

# Long-Term Stability of Eating Disorder Diagnoses

Manfred M. Fichter, MD<sup>1,2\*</sup>  
 Norbert Quadflieg, Dipl Psych<sup>1</sup>

## ABSTRACT

**Objective:** Data on the stability of eating disorder (ED) diagnoses (DSM-IV) over 12 years are presented for a large sample ( $N = 311$ ) of female eating disordered patients with anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED).

**Method:** Assessments were made at the beginning of therapy and 2-, 6-, and 12-year follow-ups. Diagnoses were derived from the Structured Inventory for Anorexic and Bulimic Eating Disorders. Possible diagnostic outcome categories were AN, BN, BED, NOS, no ED, and deceased.

**Results:** At all follow-ups, more patients changed from AN or BED to BN than vice versa. No diagnostic crossover from AN to BED or vice versa occurred. BED showed the greatest variability and AN had the greatest stability over time.

While the long-term outcome of BN and BED is similar, AN had a considerably worse long-term outcome than either BN or BED.

**Conclusion:** Of the ED diagnoses, AN was most stable and BED most variable. The considerable diagnostic flux between BN and BED and similarities in course and outcome of BN and BED point to common biological and psychological maintaining processes. AN and BED are nosologically quite distant. © 2007 by Wiley Periodicals, Inc.

**Keywords:** eating disorders diagnosis; anorexia nervosa; bulimia nervosa; binge eating disorder; longitudinal study; outcome; long-term course; crossover; chronicity

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## Introduction

In the 4th edition of the diagnostic and statistical manual of mental disorders (DSM-IV),<sup>1</sup> eating disorders (ED) were divided into three categories: anorexia nervosa (AN), bulimia nervosa (BN), and eating disorder not otherwise specified (EDNOS). As a step into additional differentiation, the appendix of the DSM-IV provides provisional criteria for binge eating disorder (BED). Classification of diagnoses should provide mutually exclusive categories of disorders.<sup>2</sup> However, the DSM-IV symptom specifications for AN and BN provide for an overlap in AN, binge eating/purging type, and BN, purging type (BN-P) on the one hand, and in BN, nonpurging

type, and BED on the other hand.<sup>3</sup> From clinical experience and from longitudinal outcome studies, it is known that crossover from one ED to another happens to a considerable amount.

There is only one prospective study which addresses the crossover between all ED diagnoses.<sup>4</sup> Our study departs from this study in three ways: it includes a larger sample, covers a far longer follow-up period (12 years), and focuses on BED rather than the highly heterogeneous class of EDNOS. We distinguished between BED and EDNOS as defined in the DSM IV ED criteria (with BED being removed); thus, our breakdown is more detailed. From a large prospective 12-year follow-up study, we are able to provide results on diagnostic crossover from patients treated for AN, BN-P, or BED<sup>5–7</sup>; these long-term longitudinal data are valuable for an analysis of the existing distinction of ED diagnoses.

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\*Correspondence to: Manfred M. Fichter, Klinik Roseneck, University of Munich, Am Roseneck 6, D-83209 Prien, Germany. E-mail: mfichter@schoen-kliniken.de

<sup>1</sup> Department of Psychiatry, University of Munich (LMU), Munich Germany

<sup>2</sup> Klinik Roseneck, Hospital for Behavioral Medicine, Prien am Chiemsee, Germany

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## Method

### Sample

This report is based on data that were collected in a longitudinal study of 311 females with an ED. Of these

103 had AN, 196 had BN-P, and 68 had BED at the start of the study. Patients were consecutive admissions of patients with AN, BN-P, and BED to the Roseneck hospital, a 370-bed medical center for biobehavioral treatment in Upper Bavaria, Germany. Details on sample characteristics and treatment were published elsewhere,<sup>5-7</sup> so we restrict ourselves here to a short summary. Average age at admission (mean ± SD) was 25.0 ± 6.9 years (AN), 25.7 ± 6.7 years (BN-P), and 28.8 ± 8.3 (BED). The inpatient treatment lasted on average 122.0 ± 47 days (AN), 97.3 ± 43 days (BN-P), and 78.1 ± 39 days (BED).

