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Do Patients with Schizophrenia Ever Show Periods of Recovery? A 15-Year Multi-Follow-up Study

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Contrary to older views, with modern treatment some or many patients with schizophrenia may show intervals of recovery. The current 15-year prospectively designed follow-up research comparing schizophrenia patients with other types of psychotic and nonpsychotic patients studied how many schizophrenia patients ever show intervals of recovery. Two hundred seventy-four early young psychiatric patients from the Chicago Followup Study, including 64 schizophrenia patients, 12 schizophreniform patients, 81 other psychotic patients, and 117 nonpsychotic patients, were assessed as inpatients and then reassessed 5 times over 15 years. Patients were evaluated for recovery for 1 or more years using an operational definition of recovery. Cumulatively, over the 15-year period slightly over 40% of patients with schizophrenia showed 1 or more periods of recovery. However, schizophrenia is still a relatively poor outcome disorder, showing poorer courses than other types of psychotic and nonpsychotic disorders ($p < .001$). Most schizophrenia patients did not show the severe social isolation often described prior to the modern treatment era. Schizophreniform patients tended to show more favorable outcomes than schizophrenia patients. Over 50% of the schizophrenia patients did not have a disorder that was chronic and continuous. Rather, their disorder was episodic, although for many more vulnerable and less resilient schizophrenia patients the episodes were more frequent and severe, with slower recovery.

Introduction

The present 15-year multi-follow-up longitudinal research studied course and outcome with a special focus on how many schizophrenia patients experience periods of recovery. Outcome in schizophrenia and whether recovery is possible have long been a central issue in theoretical views of the nature of this disorder.[1–15] Concepts about the nature of schizophrenia and about the boundaries of what constitutes schizophrenia are based in part on views about a very poor longitudinal course, as 1 central characteristic of the original concept of schizophrenia.[16–17] Kraepelin originally viewed the disorder, now labeled as schizophrenia, as involving a progressive downhill course.[17] A series of modern follow-up studies, including our own earlier longitudinal research and that of others, has suggested that schizophrenia is still a relatively poor outcome disorder,[18–21] although the results of these studies are not as uniformly negative as earlier studies suggested.

Recently, in this modern-day era of antipsychotic treatment, there has been considerable controversy on course and outcome, with views about possible improvements in symptoms and functioning as schizophrenia patients get older. In addition, there has been controversy about potential recovery, with some optimistic views that a number of patients with schizophrenia can show recovery.[13, 22–25] In recent times the issue of potential recovery has become even more important with the President's New Freedom Commission on Mental Health calling for a transformation of the mental health system to a consumer- and family-driven, recovery-focused *system*. At present it is not clear how many or what percent of patients with schizophrenia have the potential to recover.

Despite the controversy and its importance to theory, there has not been a systematic prospective, multi-follow-up, longitudinal research program focusing on the *cumulative* percent of modern-day schizophrenia patients who over time ever show recovery for 1 or more years (absence of major symptoms and adequate psychosocial functioning). The current prospectively designed 15-year multi-follow-up longitudinal research studied course, outcome, and potential recovery in a large sample of patients with schizophrenia, and in control samples of psychotic and nonpsychotic patients, to address the following questions:

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1. Do some or even a large percentage of patients with schizophrenia show periods of recovery? If so, what percentage?
2. Do patients with schizophreniform disorders show more favorable courses and outcomes than patients with schizophrenia?
3. Is schizophrenia associated with slower recovery than other psychotic disorders?
4. Is psychosis in nonschizophrenia patients a risk factor for subsequent poor outcome?

Method

Patient Sample

The present investigation is derived from the Chicago Followup Study, a prospective multi-follow-up research program studying course, outcome, and potential recovery in schizophrenia and mood disorders.[7, 20–21, 26–30] The sample of 274 DSM-III diagnosed patients from private and public hospitals was studied prospectively at index hospitalization and then followed up multiple times over a 15-year period. The sample included 64 patients with schizophrenia and 12 with schizophreniform disorders. The control samples included 81 other patients who were psychotic at index hospitalization (31 bipolar manic patients, 28 psychotic unipolar depressives, 6 psychotic bipolar depressives, 5 paranoid disorders, and 11 other psychotic patients) and 117 nonpsychotic control patients (69 nonpsychotic unipolar depressives, 5 dysthymic patients, 6 borderline patients, 10 other personality disorders, 6 substance abuse patients, 6 patients with eating disorders, 6 anxiety disorders, and 9 other patients with nonpsychotic disorders).

The initially young, relatively early sample of patients was assessed at index hospitalization and then reassessed in 5 successive follow-up interviews over a 15-year period. The 5-year-long samples of symptoms and psychosocial behavior were collected at a mean of 2 years, 4.5 years, 7.5 years, 10 years, and 15 years posthospital discharge. All 274 patients were studied at index hospitalization and at the 15-year follow-ups. As reported in Table 1, 210 of the 274 patients (77%) were studied at all 5 follow-ups over the 15 years, and another 43 patients (16%) were studied at 4 of the 5 follow-ups.

