Followup Study of Narcotic Drug Addicts After Hospitalization

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A FEW STUDIES have attempted to evaluate systematically the status of patients at varying lengths of time after hospital treatment for drug addiction (*1–3*). These have been based either upon a questionnaire sent to discharged patients or upon the records of patients readmitted to a Federal narcotic treatment hospital. In a recent study (*4*) the major source of the information was a team of 4 parole officers who supervised 346 former addicts on parole from New York State correctional institutions.

In the present study the data were gathered by a field team which attempted to make contact with all addict patients discharged from the U.S. Public Health Service Hospital at Lexington, Ky., during the period from July 17, 1952, to December 31, 1955, who gave a home address in any part of New York City. Followup contacts on all patients not classified as readdicted were continued during the calendar year 1956, and the study was terminated on December 31, 1956. At that time the National Institute of Mental Health, Public Health Service, took over the followup team as part of their New York Demonstration Center and has continued certain studies of selected groups of former addict patients.

Purpose of Study

The original primary goal of the study was to arrive at some estimate of the value of hospital treatment of narcotic drug addicts in preventing their relapse into a state of readdiction. In addition it was hoped that the rate of readdiction could be correlated with pertinent demographic characteristics and with various aspects of the patients' hospital experience.

Before these more fundamental determinations could be made, it was necessary to find out, first, whether contact could be achieved and maintained with persons who had been treated for narcotic drug addiction after they had been discharged from the hospital and had returned to their own community, and second, if contact could be achieved, to find out whether one could determine with reasonable certainty whether or not the former patients had become readdicted to narcotic drugs.

The study was undertaken to try to get answers to three questions.

1. Can contact be achieved with addict patients discharged from the Public Health Service Hospital at Lexington to New York City?
2. If so, can it be determined with reasonable certainty which patients remain abstinent and which become readdicted?
3. If the first two questions can be answered affirmatively, what are the gross readdiction rates at various times following discharge, and what relationships, if any, can be found between

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relapse rates and such factors as age, sex, ethnic group, social status, and length of hospital stay?

Principles of Treatment

The Public Health Service first began work with the problem of narcotic drug addiction in 1923 when Dr. Lawrence Kolb, a Service officer trained as a psychiatrist, conducted a survey of the prevalence of addiction in the United States. Kolb's studies produced the first reasonably valid estimate of the amount of addiction in the United States, an estimated 110,000 addicts (*5*). In subsequent clinical and psychiatric investigations at the Hygienic Laboratory (now the National Institutes of Health) and among Federal prisoners, he studied the physiology and psychology of narcotic drug abuse. His work became the foundation for the currently accepted medical approach to the treatment of narcotic drug addiction which identifies the addict as a mentally ill person in need of medical treatment, notwithstanding his tendency to engage in criminal acts.

The work of Treadway, Kolb, and Himmelsbach (*6–8*) led to formulation of a hospital regimen for narcotic drug addiction which includes (*a*) provision for the withdrawal of the addicting drug in a secure environment, (*b*) continued psychiatric treatment, and (*c*) rehabilitation through an opportunity for the patient to work and learn a trade.

The medical and social aspects of narcotic drug addiction were recognized by Congress when it authorized, in 1929, the construction of two Public Health Service Hospitals for the purpose of confining and treating persons who had committed offenses against Federal law and who were addicted to narcotic drugs. The hospital at Lexington was opened in 1935 and a similar hospital in Fort Worth, Tex., in 1938. To the extent space was available, the Service was authorized to treat addicts who were willing to enter the hospital voluntarily for treatment. In addition, facilities were provided for conducting research into the properties and effects of addicting drugs and effective methods of treatment and rehabilitation.

The treatment program at Lexington assumes that narcotic drug addiction is primarily a symptom of emotional disturbance or functional inadequacy and that addiction has two separate aspects, physical dependence and psychological dependence. Physical dependence is easily treated by withdrawal of the addicting drug in a controlled drug-free environment. Psychological dependence is more difficult to treat since it involves a basic functional inadequacy of the individual. Treatment aims at gaining patient acceptance of the desirability of living without drugs and at helping him to meet stress without recourse to drugs. Thus, psychological therapy and work therapy are used in rehabilitating the patient following relief from physical dependence on drugs.

The recommended length of stay for voluntary patients has tended to decrease over the years. For the first few years of operation of the hospital at Lexington, a period of 9 to 12 months was considered the optimum length of stay for these patients. The recommended period was later reduced to 6 months, and still

Study Staff

Several members of the staff of the Bureau of Medical Services, Public Health Service, participated in planning and carrying out the study under Dr. Hunt's general direction. The principal staff members with their positions during the period of the study were Robert W. Barclay, program analysis and reports officer, Bureau of Medical Services; Leon Brill, chief, New York followup team; Dr. Kenneth L. Chapman, medical officer in charge, U.S. Public Health Service Hospital, Lexington, Ky.; Mary C. Gillis, chief, Social Service Branch, Division of Hospitals; Dr. Clifton K. Himmelsbach, chief, Division of Hospitals; Helen D. McGuire, chief, Medical Record Branch, Division of Hospitals; Joseph S. Murtaugh, chief, Operating Reports, Analysis, and Procedures Branch, Division of Administrative Management; and Frances C. Nemec, chief medical record librarian, U.S. Public Health Service Hospital, Lexington, Ky.

