior problems (*105*). Reduction or cessation of smoking was achieved in all the cases.

Pumroy and March (*76*) employed a hierarchy approach similar to that of Pyke, Agnew, and Kopperud (*44*). They asked subjects to list smoking situations in terms of their attractiveness. Subjects were encouraged to stop smoking first in the least attractive smoking situations, then to progress through the list to those situations in which giving up cigarettes would be increasingly difficult. Data for this study were incompletely reported; thus evaluation was difficult.

The methods reviewed are subject to a number of theoretical criticisms. One is that aversive conditioning relies mainly upon the use of punishment as a motivating force and, as pointed out by Keutzer and co-workers (*49*), the effects of punishment frequently are not predictable, especially when no ready substitute for the undesired behavior is available. A further objection is that while conditioning aims at the manipulation of behavior, the link between smoking behavior and associated feelings (anxiety, desire for cigarettes) is not thoroughly understood. Whether or not the aversive conditioning of smoking generalizes to the feelings which give rise to it has not been adequately determined.

Physician methods. According to a national survey 5 years ago, about half the physicians in the United States had advised their patients to stop smoking; other physicians had advised only patients with specific conditions not to smoke (*106*). In a recent national survey by the National Opinion Research Center, 77 percent of the physicians agreed that it was the physician's responsibility to attempt to convince his patients to stop smoking and 86 percent stated that physicians should assist patients who wish to stop (*107*). Only 38 percent reported that they advised almost all patients to stop. For patients with smoking-related conditions, however, the percentage of physicians who advised their patients to stop varied by illness from 71 to 88 percent. The most prominent methods used by these physicians were explaining the health risks involved and urging the patient to use willpower. About 10 percent of the physicians recommended drugs. Two-thirds of the physicians said that there is no effective method that the physician can use with his patient. Green and Horn, commenting on these findings, stated that more research is needed to develop effective cessation methods which physicians can use with their patients (*107*).

Judith Mausner has conducted several studies among medical students and physicians (*108*). In one, she tested the influence of the private physician in suggesting cessation to his patients (*51*). Although her results were not good in terms of success, she was not studying persons trying to stop smoking, and she concluded that "private physicians can be effective if they will take an active role in discouraging smoking among their patients" (*108*). She urges physicians to exert their personal influence, because the brief time it would take a physician to present a message to a patient would be worth the effort in terms of results. Since physicians have contacts with many smokers, the number of quitters would be large even if only a small percentage took their physicians' advice.

An article in *Patient Care* mentions a number of techniques used by physicians (*109*), and at the National Forum on the Office Management of Smoking Problems, Stross (*110*), Fredrickson (*111*), and Horn (*112*) suggested approaches that physicians could use in their practice. It is difficult to evaluate physician counseling among private practitioners, and only a few reports of such efforts are available. The

effect of the physician was tested in a limited way in a study by Poussaint and associates (*54*, *55*), although the method was not strictly a counseling technique. Each subject met for an hour with a medical student acting as a physician who told the subject he would receive a drug (actually a placebo) to help him stop smoking. Post-treatment results did not differ significantly between subjects whose "doctor" smoked and those whose "doctor" did not smoke during the interview. The authors concluded that those who quit did so because of the "doctor's" influence.

Many of the methods in the listing include some counseling by physicians. For example, physicians were involved in all of the drug trials and many of the other procedures; often they counseled subjects who sought them out individually.

At a 1968 meeting of the California Medical Association, ways to maximize the influence of physicians on their patients' smoking habits were discussed (*113*). It was pointed out that physicians often overlook the problem of smoking unless the patient is suffering from a respiratory or other smoking-related condition. Horn suggested that "The Smoker's Self-Testing Kit" being developed by the National Clearinghouse for Smoking and Health could be used in physicians' offices as an opening for them to advise their patients not to smoke. Other suggestions included having literature about cigarettes available in the waiting room, removal of ashtrays, prohibitions about smoking in the office, and in other ways promoting an atmosphere conducive to nonsmoking.

The National Forum on the Office Management of Smoking Problems (*114*) recommended that in their offices physicians should (*a*) inquire about the smoking habits of all their patients, (*b*) inform each patient about the risks involved in continued smoking and the benefits to be derived from stopping, and (*c*) advise strongly against smoking. They pointed out that this minimum program could be carried out with little expenditure of additional time over the usual office routine. The influence of the physician can be important, and the cumulative effect of each physician's efforts might well produce an impact on smoking behavior.

Group discussion and therapy. Groups of several kinds and other forms of therapy comprise a major proportion of the smoking withdrawal methods which have been and are currently being tried. This category of techniques is diametrically opposed to those involving conditioning, in the sense that group therapy is frequently directed at the causes of smoking as well as the behavior itself. Practitioners who favor counseling or therapy as an aid to smoking cessation generally acknowledge the importance of personal dynamics—emotions and motivations—in the development and continuation of the smoking habit, and believe that any effective withdrawal technique must deal with these aspects.

