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## Recovery From Anorexia Nervosa and Bulimia Nervosa at 22-Year Follow-Up

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### ABSTRACT

**Objective:** The course of eating disorders is often protracted, with fewer than half of adults achieving recovery from anorexia nervosa or bulimia nervosa. Some argue for palliative management when duration exceeds a decade, yet outcomes beyond 20 years are rarely described. This study investigates early and long-term recovery in the Massachusetts General Hospital Longitudinal Study of Anorexia and Bulimia Nervosa.

**Methods:** Females with *DSM-III-R/DSM-IV* anorexia nervosa or bulimia nervosa were assessed at 9 and at 20 to 25 years of follow-up (mean [SD] = 22.10 [1.10] years; study initiated in 1987, last follow-up conducted in 2013) via structured clinical interview (Longitudinal Interval Follow-Up Evaluation of Eating Disorders [LIFE-EAT-II]). Seventy-seven percent of the original cohort was re-interviewed, and multiple imputation was used to include all surviving participants from the original cohort (N = 228). Kaplan-Meier curves estimated recovery by 9-year follow-up, and McNemar test examined concordance between recovery at 9-year and 22-year follow-up.

**Results:** At 22-year follow-up, 62.8% of participants with anorexia nervosa and 68.2% of participants with bulimia nervosa recovered, compared to 31.4% of participants with anorexia nervosa and 68.2% of participants with bulimia nervosa by 9-year follow-up. Approximately half of those with anorexia nervosa who had not recovered by 9 years progressed to recovery at 22 years. Early recovery was associated with increased likelihood of long-term recovery in anorexia nervosa (odds ratio [OR] = 10.5; 95% CI, 3.77–29.28; McNemar  $\chi^2_1 = 31.39$ ;  $P < .01$ ) but not in bulimia nervosa (OR = 1.0; 95% CI, 0.49–2.05; McNemar  $\chi^2_1 = 0$ ;  $P = 1.0$ ).

**Conclusion:** At 22 years, approximately two-thirds of females with anorexia nervosa and bulimia nervosa were recovered. Recovery from bulimia nervosa happened earlier, but recovery from anorexia nervosa continued over the long term, arguing against the implementation of palliative care for most individuals with eating disorders.

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Anorexia nervosa and bulimia nervosa are often chronic conditions associated with medical morbidity, psychiatric comorbidities, and premature mortality.<sup>1,2</sup> Five decades of literature suggest that fewer than half of adults with anorexia nervosa and bulimia nervosa will recover; an additional one-third will improve but remain symptomatic; and up to one-fifth will be chronically ill.<sup>3,4</sup> Individuals who have been ill for a decade or more have been described as having “severe and enduring” eating disorders.<sup>5</sup> Recently, some have argued that the care of those with severe and enduring eating disorders should target quality of life rather than symptom remission.<sup>6–9</sup> However, few studies have investigated the outcomes of eating disorders beyond 20 years of follow-up. Before shifting clinical efforts and research attention from active treatment to acquiescent management, long-term follow-up data that describe outcomes of eating disorders are needed to address 2 questions: How *well* can individuals with eating disorders become beyond a decade of follow-up? and When are improvements no longer observed?

Despite recent treatment advances, a sizable minority of patients with eating disorders do not respond to evidence-based treatments, experience multiple treatment failures, and are reluctant or challenging to engage in treatment.<sup>6,9,10</sup> Approximately half of patients will not recover following an adequate treatment course, and longer duration of illness is among the identified predictors of poor outcomes.<sup>9</sup> As a result of repeated treatment failures, Hay and colleagues suggested that “both the clinician and [chronically ill] patient often share the experience of hopelessness and despair about the likelihood of meaningful change.”<sup>7(p996)</sup> For these patients with severe and enduring illness, Robinson<sup>5</sup> and others proposed a paradigmatic shift in therapeutic approach focused on harm reduction rather than recovery. Similarly, Strober and Johnson<sup>6</sup> and Wonderlich and colleagues<sup>9</sup> suggested that rather than prioritizing behavioral change (eg, weight restoration and binge/purge abstinence), treatment should match the patient’s goals—which may be quite different from behavioral change—in order to minimize risk of dropout. Preliminary data adopting a specialist supportive clinical management approach for patients with severe and enduring illness suggested that quality of life improvements are sizable and that improvement in symptoms of eating disorders were also observed in some patients but were not substantial when not the focus of treatment.<sup>8</sup>