Diagnoses were based on 2 structured research interviews conducted at index hospitalization.[31–32] Inter-rater reliability for schizophrenia using Kappa was $k = 0.88$. Later follow-up interviewers were not informed of diagnosis or the results of previous follow-ups. Informed written consent was obtained at index hospitalization and at each follow-up. The research was approved by an Institutional Review Board.

At index hospitalization patients were consecutive admissions within the limitation of giving preference to younger (17–30 years) patients with few or no previous hospitalizations, to study patients early in their illness, thus diminishing the effects of long-term treatment and chronicity. The mean age of the patients at index hospitalization was 22.8 years. The mean education level at index was 13.3 years. Based on the Hollingshead-Redlich Scale for Socioeconomic Status (SES)[33] with parental SES as the criterion, 61% of the sample were from households with SES of 1–3, and 39% were from households with SES of 4 or 5. Fifty percent of the sample was males. Fifty-four percent of the sample were first-admission patients at index hospitalization, and another 21% had only 1 previous hospitalization. A more detailed description of the characteristics of the patients within each individual diagnostic group is presented in Table 2. Comparisons of the individual diagnostic groups showed no significant difference between them in age at index or in socioeconomic status. There were significant sex differences. A larger percent of the schizophrenia patients was male (67%), and a larger percent of the nonpsychotic depressive patients was female (62%). These differences in the sex ratios of the diagnostic groups are typical of those found in young psychiatric patients. The other psychotic disorders and the nonpsychotic patients had more years of education than the schizophrenia patients ($p < .05$). The 3 groups that were psychotic at index did not differ significantly from each other on number of hospitalizations prior to index, but the nonpsychotic patient group had significantly less previous hospitalizations than the patients with schizophrenia and those with other psychotic disorders ($p < .05$). Outcome data on posthospital

Table 1. Number of Patients Assessed at 4 or 5 of the 5 Follow-ups

Diagnostic Group	Number of Patients Assessed				
	Total Sample	7.5-Year Follow-up	10-Year Follow-up	15-Year Follow-up	Assessed at 4 or 5 Follow-ups
Schizophrenia Patients	64	59	58	64	54
Schizophreniform Patients	12	9	11	12	11
Other Psychotic Patients	81	76	78	81	79
Nonpsychotic Patients	117	104	111	117	109

Table 2. Characteristics of Patient Sample

Characteristic	Diagnostic Group			
	Schizophrenia	Schizophreniform	Other Psychotic	Nonpsychotic
Age at Index (Mean Years)	23.02	22.42	22.81	22.81
Sex (% Male)*	67%	58%	47%	42%
Education*	12.47	13.00	13.43	13.63
Social Economic Status	3.09	3.70	2.90	2.92
% at Index with 0 or 1 Previous Hospitalization*	66%	75%	68%	86%

Note: Social economic status is measured using the Hollingshead-Redlich Scale.
*$p < .05$.

status were obtained for 77% of the original sample over the 15 years.

The 64 patients with schizophrenia in the present research were compared to a smaller subgroup of schizophrenia patients who were assessed at index hospitalization and then reassessed at a first follow-up, and for some at a second and third follow-up, but who were not assessed at the 10- or 15-year follow-ups. The current sample of schizophrenia patients does not differ significantly from this subgroup in education level, age at index, percent of males, social class, global outcome at the 2-year follow-ups, rehospitalization at the 2-year follow-ups, or percent of patients in recovery at the 2-year follow-ups.

Follow-up Assessments

To assess global functioning and adjustment, and specific areas of adjustment at follow-ups, we utilized the Levenstein-Klein-Pollack (LKP) scale and the Strauss-Carpenter Scales (S-C S). We employed structured interviews (the Schedule for Affective Disorders and Schizophrenia and the Harrow Functioning Interview)[20, 31–32] to evaluate major symptoms (e.g., positive symptoms, negative symptoms, anxiety, and affective symptoms), instrumental work performance and self-support, social functioning, family functioning, and rehospitalization.

The LKP has been used successfully by our research team and others.[7, 20–21, 32, 34–35] The 8-point LKP scale takes into account work and social functioning, life adjustment, level of self-support, major symptoms, relapses, and rehospitalization. In a recent assessment of inter-rater reliability we obtained an intraclass correlation of 0.92. Ratings for global assessment in the year before follow-up on the 8-point LKP scale range from "1" (adequate functioning and recovery during the follow-up year) to "8" (very poor psychosocial functioning, considerable symptoms, and lengthy rehospitalization). We obtained a correlation of $r = 0.85$ ($p < .0001$) between the 8-point LKP scale and scores on the Global Assessment Scale,[36] which is almost identical to the Global Assessment Functioning Scale.[37] To assess specific areas of functioning and adjustment at each follow-up we used a system developed by Strauss and Carpenter to evaluate instrumental work performance, social functioning, and rehospitalization.[38] These 5-point scales (scores range from 0 to 4) for each area have consistently shown high inter-rater reliability.