The group methods reviewed in the listing cover a wide range and represent many levels of interaction. In a sense, any program in which two or more smokers meet in an effort to stop smoking may be termed a "group." However, groups in which lectures and advice are given by an expert or authority differ greatly from those in which views and experiences are shared among members and personal interactions are encouraged. Most of the methods in this category summarized in the listing combined counseling of some kind with medication and educational material—a multidimensional approach. For example, Bachman, a physician, emphasized "scare techniques" in his groups, made up of persons who were ill and had been advised to quit for health reasons (*58*).

Ball, Kirby, and Bogen also treated chronically ill patients, with results similar to Bachman's—57 percent success at the end of treatment (*63*). These fairly high initial results are consistent with the "emergency" nature of the patients' attempt to stop smoking. Filbey, Reed, and Lloyd were the only investigators reviewed who carried out an inservice smoking withdrawal clinic in a hospital and had to deal with problems of space, scheduling, and coordination with other hospital routines (*66*). These investigators used an "educational and supportive" rather than an adamant or "depriving" approach with patients who were referred by their physicians.

Psychological aspects of smoking were stressed by Lawton (*57*), Horn (*61*) and by Schwartz and Dubitzky (*69*, *115*, *116*). Horn's

study showed low success rates, but the focus of his method was on gradual reduction rather than immediate and complete cessation. The Smoking Control Research Project (*70*) was the only study which systematically compared group counseling to individual counseling; both methods employed psychologists as the leaders. The two approaches had virtually the same success rate when all persons starting treatment (including dropouts) were counted in the computations.

Ideas proposed by Tomkins (*117*), tested by Schwartz and Dubitzky (*7*), and Horn, Ikard, and Waingrow (personal communication, Fred Ikard, May 1, 1967), have been used by the National Clearinghouse for Smoking and Health to develop "The Smokers' Self-Testing Kit." The kit follows Horn's approach designed to encourage smoking cessation by stimulating people to analyze why they wish to give up smoking, in terms of his schema regarding the steps leading to withdrawal (*118*). This "insight development" can be fostered through the mass media in groups or by individuals alone. "The Smokers' Self-Testing Kit" is now being tested further and applied in a variety of settings and through various channels of communication (personal communication, Selwyn Waingrow, March 5, 1969). The kit enables each smoker to assess his own behavior and the factors in his life which increase or decrease his chances of successfully giving up cigarettes.

Fredrickson, in New York City, has conducted a number of group withdrawal clinics based mainly on principles of behavioral psychology (*72*) and proposed by Hochbaum (*119*). Thus far these clinics have achieved a 53 percent success rate 2 months after treatment. The most promising strategy, Hochbaum and Fredrickson maintain, is one which holds that cigarette habituation is learned, and therefore cessation of smoking involves a process of re-learning whereby the smoker is helped to teach himself to be a nonsmoker. The factors necessary for success in smoking withdrawal are considered to be the same as those associated with success in any other learning task: adequate motivation, faithful practice, patience, persistence, and so on. Most important, the individual must experience the many activities and feeling states formerly associated with smoking without the benefit of cigarettes. Presumably, this process leads to a reduction in the urge to smoke. This orientation is described in detail to the smoker who wishes to quit, giving him a rationale or explanation for what the clinic is trying to accomplish and heightening his interest in the effort.

Fredrickson states that there are three mental sets the subject must adopt to be able to stop smoking completely: strong personal motivation characterized by a sense of immediacy, commitment to a clearly defined program of action, and, closely related to the second, identification and confrontation of attitudes that resist bona fide behavior change.

Fredrickson considers smoking withdrawal a process of successive steps in which progressive reinforcement leads a person to set his aspirations higher each time and eventually achieve total cessation. The most significant reinforcement for a successful subject is to become a clinic leader himself, which gives him continued support for his long term nonsmoker status.

In the Smoking Control Research Project three methods—prescriptions, individual counseling, and group counseling—were used to help smokers quit (*7, 69–71*). Subjects were assigned randomly to seven combinations (when placebos and tranquilizers were considered) and two control groups of 36 subjects each. Tranquilizers showed the poorest success rates. For example, based on individual counseling subjects who completed treatment, one in three persons assigned to placebo was successful after 1 year compared to one in seven persons who received tranquilizers.

Schwartz and Dubitzky also collected a large amount of psychosocial data which enabled them to devise profiles of successful subjects, of persons who were originally successful but who returned to smoking, of reducers, and of persons unable to change at all (*7, 120*). Specific factors in addition to those based on the Tomkins typology (*117*) emerged as important to success and failure; these related to personal adjustment, chronic anxiety and illness, attitudes toward smoking, and certain socioenvironmental variables.

Record cards and "helpful tips" were found to be the most useful adjuncts to the main meth-

od. The most effective counselors were also the best informed about the facts relating to smoking and health (*121*, *122*). Findings showed that only certain persons can be helped by groups, and that it is therefore best to screen potential subjects according to carefully devised criteria.

Miscellaneous methods. Cessation methods such as fear-arousing communications have been included in many 5-day plans and withdrawal clinics. Leventhal, Watts, and Pagano showed that a "high-fear" communication strengthened desire to stop but had no effect on actual smoking behavior (*123*). In contrast, the receipt of instructions on how to stop smoking had no effect on desire to stop smoking, but was highly effective in getting subjects to change their behavior.

