THE SHELTERED WORKSHOP IN THE REHABILITATION OF THE TUBERCULOUS

MEDICAL EXPERIENCE AT ALTRO, 1915-1939[1]

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THE war gives our subject added meaning. The hunt for industrial manpower has pointed up the urgency of utilizing the physically handicapped in the battle of production. Government, industry, and labor are asking how the tuberculous worker can be fitted into the present industrial set-up. They wish to know from the medical men which workers to choose and what are their prospects.

It is believed that Altro Work Shops have some of the data to give them the assurances that they require. In fact, some alert sections of industry already have instituted schemes of industrial convalescence for the tuberculous—graduated part-time employment—and can testify to the good results that have been achieved. State and federal rehabilitation and employment services which have had experience in the vocational training and placement of tuberculous ex-patients can affirm the optimistic attitude we take here today.

What does the experience of the Altro Work Shops show? How much is this experience worth and how can it be used as a guide in the general field of the rehabilitation of the tuberculous and in the specific area of the sheltered workshop's function?

The Altro Work Shops is a garment factory manned by tuberculous ex-patients working under medical supervision. It has been functioning under the direction of the Committee for the Care of the Jewish Tuberculous, Inc. for the past twenty-seven years. Successful operation for so long a period is, in itself, something of an accomplishment. It is our belief that Altro's experience is particu-

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larly valuable because it demonstrates that you can take tuberculous ex-patients who are discharged from a sanatorium in the moderately and far-advanced stages of the disease, place them at part-time work at machines in a factory and run this factory just as smoothly as any in private industry. And that, without in any way sacrificing the worker's health interests. You can place them at work and gradually increase their confidence, their *joie de vivre*, their work capacity to a point where many of them become self-supporting and are able to work full time in preparation for their return to their places in every-day life.

Altro has been able to do this primarily because it has treated the worker and his family as a unit, has supplemented, where necessary, the worker's earnings by a subsidy sufficient for the family's needs and has kept the worker during his stay at Altro under closely supervised medical observation approximating that of the sanatorium. In fact, the parent Committee does more than that. Often the Altro worker is seen at the time of initial diagnosis and if he is cared for at the Montefiore Country Sanatorium, the Committee, acting as the social service agency for that sanatorium, works with the family, takes care of its health needs and contributes to its support while the patient is at the sanatorium. This many-sided program enables the patient to go through an adequate span of treatment with his all-important mental burden considerably lessened.

The Altro data show that the morbidity and mortality rates among such workers can be reduced to a gratifyingly low level. Furthermore, workers who pass through the entire course, achieving full work tolerance and graduating, have essentially as favorable a record of survival after graduation from the workshop as that of the general population. One could not give any group of handicapped people a higher recommendation.

An analysis based on the experience of all tuberculous ex-patients who worked at the Altro Work Shops beyond a three-months' probationary period during the years 1915 to 1939 follows. Nine hun-

dred and sixty-four workers were admitted for the first time during this period and where possible they were followed to the closing date of the study, July, 1941.

The longest period of observation was twenty-five years after discharge from the workshop. The average period of observation was 7.8 years. Ninety-seven per cent of the workers were traced to the end of five years and 92 per cent for ten years.

General Description of Altro Workers

Before the experience of workers during their Altro stay and that of the post-Altro years is discussed, they shall be described as they were up to the point of admission to the workshop.

Sex. There were 705 males and 259 females.

Marital Condition. Three of every five males were married at admission, but only one of six of the female workers.

Age. Half of the workers were under thirty years of age at Altro admission. The median age for the male workers was 33 years; for the female workers 25 years. Ninety-seven per cent were from 15 to 49 years of age.

Occupation. Of the Altro workers who were employed before their illness, 41 per cent were either garment workers or workers in some related sewing trade. Other occupational groups were clerks, salesmen, semi-skilled operatives, and laborers.

About three out of four garment workers who had jobs after leaving the workshop remained in this occupation. In addition, a little less than one in five of the nongarment workers became garment workers after leaving.

Medical Status of Workers at Admission to Altro. Altro workers are accepted from all sanatoria but because we have close working arrangements with the Montefiore Country Sanatorium, 62 per cent of our workers came directly from that institution. The median stay at all sanatoria preceding Altro admission was 14.4 months. About 6 per cent had had no sanatorium experience or had remained in an institution for less than thirty days. However, many of those with-

out sanatorium experience before Altro had been treated in rest cottages. All the workers had had some treatment previously.

From the date of sanatorium discharge to the date of admission to the workshop, there was a median time interval of 4.3 months. The median stay at the workshop for all workers was 16.8 months.