Members of the New York followup team, in addition to Mr. Brill, were Mary McGovern, R.N., Harold J. O'Keefe, and Benjamin L. Zinda.

later to 4½ months. These changes grew partly out of the need to reduce overcrowding and partly from the difficulty of demonstrating that the more prolonged periods of hospitalization added significantly to the value of treatment.

A more detailed discussion of the treatment program at Lexington is given by Lowry (*9*).

Method of Study

The group studied consisted of all the patients discharged from the Public Health Service Hospital at Lexington during the period from July 17, 1952, to December 31, 1955, who (*a*) had been hospitalized with a diagnosis of narcotic drug addiction, (*b*) were reported by the hospital as having completed the withdrawal period, and (*c*) gave a home address in any part of New York City. Patients who were hospitalized more than once during the period of the study are included in the tabulations only for the first posthospitalization period, although some of them were seen by the followup team after their second or subsequent discharges.

In any future studies, consideration should be given to defining "completion of withdrawal" with precision. This was not done in the present study, and it is probable that some of the patients who left the hospital against medical advice did so within a few days after receiving the last dose of narcotic drug, with no opportunity to receive any benefits accruing from additional hospitalization. Patients who stayed 30 days or longer may be presumed to have become free of clinical signs of abstinence.

Followup contacts were continued until the study was terminated on December 31, 1956, so that each patient was followed for a minimum of 1 year after discharge or until he was determined to have become readdicted, whichever happened first. The maximum period of followup for abstinent patients, therefore, varied from 1 year to nearly 4½ years. Since 87.3 percent of the patients were classified as readdicted within 12 months after discharge, any bias introduced by the unequal period of followup tends to favor the abstinent group. If each "abstinent" patient had been followed for 4½ years, the proportion remaining abstinent for that length of time would in all probability have been smaller than the results reported here.

Followup Procedure

The full-time followup team established in New York consisted of two psychiatric social workers and one public health nurse. The senior psychiatric social worker and the public health nurse had been members of the staff of the hospital at Lexington. Early in the study the senior psychiatric social worker resigned, the second social worker became chief of the team for the remainder of the study, and another male psychiatric social worker was added to the staff.

At the time of discharge of every patient meeting the criteria for inclusion in the study, the hospital mailed to the followup team the name and address of the patient, of any known relatives and friends, and a résumé of available social information concerning the patient.

The followup team sent a letter to each discharged patient informing him that the team was aware that he had returned home and telling him that they were interested in helping him. If no response was received, a second letter was sent indicating regret that the patient had not as yet had an opportunity to respond and emphasizing the interest of the followup team in seeing him. Different kinds of letters to meet a variety of needs were devised and duplicated. The duplicated letters preserved as personal a tone as possible and were uniformly worded around an offer to help the patient with his problem.

Extreme care was taken to observe confidentiality. Envelopes gave only a post office box number and letters made no mention of hospitalization. If the patient did not respond to either letter, or if letters were returned marked "unknown at this address," the team cautiously proceeded to get in touch with members of the family, asking only for the patient's address. In telephone contacts the patient or members of his family were encouraged to come to the office for an interview, although as much information as possible was elicited during the telephone conversation. If both the patients and those having knowledge of them failed to respond, an attempt was made to locate the

patients through direct visits. If patients or their families could not be located or refused to respond, information was sought from the New York City police files, files of the Federal Bureau of Narcotics, or the New York City Social Service Exchange. All these organizations accepted the need for complete confidentiality of information.

There were 1,912 patients referred to the New York followup team, and the team was successful in achieving some degree of contact with 1,881, or 98.4 percent. The first question, therefore, was answered in the affirmative: the followup team could achieve and maintain substantial contact with a large proportion of addict patients following their discharge from the hospital.

Determination of Readdiction

The determination of readdiction, however, proved to be much more difficult. In planning the study, it had been assumed that the patients would be either fully abstinent or fully readdicted, and that the only problem would be that of determining the presence or absence of full-blown readdiction. Since all patients in the study had, by definition, been fully addicted at least once, it was thought that any return to the use of drugs would lead to rapid reestablishment of addiction. In the early stages of the study, the followup team classified a number of patients as readdicted when they had satisfied themselves that a patient had taken as little as a single injection of heroin.

It was later found that this assumption was incorrect, and that occasionally some patients would take one, two, or even more, injections of heroin during the readjustment period immediately after discharge from the hospital or during later periods of special stress, but then cease the use of drugs before readdiction had become established. Based on such evidence, a distinction was made between irregular use and readdiction.

Readdiction was defined for the purpose of this study as the use of a narcotic drug in the amount of at least one injection per day for a period of 2 weeks. Any use of drugs less frequently than once a day or for a period of less than 2 weeks was classified as irregular use. From the medical point of view physical dependence is necessary for a diagnosis of drug addiction, and it is unlikely that one daily injection of a narcotic drug for a 2-week period would result in significant physical dependence. The definition adopted is therefore a probabilistic one. It assumes that although the daily injection of a single dose of a narcotic drug for a 2-week period does not induce addiction in most persons previously not addicted, such doses taken voluntarily by one previously addicted make it highly probable that he is, or will become, readdicted.