Janis and Mann demonstrated the use of role playing (acting the part of a lung cancer patient) in changing smoking habits by comparing experimental subjects to controls (*12*). However, their results were inconclusive, inasmuch as success was measured in terms of mean reduction of cigarettes rather than cessation. Moreover, the decrease in amount smoked for the "successful" group was just 10.5 cigarettes—45.6 percent reduction—which hardly can be called successful. The reduction for the controls was 22.1 percent. It is likely that many of the subjects did not achieve long term cessation and went back to their former levels, but the study did not report a followup.

B. Mausner has also used the technique of role playing to change smoking behavior (*124*). In comparison with a control group, he found a significant proportion of the experimental subjects achieved short term reduction in smoking levels. He was not testing role playing against persuasive messages, but stated that "programs which are aimed towards changing expectations are more likely to succeed than those which are purely informational." Mausner has also used programed learning, but found that it led only to learning the message—not to changing attitudes or behavior.

Hypnosis has been tried by a number of practitioners. Some, such as von Dedenroth (*125*), have reported good results, but success rates for hypnotic treatment have not been confirmed by rigorous followups based on all subjects (*126*, *127*). Moses recorded 70 percent success based on a portion of the smokers he treated by hypnosis, but by followup the long term success rate had fallen to 18 percent (*73*). Hammett and associates reported 89 percent success at 3 months, based on subjects who completed hypnosis treatment (*74*). Edwards' rate of success with males undergoing hypnosis was 13 percent at 3 months (*20*).

In an approach based on principles of learning and featuring specifically a threatened loss of money, Elliott and Tighe (*77*) reported good results with two small groups of college students (38 percent after 15 months). The "treatment period" lasted 12 weeks in one study and 16 weeks in another, and the sum of $50 in the first and $65 in the second trial (paid by the student) was apparently large enough to keep some of the students, generally light smokers who had not smoked for a long time, from returning to cigarettes.

Comments

In summary, many investigators have tried "methods" to help smokers give up cigarettes but few have shown high success rates. Their combined activities, however, have contributed to the antismoking climate which affects nonparticipating smokers and youth who have not yet taken up the habit. Part of the reason why success has not been better might be partially explained by results of a survey in which it was found that the most commonly offered methods of stopping are the ones least acceptable to smokers who wish to quit (*128*). Thus, the high dropout rates experienced by many methods may be due to low acceptance of the method.

Smoking is a difficult habit to break. The results of the Smoking Control Research Project indicate that many smokers must try several times before they can quit. For them, the smoking clinic is one step closer to total success. The value of temporary reduction should be explored in terms of its possible relationship to later successful attempts by the smoker to quit, as well as its potential for contributing to a bandwagon effect for reduction of smoking by helping to establish new norms for acceptable levels of smoking.

The studies reviewed indicate that they have

served their purpose by showing that people can be helped to stop smoking by a variety of techniques. They have also demonstrated that drugs, such as nicotine substitutes (particularly lobeline) and tranquilizers, are not effective in assisting smokers to give up the habit. Conditioning methods are both ineffective and impractical as they reach only limited numbers of persons. Clinics were a necessary step, but from a research standpoint they have reached a point of diminishing returns.

The problem now is to explain the process of cessation and recidivism and to explore the possibility of applying mass media approaches to reach large numbers of smokers. Steps in this direction are now underway as evidenced by the community smoking projects in Syracuse, N.Y., and San Diego, Calif., development of the smokers' kit, American Cancer Society TV spots, and the telecasting of the National Smokers' Test by CBS on January 16, 1968. Recent activities of local hospitals (*129*) and resolutions by the American Medical Association (*130*) and the American College of Chest Physicians (*114*) indicate that physicians are beginning to take a more active role in urging their patients to refrain from smoking.

The potential of new and original smoking cessation techniques, presented on individual, group, or mass media bases, has not been fully explored. However, too much should not be expected from any one approach, no matter how ingenious, since no single method can be counted on to produce high rates of long term success. Most methods achieve their maximal success at the end of the treatment program but recidivism occurs sharply during the next few months. Thus, even if highly successful cessation methods were devised, these techniques themselves cannot be expected to maintain the burden of keeping people off cigarettes once abstinence is achieved. This task must necessarily be reserved for societal and environmental influences.

Cigarette consumption, according to a report in the *Wall Street Journal*, has declined steadily since September 1967 (*131*). Some tobacco executives trace this decline to the appearance of anticigarette commercials on television. Although the decrease in cigarette consumption is expected to be gradual, cigarette companies "see the handwriting on the wall" and are diversifying into other products; some companies are merging into other corporations or about to drop the word "tobacco" from their names. The Federal Communications Commission has now proposed to ban radio-television advertising for cigarettes or require a warning to appear on all ads. Tobacco executives contend that the warning would frighten people away from smoking and state that they will stop advertising in order to end antismoking television commercials which they admit have hurt sales.

The action of voluntary and governmental agencies, increased efforts by physicians to counsel patients in their offices, and the application of research findings about the psychosocial factors involved in smoking cessation, are helping to create the environmental conditions which will aid smokers to quit permanently.