Before presenting the facts on the clinical classification of our workers, it may be stated that the pre-Altro sanatorium data were reexamined and reclassified in conformity with the present-day standards of the National Tuberculosis Association.

Stage of Disease. At Altro admission 21 per cent of the workers had disease which was minimal in extent, 42 per cent were moderately advanced, and 37 per cent were far advanced. Thus, four out of five of our workers came to us in the moderately or far-advanced stage of disease.

Condition or Clinical Status on Admission. With regard to the worker's clinical status or condition on admission to the workshop, 64 per cent were arrested, including a few apparently cured; 11 per cent were apparently arrested; 17 per cent were quiescent; and 8 per cent were unstable or frankly active. Workers with frankly active disease dated back, for the most part, to the early days of operation of the workshop.

Sputum History. The clinician at the bed-side directs his therapy primarily at closing the patient's cavity and ridding him of his positive sputum. Sputum conversion has become the touchstone of successful treatment in pulmonary tuberculosis. Therefore, in addition to the two classifications cited, *i. e.,* stage and condition, it was found useful to employ a third grouping based on the ex-patient's sputum history before admission to the workshop.

The workers were divided into three groups. First, those workers who never had had a positive sputum and still had a negative sputum when admitted to the workshop—*minus-minus* group; second, those workers who had not been rid of their positive sputum at admission to the workshop—*plus-plus* group; third, those re-

maining workers who had had a positive sputum some time during their illness which had been successfully converted to a negative sputum before admission to the workshop—*plus-minus* group. Such grouping contains an unknown degree of error since the frequency of sputum examinations and refinements in the bacteriologic technique employed varied from sanatorium to sanatorium and changed from period to period.

At admission to the workshop, 30 per cent of the workers were in the minus-minus group, 15 per cent were in the plus-plus group, and 55 per cent were in the plus-minus group.

Because of the extended period of observation, the workers were divided chronologically into two groups: those admitted to the workshop in the years 1915 to 1929, a group of 445 persons; and those of the years 1930 to 1939, 519 persons. Such a division differentiates the patients of the pre-collapse therapy era from those of the period wherein collapse therapy was prominent.

During the past quarter century the clinical composition of our tuberculosis sanatorium population has changed and these changes were reflected in the make-up of the Altro population. In the days preceding the frequent use of serial chest x-rays, refined bacteriologic methods and collapse therapy, sanatoria were discharging proportionally more patients with progressive or quiescent disease, patients with open cavities and positive sputum which persisted despite bed rest therapy. At the other end of the scale, patients with old calcified lesions or old fibrous scars of no clinical significance were admitted and treated for active tuberculosis. Between these two groups were the patients admitted to the sanatorium with active lesions, open or closed, which responded favorably to bed rest therapy. It is the middle group of the successfully treated patients which has increased in the collapse therapy era with consequent reduction in the other two groups cited. The improvement in the clinical status of patients discharged from sanatoria since 1930 is a world-wide phenomenon. It is present in the British, Dutch, and

Swiss sanatorium statistics as well as our own. It enables us to broaden our base considerably, in planning the rehabilitation of our tuberculous patients.

Altro workers admitted during the years 1930 to 1939 were classed clinically in the more stable groups. Thus, only 6 per cent were admitted to the workshop with a positive sputum as against 25 per cent in the earlier period. This drop in percentage of those admitted with a positive sputum was to a great extent due to refusing admission to patients with frankly active disease.

Even more striking was the rise, from the early to the late period, in the percentage of workers admitted with successfully converted sputum—the plus-minus group. There were 38 per cent in the earlier period; 69 per cent in the later period.

In addition, many workers with disease of minimal extent were judged to be not in need of a sheltered workshop regimen during the later period. There was a change in the proportion in the minimal group. Such cases formed 31 per cent in the earlier period as compared with 12.5 per cent for the last ten years of the survey. At the same time, there was a rise in the proportions of the moderately-advanced and far-advanced groups to 48.2 per cent and 39.3 per cent, respectively.

Finally, workers of the later period gave a history of a longer stay in the sanatorium than those of the earlier period of operation—16.8 months as against 11.3 months. This finding is also in keeping with the modern objectives of the sanatorium to close cavities and rid the sputum of tubercle bacilli.

Treatment Before Altro Admission. The type of treatment received by the workers before Altro admission differed markedly in the two periods. In the group admitted to the workshops from 1915 to 1929, only about 6 per cent of the workers received collapse therapy—all pneumothorax patients. (Patients with six months or longer of pneumothorax are included.) In the later period, 1930 to 1939, 52 per cent of the workers had received some form of col-

lapse therapy—40 per cent had had pneumothorax, 7 per cent had had thoracoplasty and 5 per cent had had phrenic nerve operations. One hundred sixty workers came to Altro with pneumothorax. Three-quarters of these workers had continued to receive their refills throughout their Altro stay.