Operational Definition of Recovery. There has been increasing emphasis in the field on the importance of using operational definitions of *recovery*.[22, 39] In the current research *recovery* was defined by outcome status during the follow-up year. Meeting the operational criteria for recovery requires, first, the absence of major symptoms throughout the follow-up year (absence of psychotic activity and absence of negative symptoms). It also requires, second, adequate psychosocial functioning, including instrumental (or paid) work half-time or more during the follow-up year (a score of "2" or greater on the 5-point [0–4] S-C S for work adjustment), and the absence of a very poor social activity level (a score of "2" or greater on the 5-point S-C Social Activity Scale); and, third, no psychiatric rehospitalizations during the follow-up year. The criteria are met by a score of "1" or "2" on the modified 8-point LKP scale. Recovery does not automatically prejudge whether the recovery will continue during future years, which may be a function of (a) the natural course of schizophrenia, (b) the type of patient assessed, and (c) treatment. Liberman has noted that "no single set of criteria for defining recovery has cornered the market,"[13(p252)] and different criteria have been used by different investigators.[15, 40–44] However, many views of recovery include the absence of major symptoms and adequate instrumental work functioning and psychosocial functioning. The index of recovery we use provides data on (a) the percentage of patients with schizophrenia in recovery at any follow-up year and (b) the *cumulative* percentage of schizophrenia patients who, over the 15 years, ever show the potential for an interval or period of recovery.

Table 3. Global Outcome for 4 Diagnostic Groups at 5 Follow-ups Over 15 Years

Period	Schizophrenia Patients (SZ)	Schizophreniform Patients	Other Psychotic Patients (OP)	Nonpsychotic Patients	*T* (SZ Versus OP)
2-Year Follow-ups	5.71 (2.28)	4.64 (2.34)	4.57 (2.33)	3.28 (2.20)	2.68**
4.5-Year Follow-ups	5.51 (2.34)	3.64 (1.69)	3.42 (2.11)	3.11 (2.14)	5.40***
7.5-Year Follow-ups	5.20 (2.26)	4.44 (2.70)	3.64 (2.23)	2.85 (2.09)	4.01***
10-Year Follow-ups	5.47 (2.44)	4.36 (2.29)	3.77 (2.23)	2.78 (2.00)	4.21***
15-Year Follow-ups	4.83 (2.27)	4.25 (2.63)	3.33 (2.11)	2.90 (2.05)	4.10***

Note: Values indicate the mean, with SD in parentheses. Lower mean scores reflect more favorable outcomes on the Levenstein-Klein-Pollack scale of global outcome.
$p < .01$;*$p < .001$.

Medications

As frequently found in the natural course of patients with schizophrenia, there was no single, uniform treatment plan that applied to all patients. Rather, at the 15-year follow-up 68% of the schizophrenia patients were on psychiatric medications, with this including 62% on antipsychotic medications. At the 15-year follow-up 53% of the patients with other psychotic disorders also were on psychiatric medications. Comparisons of functioning for patients on antipsychotic medications versus those not on medications are reported in the "Results" section.

Results

Diagnostic Differences at 5 Follow-ups Over 15 Years

Table 3 presents the means scores on global outcome for the 4 diagnostic groups at each of 5 follow-ups over 15 years: Table 4 presents repeated measures ANOVAs comparing diagnostic groups.

1. Using a 4 (diagnostic groups) × 5 (follow-ups) mixed-design, repeated-measures analysis of variance (ANOVA) of the scores on global functioning, the main effect for diagnosis (the between-subjects analysis) indicates strong significant differences ($F = 19.06$, df = 3,206, $p < .001$). The main effect for time course, the within-subjects analysis (5 follow-ups over 15 years), shows a trend that is not quite significant ($F = 2.26$, df = 4,824, $p < .06$). At each of the 5 follow-ups over the 15-year period the patients with schizophrenia showed poorer mean global outcome scores than the other 3 groups (see Table 3). The poorest mean score for global outcome for the schizophrenia patients was at the 2-year follow-ups, and the best mean score was at the 15-year follow-ups ($p < .01$). All 4 patient groups showed their poorest scores on global outcome at the 2-year follow-ups.
2. A separate 2 × 5 mixed-design, repeated-measures ANOVA comparing the schizophrenia patients with only the other types of psychotic patients at the 5 follow-ups also shows significantly poorer global outcome for the schizophrenia patients ($F = 19.52$, df = 1,109, $p < .001$).
3. The subsample of schizophreniform patients showed better global outcome than the schizophrenia patients and poorer global outcome than the other psychotic patients at each of the 5 follow-ups over 15 years. At the 4.5-year follow-ups their scores on global outcome were significantly better than those of the schizophrenia patients ($t = 2.52$, 66 df, $p = .01$) but not at the other follow-ups, partly because of the small size of the schizophreniform sample.
4. A separate 2 × 5 ANOVA comparing patients with an initial psychotic disorder at index (the other types of psychotic disorders) with the nonpsychotic disorders shows significant differences in later global outcome ($F = 9.52$, df = 1,156, $p < .01$).