Patients were therefore classified in accordance with these definitions.

- *Abstinent.* The patient is not taking any narcotic drugs at the time of observation and has not taken any since the previous observation.
- *Irregular use.* The patient is using, or has used, narcotic drugs to some extent since the previous observation, but has not taken as much as one injection per day for a period of 2 weeks.
- *Readdicted.* The patient is using, or has used, narcotic drugs to the extent of at least one injection per day for a period of 2 weeks.

Since the followup team could not ascertain under controlled conditions the number of doses a patient took in a given period of time, it was necessary for them to seek criteria which would permit a reasonably accurate determination. During the early years of the study various attempts were made to develop schemes for translating bits and pieces of information about individual patients into an objective rating scale. Efforts were made, for example, to devise a series of relative weights to be given to information received from a patient, his family, law enforcement agencies, and physicians, with the thought that the sources of information could be arrayed in a series with consistently increasing validity. All of these attempts proved fruitless and were abandoned.

The procedure finally adopted was developed on the basis of the followup team's experience that sufficient information could be obtained in almost all cases to warrant a considered conclusion that a given patient was either abstinent or addicted. The interviewers became adept in identifying and evaluating individual bits of evidence and in validating them by checking police, hospital, and social agency files.

Objective corroborative evidence of readdiction was obtained from these outside sources for substantial numbers of patients. Many patients (469 of the 1,881 followed) were arrested for narcotic offenses. A number of these showed overt withdrawal symptoms after a few hours in jail. Others approached physicians to obtain drugs and were reported as drug users under the New York law. Many patients who became readdicted (249) applied for hospitalization either in New York City or at the Lexington hospital.

The criteria finally adopted for determining readdiction, therefore, were based on (*a*) a series of clues stemming from the awareness of the interviewers of the signs and symptoms of readdiction, (*b*) objective verification from social agencies, police, and health department files, and (*c*) admission to the hospital at Lexington or the Riverside Hospital in New York. While absolute evidence of readdiction was available for only a fraction of the patients, for most, the team was able to come to a firm conclusion about the presence or absence of readdiction. During the final year of the study, the chief of the followup team reviewed the records of all patients and was responsible for determining the final classification of each patient in the study. If there were any doubts about the diagnosis of readdiction, the patient was classified as an irregular user or as abstinent.

It is recognized that a more objective measure of readdiction would have been desirable, but the experience of the team during this study and continuing contact since the study with many of the same patients leads to the belief that any errors in classification of patients were not of sufficient magnitude to affect the conclusions seriously.

Findings of Study

There were 1,912 patients referred to the New York City followup team. Some degree of contact was achieved with 1,881 or 98.4 percent. Table 1 is a comparison of the patients referred for study and those subsequently followed, grouped by voluntary and nonvoluntary status, sex, and age, and classified by ethnic group.

The team was unable to locate 31 patients, only one of whom was a nonvoluntary patient. Following is the distribution by sex and ethnic

Table 1. Patients with New York City addresses discharged from the Public Health Service Hospital, Lexington, Ky., between July 17, 1952, and Dec. 31, 1955, referred for study and subsequently followed

Status, sex, and age (years)	Referred					Followed				
	Total	White	Negro	Puerto Rican	Chinese and other	Total	White	Negro	Puerto Rican	Chinese and other
All patients	1,912	721	948	187	56	1,881	709	935	185	52
Voluntary	1,533	655	669	156	53	1,503	643	657	154	49
Male	1,176	479	517	128	52	1,159	474	511	126	48
Under 30	774	260	398	114	2	770	260	396	112	2
Over 30	402	219	119	14	50	389	214	115	14	46
Female	357	176	152	28	1	344	169	146	28	1
Under 30	197	58	117	21	1	193	58	113	21	1
Over 30	160	118	35	7	0	151	111	33	7	0
Nonvoluntary	[1] 379	66	279	31	3	[2] 378	66	278	31	3
Male	338	56	249	30	3	337	56	248	30	3
Under 30	269	42	204	23	0	268	42	203	23	0
Over 30	69	14	45	7	3	69	14	45	7	3
Female	41	10	30	1	0	41	10	30	1	0
Under 30	35	9	26	0	0	35	9	26	0	0
Over 30	6	1	4	1	0	6	1	4	1	0

[1] 310 prisoners, 69 probationers.
[2] 309 prisoners, 69 probationers.

group of the remaining 30 voluntary patients who could not be followed.

Race	*Male*	*Female*
White	5	7
Negro	6	6
Puerto Rican	2	0
Chinese and others	4	0
Total	17	13

The male to female ratio for the total group referred is nearly four to one; a disproportionate number of females could not be followed ($P<0.01$).

Comparison With Other Discharged Patients

The New York City group followed differed significantly as a sample in a number of characteristics from all patients discharged from Lexington during the last full fiscal year of the study. The New York City group had higher proportions of nonvoluntary patients, of men, of Negroes, and of patients under 30 years of age ($P<0.01$ for each). The proportion in each of these classifications for all discharged patients and for patients followed are summarized.