The workshop, then, has been devoting itself increasingly to the plus-minus, arrested groups of ex-patients, those who can be expected to reap the greatest profit from a temporary rehabilitation course.

The foregoing analysis of the status of workers on admission to the workshop indicates that the group as a whole was not unduly weighted by ex-patients in the most favorable clinical category. They may be considered a representative cross-section of the type of ex-patient rehabilitation offices are called upon to help.

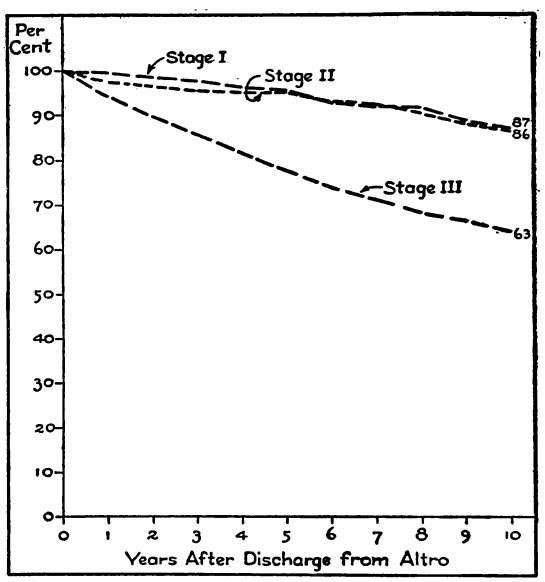

Fig. 1. Per cent of patients who survived in successive years after discharge from Altro. Patients classified according to stage at admission.

Survival Rates and Mortality of Altro Workers

To study the general mortality, and the tuberculous morbidity and recurrence rates of our workers, an adaptation of the modified life-table method as suggested by Frost (1) and applied by Downes (2), Hilleboe (3) and others has been used.

Figure 1 and Tables 1, 2, and 3 show the rate of survival annually up to ten years post-Altro according to stage of disease at Altro admission. At the end of ten years, 87 per cent of the minimal or first-stage workers had

Years After Discharge	Persons at Beginning of Year	Withdrawn During Year	Average at Risk During Year	Number of Deaths	Percentage Dying During Selected Year	Percentage Surviving Through Selected Year	Percentage Surviving Through Past and Selected Years
1	201	10	196.0	1	.51	99.49	99.49
2	190	14	183.0	2	1.09	98.91	98.41
3	174	2	173.0	1	.58	99.42	97.84
4	171	4	169.0	3	1.78	98.22	96.10
5	164	5	161.5	1	.62	99.38	95.50
6	158	7	154.5	5	3.24	96.76	92.41
7	146	6	143.0	1	.70	99.30	91.76
8	139	11	133.5	1	.75	99.25	91.07
9	127	5	124.5	4	3.21	96.79	88.15
10	118	10	113.0	2	1.77	98.23	86.59

Table 1. Survival rates after discharge from Altro of patients having minimal tuberculosis on admission.

survived and 86 per cent of the moderately-advanced or second-stage workers. The survival rates for workers in these two stages of disease

Table 2. Survival rates after discharge from Altro of patients having moderately advanced tuberculosis on admission.

Years After Discharge	Persons at Beginning of Year	Withdrawn During Year	Average at Risk During Year	Number of Deaths	Percentage Dying During Selected Year	Percentage Surviving Through Selected Year	Percentage Surviving Through Past and Selected Years
1	397	17	388.5	9	2.32	97.68	97.68
2	371	27	357.5	4	1.12	98.88	96.59
3	340	29	325.5	4	1.23	98.77	95.40
4	307	23	295.5	1	.34	99.66	95.08
5	283	29	268.5	0	0	100.00	95.08
6	254	32	238.0	6	2.52	97.48	92.68
7	216	31	200.5	1	.50	99.50	92.22
8	184	27	170.5	4	2.35	97.65	90.05
9	153	28	139.0	4	2.88	97.12	87.46
10	121	27	107.5	2	1.86	98.14	85.83