Only patients participating in all three follow-ups and those who had died during the follow-up period constituted the sample of the present report. These were 89 patients with AN (86.4% of the original 103 AN cases; 26 restricting type and 63 binge eating/purging type; mean follow-up (excluding deaths) at 2.4 ± 0.9 years, 6.0 ± 0.8 years, and 12.4 ± 0.9 years), 162 patients with BN-P (82.7% of the original 196 cases; mean follow-up (excluding deaths) at 2.0 ± 0.6 years, 6.1 ± 0.8 years, and 12.4 ± 0.9 years), and 60 patients with BED (88.2% of the original 68 cases; mean follow-up (excluding deaths) at 3.2 ± 0.8 years, 6.6 ± 0.9 years, and 12.5 ± 0.8 years). In the total group including all diagnostic group follow-ups (excluding deaths) were conducted 2.3 ± 0.9 years, 6.2 ± 0.9 years, and 12.4 ± 0.9 years after treatment.

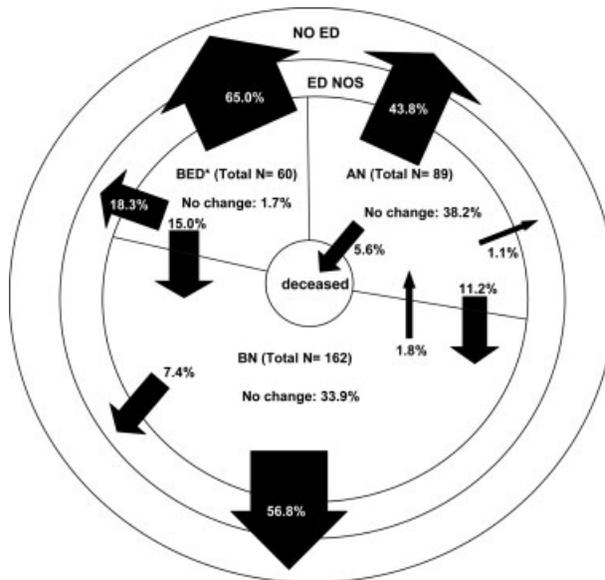
**Instruments and Procedure**

Follow-ups were conducted 2, 6, and 12 years after intensive treatment. At the follow-ups, a detailed interview covering all areas relevant for ED diagnosis according to DSM-IV was conducted by clinical psychologists and psychiatric residents especially trained for this task. Informed consent was obtained from each patient. The study was approved by the ethics committee of the Bavarian Medical Association. All ED diagnoses were made according to DSM-IV. ED diagnoses at admission to the study were derived from the self-report of the patients, the patients' hospital charts including the therapists' diagnoses, and information gathered retrospectively at the follow-ups.<sup>5-7</sup> The ED diagnoses at follow-ups were derived from the Structured Inventory for Anorexic and Bulimic Syndromes (SIAB). The expert interview (SIAB-EX)<sup>8,9</sup> was used at all follow-ups except for 2-year follow-ups in BED where the self-rating questionnaire (SIAB-S)<sup>10</sup> was used.

**Results**

At the 2-year follow-up, overall 28.9% of the patients maintained their admission diagnosis;