Whether stabilization and minimal symptomatic improvement are as good as it gets for these patients remains an empirical question. Further, markers for when to shift

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from a recovery focus to management orientation are not delineated due to a dearth of long-term studies. Even Robinson, who offered the definition of severe and enduring eating disorders, acknowledged that the definition is “to some extent arbitrary,”<sup>5(p7)</sup> and Vitousek and colleagues affirmed that even “apparently intractable cases sometimes evolve toward recovery.”<sup>10(p415)</sup>

While reviews routinely cite recovery rates from anorexia nervosa and bulimia nervosa just shy of 50%,<sup>3,4</sup> likelihood of improvement may be correlated with duration of follow-up. In his review of 119 outcome studies of 5,590 patients with anorexia nervosa, Steinhausen<sup>3</sup> demonstrated that for surviving patients, recovery increases linearly with longer duration of follow-up. Mean recovery in anorexia nervosa increased from 32.6% in studies with follow-up < 4 years, to 47.0% in studies with 4 to 10 years of follow-up, to 73.2% in studies with longer-term follow-up (> 10 years), a finding also demonstrated in a more recent 12-year follow-up study of individuals with anorexia nervosa.<sup>11</sup> Yet, published data beyond 20 years of follow-up are available on only 3 anorexia nervosa cohorts—all inpatient samples—and the findings are less consistent.<sup>12–15</sup> In the earliest of these studies, Theander<sup>14</sup> reported outcomes from an inpatient female sample with a mean of 33 years of follow-up, finding that 76% achieved long-term recovery, with the majority recovering by 12 years. Löwe et al<sup>12</sup> and Zipfel et al<sup>15</sup> found that 21 years following an initial hospitalization for anorexia nervosa, 50.6% of women recovered; importantly, many who had partially recovered at 12-years progressed to full recovery by long-term follow-up. Soberingly, Ratnasuriya and colleagues<sup>13</sup> reported that 20 years after hospitalization, only 30% of women with anorexia nervosa had a good outcome. However, even Ratnasuriya et al were reluctant to shift focus away from symptom change: “[W]e have shown that patients can recover even after several years of illness, so that it is never too late to attempt a vigorous programme of treatment.”<sup>13(p501)</sup>

In contrast, the relationship between recovery and follow-up duration in bulimia nervosa appears nonlinear; bulimia nervosa recovery rates peaked between 4 to 9 years of follow-up and did not increase substantially beyond 10 years.<sup>4,16,17</sup> Only 1 report<sup>18</sup> followed the long-term course of bulimia nervosa in a small college sample assessed at 10 and 20 years of follow-up. At 20-year follow-up, 76% of women with bulimia nervosa had recovered, and in contrast to the other studies, recovery rates increased between the 10- and 20-year follow-ups.

In summary, only a handful of studies describe outcomes of eating disorders beyond 10 years. While these suggest the possibility of continued improvement, they also underscore the heterogeneity of findings, limiting the conclusions that can be drawn. Using a uniquely well-described outpatient treatment-seeking sample of women with anorexia nervosa and bulimia nervosa followed at regular intervals for a mean of 9 years and re-interviewed at a mean of 22 years of follow-up, we asked: (1) What is the likelihood of recovery from anorexia nervosa and bulimia nervosa approximately

- Eating disorders are often described as chronic illnesses, but long-term outcome studies beyond 20 years have been lacking.
- Most individuals with anorexia nervosa and bulimia nervosa will achieve long-term recovery.
- Rates of recovery from bulimia nervosa peak in the first decade of follow-up, while rates of recovery from anorexia nervosa continue to increase over 2 decades of follow-up.