Years After Discharge	Persons at Beginning of Year	Withdrawn During Year	Average at Risk During Year	Number of Deaths	Percentage Dying During Selected Year	Percentage Surviving Through Selected Year	Percentage Surviving Through Past and Selected Years
1	350	20	340.0	19	5.59	94.41	94.41
2	311	22	300.0	14	4.67	95.33	90.00
3	275	20	265.0	12	4.53	95.47	85.92
4	243	19	233.5	12	5.14	94.86	81.50
5	212	18	203.0	10	4.93	95.07	77.48
6	184	22	173.0	9	5.20	94.80	73.45
7	153	21	142.5	5	3.51	96.49	70.87
8	127	17	118.5	5	4.22	95.78	67.88
9	105	13	98.5	3	3.05	96.95	65.81
10	89	9	84.5	3	3.55	96.45	63.47

Table 3. Survival rates after discharge from Altro of patients having advanced tuberculosis on admission.

were almost identical throughout the period. The rate of survival for workers with far-advanced disease was different. It decreased steadily and fairly rapidly; at the end of ten years 63 per cent of these workers were alive.

Figure 2 shows the rate of survival related to the sputum history of workers at Altro admission. At the end of ten years, 84 per cent of both minus-minus and plus-minus groups of workers were alive. There was a similarity in the level of the survival rates for workers in these two sputum groups throughout the period. These data indicate that workers who had had a positive sputum some time during their illness which had successfully been converted to a negative sputum before admission to the workshop (plus-minus group) had an expectation of survival quite as favorable as those of workers who had never had a positive sputum (minus-minus group). A similar experience was reported by the British observers Bardswell and Thompson (4).

The survival rates of workers admitted to the workshop with a positive sputum—plus-plus group—are quite different from those of the other sputum groups. The rates decreased sharply in the early years post-Altro, and at the end of ten years 54 per cent of these workers had survived.

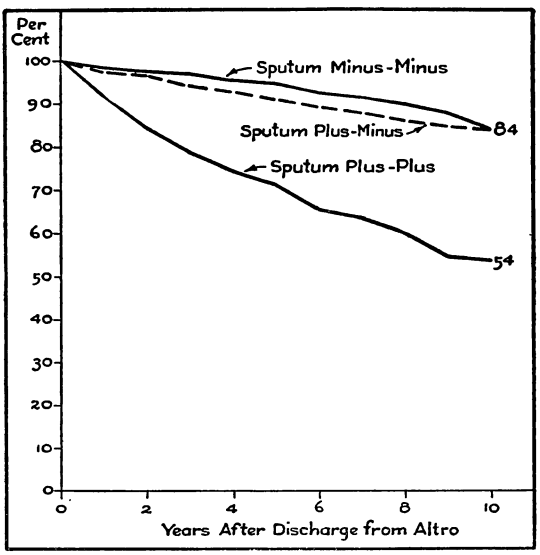

Fig. 2. Per cent of patients who survived in successive years after discharge from Altro. Patients classified according to sputum on admission.

As early as 1916 King (5) called attention to the value of sputum history as a simple prognostic indicator in pulmonary tuberculosis. These data from Altro confirm this. When our third stage workers were further analyzed on the basis of their sputum history, it was found that 84 per cent of those with successful conversion of the sputum before admission to the workshop were alive six years after discharge from Altro, whereas only 58 per cent of those admitted with a positive sputum survived. Obversely for these six years the percentage of the plus-plus third stage group that *did not survive* was about two and one half times greater than that of the plus-minus third-stage group. Successful sputum conversion before admission to the workshop thus gave to workers with far-advanced disease an expectation of survival somewhat similar to that for persons with minimal or moderately-advanced disease. At the end of six post-Altro years the per cents surviving were 84 and 92, respectively. The importance of sputum conversion for these far-advanced workers is evident.

Figure 3 shows the rates of survival annually up to ten years post-

Altro related to condition of workers at Altro admission. Of the workers classed as arrested and apparently cured, 86 per cent were alive at the end of ten years. For workers who were quiescent or apparently arrested, the proportion was slightly smaller — 78 per cent; but only 34 per cent of the unstable, frankly active patients were alive at the end of ten years. As previously stated, the unstable patients belong to the early period of the workshop's operation. The poor prognosis of patients with open cavities and unstable lesions evident on the x-ray film is common knowledge today. Such patients either require further treatment at an institution or simply custodial isolation.