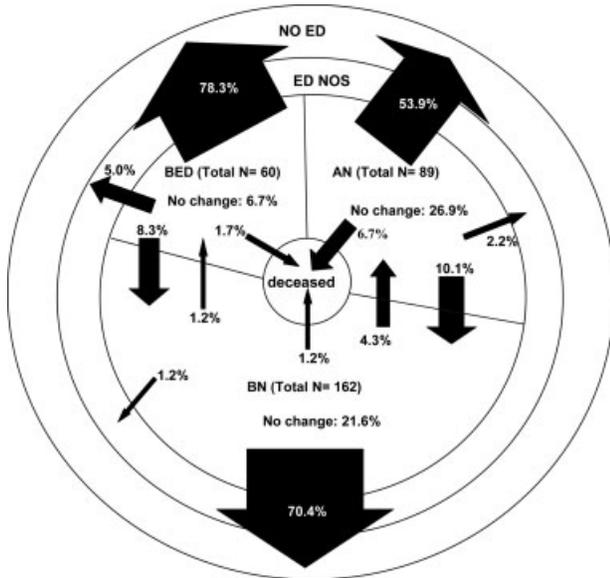
**FIGURE 1** Diagnostic outcome (percentage of persons) 2 years after intensive treatment for an eating disorder (anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED); DSM-IV). The three segments of the "pie" indicate the admission diagnoses. NOS, eating disorder not otherwise specified; NO ED, no eating disorder diagnosis (neither AN, nor BN, nor BED nor EDNOS); \* based on SIAB-S.



7.7% remained symptomatic but now met criteria for EDNOS (in most cases now exhibiting a sub-threshold variant of their admission diagnosis); 7.1% had crossed over into one of the other major DSM-defined ED categories (most typically BN); and 1.6% (all initially diagnosed with AN) had died. This overall picture was observed also at the 6- and 12-year follow-ups (detailed results not reported). As illustrated in **Figures 1-3**, the overall pattern does not really show the important differences by diagnostic group. These figures show the shift of diagnosis from the original ED at treatment (AN, BN-P or BED, indicated by the three segments of the "pie" in each figure) to outcomes at each of the three follow-ups. For example, the broad arrow labeled "56.8" pointing downwards from BN to the circle labeled "NO ED" indicates that 56.8% of the patients who were treated for BN changed to having neither AN, nor BN, nor BED, nor EDNOS at the 2-year follow-up. In all figures, widths of the arrows are proportional to percentage indicated by the arrow.

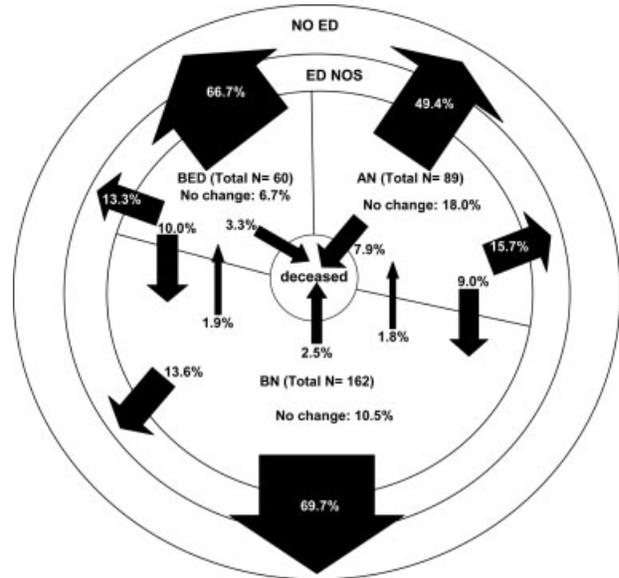
At the 2-year follow-up, almost all BED patients no longer met criteria for BED. Mostly, either had remitted (having neither AN, nor BN, nor BED, nor ED-NOS; may still have residual ED symptoms not qualifying for EDNOS) or presented with EDNOS. A

**FIGURE 2.** Diagnostic outcome (percentage of persons) 6 years after intensive treatment for an eating disorder (anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED); DSM-IV). The three segments of the “pie” indicate the admission diagnoses. NOS, eating disorder not otherwise specified; NO ED, no eating disorder diagnosis (neither AN, nor BN, nor BED nor EDNOS).