Table 4. Repeated Measures Analysis of Variances (ANOVAs): Diagnoses × Time Course

	df	Ms	*F*	Significance
ANOVA: 4 Diagnostic Groups × 5 Time Periods				
Main Effect: DX	3	296.40	19.06	.001
Main Effect: Time Course (*t*)	4	4.53	2.26	.061
Interaction: (DX × *t*)	12	3.10	1.55	.102
ANOVA: 2 Diagnostic Groups (SZ and OP) × 5 Time Periods				
Main Effect: DX	1	333.84	19.52	.001
Main Effect: Time Course (*t*)	4	17.15	8.29	.001
Interaction: (DX × *t*)	4	2.60	1.25	ns

Periods of Recovery in Schizophrenia

Figure 1 presents a trajectory on recovery using the data on the percentage of patients showing recovery for a year or longer (no major symptoms, working half-time or

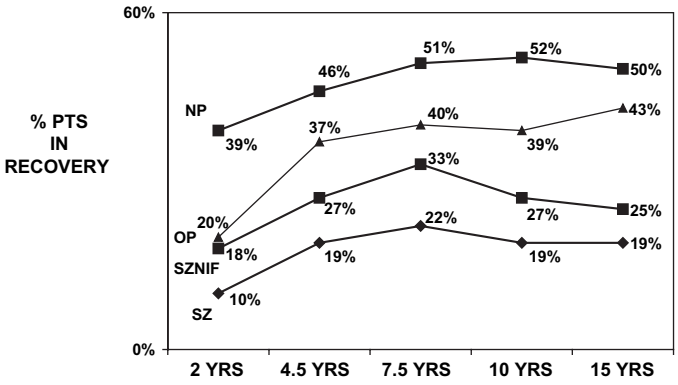

Fig. 1. Percentage of patients in recovery during followup year. *Note*: SZ = schizophrenia, SZNIF = schizophreniform, OP = other psychotic, NP = nonpsychotic.

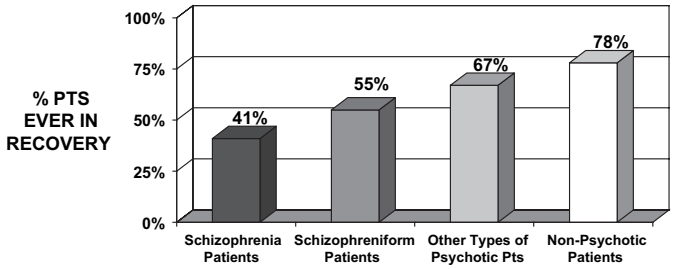

Fig. 2. Percent of Patients Ever in Recovery (5 Follow-ups Over 15 Years).

more, and the absence of a very poor social activity level) during the 15-year follow-up period:

1. The percentage of schizophrenia patients in recovery varied over the 15 years of follow-ups, with the smallest percentage (10%) at the 2-year follow-up and 19% or more at each of the subsequent follow-ups.
2. A smaller percentage of patients with schizophrenia than patients with other types of psychotic disorders were in recovery at each of the 5 follow-ups. At 4 of the 5 follow-ups the differences in recovery between the schizophrenia patients and the other psychotic patients also were significant ($p < .05$). A significantly smaller percentage of schizophrenia patients than nonpsychotic patients were in a period of recovery at all 5 follow-ups ($p < .001$).
3. Fitting with earlier research of ours,[45] separate analyses of subtypes of schizophrenia do not show significant differences in global outcome or in the percentage of patients in a period of recovery at any of the 5 follow-ups when we compared the subsample of patients with paranoid schizophrenia ($n = 29$) with those with undifferentiated schizophrenia ($n = 29$). In addition, there is not a significant difference in the percentage of patients from the paranoid versus the undifferentiated subtypes who ever experienced 1 or more periods of recovery. Astrup has also found similar results.[46(p209)]
4. Fewer of the patients with other types of psychotic disorders were in recovery than patients with initial nonpsychotic disorders at each of the 5 follow-ups.

Course and Recovery in Schizophreniform Disorders

The schizophreniform patients showed better global outcome than the schizophrenia patients at each follow-up, with 1 comparison being significant ($p = .01$). Similarly, a larger percentage of patients with schizophreniform disorders than patients with schizophrenia were in recovery at each of the 5 follow-ups, although these differences are not significant. The schizophreniform patients showed somewhat better courses over time than the patients with schizophrenia, but many experienced difficulties. Seventy-five percent of the schizophreniform patients experienced subsequent psychotic activity at some point, although it was usually at 1 or 2 follow-ups rather than continuously. Eleven of the 12 schizophreniform patients had complete data on outcome at either 4 or 5 of the 5 follow-ups over 15 years. Only 1 of these 11 schizophreniform patients showed psychotic activity at all follow-ups. On the positive side, unlike the schizophrenia patients, at some point over the 15-year period, 7 of the 12 (58%) schizophreniform patients were working full-time during a follow-up year, most of these at more than 1 follow-up. While none of the 11 schizophreniform patients (with data at 4 or more follow-ups) was in recovery at each of the follow-ups, 3 of the 11 schizophreniform patients (27%) were in recovery for almost all of the follow-ups and thus could be viewed as showing a very favorable course over the 15 years.