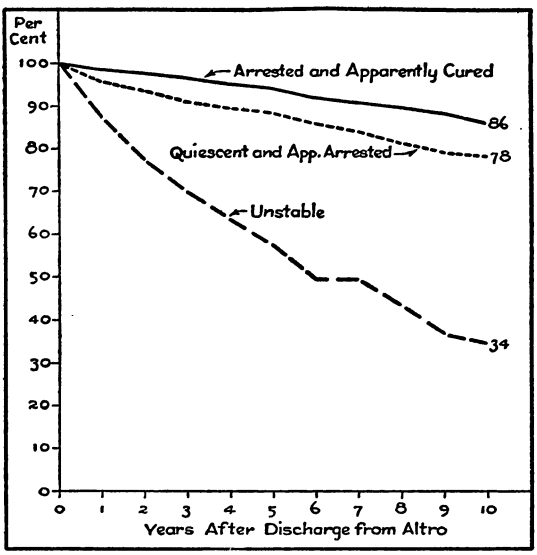

Fig. 3. Per cent of patients who survived in successive years after discharge from Altro. Patients classified according to condition at admission.

Mortality of Altro Workers Compared with the General Population. The mortality of the Altro group after discharge is compared with that of the general population in Table 4. The results are expressed in terms of the ratio of the actual deaths to the number expected in a population of the same size and same composition of sex and age. The standard of comparison was the mortality from all causes in the white population of New York City during the period covered by this study. For the entire experience the mortality of the Altro workers was about twice that of the general population. A similarity in mortality was found between the two sexes when the death rates were adjusted so as to take account of the difference in age distribution of the two sexes.

Age Groups	Altro Admissions 1915–1939			Ratio of Actual to Expected Deaths
	Years of Life Exposed	Actual Deaths	Expected Deaths	
All Ages	9269.5	180	85.71	2.10
15–19	81.5	1	0.18	5.56
20–24	798.5	14	2.15	6.51
25–29	1,464.5	20	4.69	4.26
30–34	1,507.0	22	6.03	3.65
35–44	2,713.5	51	17.64	2.89
45–54	1,986.0	45	28.99	1.55
55–64	641.0	24	20.90	1.15
65–74	77.5	3	5.13	0.58

Table 4. Ratio of actual to expected deaths from all causes among patients discharged from Altro, 1915-1939.[1, 2]

[1] Expected deaths calculated on the basis of mortality from all causes among white persons in New York City. Mortality in the following years was used to obtain an average for the period through which the life experience of Altro patients passed; 1922, 1923, 1924 and 1933, 1934, 1935.

[2] No significant difference in specific sex ratios was present when the male deaths, actual and expected, were adjusted to the female years of life.

Among Altro workers in the aggregate the ratios were highest in the third decade of life, deaths being six times the expected rate at that age period. The ratios declined steadily and at 55 years and over the Altro patients experienced about the same mortality as persons of the same age in the general population.

When stage of disease was considered as shown in Table 5, Altro workers with minimal disease were found, in the aggregate, to have a mortality experience not unlike the general population, the ratio of the actual to the expected being only 1.04. The patients in the moderately-advanced stage had in the aggregate a mortality rate of one and one-half times that expected in the general population (Ratio 1.53) and for the patients in the far-advanced stage, it was four times that of the general population (Ratio 4.01).

These are quite favorable ratios for a group of tuberculous workers. Equally high ratios are encountered in the general population among apparently well persons in certain economic and occupational groupings.

Classification by Stage at Admission to Altro	Years of Life Observed	Expected Number of Deaths	Actual Number of Deaths	Ratio of Actual to Expected Deaths
All Stages	9,210.5	85.71	179	2.09
Minimal	2,574.5	28.97	30	1.04
Moderately Advanced	3,691.0	30.75	47	1.53
Advanced	2,945.0	25.41	102	4.01

Table 5. Ratio of actual to expected deaths post-Altro among patients classified according to stage at admission, 1915-1939.[1]

[1] Expected deaths calculated on the basis of age-specific mortality from all causes among white persons in New York City. Data from the following years were used to obtain an average for the period through which the life experience of Altro patients passed: 1922, 1923, 1924 and 1933, 1934, 1935.

Morbidity Rates of Altro Workers

Since pulmonary tuberculosis is a chronic recurrent illness which is disabling for long periods of time, it is important to know how often and at what period recurrences take place and how much of his time the patient spends in "curing" for such recurrences.

"Recurrence" is defined as reactivation of tuberculosis with resumption of "cure" either at home or at an institution. Recurrence rates for Altro patients have also been computed by the modified life table method. In the later period of the study, recurrences were frequently detected on routine chest x-ray films before the appearance of symptoms or of a positive sputum.

Recurrence rates of patients classified according to sputum history at admission to Altro are shown in Figure 4 and Table 6. The chances of having a breakdown after admission to the workshop were found to vary with the sputum history and the time after admission. At the end of ten years, 27 per cent of the workers with a minus-minus sputum history had had a recurrence compared with 30 per cent of the workers in the plus-minus group. When these two sputum groups are combined, at the end of ten years 28 per cent had a recurrence of illness. The average annual recurrence rate was 3.2 per 100. These two groups totaled 790 patients or 85 per cent of the workers admitted to the workshop.