REFERENCES

(*1*) Ejrup, B., and Wikander, P. A.: Fortsatta forsok till avvanjing fran tobak medelst injektions behandling. Svenska Iakartidn 56: 1975–1986 (1959).

(*2*) Ejrup, B.: Follow-up of the material of smokers difficult to treat. Svenska Iakartidn 56: 2254–2262 (1959).

(*3*) Ejrup, B.: A proposed medical regimen to stop smoking: the follow-up results. Swedish Cancer Soc Yearbook 3: 468–473 (1963).

(*4*) Bjartveit, K.: Utvalget for forskning i roykevaner. Final report. Norwegian Research Group on Smoking Habits. Oslo, Norway, 1967.

(*5*) Ejrup, B.: Report to American Cancer Society Conference of Experts on Ways to Help People Give Up Cigarette Smoking. New York City, Dec. 19–20, 1967.

(*6*) Bureau of Research and Planning, California Medical Association: A study of the attitudes and opinions of physicians on smoking. San Francisco, September 1967.

(*7*) Schwartz, J. L., and Dubitzky, M.: Psycho-social factors involved in cigarette smoking and cessation. Final report of the Smoking Control Research Project. Institute for Health Research and the Permanente Medical Group-Kaiser Foundation Health Plan, Berkeley, Calif., 1968, 629 pp.

(*8*) Schwartz, J. L., and Dubitzky, M.: Implications for future treatment programs. *In* Proceedings of the World Conference on Smoking and Health. National Interagency Council on Smoking and Health, New York, N.Y., 1967, pp. 216–226.

(*9*) Lynch, G. W.: Smoking habits of medical and non-medical university staff; changes since RCP report. Brit Med J No. 5334: 852–855, Mar. 30, 1963.

(10) Hammond, E. C., and Garfinkel, L.: Changes in cigarette smoking, 1959–1965. Paper presented at American Public Health Association annual meeting, San Francisco, Nov. 2, 1966.
(11) White, M. E.: Cigarette smoking. Med World 97: 489–490, December 1962.
(12) Janis, I. L., and Mann, L.: Effectiveness of emotional role-playing in modifying smoking habits and attitudes. J Exp Res Pers 1: 84–90 (1965).
(13) Rosenberg, A.: Attempt at stopping the tobacco habit. Ugeskr laeg 121: 881–886 (1959); 122: 714–718 (1960).
(14) Rosenberg, A.: An attempt to break the smoking habit. Appl Ther 4: 1029–1033, November 1962.
(15) Research Committee of the British Tuberculosis Association: Smoking deterrent study. Brit Med J No. 5355: 486–487, Aug. 24, 1963.
(16) Jochum, K., and Jost, F.: Nicotine addiction and its treatment. Muenchen Med Wschr 103: 618–622 (1961).
(17) Jost, F., et al.: Experiences and practical indications in breaking the nicotine habit. Folia clin Int (Barcelona) 12: 303–314, June 1962
(18) Jost, F., and Tuba, J: Breaking the tobacco habit. Clin Ter 23: 432–450, Sept. 15, 1962.
(19) London, S. J.: Clinical evaluation of a new lobeline smoking deterrent. Curr Ther Res 5: 167–175, April 1963.
(20) Edwards, G.: Hypnosis and lobeline in an anti-smoking clinic. Med Officer 111: 239–243, April 1964.
(21) Edwards, G.: Double-blind trial of lobeline in an anti-smoking clinic. Med Officer 112: 158–160, September 1964.
(22) Merry, J., and Preston, G.: The effect of buffered lobeline sulphate on cigarette smoking. Practitioner 190: 628–631, May 1963.
(23) Hoffstaedt, E. G. W., and Pearson, R. C. M.: The experimental smokers' advisory clinic Newcastle upon Tyne. Med Officer 111: 59–60, January 1964.
(24) Hoffstaedt, E. G. W.: The treatment of the unwilling smoker. A clinical approach. Practitioner 195: 794–798, December 1965.
(25) Perlstein, I. B.: Smoking deterrent therapy in private practice. *In* The First Annual M. R. Thompson Symposium on Recent Advances in the Medical Aspects of Smoking. Matthew Publishing Co., New York, 1964, pp. 40–45.
(26) Swartz, H., and Cohen, A.: Clinical evaluation of Smokurb as a smoking deterrent. Curr Ther Res 6: 290–296, April 1964.
(27) Leone, L. A., Musiker, H. R., Albala, M. M., and McGurk, W.: A study of the effectiveness of the smoking deterrence clinic. Rhode Island Med J 51: 247–257, 260, April 1968.
(28) Turle, G. C.: An investigation into the therapeutic action of hydroxyzine (Atarax) in the treatment of nervous disorders and the control of the tobacco habit. J Med Sci 104: 826–833 (1958).
(29) Ross, C. A.: Smoking withdrawal research clinics. *In* Studies and issues in smoking behavior, edited by Salvatore V. Zagona. University of Arizona Press, Tucson, 1967, pp. 111–113.
(30) Yllo, A.: Cures in breaking the smoking habit and lobnico. Svenska Iakartidn 56: 2139–2144 (1959).
(31) Arvidsson, T.: Smoking patterns and cures. Abbottempo (Abbot Labs, Montreal, Canada) 3: 3–4, Aug. 25, 1965.
(32) Whitehead, R. W., and Davies, J. M.: A study of methylphenidate and diazepam as possible smoking deterrents. Curr Ther Res 6: 363–367, May 1964.
(33) McFarland, J. W., Gimbel, H. W., Donald, W. A. J., and Folkenberg, E. J.: The five-day program to help individuals stop smoking. A preliminary report. Conn Med 28: 885–890 (1964).
(34) Campbell, K.: A smokers' clinic. Med Officer 114: 116–117, August 1965.
(35) Campbell, K., and Spalding, W. J.: A smokers' clinic follow-up. Med Officer 117: 95–96 (1967).
(36) Lawton, M. P.: Group methods in smoking withdrawal. Arch Environ Health (Chicago) 14: 258–265 (1967).
(37) Thompson, D. S., and Wilson, T. R.: Discontinuance of cigarette smoking: "natural" and with "therapy." JAMA 196: 1048–1052 (1966).
(38) Guilford, J. S.: Factors related to successful abstinence from smoking. (Final report.) American Institutes for Research, Los Angeles, Calif., July 1966.
(39) Evans, C.: An attempt at group therapy as a cure for the smoking habit. Med J Aust 3: 702–705, October 1967.
(40) Lichtenstein, E., and Keutzer, C.: Behavior modification approaches to smoking control. Paper presented at the Western Psychological Association meeting, San Diego, Calif., March 1968.
(41) Hess, C. B.: New York City's stop smoking program. *In* Proceedings of the Working Conference on Helping the Adult Smoker Stop Smoking. American Cancer Society, Illinois Division, 1964, pp. 34–38.
(42) Dale, C. L., Graves, W. C., Beck, H. B., and Lau, H. S.: Smoking withdrawal achieved by natural means. Hinsdale Sanitarium, Hinsdale, Ill., 1967. Mimeographed.
(43) Greene, R. J.: Modification of smoking behavior by free operant conditioning methods. Psychol Record 14: 171–178 (1964).
(44) Pyke, S., Agnew, N. M., and Kopperud, J.: Modification of an over-learned maladaptive response through a relearning program: a pilot study on smoking. Behav Res Ther 4: 197–203 (1966).