Cumulative Percent of Schizophrenia Patients Ever in Recovery

Figure 2 presents the cumulative percentage of schizophrenia patients and each of the other diagnostic groups with 1 or more periods of recovery over the 15 years:

1. By the 15-year follow-up 41% of the patients with schizophrenia had experienced 1 or more periods of recovery at some point.
2. The majority of the other 3 groups of psychotic and nonpsychotic patients experienced 1 or more periods of recovery over the 15 years. By the 15-year follow-up 55% of the schizophreniform patients had experienced a period of recovery.
3. Over the 15 years over two-thirds of the other psychotic patients and three-quarters of the nonpsychotic patients had experienced 1 of more periods of recovery. Significantly fewer of the schizophrenia patients showed 1 or more periods of recovery than the other psychotic patients ($\chi^2 = 12.02$, 1 df, $p < .001$) and the nonpsychotic patients ($\chi^2 = 26.32$, 1 df, $p < .0001$).

Table 5. Major Individual Areas of Functioning

Functioning Areas	Diagnostic Group			
	Schizophrenia	Schizophreniform	Other Psychotic	Nonpsychotic
% Patients Working Full-time				
2-Year Follow-up	23	36	46	58
4.5-Year Follow-up	23	36	53	65
7.5-Year Follow-up	19	44	50	67
10-Year Follow-up	26	46	53	69
15-Year Follow-up	29	33	56	68
Social Function (Strauss-Carpenter Scale)[a]				
2-Year Follow-up	2.94 (1.44)	3.00 (1.41)	3.24 (1.25)	3.42 (1.07)
4.5-Year Follow-up	2.70 (1.47)	3.27 (1.19)	3.25 (1.14)	3.24 (1.18)
7.5-Year Follow-up	3.02 (1.38)	2.56 (1.42)	3.22 (1.20)	3.27 (1.19)
10-Year Follow-up	2.68 (1.61)	2.82 (1.60)	3.25 (1.11)	3.27 (1.12)
15-Year Follow-up	2.52 (1.65)	3.08 (1.31)	3.15 (1.23)	3.17 (1.21)
% Patients Rehospitalized				
2-Year Follow-up	56	18	39	27
4.5-Year Follow-up	44	45	29	18
7.5-Year Follow-up	37	33	21	14
10-Year Follow-up	42	27	18	12
15-Year Follow-up	32	25	19	11

[a] Values indicate the mean, with SD in parentheses. They are based on scores from the Strauss-Carpenter Social Functioning Scale (Strauss & Carpenter, 1972). Higher scores on this 0–4 points scale reflect more active social activity and functioning.

4. Unlike the schizophrenia patients, the majority (60%) of these 2 groups of patients without schizophrenia who had experienced at least 1 period of recovery experienced 3 or more periods of recovery.

Major Individual Areas of Functioning

Table 5 presents data from each of the 5 follow-ups on major individual areas of functioning, including instrumental work functioning, social functioning, and rehospitalization.

Work Functioning. An overall 4 (diagnostic groups) × 5 (time periods) mixed-design ANOVA using the data from the 5-point Strauss-Carpenter Scale of instrumental work functioning shows large significant diagnostic differences ($F = 24.05$, df = 3,200, $p < .001$). At each of the 5 follow-ups the schizophrenia patients had the smallest percentage of patients working full-time, and the initially nonpsychotic patients had the largest percentage of patients working full-time (see Table 5). One-way ANOVAs at each follow-up followed by post hoc Newman-Keuls tests on instrumental work functioning show significant diagnostic differences ($p < .05$) between the schizophrenia patients and the other psychotic and nonpsychotic patients at all 5 follow-ups over the 15 years.

Social Functioning. Table 5 presents the data on social activity level derived from the 5-point S-C S. Patients with schizophrenia had poorer social functioning than the other psychotic and nonpsychotic patients at each follow-up. The overall 4 × 5 ANOVA shows a significant main effect for diagnosis ($F = 3.99$, df = 3,194, $p < .01$). However, the diagnostic differences in social functioning were smaller than in the area of instrumental work functioning.

In addition, analyses of the individual scores indicate that most of the patients with schizophrenia had at least some moderate level of social contacts at each follow-up. The patients with schizophrenia did not show the type of progressive social decline or total social isolation that many described before the modern treatment era.

Rehospitalization. The data on rehospitalization (Table 5) indicate that schizophrenia patients were rehospitalized more frequently at each of the 5 follow-ups. The overall 4 × 5 ANOVA for diagnoses using the 5-point S-C S for rehospitalization shows significant diagnostic differences ($F = 5.45$, df = 3,202, $p < .001$).

Table 5 also indicates a decreasing rate of hospitalization for schizophrenia and for the other psychotic and nonpsychotic patient groups over the years, a result also found by other major investigators.[47] Some of this decline in rehospitalization may be due to (a) cohort effects (i.e., over the years in different eras there are different criteria for hospitalization for patients and for length of stay in hospital), (b) patient improvement as

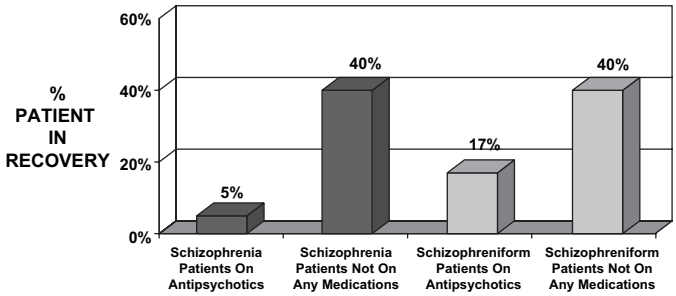

Fig. 3. Percent of Nonmedicated Schizophrenia and Schizophreniform Patients in Recovery at 15-Year Follow-ups.

they advance in age, and (c) what we have described as a rising "threshold of hospitalization." This involves less optimism about the results of rehospitalization,[7] based on previous experience when hospitals did not fulfill earlier expectations of "curing" the patient.