Workers admitted to the workshop with a positive sputum showed much higher recurrence rates, the majority of recurrences taking place within two years after admission. At the end of ten years, 76.3 per cent of these workers had had a recurrence but the greater part of these occurred among the frankly active patients admitted to the workshop in the early period of operation.

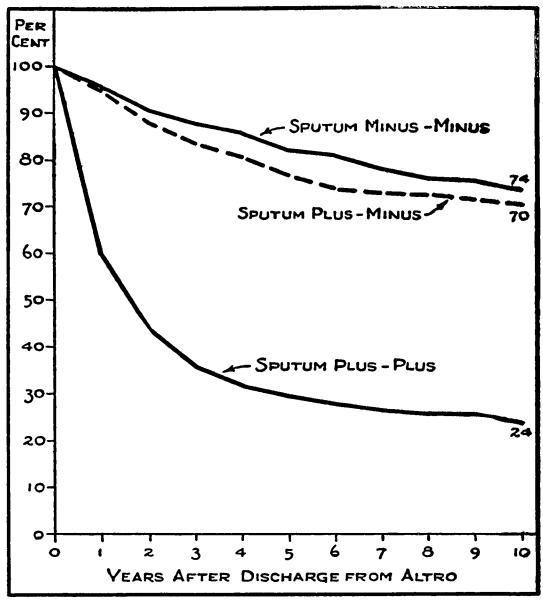

Fig. 4. Per cent of patients with no recurrence of illness during ten years after admission to Altro, 1915-1939.

The next presentation concerns the percentage of total time spent in "curing" from all tuberculous illness *following Altro discharge.*

Table 6. Per cent of patients with no recurrence of illness during ten years after admission to Altro, 1915-1939.[1]

Years After Admission to Altro	Per Cent With No Recurrence During Past and Specified Years		
	Minus - Minus Sputum	Plus - Minus Sputum	Plus - Plus Sputum
1	95.79	94.65	59.71
2	90.15	87.79	43.88
3	87.94	83.15	35.87
4	85.61	80.52	31.52
5	81.75	76.48	29.30
6	80.88	73.52	27.84
7	77.91	72.47	26.24
8	75.72	72.14	25.39
9	75.72	71.16	25.39
10	73.66	70.13	23.72

[1] Patients classified according to sputum status on admission to Altro.

The data are given in Figure 5 in three five-year periods and are related to the worker's sputum history at Altro admission.

The results are striking. The workers of the minus-minus group spent 10 per cent or less of their time in bed in all three five-year periods. The plus-minus workers were quite similar in this respect to the minus-minus group. They spent a slightly greater proportion of their time "curing" in the first two five-year periods than did the workers of the minus-minus group; but for the last period, the figures were identical.

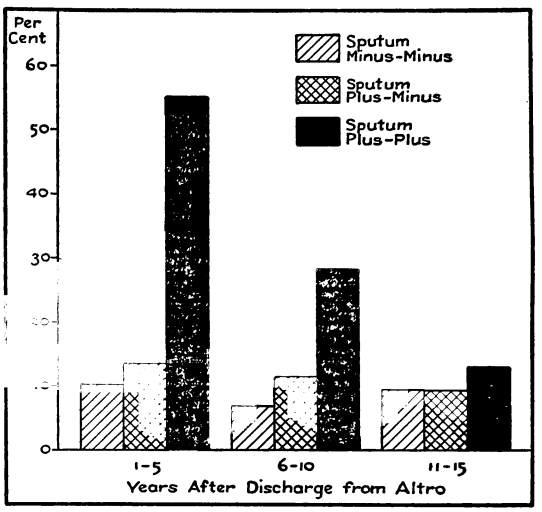

Fig. 5. Per cent of years alive that were tuberculous sick years post-Altro.

Considerably less favorable are the figures for the group of workers who entered the workshop with a positive sputum. In the first five years after discharge, these workers were invalided by tuberculosis 55 per cent of the time. This was four to five times that of the more favorable sputum groups. In the second and third five-year periods, the proportion of sick years spent in "curing" decreased to 28 per cent and 13 per cent, respectively. Since, as previously shown, mortality operated most forcibly upon the plus-plus group of workers in the first five years following Altro discharge, thus eliminating the more sickly, the more resistant survivors in the second and third five-year period spent proportionately less time "curing." But even in these later periods the plus-plus group of workers never reached the low level of sick years of either the minus-minus or the plus-minus group. These data on tuberculous "sick years" post-Altro for

different classes of workers represent an important and realistic measure of the net effect of recurrence of illness.