1 and 2 decades after presentation? and (2) What is the relationship between early and long-term recovery at 9-year and at 22-year follow-up?

## METHODS

### Participants

Participants meeting the following inclusion criteria were recruited from Boston-area outpatient eating disorder services (January 1, 1987 through December 31, 1991): *DSM-III-R* anorexia nervosa or bulimia nervosa diagnosis; female; age ≥ 12 years; residence within 200 miles of Boston, Massachusetts; English speaking; and no evidence of organic brain syndrome or terminal illness. Of the 294 women meeting criteria, 250 (85%) consented to participate and 4 dropped out prior to the first follow-up assessment. The final study group in the Massachusetts General Hospital Longitudinal Study of Anorexia and Bulimia Nervosa therefore comprised 246 women. Retrospectively applying *DSM-IV* criteria to intake data, 136 women met criteria for anorexia nervosa and 110 for bulimia nervosa.

Of the initial sample of 246 participants, 18 died by 20 to 25 years after study entry.<sup>19</sup> Of the 228 survivors, 176 (77%) participated in the 20- to 25-year follow-up study, 37 (16%) were contacted but declined participation, and 15 (7%) were lost to follow-up (vital status confirmed through National Death Index, but participants could not be located or invited for follow-up). At the 22-year follow-up, mean (SD) age was 45.0 (6.7) years in those with an initial diagnosis of anorexia nervosa and 49.0 (6.1) years in those with an initial diagnosis of bulimia nervosa. The sample was 95% white. This report focuses on participants presumed alive at follow-up.

### Study Procedures and Missing Data Handling

During the first wave (Wave 1) of data collection (initiated in 1987), participants were interviewed every 6 to 12 months for a mean (SD) of 9.1 (1.6) years. In the second wave (Wave 2) of data collection (initiated in 2011), surviving participants were re-contacted between 20 to 25 years after study entry for a 1-time follow-up. Among the 176 participants, the mean (SD) length of follow-up was 22.1 (1.1) years.

Multiple imputation procedures in Mplus, version 7,<sup>20</sup> were used to include all participants presumed to be alive who had missing data at Wave 2 in the analyses. To enhance the imputation of the missing data, we identified correlates

**Table 1. Psychiatric Status Ratings for Anorexia Nervosa and Bulimia Nervosa**

Psychiatric Status Rating	Anorexia Nervosa	Bulimia Nervosa	Descriptors
1	No symptoms	No symptoms	Recovery <sup>a</sup>
2	~95% expected body weight; fat phobia, body image disturbance, and/or overvaluation of weight/shape present	No binge/purge behaviors; fights urges to binge/purge; cognitive symptoms may be present	
3	~90% expected body weight; fat phobia, body image disturbance, and/or overvaluation of weight/shape present	Binge/purge behaviors $\leq 2\times$ /mo; cognitive symptoms may be present	Partial recovery
4	Narrowly misses full criteria for anorexia nervosa	Narrowly misses full criteria for bulimia nervosa	
5	Full criteria for anorexia nervosa	Full criteria for bulimia nervosa	Full criteria
6	Full criteria for anorexia nervosa; symptoms severe enough to warrant inpatient care	Full criteria for bulimia nervosa; symptoms severe enough to warrant inpatient care	

<sup>a</sup>For an individual to meet criteria for *recovery* from anorexia nervosa or bulimia nervosa, she would have a maximum psychiatric status rating of 2 for 52 consecutive weeks.