	Patients followed (percent)	*All patients discharged (percent)*
Nonvoluntary	20.1	15.8
Males	79.5	75.2
Negroes	49.7	42.5
Under 30 years	67.3	47.6

Characteristics of the Study Group

Among the patients admitted voluntarily, the group followed had about equal proportions of whites (42.8 percent) and Negroes (43.7 percent); the Puerto Ricans comprised 10 percent and the Chinese about 3 percent. About three out of every four patients in the New York group were men, and two-thirds of these were under 30 years of age. The voluntary patients were predominantly young men; about one-third were white and one-half Negro.

The nonvoluntary patients in the group followed (309 prisoners, 69 probationers) were 73.5 percent Negro, 17.5 percent white, 8.2 percent Puerto Rican, and less than 1 percent Chinese and other. Two-thirds of the nonvoluntary patients were male Negroes and 81.9 percent of these were under 30 years of age. The nonvoluntary patients were predominantly young, male, and Negro.

Table 3. Cumulative number and percent of patients resuming the use of narcotic drugs at various times after referral

Months after referral	Cumulative number	Cumulative percent
Under 6	1,567	83.3
6–12	1,642	87.3
13–18	1,671	88.8
19–24	1,679	89.2
25 or more	1,694	90.1

Readdiction Rates After Discharge

The addiction status at the end of the followup period for the study group is found in table 2. Out of 1,881 patients followed, 1,694 (90.1 percent) were judged by the study's criteria to be readdicted, 124 (6.6 percent) abstinent, and 63 (3.3 percent) used narcotics irregularly or their addiction status could not be determined.

The rapidity with which patients resumed the use of narcotic drugs after discharge was striking. Within 6 months after referral, 5

Table 2. Readdiction status of all patients at completion of followup period

Status	Total patients		White		Negro		Puerto Rican		Chinese and other	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All patients	1,881	100.0	709	100.0	935	100.0	185	100.0	52	100.0
Readdicted	1,694	90.1	630	88.9	848	90.7	173	93.5	43	82.7
Abstinent	124	6.6	53	7.5	55	5.9	8	4.3	8	15.4
Irregular or undetermined	63	3.3	26	3.6	32	3.4	4	2.2	1	1.9

Table 4. Rates for patients who were readdicted, abstinent, or irregular users by status, sex, and age, classified by ethnic group

Status, sex, and age (years)	Total patients		White		Negro		Puerto Rican		Chinese and other	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
	Readdicted									
Total	1,694	90.1	630	88.9	848	90.7	173	93.5	43	82.7
Voluntary	1,370	91.2	578	89.9	603	91.8	147	95.4	42	85.7
Male	1,060	91.4	427	90.1	469	91.8	123	97.6	41	85.4
Under 30	720	93.5	244	93.8	366	92.4	109	97.3	1	-------
Over 30	340	87.4	183	85.5	103	89.6	14	-------	40	86.9
Female	310	90.1	151	89.3	134	91.8	24	85.7	1	-------
Under 30	174	90.1	50	86.2	104	92.0	19	90.4	1	-------
Over 30	136	90.1	101	91.0	30	90.9	5	-------	0	-------
Nonvoluntary [1]	324	85.7	52	78.8	245	88.1	26	83.9	1	-------
Male	291	86.4	43	76.8	222	89.5	25	83.3	1	-------
Under 30	241	89.9	33	78.6	189	93.1	19	82.6	0	-------
Over 30	50	72.4	10	71.4	33	73.3	6	85.7	1	-------
Female	33	80.4	9	90.0	23	76.7	1	-------	0	-------
Under 30	29	82.9	8	88.9	21	80.8	0	-------	0	-------
Over 30	4	-------	1	-------	2	-------	1	-------	0	-------
	Abstinent									
Total	124	6.6	53	7.5	55	5.9	8	4.3	8	15.4
Voluntary	83	5.5	42	6.5	30	4.6	5	3.2	6	12.2
Males	62	5.3	29	6.1	25	4.9	2	1.6	6	12.5
Under 30	30	3.9	9	3.5	18	4.5	2	1.8	1	-------
Over 30	32	8.2	20	9.3	7	6.1	0	-------	5	10.9
Females	21	6.1	13	7.7	5	3.4	3	10.7	0	-------
Under 30	12	6.2	7	12.1	4	3.5	1	4.8	0	-------
Over 30	9	6.0	6	5.4	1	3.0	2	-------	0	-------
Nonvoluntary [2]	41	10.9	11	16.7	25	9.0	3	9.7	2	-------
Males	34	10.1	11	19.6	18	7.3	3	10.0	2	-------
Under 30	19	7.1	8	19.0	8	3.9	3	13.0	0	-------
Over 30	15	21.7	3	21.4	10	22.2	0	-------	2	-------
Females	7	17.1	0	-------	7	23.3	0	-------	0	-------
Under 30	5	14.3	0	-------	5	19.2	0	-------	0	-------
Over 30	2	-------	0	-------	2	-------	0	-------	0	-------
	Irregular users or use undetermined									
Total	63	3.3	26	3.6	32	3.4	4	2.2	1	1.9
Voluntary	50	3.3	23	3.6	24	3.7	2	-------	1	-------
Male	37	3.2	18	3.8	17	3.3	1	-------	1	-------
Under 30	20	2.6	7	2.7	12	3.0	1	-------	0	-------
Over 30	17	4.4	11	5.1	5	4.3	0	-------	1	-------
Female	13	3.8	5	3.0	7	4.8	1	-------	0	-------
Under 30	7	3.6	1	-------	5	4.4	1	-------	0	-------
Over 30	6	4.0	4	3.6	2	6.0	0	-------	0	-------
Nonvoluntary [3]	13	3.4	3	4.5	8	2.9	2	-------	0	-------
Male	12	3.6	2	-------	8	3.2	2	-------	0	-------
Under 30	8	3.0	1	-------	6	3.0	1	-------	0	-------
Over 30	4	5.8	1	-------	2	-------	1	-------	0	-------
Female	1	-------	1	-------	0	-------	0	-------	0	-------
Under 30	1	-------	1	-------	0	-------	0	-------	0	-------
Over 30	0	-------	0	-------	0	-------	0	-------	0	-------
All patients	1,881	100	709	100	935	100	185	100	52	100