It will be recalled that 85 per cent of all Altro workers were either in the plus-minus or minus-minus sputum group. For these workers, who constituted such a great majority, the percentage of "well" years in each of these three five-year periods following Altro discharge did not fall below 86 per cent and, in one group, it was as high as 93 per cent. Thus, "well" years during which Altro workers were productive members of the community made up by far the greatest part of their post-Altro life.

Record of Graduates

Thus far data have been presented concerning all workers admitted to the workshop regardless of whether they had completed the course of work therapy. This final presentation concerns those workers who had successfully reached full work tolerance and had been graduated. They constituted 552 workers or 58 per cent of the total. The proportion of workers who had graduated increased in the last ten years of the study—slightly over two-thirds of the patients admitted being graduated. This increase was in large measure due to a larger proportion of workers with far-advanced disease who had been graduated compared with the earlier period. Three out of five such workers admitted in the period 1930-1939 had been graduated and only one out of four in the early period. In fact, the proportion of workers with far-advanced disease who had graduated during the last ten years was greater than that of workers with minimal and moderately-advanced disease during the first fifteen years of the workshop's experience and in numbers had far exceeded them.

The median stay at the workshop for all graduates was 20.2 months. In the earlier period it was 24.3 months, whereas later it was 19.3 months. This reduction in the median length of the course was largely the result of the reduction in the length of stay found

necessary for workers with advanced disease. Thus, for the period 1930-1939, the length of the course for workers with far-advanced disease was only five months longer than that of workers with minimal disease. Nor was there any significant relationship between the length of stay at the sanatorium preceding admission to the workshop and the length of the work-therapy course.

Table 7. Recurrence of illness from tuberculosis and per cent surviving post-Altro for 551 patients who achieved full work tolerance and were graduated.[1]

Years After Discharge	Per Cent With No Recurrence of Illness During Past and Specified Years	Per Cent Surviving Through Past and Specified Years
1	99.81	99.81
2	96.33	99.21
3	91.40	98.77
4	87.78	97.83
5	86.22	97.83

[1] Data include all graduates admitted to Altro, 1915-1939. All stages of disease are combined.

Comparatively few workers in the recent period required a course of three or more years, such workers accounting for less than 4 per cent of the graduates in the later period. Thirty per cent of graduates had remained at the workshop three or more years in the earlier period.

The mortality and recurrence rates of graduates were extremely satisfactory. Since there was no significant difference in these rates for the workers in the various stages of disease, the data are given for the entire group in Table 7. At the end of five years following graduation from the workshop, 97.8 per cent had survived. This percentage surviving is equal to the expected survival among the general population of like age distribution.[2]

Recurrences were experienced by 13.8 per cent of these workers during the first five years following graduation, an average annual recurrence rate of 3 per 100 compared with 6.6 per 100 for the entire group of workers. The proportion of time spent in "curing" was only 5 per cent for the first five years following graduation.

[2] Computation based upon life table of white males in the United States, 1929-1931. Dublin, Louis I. and Lotka, Alfred J.: LENGTH OF LIFE. New York, Ronald Press, 1936, p. 14.

These data demonstrate that workers who achieve full work tolerance at the workshop and are graduated into general industry have a laudable record of health during their post-Altro employment.

Discussion and Conclusions

With such results, it is suitable to evaluate the position that the sheltered workshop should have in the general scheme of the rehabilitation of the tuberculous. The purpose of the workshop is to "condition" patients who, on discharge from the sanatorium, are not ready to do a full day's work. From the medical standpoint, the moderately-advanced and far-advanced successfully treated patients generally need this type of care most. It is not the purpose of the workshop to choose those ex-patients with whom the best end results will be obtained but rather to employ those who without such "hardening" would run great risks of recurrence of their disease.

From the occupational aspect, those needing the sheltered workshop include part-time workers who have had a trade before becoming ill and could return to such a trade if their physical condition would allow it. Where workers have been employed previous to their illness on a job which is no longer suitable to their physical and mental condition, vocational retraining must be undertaken, but not infrequently such training has to be postponed until the worker is hardened so that the end of the training period shall coincide with his achieving full work tolerance for his new job. In addition, there are students and others who have never been employed before their illness. For such persons too, the retraining is often postponed until the physical condition will allow it.

Obviously, not all patients discharged from the sanatorium with a satisfactory clinical status require a sheltered workshop regimen. A large proportion of patients favorably situated, economically and occupationally, return to their work part time or full time under

the supervision of their private physician and make eminently successful post-sanatorium adjustments.