of missingness by comparing the 176 individuals (100 anorexia nervosa, 76 bulimia nervosa) who participated in Wave 2 to the 52 individuals (21 anorexia nervosa, 31 bulimia nervosa) who did not participate or were lost to follow-up but presumed alive. Compared to the 21 women with anorexia nervosa who did not participate in Wave 2, the 100 participants with anorexia nervosa had a shorter duration of illness at intake (mean [SD] = 5 [5] years vs 8 [6] years,  $P = .03$ ), but did not differ in age or intake body mass index (BMI). Compared to the 31 women with bulimia nervosa who did not participate in Wave 2, the 76 participants with bulimia nervosa had a lower intake BMI (mean [SD] = 22 [3] vs 25 [4],  $P = .02$ ), younger age at eating disorder onset (mean [SD] = 17 [4] years vs 19 [5] years,  $P = .03$ ), and higher rates of recovery at the end of Wave 1 ( $P < .02$ ), but did not differ in age. As such, duration of illness at intake, BMI at intake, age of eating disorder onset, age at intake, and recovery status at Wave 1 were included as auxiliary variables in the imputation phase of the analysis to enhance the estimation of the imputed missing data.

In line with recommendations by Enders,<sup>21</sup> missing data for anorexia nervosa and bulimia nervosa were imputed separately. Also in line with Enders, we imputed 40 data sets for anorexia nervosa and bulimia nervosa, respectively, based on the extent of missing data at Wave 2 for anorexia nervosa (missing data ranged from 17.4% to 31.4% per variable) and bulimia nervosa (missing data ranged from 29.0% to 43.0% per variable) to enhance power. This procedure allowed us to include all 228 participants presumed to be alive in the analyses.

## Measures

Trained researchers administered the Longitudinal Interval Follow-Up Evaluation of Eating Disorders (LIFE-EAT-II).<sup>22</sup> During Wave 1 (1987–2000), interviews were administered at 6- to 12-month intervals, in-person whenever possible; in Wave 2 (2011–2013), interviews were administered by telephone to assess symptoms in the past year. Based on retrospective recall of 6 to 12 months using individual-specific detailed calendars anchored with key events, this instrument yielded weekly psychiatric status rating (PSR) scores (ordinal, symptom-oriented scale scores based on Research Diagnostic Criteria ratings<sup>23</sup> for

anorexia nervosa and bulimia nervosa for each participant [Table 1]). Eating disorder recovery was defined as an anorexia nervosa and bulimia nervosa PSR score of  $\leq 2$  for 52 consecutive weeks. The LIFE-EAT-II is widely used in longitudinal research with demonstrated reliability and validity<sup>24–26</sup>; we found an 88% agreement rate and an intraclass correlation of 0.93 among 3 raters in our study.

At Wave 2, participants also completed online self-report measures of eating pathology and quality of life through an electronic data capture system called REDCap.<sup>27</sup> The Eating Disorder Examination Questionnaire (EDE-Q)<sup>28</sup> is a 28-item self-report of symptoms over the past 28 days, yielding 4 scales: restraint, eating concern, weight concern, and shape concern, with higher scores indicating increased eating disorder pathology. Internal consistency was good across subscales (Cronbach  $\alpha$  values ranged from 0.81–0.95 for participants with complete data).

The World Health Organization Quality of Life, short version (WHOQOL-BREF), is a 26-item questionnaire covering the past 4 weeks in 4 domains: physical health, psychological health, social relationships, and environment, with higher scores indicating higher quality of life.<sup>29</sup> Per Skevington and colleagues,<sup>30</sup> we summed the first 2 items to represent overall quality of life plus physical health. Internal consistency was good (Cronbach  $\alpha$  was 0.87 for participants with complete data).

## Statistical Analyses

All analyses except for survival analysis are based on an average of the 40 imputed datasets.\* To address aim 1, we examined the likelihood of recovery from anorexia nervosa and bulimia nervosa during Wave 1 versus Wave 2. We conducted survival analyses to determine the recovery status and the median time to recovery for participants with an initial diagnosis of anorexia nervosa or bulimia nervosa during Wave 1 of the study using SPSS (SPSS Inc, 2009). We summarized EDE-Q subscale and WHOQOL-BREF domain scores by Wave 2 recovery status.

To address aim 2, we examined the relationship between Wave 1 and Wave 2 recovery status using McNemar  $\chi^2$  test

\*Note that we also analyzed the data using complete case analysis and found that the pattern of results was unchanged.