(45) McGuire, R. J., and Vallance, M.: Aversion therapy by electric shock: a simple technique. Brit Med J No. 5376: 151–153, Jan. 18, 1964.
(46) Getze, G.: Adverse appeal to senses cuts smoking. Los Angeles Times, 1968. (The Center for Behavior Therapy, Beverly Hills, Calif. Processed.)
(47) Koenig, K. P.: Cigarette smoking, behavioristic therapies, and therapists. Stanford University, 1966. Mimeographed.
(48) Koenig, K. P., and Masters, J.: Experimental treatment of habitual smoking. Behav Res Ther 3: 235–243, December 1965.
(49) Keutzer, C. S., Lichtenstein, E., and Mees, H. L.: Modification of smoking behavior: a review. University of Oregon, Eugene, 1967. Mimeographed.
(50) Rutner, I. V.: The modification of smoking behavior through techniques of self control. Master of arts thesis. Wichita State University, Wichita, Kans., July 1967.
(51) Mausner, B., Mausner, J., and Rial, W.: The influence of the physician on the smoking behavior of his patients. *In* Studies and issues in smoking behavior, edited by Salvatore V. Zagona. University of Arizona Press, Tucson, 1967, pp. 103–106.
(52) Mausner, B.: Report on a smoking clinic. Amer Psychol 21: 251–255, March 1966.
(53) Cruickshank, A.: Smokers advisory clinic, Ministry of Health: a preliminary report on an experimental project. Monthly Bull Minist Health (London) 22: (*a*) 110–115; (*b*) final report on initial clinic, 193–194 (1963).
(54) Poussaint, A. F., Bergman, S. H., and Lichtenstein, E.: The effects of physician's smoking on the treatment of smokers. Dis Nerv Syst 27: 539–543, August 1966.
(55) Lichtenstein, E., et al.: A further report on the effects of the physician's treating of smoking by placebo. Dis Nerv Syst 28: 754–755, November 1967.
(56) Lawton, M. P.: Psychological processes in the cessation of smoking. Paper presented at the American Psychological Association meeting, Los Angeles, Calif., Sept. 8, 1964.
(57) Lawton, M. P.: A group therapeutic approach to giving up smoking. Appl Ther 4: 1025–1028 (1962).
(58) Bachman, D. S.: Group smoking deterrent therapy. GP 30: 86–89, September 1964.
(59) Smyth, D. A.: Experience with an anti-smoking clinic. J Coll Gen Pract 11: 57–58, March 1966.
(60) Horn, D.: A systematic approach to the control of personal cigarette smoking. Paper presented at the American Psychological Association meeting, Los Angeles, Calif., Sept. 8, 1964.
(61) Horn, D.: An experimental course for the control of personal cigarette smoking. Paper presented at the Public Health Cancer Association, annual meeting of the American Public Health Association, New York City, Oct. 7, 1964.
(62) Nugent, S. M., and O'Keeffe, K. A.: The treatment of addictive smokers. Brit J Addict 61: 125–128, November 1965.
(63) Ball, K. P., Kirby, B. J., and Bogen, C.: First year's experience in an anti-smoking clinic. Brit Med J No. 5451: 1651–1653, June 1965.
(64) Ball, K. P., and Mair, M.: Results of an anti-smoking clinic. Central Middlesex Hospital, London, England, September 1967. Mimeographed.
(65) Wood, C. R., and Meadows, S. H.: Experimental clinic for preventing chronic bronchitis. Brit Med J No. 5365: 1088–1092, November 1963.
(66) Filbey, E. E., Reed, K. E., and Lloyd, F. T.: An inpatient smoking control service. Hosp Manage 103: 60–64, June 1967.
(67) Reed, K.: Smoking control with an in-patient general hospital population. *In* Studies and issues in smoking behavior, edited by Salvatore V. Zagona. University of Arizona Press, Tucson, 1967, pp. 107–109.
(68) Allen, W. A., and Fackler, W. A.: An exploratory survey and smoking control program conducted among parents of Philadelphia school children. *In* Studies and issues in smoking behavior, edited by Salvatore V. Zagona. University of Arizona Press, Tucson, 1967, pp. 63–65.
(69) Schwartz, J. L., and Dubitzky, M.: The smoking control research project: purpose, design, and initial results. Psych Reports 20: 367–376 (1967).
(70) Schwartz, J. L., and Dubitzky, M.: Clinical reduction of smoking: a California study. Addictions 14: 35–44, winter 1967.
(71) Schwartz, J. L., and Dubitzky, M.: One-year follow-up results of a smoking cessation program. Canad J Public Health 59: 161–165, April 1968.
(72) Fredrickson, D. T.: New York City smoking withdrawal clinic. Paper presented at the American Cancer Society Conference on Ways to Help People Stop Smoking, New York City, Dec. 19, 1967.
(73) Moses, F. M.: Treating smoking habit by discussion and hypnosis. Dis Nerv Syst 25: 184–188, March 1964.
(74) Hammett, V. B. O., and Graff, H.: Therapy of smoking. Curr Psychiat Ther 6: 70–75 (1966).
(75) Graff, H., et al.: Results of four antismoking therapy methods. Penn Med 69: 39–43, February 1966.
(76) Pumroy, D. K., and March, B.: The evaluation of a cigarette smoking reduction method. Paper presented at the Eastern Psychological Association meeting. New York City, April 1966.
(77) Elliott, R., and Tighe, T.: Breaking the cigarette habit: effects of a technique involving threatened loss of money. Dartmouth College, Hanover, N.H., 1967. Mimeographed.
(78) Loranger, A. W., Prout, C. T., and White, M. A.:

The placebo effect in psychiatric drug research. JAMA 176: 920–925, June 17, 1961.

(79) Leone, L. A., Musiker, H., Albala, M., and McGurk, W.: A study of the effectiveness of a smoking deterrence clinic. Rhode Island State Hospital, Providence, R.I., 1967. Mimeographed.

(80) New Jersey State Department of Health: Workshop on smoking and health. Public Health News 47: 51–61, March 1966.

(81) American Cancer Society: Helping people to stop smoking cigarettes. New York, 1968.

(82) Schwartz, J. L., Dubitzky, M., Anderson, N., and Pellegrin, F.: Can health plan members quit smoking? Planning Health 12: 1–3, summer 1967.

(83) Dalzell-Ward, A. J.: The development of anti-smoking clinics in the United Kingdom. *In* Proceedings of the Working Conference on Helping the Adult Smoker Stop Smoking. American Cancer Society, Illinois Division, 1964, pp. 18–20.

(84) Sorensen, B. F.: Mulighed for tobaksafvaenning? Ugeskr Laeg 126: 1277–1278, September 1964.

(85) LeMer, G.: Resultats obtenus par un Anti-Tabac sur un Groupe de 45 Fumeurs. Clinique (Paris) 56: 643, December 1961.

(86) Courilleau, M.: Tabagisme et sulfate de lobeline. Gazette Medicale de France 71: 4292–4296, December 1964.

(87) Farago, I.: Nikotinartalmak-nikotinelvonas. Orv Hetil 105: 1415–1418 (1964).

(88) Heinzl, Z., et al.: Nase zkusenosti a protikuracky bojem. Activ Nerv Sup (Praha) 3: 323–324 (1961).

(89) Cordero, M.: Centro de consulta para fumadores un Checoslovaquia. Dia Medico 33: 1633–1634, August 1961.

(90) Edmunds, C. W.: On the action of lobeline. Amer J Physiol 11: 79 (1904).

(91) Edmunds, C. W.: Cross tolerance between nicotine and lobeline. J Pharmacol Exp Ther 1: 27 (1909).

(92) Dorsey, J. L.: Control of the tobacco habit. Ann Intern Med 10: 628 (1936).

(93) Wright, I. S., and Littauer, D.: Lobeline sulfate. Its pharmacology and the use in the treatment of the tobacco habit. JAMA 109: 649–654, Aug. 28, 1937.