considerable percentage changed to BN. A similar picture emerged at the 6-year follow-up with still more remissions and one patient being deceased. The 12-year outcome in BED confirmed the results of the earlier follow-ups with one additional patient having died. No changes from BED to AN were observed at any point. In contrast, those patients with an initial diagnosis of AN showed the greatest diagnostic stability and were least likely to have recovered. Crossover to AN was uncommon and occurred only among patients with an admission diagnosis of BN. Compared with BED and BN, the death rate in AN was very high. About 10% of patients with an admission diagnosis of AN had changed to BN at any follow-up, but no patients changed from AN to BED. Over time an increasing percentage of AN showed remission or partial remission (EDNOS). Remission rates in AN were lower than in BN where nearly two-thirds of the patients at least partially remitted at the 2-year follow-up. One-third continued to have BN at this time, and only a small percentage crossed over to AN. Remission rates in BN increased at the 6- and 12-year follow-ups, respectively, two and four patients were deceased. More patients changed from AN or BED into BN than vice versa. Generally, most changes away from any ED diagnosis (AN,

**FIGURE 3.** Diagnostic outcome (percentage of persons) 12 years after intensive treatment for an eating disorder (anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED); DSM-IV). The three segments of the “pie” indicate the admission diagnoses. NOS, eating disorder not otherwise specified; NO ED, no eating disorder diagnosis (neither AN, nor BN, nor BED nor EDNOS).

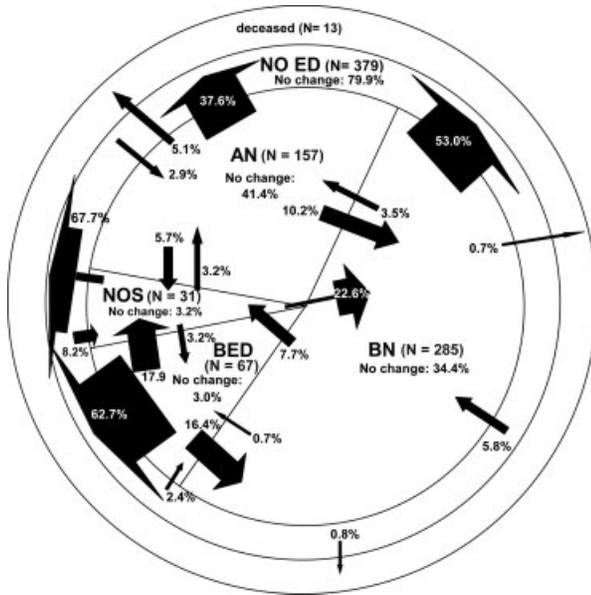


BN, BED) were to the “no ED diagnosis” category (NO ED) which means that the patient had neither AN, nor BN, nor BED nor EDNOS but still may have retained ED symptoms below the diagnostic threshold.

Number of cases for subtypes of AN at admission were rather low, so we report data which allow very limited conclusions only. All deaths in AN were from the AN binge eating/purging subtype (AN-BP). Neither AN, nor BN, nor BED, nor EDNOS was found in 61.5%, 69.2%, and 65.4% of restricting AN (AN-R), and in 36.5%, 47.6%, and 42.9% of AN-BP. Crossover from AN-R to AN-BP was encountered in 19.2%, 11.5%, and 3.8%, and vice versa from AN-BP to AN-R in 4.8%, 9.5%, and 3.2%. Maintaining the type of AN admission diagnosis were 3.8%, 15.4%, and 11.5% of AN-R, and 39.7%, 17.5%, and 15.9% of AN-BP (2-, 6-, and 12-year follow-up, respectively).