**Table 2. EDE-Q Subscale and WHOQOL-BREF Domain Scores by Long-Term Recovery**

Long-Term Recovery	EDE-Q Subscale <sup>a</sup>					WHOQOL-BREF Domain <sup>a</sup>				
	Global [0–6]	Restraint [0–6]	Eating Concern [0–6]	Social Concern [0–6]	Weight Concern [0–6]	Overall (Q1 + Q2) <sup>b</sup> [2–10]	Physical [4–20]	Psychological [4–20]	Social [4–20]	Environment [4–20]
Anorexia nervosa (n = 121)										
Recovered (n = 76)	0.9 (1.1)**	0.8 (1.4)**	0.3 (0.8)**	1.4 (1.4)**	1.2 (1.4)**	8.5 (1.5)**	13.7 (1.6)*	14.3 (1.7)**	15.2 (3.5)*	16.7 (2.0)*
Not recovered (n = 45)	2.9 (1.5)**	3.3 (1.9)**	2.0 (1.7)**	3.3 (1.6)**	2.8 (1.6)**	7.0 (1.8)**	12.7 (1.8)*	12.2 (2.2)**	13.3 (3.8)*	15.6 (2.2)*
Bulimia nervosa (n = 107)										
Recovered (n = 73)	1.3 (1.2)**	1.3 (1.5)**	0.5 (1.2)**	1.6 (1.6)**	1.7 (1.6)*	8.0 (1.5)	13.4 (1.6)	14.1 (1.8)*	14.2 (3.4)	16.4 (2.6)
Not recovered (n = 34)	3.0 (1.5)**	2.8 (1.8)**	2.4 (1.6)**	3.6 (1.7)**	3.2 (1.8)*	7.8 (1.8)	12.9 (2.0)	12.6 (2.0)*	14.0 (2.6)	15.9 (2.9)

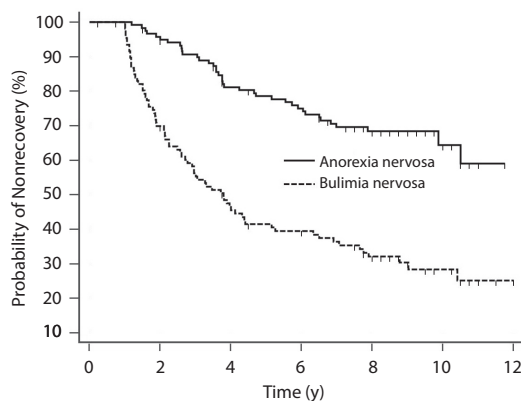
<sup>a</sup>Values are mean (SD). The means and SDs are based on an average of 40 imputed data sets for anorexia nervosa and bulimia nervosa, respectively.

<sup>b</sup>Q1 = How would you rate your quality of life? Q2 = How satisfied are you with your health?

\* $P < .05$ .

\*\* $P < .01$  for  $t$  tests comparing mean subscale/domain scores by recovery status.

Abbreviations: EDE-Q = Eating Disorder Examination Questionnaire, WHOQOL-BREF = World Health Organization Quality of Life, short version.

**Figure 1. Time to Recovery From Anorexia Nervosa or Bulimia Nervosa During Wave 1**

of dependent proportions. The measure of effect size was the odds ratio (OR) and its 95% confidence interval (CI). We examined whether there was a threshold length of early recovery (Wave 1) that best predicted long-term recovery (Wave 2) by re-analyzing the relationship between recovery status at Wave 1 and Wave 2 using different durations of Wave 1 recovery (ie, in addition to 52 consecutive weeks, we examined 26 or 13 consecutive weeks of recovery).

## RESULTS

### Early Versus Long-Term Recovery From Anorexia Nervosa and Bulimia Nervosa

During Wave 1, 31.4% of participants with anorexia nervosa and 68.2% with bulimia nervosa recovered. Individuals with anorexia nervosa were slower to recover than those with bulimia nervosa during Wave 1 ( $\chi^2_1 = 38.2$ ,  $P < .001$ ) (Figure 1). The median time to recovery for anorexia nervosa could not be calculated because fewer than 50% recovered. For bulimia nervosa, the median time to recovery was estimated at 3.8 years.