(94) Rapp, G. W., and Olen, A. A.: A critical evaluation of a lobeline base smoking deterrent. Amer J Med Sci 230: 9 (1955).

(95) Ejrup, B.: The role of nicotine in smoking pleasure, nicotinism, treatment. *In* Tobacco alkaloids and related compounds. Pergamon Press, Inc., New York, 1965, pp. 333–345.

(96) Lokander, S.: Om avvanjning fran tobak bland mattlighetsrokare. Svenska Lakartidningen 56: 30 (1959).

(97) Henke, S.: Deutsch Prax, 1959.

(98) Bartlett, W. A., and Whitehead, R. W.: The effectiveness of meprobamate and lobeline as smoking deterrents. J Lab Clin Med 50: 278–281 (1957).

(99) Scott, G. W., et al.: Buffered lobeline as a smoking deterrent. Lancet 1: 54–55 (1962).

(100) Ochsner, A.: Aids in the discontinuance of smoking. *In* Proceedings of the Working Conference on Helping the Adult Smoker Stop Smoking. American Cancer Society, Illinois Division, 1964, p. 27.

(101) McFarland, J. W.: Lifeline for ex-smokers. Nurs Outlook 12: 50–52 (1964).

(102) McFarland, J. W.: Physical measures used in breaking the smoking habit. Arch Phys Med 46: 323–327, April 1965.

(103) Wilde, G. J. S.: Behavior therapy for addicted cigarette smokers: a preliminary investigation. Behav Res Ther 2: 107–109 (1964).

(104) Homme, L. E.: Perspectives in psychology: XXIV. Control of coverants, the operants of the mind. Psychol Record 15: 501–511 (1965).

(105) Kraft, T., and Al-Issa, I.: Desensitization and reduction in cigarette consumption. J Psychol 67: 323–329 (1967).

(106) 60,000 answer, MM smoking survey. Mod Med 32: 18–30 (1964).

(107) Green, D. E., and Horn, D.: Physicians' attitudes toward their involvement in smoking problems of patients. Dis Chest 54: 180–181, September 1968.

(108) Mausner, J.: Summary of experience and recommendations. Paper presented at American Cancer Society Conference on Ways to Help People Stop Smoking. New York City, Dec. 19, 1967.

(109) A carton of ideas to help your patients stop smoking. Patient Care 2: 54–55, 58–64, April 1968.

(110) Stross, L.: Practical office approaches. Dis Chest 54: 192–195, September 1968.

(111) Fredrickson, D. T.: How to help your patient stop smoking—guidelines for the office physician. Dis Chest 54: 196–202, September 1968.

(112) Horn, D.: An approach to office management of the cigarette smoker. Dis Chest 54: 203–209, September 1968.

(113) Conference on Smoking and Health. Panel at the California Medical Association annual meeting. San Francisco, Mar. 23, 1968.

(114) The National Forum on Office Management of Smoking Problems: Formal recommendations. Dis Chest 54: 172–173, September 1968.

(115) Schwartz, J. L., and Dubitzky, M.: Changes in anxiety, mood, and self-esteem resulting from an attempt to stop smoking. Amer J Psychiat 124: 1580–1584, May 1968.

(116) Dubitzky, M., and Schwartz, J. L.: Ego-resiliency, ego-control, and smoking cessation. J Psychol 70: 27–33, September 1968.

(117) Tomkins, S.: Theoretical implications and guidelines to future research. *In* Behavioral aspects of smoking, edited by B. Mausner and E. Platt. Health Education Monographs, supp. No. 2, 1966, pp. 35–48.

(118) Horn, D.: Insight development: a new approach in dealing with the cigarette problem. Presidential address delivered at the annual meeting of the Public Health Cancer Association of America, Oct. 27, 1967, Miami Beach, Fla., in connection with American Public Health Association meeting.

(119) Hochbaum, G. M.: An approach to the smoking problem. Paper presented at the annual conference of the Massachusetts Interagency Council on Smoking and Health, Boston, Oct. 31, 1967.

(120) Schwartz, J. L., and Dubitzky, M.: Requisites for success in smoking withdrawal. *In* Smoking, health, and behavior, edited by E. F. Borgatta and R. R. Evans. Aldine Publishing Co., Chicago, 1968, pp. 231–247.

(121) Jenks, R., Schwartz, J. L., and Dubitzky, M.: The effect of the counselor's approach to changing smoking behavior. J Couns Psychol 16: 215–221, May 1969.

(122) Weir, J. M., Dubitzky, M., and Schwartz, J. L.: Counselor style and group effectiveness in a smoking withdrawal study. J Psychother 23: 106–108, January 1969.

(123) Leventhal, H., Watts, J. C., and Pagano, F.: Effects of fear and instructions on how to cope with danger. Yale University, New Haven, Conn., undated. Mimeographed.

(124) Mausner, B.: Summary of experience and recommendations. Report to American Cancer Society Conference on Ways to Help People Stop Smoking, New York City, Dec. 19, 1967.

(125) von Dedenroth, T. E. A.: The use of hypnosis in 1,000 cases of "tobaccomaniacs." Amer J Clin Hypnosis 10: 194–197, January 1968.