[1] 265 prisoners, 59 probationers. [2] 34 prisoners, 7 probationers. [3] 10 prisoners, 3 probationers.

out of 6 patients had resumed the use of narcotic drugs (83.3 percent of all patients, or 92.5 percent of those who became readdicted during the course of the study). By 2 years after referral, 9 out of 10 had resumed the use of narcotic drugs (table 3). Patients who were classified as readdicted by the study's criteria were no longer included in the tabulations once they were so classified so that, in effect, we followed to the end of the study only the patients who remained completely abstinent after referral.

Variations in Relapse Rates

Table 4 presents data on the 1,694 patients who became readdicted, the 124 abstinent patients, and the 63 patients using narcotics irregularly or for whom use could not be determined classified by ethnic group, type of admission (voluntary and nonvoluntary), sex, and age.

Age proved to be the principal significant variable in the determination of rates of readdiction, with men 30 years of age and older having generally lower readdiction rates than those under 30. Age had no significant effect among female voluntary patients. There were so few female nonvoluntary patients that no significant comparison with respect to age could be made. Comparisons of types of admission, length of stay, sex, and ethnic group, data permitting, thus take the variable of age into consideration. In addition, readdiction rates were significantly lower for:

1. The nonvoluntary group of patients aged 30 or more as compared with their voluntary counterparts.
2. The white nonvoluntary group less than 30 years of age as compared with their Negro counterparts.
3. Patients under 30 years of age staying in the hospital 31 days or more as compared with those staying 30 days or less.

Ethnic group and sex produced no significant differences among the voluntary patients or among the nonvoluntary except for the single significant difference in readdiction rates between young white and Negro men. The readdiction rates for these groups were 78.6 and 93.1 percent respectively ($df=2$; $x^2=12.7467$; $P<0.01$).

Age. The readdiction rate for all men 30 years of age or older, 85.1 percent, is significantly lower than that for all men under 30

Table 5. Readdiction rates of male patients, by age

Readdiction status	Under 30 years		Over 30 years		Total	
	Number	Percent	Number	Percent	Number	Percent
Readdicted	961	92. 6	390	85. 1	1, 351	90. 3
Abstinent	49	4. 7	47	10. 3	96	6. 4
Irregular or undetermined	28	2. 7	21	4. 6	49	3. 3

NOTE: $df=2$; $x^2=20.5888$; $P<0.01$.

Table 6. Readdiction rates of voluntary white male patients, by age

Readdiction status	Voluntary white males under 30 years		Voluntary white males over 30 years		Total	
	Number	Percent	Number	Percent	Number	Percent
Readdicted	244	93. 8	183	85. 5	427	90. 1
Abstinent	9	3. 5	20	9. 3	29	6. 1
Irregular or undetermined	7	2. 7	11	5. 2	18	3. 8

NOTE: $df=2$; $x^2=9.4206$; $P<0.01$.

years, 92.6 percent (table 5). This holds both for voluntary male patients under 30, with a readdiction rate of 93.5 percent, and for those over 30, with a rate of 87.4 percent (df=2; $x^2=12.6870$; $P<0.01$), and for nonvoluntary male patients under 30, with a rate of 89.9 percent, and over 30, with a rate of 72.5 percent (df=2; $x^2=15.4798$; $P<0.01$).

The difference between the readdiction rates for the younger and older voluntary male patients is, however, due to the difference between the readdiction rates for younger (93.8 percent) and older (85.5 percent) voluntary white male patients (table 6). The difference between the readdiction rates for the younger and older nonvoluntary male patients is due to the difference between the readdiction rates for younger (93.1 percent) and older (73.3 percent) Negro male patients (table 7). Being over 30 years of age increases a patient's chance of remaining abstinent for both voluntary white and nonvoluntary Negro male patients.