Outcome and Medication Treatment

Although most patients with schizophrenia were on antipsychotic medications, a sizable minority were not. Some chose to leave the mental health system because their symptom level and functioning improved. Some of those patients continued to function well for a period of time. Data by Fenton and McGlashan,[48] other data of ours from our earlier studies,[7, 20] and more recent data of ours[49] suggest that some of the schizophrenia patients who go off antipsychotics are a different type of patient. They have better premorbid developmental achievements, have more favorable prognostic characteristics, and are more resilient and less vulnerable to psychopathology (or "healthier"), leading to their better functioning. Thus schizophrenia patients treated with antipsychotic medications at the 15-year follow-ups had significantly poorer global adjustment and outcome than those not on any medications ($t = 3.58$, 57 df, $p < .001$). A larger percent of the schizophrenia patients not on medications were in recovery, and the data on recovery at the 15-year follow-ups are presented in Figure 3. Similarly, the other types of psychotic patients not on medications at the 15-year follow-ups showed better outcome than those on medications ($t = 5.79$, 77 df, $p < .0001$).

These results also may be influenced to some degree by patients with schizophrenia not on antipsychotic medications who reexperience major symptoms and are then put back on medications again. However, it is also possible that for select patients continuous treatment with neuroleptics may interfere with some aspects of functioning (e.g., continuous treatment with first-generation antipsychotics may lead to less energetic and more apathetic behavior, thus interfering with work functioning for some patients, and first-generation antipsychotics may increase the likelihood of depressive syndromes).[50] Other potential issues concerning continuous use of antipsychotics also have been reported.[51–54] While all of the reasons are not completely understood, the data indicate that very poor outcome patients with schizophrenia are more likely to be on antipsychotic medications.[49] Thus, 19 of the 23 schizophrenia patients (83%) with uniformly poor outcome at the 15-year follow-ups were on antipsychotic medications.[49] In contrast, only 2 of the 11 schizophrenia patients who were in a period of recovery and also had medication data available at the 15-year follow-up were on antipsychotic medications ($\chi^2 = 9.67$, 1 df, $p < .01$).

Resiliency: Improvement and Relapse in Schizophrenia and in Other Psychotic and Nonpsychotic Disorders

Table 6 reports data on recovery and on relapse across follow-ups as patients moved from the 10-year to the 15-year follow-ups, for the 58 schizophrenia patients with complete data at both of these follow-ups. At the 10-year follow-ups, 11 of the schizophrenia patients with data available at both the 10- and 15-year follow-ups were in a period of recovery. Seven of these 11 patients were still in a period of recovery at the 15-year follow-ups. Of the 47 patients with schizophrenia

Table 6. Recovery and Relapse as Patients Moved From the 10-Year to the 15-Year Follow-ups

	Patients Not in Recovery at 10-Year Follow-up			Patients in Recovery at 10-Year Follow-up		
Diagnostic Group	Not in Recovery at 15-Year Follow-up (*n*)	In Recovery at 15-Year Follow-up (*n*)	% in Recovery at 15-Year Follow-up	Not in Recovery at 15-Year Follow-up (*n*)	In Recovery at 15-Year Follow-up (*n*)	% in Recovery at 15-Year Follow-up
Schizophrenia	45	2	4	4	7	64
Other Psychotic	33	15	31**	12	18	60
Nonpsychotic	42	11	21*	12	46	79

Note: Twenty-seven of the 274 patients who were followed-up at the 15-year period were not available for follow-up at the 10-year period. This included 6 of the 64 patients with schizophrenia.
Comparison of schizophrenia patients with other psychotic and nonpsychotic patients: *$p < .05$; **$p < .01$.

not in recovery at the 10-year follow-ups, 2 entered a period of recovery at the 15-year follow-ups.

The data in Table 6 on changes in outcome over time for the other psychotic and nonpsychotic patients indicate a significantly higher rate of recovery at the 15-year follow-up for those psychotic and nonpsychotic patients who were not in recovery at the 10-year follow-up than for the schizophrenia patients. The schizophrenia patients also showed a higher rate of relapse than the other patient groups at some of the earlier follow-ups, but this did not occur at the 15-year follow-ups. In general, the differences between the schizophrenia patients and the other 2 groups in rate of recovery and rate of relapse were significant ($p < .05$) at some follow-up years and were not significant in a number of others.

Further analyses were conducted to study variability over time in global outcome in schizophrenia. The correlations for global outcome for schizophrenia patients at adjacent follow-ups 2.5–5 years apart (e.g., the 2-year correlated with the 4.5-year follow-ups, the 4.5-year correlated with the 7.5-year follow-ups, etc.) show moderate to high consistency in global outcome over time, with all correlations over $r = .55$ ($p < .001$).