(126) Poverinsky, Y. A.: Psychotherapy of smoking. *In* Psychotherapy in the Soviet Union, edited by R. B. Winn. Philosophical Library, New York, 1961, pp. 144–152.

(127) Heiss, J. G.: The painless way to stop smoking. Channel Press, New York, 1962.

(128) Schwartz, J. L., and Dubitzky, M.: Expressed willingness of smokers to try 10 smoking withdrawal methods. Public Health Rep 82: 855–861, October 1967.

(129) Grant, C. Y.: Hospital leadership in antismoking. J Amer Hosp Assoc 42: 74–77, November 1968.

(130) Report of medical meeting. San Francisco Chronicle, Dec. 3, 1968.

(131) Kessler, R.: Cigarette foes suggest a long-term decline in smoking has started. Wall Street Journal, Mar. 27, 1969, pp. 1, 19.

Pitt Establishes School of Health-Related Professions

The University of Pittsburgh has announced the establishment of a new School of Health-Related Professions. The school will have three departmental programs operational by July 1, 1969. A program in child care and development will lead to a master's degree. Baccalaureate-granting departments will be medical technology and physical therapy.

The major courses of study offered by the new school will develop "allied health professionals," highly trained people skilled in their jobs who can free physicians and dentists for the complex duties of their specialty.

Dr. Anne Pascasio was named dean of the new school, which will incorporate the program and facilities of the physical therapy education program of the D. T. Watson School of Physiatrics in Leetsdale, Pa., into the university-based program.

Plans call for the department of physical therapy of the new School of Health-Related Professions to use the training facilities of the D. T. Watson Home in Leetsdale for the next 2 years, at which time the program will be moved to the health center at Pitt's Oakland campus. The school is also exploring future programs in occupational therapy and medical record librarianship.

HOME STUDY COURSES

The National Communicable Disease Center, Public Health Service, offers six correspondence courses which are given continuously. The subjects are community hygiene, basic mathematics for the sanitarian, communicable disease control for the sanitarian, vectorborne disease control, waterborne disease control, and foodborne disease control.

Community hygiene. The course is designed to give the public health worker a general knowledge of the application of the various principles of sanitary science as they relate to the prevention and control of communicable disease. Though not a prerequisite, this course provides baseline information for specialized home study courses and certain other courses offered by the Center's training program. The basic reference is a standard textbook which must be obtained at the student's expense.

Basic mathematics. The course offers a review of the subject as it is related to public health operations in the field. The course content has been selected to develop and refresh the competence of the public health practitioner in making conversions from one system of measurement to another, determining amounts of chemicals to use under widely varying situations, and calculating the volumes and areas of common geometric forms. All training materials are furnished by the National Communicable Disease Center.

Communicable disease control. Subjects are morphology and reproduction of microbes; influence of the environment on microbes; quantitative and qualitative considerations regarding bacteria under varying circumstances; the mechanism whereby pathogens cause disease; body defenses; arthropod-borne diseases; and etiology and control of parasitic infections, diseases of animal origin, and foodborne, milkborne, and waterborne diseases. The program of study stresses modern concepts of control of diseases which are spread by favorable environmental conditions.

Of the three basic references used to study communicable disease control, one is a standard textbook on microbiology which must be purchased by the student. All other references are furnished by the Center.

Vectorborne disease control. The course is largely descriptive; no special projects or laboratory exercises are required. Only descriptive taxonomy is covered, but taxonomic keys and other aids will be furnished to students who pursue individual interests at their discretion.

The subject of vector control is covered comprehensively through training material furnished by NCDC. The 11 lessons deal with arthropods of public health importance; insecticide and insecticidal equipment; sanitation in vector control; biology and control of flies, of mosquitoes, of fleas and lice, and of ticks and mites; household and stored-food insects; biological factors in domestic rodent control; and control of domestic rats and mice.

Waterborne disease control. The course is designed to give public health workers a general knowledge of the procedures and factors involved in the prevention and control of such diseases. Not intended to be a technical presentation on water treatment, this course emphasizes principles of disease control which may be applied to obtain a safe product.

The subjects covered are waterborne diseases; water sources and impurities; standards; elementary chemistry and biology, basic mathematics, hydraulics, and hydrostatics; treatment; cross connections; sampling; bacteriological tests commonly used in water sanitation; and protection and development of private water supplies. All references are furnished at no cost to the student.

Foodborne disease control. The course offers practical information about the common foodborne diseases, conditions that favor their transmission, methods that effectively control them, and the legal and administrative aspects of control and enforcement. Course content includes a review of the agents that cause foodborne diseases; the media, carriers, and methods by which the agents can be transmitted; reservoirs and other sources of contamination; aspects of control that are pertinent to food protection, physical facilities, and sanitary operating procedures; and time-temperature requirements associated with control through hot and cold processing.

The principal textbook must be purchased by the student, but all supplemental materials are provided by the Center.

Additional information. Write to C. Bradley Bridges, Chief, Special Projects Unit, Community Services Training Section, Training Program, National Communicable Disease Center, Public Health Service, Atlanta, Ga. 30333.