Type of admission. The readdiction rate for all nonvoluntary patients (85.7 percent) is lower than the rate for voluntary patients (91.2 percent). Inasmuch as all but 8 nonvoluntary patients had a length of stay of 121 or more days, the comparison is limited to patients with a similar length of stay (table 8). For those under age 30, the readdiction rates are 90.5 percent for voluntary patients and 90.2 percent for nonvoluntary patients, rates which proved not to be statistically significant (df=2; $x^2=0.2023$; $P=0.92+$). For those aged 30 or more years, the readdiction rates were 88.8 percent for the voluntary group and 69.3 percent for the nonvoluntary group. The voluntary group had a statistically significant higher rate of readdiction (df=2; $x^2=15.8410$; $P<0.01$). Of the total group of 910 patients with a length of stay of 121 or more days, 540 were voluntary patients and only 370 nonvoluntary. Furthermore, the readdiction rates are nearly the same for the younger and older groups of voluntary patients, 90.5 percent and 88.8 percent, so that if these groups are combined and tested against the rate of readdiction of 90.2 percent for nonvoluntary patients under 30 years of age, the difference between the rates is not statistically significant (df=2; $x^2=0.2440$; $P=0.90-$). Thus it becomes clear that it is the reduced rate of readdiction in the nonvoluntary group of patients aged 30 years or more which accounts for the difference between the rates for the voluntary and nonvoluntary groups.

Length of stay. The relationship between the readdiction rate and length of hospital stay is a particularly important consideration. Studies conducted by the Public Health Service (*10*) indicate that signs of withdrawal disappear in 7 to 14 days after patients are withdrawn from narcotics but that physiological readjustment, as determined by laboratory tests, is seldom complete in less than 120 days. The recommended minimum length of stay at Lexington for voluntary patients is 145 days, but only 16.2 percent of all patients followed stayed 146 days or more (table 9). Of the voluntary patients only 21, or 1.4 percent, stayed as long as 146 days, while 74.9 percent of the nonvoluntary patients stayed 146 days or more.

If length of stay has an effect on readdiction rates, then patients staying increasingly longer periods should have a significantly lower rate of readdiction than those staying for relatively shorter periods. Table 8 indicates only 8 nonvoluntary patients stayed less than 121 days.

Table 7. Readdiction rates of nonvoluntary Negro male patients, by age

Readdiction status	Nonvoluntary Negro males under 30		Nonvoluntary Negro males over 30		Total	
	Number	Percent	Number	Percent	Number	Percent
Readdicted	189	93.1	33	73.3	222	89.5
Abstinent	8	3.9	10	22.2	18	7.3
Irregular or undetermined	6	3.0	2	4.5	8	3.2

NOTE: df=2; $x^2=19.0969$; $P<0.01$.

Since age also has an effect on readdiction rates, the problem is to determine whether there is any connection between readdiction rates and length of stay for voluntary patients with age held constant. Tests of the effect of length of stay on readdiction rates are therefore restricted to voluntary patients. In table 8 patients are classified by age and period of stay: under 31 days, 31–60 days, 61–120 days, and 121 days and over.

The readdiction rates for voluntary patients over 30 years of age were not significantly dif-

Table 8. Readdiction rates by length of hospital stay, type of admission, and age

Length of hospital stay and age	Followed	Readdicted		Abstinent		Irregular	
		Number	Percent	Number	Percent	Number	Percent
	All patients						
Total	1,881	1,694	90.1	124	6.6	63	3.3
Under 31 days	633	590	93.2	25	3.9	18	2.9
Under 30 years	423	405	95.7	10	2.4	8	1.9
Over 30 years	210	185	88.1	15	7.1	10	4.8
31–60 days	204	180	88.2	14	6.9	10	4.9
Under 30 years	127	113	89.0	6	4.7	8	6.3
Over 30 years	77	67	87.0	8	10.4	2	2.6
61–120 days	134	121	90.3	6	4.5	7	5.2
Under 30 years	94	85	90.4	6	6.4	3	3.2
Over 30 years	40	36	90.0	0	--------	4	10.0
121 days or more	910	803	88.2	79	8.7	28	3.1
Under 30 years	621	561	90.3	44	7.1	16	2.6
Over 30 years	289	242	83.7	35	12.1	12	4.2
	Voluntary patients						
Total	1,503	1,370	91.2	83	5.5	50	3.3
Under 31 days	633	590	93.2	25	3.9	18	2.9
Under 30 years	423	405	95.7	10	2.4	8	1.9
Over 30 years	210	185	88.1	15	7.1	10	4.8
31–60 days	202	179	88.6	14	6.9	9	4.5
Under 30 years	125	112	89.6	6	4.8	7	5.6
Over 30 years	77	67	87.0	8	10.4	2	2.6
61–120 days	128	116	90.6	5	3.9	7	5.5
Under 30 years	89	81	91.0	5	5.6	3	3.4
Over 30 years	39	35	89.7	0	--------	4	10.3
121 days or more	540	485	89.9	39	7.2	16	3.0
Under 30 years	326	295	90.5	22	6.7	9	2.8
Over 30 years	214	190	88.8	17	7.9	7	3.3
	Nonvoluntary patients						
Total	378	324	85.7	41	10.9	13	3.4
Under 31 days	0	0	--------	0	--------	0	--------
Under 30 years	0	0	--------	0	--------	0	--------
Over 30 years	0	0	--------	0	--------	0	--------
31–60 days	2	1	--------	0	--------	1	--------
Under 30 years	2	1	--------	0	--------	1	--------
Over 30 years	0	0	--------	0	--------	0	--------
61–120 days	6	5	83.3	1	--------	0	--------
Under 30 years	5	4	--------	1	--------	0	--------
Over 30 years	1	1	--------	0	--------	0	--------
121 days or more	370	318	85.7	40	10.8	12	3.5
Under 30 years	295	266	90.2	22	7.5	7	2.3
Over 30 years	75	52	69.3	18	24.0	5	6.7

ferent for length of stay, even with the inclusion of patients staying in the hospital less than 31 days (table 10).