At Wave 2, 62.8% of participants with an initial diagnosis of anorexia nervosa were recovered. Among participants with anorexia nervosa who were not recovered at Wave 1,

**Table 3. Concordance Between Recovery During Wave 1 and at Wave 2<sup>a</sup>**

Wave 1 Recovery Status	Wave 2 Recovery Status	
	Anorexia nervosa (n = 121)	Bulimia nervosa (n = 107)
Anorexia nervosa		
Recovered	34	58
Not recovered	42	15
Bulimia nervosa		
Recovered	4	15
Not recovered	41	19

<sup>a</sup>Recovered = maximum psychiatric status rating of 1 or 2 for 52 consecutive weeks. Not recovered = maximum psychiatric status rating of 3, 4, 5, or 6 for 52 consecutive weeks. The proportions are based on an average of 40 imputed data sets for anorexia nervosa and bulimia nervosa, respectively.

50.6% were recovered at Wave 2, and 10.5% of patients with anorexia nervosa who were recovered at Wave 1 were no longer recovered at Wave 2.

For participants with an initial diagnosis of bulimia nervosa, 68.2% were recovered at Wave 2. Among participants with bulimia nervosa who were not recovered at Wave 1, 44.1% were recovered by Wave 2, and 20.5% who were recovered at Wave 1 were no longer recovered at Wave 2.

Table 2 summarizes EDE-Q and WHOQOL-BREF scores by Wave 2 recovery status. As expected, recovered participants had lower mean EDE-Q scores than those who were not recovered. In anorexia nervosa, recovery was associated with a higher quality of life; in bulimia nervosa, only 1 domain of quality of life was significantly higher in the recovered than nonrecovered participants.

### Relationship Between Early and Long-Term Recovery

Table 3 shows the difference in proportion of individuals who achieved recovery by Wave 1 and those who were recovered by Wave 2. In anorexia nervosa, probability of recovery at Wave 1 was strongly associated with likelihood of recovery at Wave 2 (OR = 10.5; 95% CI, 3.77–29.28; McNemar  $\chi^2_1 = 31.39$ ;  $P < .01$ ). Participants with anorexia nervosa who achieved recovery by Wave 1 were 10.5 times more likely to be recovered at Wave 2 than those who did not recover by Wave 1. Associations between recovery status during Wave 1 and at Wave 2 were somewhat smaller when



recovery duration was set at 26 (OR=6.2; 95% CI, 2.60–14.61; McNemar  $\chi^2_1=22.35$ ;  $P<.01$ ) or 13 (OR=7.4; 95% CI, 2.90–18.83; McNemar  $\chi^2_1=24.38$ ;  $P<.01$ ) consecutive weeks.

By contrast, the majority with an initial diagnosis of bulimia nervosa were recovered at both Wave 1 and at Wave 2. In bulimia nervosa, early recovery was not associated with increased likelihood of recovery at Wave 2 when duration was set at 52 (OR=1.0; 95% CI, 0.49–2.05; McNemar  $\chi^2_1=0$ ;  $P=1.0$ ) or 26 (OR=1.6; 95% CI, 0.77–3.46; McNemar  $\chi^2_1=1.69$ ;  $P=.19$ ) consecutive weeks. Initial recovery was modestly associated with increased likelihood of recovery at Wave 2 when duration was set at 13 consecutive weeks (OR=2.2; 95% CI, 1.01–4.88; McNemar  $\chi^2_1=4.12$ ;  $P=.06$ ).