Others with *full-time* work tolerance at sanatorium discharge require vocational training and are referred to the agencies engaged in such work. Still others with *part-time* work tolerance at sanatorium discharge need a short period of part-time work as well as vocational training and for these, the training course may act as the necessary hardening regimen. Many female patients discharged from sanatoria take up their household duties part time or full time and reach a satisfactory adjustment through this means.

Altro, while it is a garment factory, does not undertake to train its people to become garment workers. Some of them do become garment workers after graduation but retraining is not the purpose of a sheltered workshop. Of course it would be extremely useful if, during this period of "conditioning," the patient could also be retrained for a new job when the old one is unsuitable or if he could be given the opportunity of sharpening his old skills when his old job is suitable. To add these two latter functions to the one of "hardening" would necessitate the establishment of an extremely diversified shop since there are a multitude of occupations from which the workers originally come and many more for which they may later be trained. Such a workshop would be economically unsound and its primary aim—the physical and psychological rehabilitation of the worker with questionable prognosis—would be diffused by the added stress of a retraining program in the workshop.

The advantages of establishing sheltered workshops in the cities are many. The ex-patients and their families are generally city dwellers, since tuberculosis is more commonly an urban disease. Too, the families are loathe to migrate since frequently that would mean a loss of educational and other facilities to which they are accustomed, usually found in cities and not so well developed in rural areas.

Set up in the cities, such workshops can serve a considerable tu-

berculous population. Furthermore, they are then close to the industrial and market centers where their supplies are bought and their products sold.

Another, although secondary, function of the workshop may be mentioned. It has been the policy at Altro to employ workers in the permanently sheltered category up to approximately 10 per cent of the roster. Medically, such patients have been called the "good chronic" cases, patients who have stabilized lesions evident on the x-ray film but who have not been rid of their positive sputum. If properly chosen, some of these patients, too, can be expected to achieve full tolerance and self support under the non-competitive conditions maintained at a sheltered workshop.

The problem here is one of very careful choice of patients. Such patients are similar to the ones that populate the Papworth and Preston Hall Colonies in England. The English experience, as well as the Altro experience, shows that it is not necessary permanently to institutionalize such patients and take up beds needed for the persistent influx of fresh cases. Nor are these chronic cases contributing to the general social good if they are sent home and relegated to complete economic dependency upon the community resources. Colonies and, to some extent, sheltered workshops, can put these substandard people to work earning part if not all of their livelihood, thus, in part, relieving the community of their support. And the workers enjoy a meaningful life.

So much for the sheltered workshop. Now how can industry function in the scheme?

In the first place, employers must recognize that workers who have old, arrested, clinically non-significant tuberculous scars in their lungs present almost as little risk as the non-tuberculous workers. In some instances, old experienced key workers have been discharged following the disclosure of such lung scars by plant x-ray surveys. This practice, we are all agreed, is unsound medically and economically wasteful.

Second, employees who have fallen ill with tuberculosis and are successfully treated should be returned to their old jobs under medical supervision when those jobs are suitable and when medical opinion finds the employee capable of full-time work. Most employers do this. Such a practice could wisely be made universal. Third, if a tuberculous employee is unable to work full time after successful sanatorium treatment, he should be allowed to work at the plant part time. Here especially adequate medical supervision is essential. Where the plants are small and such medical care is not feasible, many plants can pool their resources and perhaps with the aid of local, state, federal, or private health facilities, establish adequate safeguards for these part-time and full-time workers. Work unsupervised is worse than no work at all. Obviously part-time workers are economically not self-supporting. In England today there are proposals that these part-time workers have additional subsidies through a government grant to make up for their needs until such time as they become wholly self-supporting.

Employers should not be asked to re-employ ex-patients with positive sputum and quiescent disease—the "good chronic" case—since the uncertainty of prognosis in these workers is great. The public health considerations are also against such a procedure.

Those planning the rehabilitation of the tuberculous are faced with two major problems at the present time. First there is the immediate problem of contributing to the manning of the war industries. As has been said, the successfully treated part-time and full-time tuberculous worker can be integrated into the scheme with great benefit to the nation and to the worker himself. A risk is present but if workers are chosen on a sound medical basis, the risk is not great and is worth taking particularly in the present emergency. Second, plans must be made for the future tuberculous service men and civilian war workers. The expansion of the facilities for training and placement of tuberculous workers is necessary. In addition, the establishment of workshops for industrial con-

valescence and perhaps colonies for the "good chronic" patients is called for. The experience at Altro can be suggestive to those engaged in such planning. It is believed that the Altro results have shown that the sheltered workshop has a definite and useful place in the scheme for the rehabilitation of the tuberculous.

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