The readdiction rates for voluntary patients under 30 years of age were consistently lower and significant for patients staying 31 days or more than for those staying less than 31 days (table 11).

When the effect of patients staying under 31 days is removed, however, the readdiction rates

Table 9. Patients staying more than 145 days

Length of stay	Total		Voluntary		Nonvoluntary	
	Number	Percent	Number	Percent	Number	Percent
All patients	1, 881	100. 0	1, 503	100. 0	378	100. 0
145 days or less	1, 577	83. 8	1, 482	98. 6	95	25. 1
146 days or more	304	16. 2	21	1. 4	283	74. 9

Table 10. Readdiction rates for voluntary patients over 30 years, by length of stay

Readdiction status	Under 31 days		31–120 days		121 days or more		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Readdicted	185	88. 1	102	87. 9	190	88. 8	477	88. 3
Abstinent	15	7. 1	8	6. 9	17	7. 9	40	7. 4
Irregular or undetermined	10	4. 8	6	5. 2	7	3. 3	23	4. 3

NOTE: df=4; $x^2=1.0077$; $P=0.90+$.

Table 11. Readdiction rates for voluntary patients under 30 years, by length of stay

Readdiction status	Under 31 days		31–60 days		61–120 days		121 days or more		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Readdicted	405	95. 7	112	89. 6	81	91. 0	295	90. 5	893	92. 7
Abstinent	10	2. 4	6	4. 8	5	5. 6	22	6. 7	43	4. 5
Irregular or undetermined	8	1. 9	7	5. 6	3	3. 4	9	2. 8	27	2. 8

NOTE: df=6; $x^2=14.3290$; $P<0.05$.

Table 12. Readdiction rates for voluntary patients under 30 years, by length of stay over 30 days

Readdiction status	31–60 days		61–120 days		121 days or more		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Readdicted	112	89. 6	81	91. 0	295	90. 5	488	90. 4
Abstinent	6	4. 8	5	5. 6	22	6. 7	33	6. 1
Irregular or undetermined	7	5. 6	3	3. 4	9	2. 8	19	3. 5

NOTE: df=4; $x^2=2.9508$; $P=0.60+$.

Table 13. Readdiction rates by number of episodes of hospitalization, type of admission, length of stay, and age

Length of hospital stay, and age	Followed	Readdicted		Abstinent		Irregular	
		Number	Percent	Number	Percent	Number	Percent
	All patients						
Total	1,881	1,694	90.1	124	6.6	63	3.3
One episode	1,416	1,269	89.6	96	6.8	51	3.6
Under 31 days	517	480	92.8	22	4.3	15	2.9
Under 30 years	374	357	95.5	9	2.4	8	2.1
Over 30 years	143	123	86.0	13	9.1	7	4.9
More than 31 days	899	789	87.8	74	8.2	36	4.0
Under 30 years	683	617	90.3	44	6.5	22	3.2
Over 30 years	216	172	79.6	30	13.9	14	6.5
Two or more episodes	465	425	91.4	28	6.0	12	2.6
Under 31 days	116	110	94.8	3	2.6	3	2.6
Under 30 years	48	48	100.0	0	--------	0	--------
Over 30 years	68	62	91.2	3	4.4	3	4.4
More than 31 days	349	315	90.2	25	7.2	9	2.6
Under 30 years	160	142	88.8	13	8.1	5	3.1
Over 30 years	189	173	91.5	12	6.4	4	2.1
	Voluntary patients						
Total	1,503	1,370	91.2	83	5.5	50	3.3
One episode	1,096	992	90.5	65	5.9	39	3.6
Under 31 days	517	480	92.8	22	4.3	15	2.9
Under 30 years	374	357	95.5	9	2.4	8	2.1
Over 30 years	143	123	86.0	13	9.1	7	4.9
More than 31 days	579	512	88.4	43	7.4	24	4.2
Under 30 years	425	383	90.1	27	6.4	15	3.5
Over 30 years	154	129	83.8	16	10.4	9	5.8
Two or more episodes	407	378	92.9	18	4.4	11	2.7
Under 31 days	116	110	94.8	3	2.6	3	2.6
Under 30 years	48	48	100.0	0	--------	0	--------
Over 30 years	68	62	91.2	3	4.4	3	4.4
More than 31 days	291	268	92.1	15	5.2	8	2.7
Under 30 years	115	106	92.2	5	4.3	4	3.5
Over 30 years	176	162	92.0	10	5.7	4	2.3
	Nonvoluntary patients						
Total	378	324	85.7	41	10.9	13	3.4
One episode	320	277	86.6	31	9.7	12	3.7
Under 31 days	0	0	--------	0	--------	0	--------
Under 30 years	0	0	--------	0	--------	0	--------
Over 30 years	0	0	--------	0	--------	0	--------
More than 31 days	320	277	86.6	31	9.7	12	3.7
Under 30 years	258	234	90.7	17	6.6	7	2.7
Over 30 years	62	43	69.4	14	22.6	5	8.0
Two or more episodes	58	47	81.0	10	17.3	1	1.7
Under 31 days	0	0	--------	0	--------	0	--------
Under 30 years	0	0	--------	0	--------	0	--------
Over 30 years	0	0	--------	0	--------	0	--------
More than 31 days	58	47	81.0	10	17.3	1	1.7
Under 30 years	45	36	80.0	8	17.8	1	2.2
Over 30 years	13	11	84.6	2	15.4	0	--------