Discussion

The current prospective longitudinal study based on a 15-year multi-follow-up research design found both promising and disappointing features associated with outcome and recovery in schizophrenia. On the *negative* side, a number of schizophrenia patients showed relatively poor outcomes, with significantly poorer outcome than the other types of psychotic disorders at all 5 follow-ups over 15 years. On the *positive* side, using *cumulative* data and an operational definition of *recovery*, a larger percent of patients with schizophrenia than expected showed the potential for intervals of recovery at some point. Several other recent long-term studies have produced results suggesting more favorable expectations for schizophrenia.[55–56] However, *cumulative* data on the percent of early young schizophrenia patients with intervals of recovery over a period of 15 years, based on multiple follow-ups, have not been available before.

In previous research we have proposed that despite modern treatment, patients with schizophrenia have a significantly poorer course during earlier phases of illness than patients with other types of psychotic disorders. The current longitudinal research[7, 20–21] and the research of Tsuang and colleagues,[3, 12] McGlashan,[57] and others who used control groups provide very strong evidence that the course and outcome for schizophrenia are poorer than those for other psychotic and nonpsychotic patients. However, current information and other data[48] indicate that despite a generally poorer course, a moderate number experience periods of recovery, and there are some suggestions that this could increase as they get older.[28, 56]

Periods of Recovery in Schizophrenia

The data on the cumulative percentage of schizophrenia patients with a period of recovery are of special moment in regard to some earlier views that patients with schizophrenia do not have the *potential* to recover. Even E. Bleuler's view of outcome in schizophrenia,[16] a view more benevolent than Kraepelin's original outlook,[17] emphasized that these patients never completely recover. Considered in regard to this older outlook the current data on patients with schizophrenia present good news. Thus, despite a lower rate of recovery than for other psychiatric groups, by the 4.5-year follow-up and in subsequent follow-ups thereafter 19% or more of these patients both were showing adequate work performance and were in a *period* of recovery from major symptoms. In addition, and most important, *cumulatively*, at 1 or more points over the 15-year period, slightly over 40% of these patients showed a period of recovery lasting 1 or more years. For many of the schizophrenia patients this period of recovery lasted for at least a few years, although for over 60% it was eventually followed over the next 5 to 8 years by symptoms and/or other adjustment difficulties. If 35–45% or more of schizophrenia patients show this potential for recovery, even for a moderate period of time, it is important for rehabilitation programs to have an estimate of how many schizophrenia patients have this type of potential for recovery and how many may require special help.

Most of the above results, including the diagnostic differences, are a product of the course of schizophrenia as compared to other diagnostic groups. However, in addition to factors involved in the natural course of schizophrenia itself, many other person-related factors may influence the course of schizophrenia in each particular patient. Among these are gender, intelligence, SES, duration of untreated psychosis, continuity of treatment, substance abuse, family involvement, and other important prognostic and developmental variables, as well as unexpected real-life events that cannot be predicted in advance. Other data from our sample do indicate some positive effects on course and outcome from gender (being female),[58] from higher intelligence,[59] from favorable prognostic factors,[60] and from good premorbid developmental achievements.[59, 61]

In a sense the present data on recovery for schizophrenia offer considerable hope. Since a number of schizophrenia patients show the potential for recovery for 1 or more periods of time, it is possible that this can be extended, and it is not inevitable that they must do poorly throughout. Investigators such as Kopelowicz, noting the benefits for patients of better data on whether some or many schizophrenia patients (and how many?) have the potential for periods of recovery, has observed that *"if you don't know where you should try to go [recovery], you may never get there."*[62] Other major investigators

have similarly noted the importance of better data about recovery,[13, 23] with another also noting, "Expectations can be so powerful a factor in recovery, patients, families, and clinicians need to hear this."[10(p515)] Here again on the positive side the data are consistent with aspects of the recovery movement.[13–14, 25, 28, 48, 63–64]

Recovery in Schizophrenia: Implications as to Whether Schizophrenia Is a Chronic and Continuous Disorder?

The data on recovery in schizophrenia also bear on concepts about the nature and boundaries of schizophrenia. As studied in the current research, for the great majority of schizophrenia patients recovery involves a *period* of recovery and not necessarily a lifetime of recovery. In general, the data indicating periods of recovery in schizophrenia also touch on the issue of whether schizophrenia is a "chronic" disorder.[65–66]

Schizophrenia was once regarded as a chronic disorder, with many of the major symptoms being continuous.[16] This view contrasted with that of bipolar disorders, which have periods of remission or recovery, often followed by relapses and then further recoveries in an ongoing cycle.

The results from the current sample and from other research[67–69] indicate that in modern times some schizophrenia patients are able to show adequate instrumental work functioning and that most schizophrenia patients do not show continuous positive symptoms[65, 70] or continuous negative symptoms.[27, 71] With regard to negative symptoms, we have provided data in previous research indicating that negative symptoms are not exclusive to schizophrenia; they can be found both in patients with schizophrenia and in some patients with other psychiatric disorders.[71] However, they are more common in schizophrenia and show some relationship to cognitive functioning.[27, 72] When looked at in terms of the continuity of negative symptoms, in the current sample, the majority of schizophrenia patients who, at some point, had negative symptoms showed them at 1 or 2 follow-ups rather than at all follow-ups.