## DISCUSSION

We evaluated recovery in a uniquely well-described cohort of women with initial diagnoses of anorexia nervosa or bulimia nervosa approximately 1 and 2 decades after presentation. While within the first decade of follow-up, nearly one-third of those with anorexia nervosa and more than two-thirds of those with bulimia nervosa had recovered; at 22 years, nearly two-thirds in both patient groups had recovered. Although recovery happened earlier in bulimia nervosa, recovery in anorexia nervosa continued over the long-term follow-up. In both patient groups, recovery was associated with normalized levels of eating disorder pathology. In anorexia nervosa, quality of life improvements were significant, while in bulimia nervosa, quality of life improvements were evident only in the psychological domain. In contrast to the extant literature characterizing eating disorders as chronic illnesses, our longitudinal data demonstrate that continued symptom improvement and meaningful recovery are possible in anorexia nervosa beyond the first decade of follow-up. For bulimia nervosa, if recovery is not observed by 9-year follow-up, it is less likely to occur in the subsequent decade.

Anorexia nervosa, in particular, is characterized as pernicious, often intractable, and is associated with among the highest risks of premature death.<sup>2,31</sup> We found that for those with an initial diagnosis of anorexia nervosa, recovery was uncommon during the first decade of our study. Yet even for those who had not achieved recovery during the first follow-up window, about half of those who had not recovered progressed to recovery by long-term follow-up. If early recovery *had been* achieved in the first decade, long-term recovery was very likely. Furthermore, even those who experienced periods of symptom resolution for as few as 3 months had a greater likelihood of experiencing recovery in the long term. These findings should give patients and clinicians hope that recovery is possible, even after long-term illness, suggesting that even brief periods of weight restoration and symptom remission from anorexia nervosa are meaningful and may be the harbingers of more durable gains to be made ahead.

For women with bulimia nervosa, recovery is probable. Consistent with the literature (eg, Herzog et al,<sup>22</sup> Fichter and

Quadflieg<sup>17</sup>), we demonstrate that improvement in bulimia nervosa occurs more rapidly than in anorexia nervosa. Also consistent with the literature,<sup>32</sup> we find that rates of recovery in bulimia nervosa do not continue to increase over time, suggesting that early change is an important prognosticator for bulimia nervosa. Albeit on a larger time scale, these data align with the randomized control trial data in bulimia nervosa, which emphasize that early behavioral change predicts treatment outcomes.<sup>33</sup>

On balance, the message of recovery for the majority of individuals with eating disorders is promising, but the subtext remains that one-third of patients will remain ill with an eating disorder even at long-term follow-up. Further, time to recovery even for those who do achieve it is long, and a subset of those who recover will relapse. While for most patients with anorexia nervosa and bulimia nervosa recovery is durable, we found that 10.5% of those with anorexia nervosa and 20.5% of those with bulimia nervosa who achieved recovery in the first decade had relapsed at long-term follow-up. Ongoing efforts to increase effectiveness of prevention and treatment, improve early response rates, and identify individuals who are most vulnerable to a chronic course are critical.<sup>34</sup>

Study strengths include the relatively large sample and high retention (77%) and use of multiple imputation to include data from all surviving participants. Additional strengths include use of interviews and self-report measures of eating disorder psychopathology and stringent definition of full recovery. Study limitations warrant acknowledgment. As ours was a predominantly white, Massachusetts-based treatment-seeking sample first ascertained from 1987 through 1991, we do not know what long-term recovery rates would be in those who do not seek treatment or who received newer evidence-based interventions. We lack specific treatment data, which precludes examination of whether and what aspects of treatment may have influenced recovery. Further, differences between those who did and did not complete Wave 2 follow-up suggest that noncompleters may have had more severe illnesses; while inclusion of these severity measures as auxiliary variables in the imputation mitigates concerns, the potential for bias remains. Additional limitations include the potential for recall bias inherent in the clinical interview. Finally, we do not have data on symptom course between the 9-year and 22-year follow-up, making it impossible to address periods of recovery or relapse that may have occurred in that window.

Our data indicate that the majority will recover from anorexia nervosa and bulimia nervosa over time. Yet 2 decades of illness represents considerably meaningful life lost, and our findings emphasize the importance of developing interventions to reduce the duration of illness. Our findings that recovery remains possible even after long-term illness argue for active treatment rather than palliative care for most patients. Increased research attention to identifying early predictors, mediators, and moderators of recovery in naturalistic and controlled treatment trials is needed to guide treatment disposition recommendations.

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