Table 14. Computations of significance of various relationships shown in table 13

Patient and stay	Degrees of freedom	Chi-square	Significance: probability is
Voluntary:			
Under 30 days	2	0.3784	0.80+
Under 30 years of age	2	.5797	.70+
Over 30 years of age	2	1.0072	.50+
31 days or more	2	2.8134	.20+
Under 30 year of age	2	.7238	.70
Over 30 years of age	2	4.7687	.09
Nonvoluntary:			
31 days or more	2	2.8885	.20+
Under 30 year of age	2	6.4459	.05
Over 30 years of age	2	.5854	.70+

for the three remaining periods (31–60, 61–120, and 121 or more days) are not significantly different (table 12).

Episodes of Hospitalization

The effect on readdiction rates of the number of episodes of hospitalization was explored. In order to minimize the effect of length of stay, age, and type of admission on readdiction rates by the number of episodes of hospitalization, the data in table 13 are so classified. Comparison between the readdiction rates for one and for two or more episodes of hospitalization proved significant ($P<.05$) only for nonvoluntary patients under 30 years of age staying 31 days or more. This group had a higher readdiction rate after the first episode of hospitalization than after two or more. Table 14 is an analysis of various comparisons.

Summary and Conclusions

This is a report of a field followup study of 1,912 addict patients living in New York City who were discharged from the U.S. Public Health Service Hospital at Lexington, Ky., between July 1952 and December 1955.

The study was undertaken to try to get answers to three questions:

1. Can contact be achieved with addict patients discharged from the Public Health Service Hospital at Lexington to New York City?

2. If so, can it be determined with reasonable certainty which patients remain abstinent and which become readdicted?

3. If the first two questions can be answered in the affirmative, what are the gross readdiction rates at various times following discharge, and what relationships, if any, can be found between relapse rates and such factors as age, sex, ethnic group, social status, and length of hospital stay?

The first question was answered affirmatively. The followup team, composed of two psychiatric social workers and one public health nurse, was able to achieve some degree of contact with 1,881 or 98.4 percent. The second question proved more difficult to answer, and no objective evaluation scale could be found. However, as the followup team increased rapport with the patient group, as the team gained more experience in evaluating the information they received from and about patients, and as confirmatory evidence piled up (such as the return of a patient to Lexington or his conviction in a local court) they were able to make the judgment with increasing confidence that individual patients either were abstinent or had resumed the use of drugs. Their final judgment, while subjective, is thought to have a high degree of validity.

The principal findings of the study were that more than 90 percent of the patients followed became readdicted, and more than 90 percent of those who became readdicted did so within 6 months after discharge from the hospital.

Age proved to be the principal significant variable in the determination of rates of readdiction, with men over 30 years of age having generally lower readdiction rates than those under 30. Age had no significant effect among female voluntary patients. There were so few female nonvoluntary patients that no significant comparisons, with respect to age, could be made. Comparisons of types of admission, length of stay, ethnic group, and sex, data permitting, thus take the variable of age into consideration.

In addition, significantly lower readdiction rates were found for (*a*) the nonvoluntary group of patients aged 30 or more as compared with their voluntary counterparts, (*b*) the white nonvoluntary group less than 30 years of age as compared with their Negro counterparts, and (*c*) patients under 30 years of age staying in the hospital 31 days or more as com-

pared with those staying 30 days or less. Ethnic group and sex produced no significant differences among the voluntary patients nor among the nonvoluntary except for the single significant difference in readdiction rates between young (under 30) white and Negro men.

No improvement in readdiction rates was demonstrated for prolonged hospitalization in excess of 30 days.

The findings of this study confirm Lowry's conclusion that: "Hospital treatment can start a patient on the way to recovery but it cannot provide a lifelong immunity that protects the patient against relapse. Hospital treatment can initiate rehabilitation but it must be completed after the patient returns to the community."

Aftercare is not available in most communities to which discharged addict patients go, and where some aftercare facilities exist, as in New York City, they are not adequate for the needs.

It is recommended that further studies be undertaken to secure additional knowledge of the long-term careers of addicted persons and of the dynamics of addiction and readdiction and to determine the effects of various kinds of treatment, including the planned variation of length of hospital stay. Improvements in method would involve (*a*) the development of more objective means of determining readdiction, (*b*) careful recording of the various therapeutic methods used for individual patients during hospitalization and the use of specifically controlled methods of treatment with types of patients selected randomly, and (*c*) the development of better data on the personal characteristics of patients and their social backgrounds, and the kinds and amounts of aftercare available to these patients.

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A 4-cent postage stamp honoring the nursing profession was issued on December 28, 1961. It shows a young woman who has finished her probationary period in nursing about to light the traditional candle that symbolizes her dedication.