The current data on recovery also point to the heterogeneity of outcome in schizophrenia. This has been noted by Liberman[23] and many others.[64, 66, 73] Fitting with the heterogeneity (and many other psychiatric disorders show heterogeneity of outcome), a subsample of our patients with schizophrenia show "chronic" characteristics in terms of manifesting psychosis (at times only mild psychosis) for very prolonged periods.[65] For this subsample of 25–35% of the patients with schizophrenia the disorder is chronic in terms of some major symptoms being continuous, although often only in mild form. For the majority it is broken by symptom-free periods.

Thus, on the basis of the current data and other data reported previously,[7, 21] one could propose a model in which, with modern-day antipsychotics and other acute treatment to shorten periods of flagrant psychosis, virtually all schizophrenia patients improve some after the original very acute phase of hospitalization. Subsequently, after the more acute phase a small subsample of patients (perhaps 10–20%) has a relatively benevolent outcome, at times with 1 or 2 episodes followed by long periods of recovery over the next 15 years. At the opposite end another small to moderate-sized subsample (25–35%) shows some chronic or continuous psychotic symptoms and/or shows other chronic symptoms, such as are found in the deficit syndrome.[74–75] However, for a moderate to large percentage of schizophrenia patients (over 50%) their disorder does not represent a "chronic" and *continuous* disorder but, rather, one of episodic periods often with adjustment difficulties and some impairment in between episodes. Viewed in this way the difference between schizophrenia and some other psychotic disorders would be that the episodes of major symptoms for many of these patients with schizophrenia are often more severe, more frequent, and more prolonged, with slower recovery. Thus, for these patients with schizophrenia the major symptoms (especially positive symptoms) are not continuous, although there may be other trait-like features (e.g., vulnerability to trait anxiety and neurocognitive impairments) that persist for many.

Vulnerability of Schizophreniform Patients and Patients With Other Types of Psychotic Disorders

The results on the schizophreniform patients indicate somewhat better global outcomes and a larger percentage of recoveries for these patients than for the schizophrenia patients at each of the 5 follow-ups over 15 years, although further analysis with a larger sample of schizophreniform patients is needed. In the ideal situation most of the schizophreniform patients, with their shorter length of illness at index, would experience very favorable outcomes over the years. This type of very favorable course over the 15-year period is not the most common one. It did occur for a subsample of the schizophreniform patients (for 3 of the 11 patients with complete data, who were in a period of recovery for almost all of their follow-ups), but the majority of them experienced some difficulties. This included occasional periods of psychotic activity for many of them, continuous psychotic activity for 1 of them, and periodic rehospitalization for some.

These results support earlier results of ours[76] and others[77–78] and provide tentative support for the view that the more chronic and longer onsets and period of disorder at index (greater than 6 months) in schizophrenia compared to schizophreniform disorder make a difference. This diagnostic distinction separates out patients with schizophrenia who are more vulnerable to subsequent poorer global courses of adjustment on a longitudinal basis.

Previously, other researchers and our own group have proposed that the presence of initial psychotic symptoms is 1 indicator of vulnerability to subsequent later difficulties in course and outcome.[79] The current results indicate that nonschizophrenia patients with initial psychotic symptoms have significantly poorer outcomes than patients with initially nonpsychotic disorders at index hospitalization. These data and the data on the schizophreniform disorders support the view that vulnerability to psychosis is a potential negative prognostic factor and that patients with initial psychotic symptoms are more likely to experience subsequent severe psychopathology over a multiyear period than patients without such initial psychotic symptoms.

Vulnerability to Psychopathology and Slower Recoverability

In previous research studying our longitudinal sample during earlier follow-ups we have suggested that 1 of the factors involved in patients with schizophrenia showing poorer courses over time and poorer global outcome is that as a group they show less resiliency, in terms of slower recoverability and greater vulnerability to subsequent psychopathology.[20, 65] The data from our earlier follow-ups have supported the view that both schizophrenia and other types of psychotic patients show some recoverability after the acute phase but that both are vulnerable to the recurrence of subsequent psychopathology. However, as can be seen in Table 6, many schizophrenia patients recover from psychopathology at a slower rate.

While the data in Table 6 support the view of slower recovery for the schizophrenia patients than for the other types of psychotic and nonpsychotic patients, these data are not completely pessimistic. Rather, Table 6 indicates that for schizophrenia patients who were able to recover for a period, half or more of them were in a period of recovery at the next follow-up. Overall, while there is some current support for our earlier hypothesis of less resilience and slower recoverability among the schizophrenia patients, some of these patients also showed resiliency, and several comparisons between the schizophrenia and other types of psychotic patients are not statistically significant. When these results are combined with our earlier results[20, 65] they indicate that less resilience, greater vulnerability, and slower recoverability are factors involved in course and outcome for many schizophrenia patients but not for all of them, and some vulnerable schizophrenia patients show the potential for improvement.

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