Following the approach by Milos et al.,<sup>4</sup> we also analyzed the percentage of instances of transit from one state (diagnosis) to another (rather than changes on the person level) over the complete time period (12 years) (Fig. 4). In this line, **Figure 4** also incorporates “re-entries” to an ED diagnosis. For example, the segment of the pie indicating BN includes all diagnoses of BN (purging and

**FIGURE 4.** Percentages of transits of eating disorder diagnoses (anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), eating disorder not otherwise specified (NOS)) and no eating disorder diagnosis (NO ED; indicating neither AN, nor BN, nor BED nor EDNOS). The figure illustrates changes of diagnosis on instance (rather than person) level. The segments in the “pie” represent the cumulative frequencies with which the respective diagnoses occurred at the four cross-sections (beginning of treatment, 2-, 6-, and 12-year follow-up; 29.1% AN, 52.8% BN, 12.4% BED and 5.7% NOS). Percentages are based on the number of possible transits for each diagnosis. *N*, number of cases.



nonpurging type) which were encountered at any cross-sectional assessment (either at admission, or at 2-year follow-up, 6-year follow-up, or at 12-year follow-up). The slice NOS includes all diagnoses of EDNOS made at any follow-up (no EDNOS cases were included at the start of the study). Arrows show the percentage of transits from one diagnosis to another or to neither AN, nor BN, nor BED, nor EDNOS, or from NO ED to an ED diagnosis, indicating instances of crossover (from one category of diagnosis to another), relapse (changing from the status of neither AN, nor BN, nor BED, nor EDNOS to any of these ED categories), or remission (changing from any DSM defined ED including EDNOS to having no ED diagnosis) from one cross-section to the temporally following cross-sectional assessment. This figure gives the most complete picture about the long-term stability of ED diagnoses.

Theoretically, transits of diagnosis from one time point to the next, including remission and relapse

to and from “no ED diagnosis” and accounting for deceased patients, could have occurred in 919 instances. Five patients were deceased at the 2-year follow-up and an additional four patients each at the 6- and 12-year follow-ups. AN showed the highest rate of chronicity and mortality and the lowest rate of remission. BN tended to remit directly to no ED diagnosis or to EDNOS but not to BED, while a considerable percentage of BED and EDNOS diagnoses changed to BN.

Seven AN patients died during the 12-year follow-up period; at the last cross-sectional assessment before their death all had the diagnosis of AN. Four BN-P patients died during the 12-year follow-up period; at the last assessment before their death, one had the original diagnosis BN-P while one had AN and two had neither AN, nor BN, nor BED, nor EDNOS. Two of the BED patients died during the follow-up period; at the last assessment before their death none had BED, one had BN-P, and one had switched from BED to EDNOS at the 2-year follow-up to neither AN, nor BN, nor BED, nor EDNOS at the 6-year follow-up.

## Conclusion

Strengths of this study include the prospective longitudinal approach, a large sample size, one baseline assessment and three follow-ups over a long period of 12 years, a high participation rate, and the use of standardized assessments. Regarding limitations, our data included treated female participants only, and the samples introduced here represent a selection of the severe end of the symptomatic spectrum excluding less disturbed individuals not seeking intensive treatment. Numbers did not allow a comprehensive break-down in subtypes of AN, but we provided some tentative data on this issue. We considered ED diagnoses present at any cross-sectional assessment and could not include multiple changes in diagnoses occurring during the follow-up intervals.

One major finding from our study was a considerable diagnostic stability in AN over time, AN-BP being the most deadly, and AN-R being the least deadly variant of ED. However, as number of cases of AN-R are very low, this finding has very limited reliability and may be considered an interesting clue only. Crossover from AN to BED and vice versa was virtually absent. BED is an apparently distinctive ED and appears to have some clinical validity

although diagnostic criteria for BED could be improved.

We found a considerably more frequent shift from AN into BN than was the case vice versa. This is in line with the findings from other studies which reported relapses to bulimic symptoms in both types of AN and in BN.<sup>4,11</sup> Bulik et al.<sup>12</sup> concluded from several studies that a large proportion of AN patients later developed BN with the percentage of patients with BN to be increasing with the follow-up interval. Tozzi et al.,<sup>11</sup> assessing diagnostic crossover retrospectively in a large sample, found 27% of BN patients shifting to AN. We could not find these patterns in our study. Over the years we observed the largest percentage of remissions from any ED for EDNOS followed by remission from BED and BN (Fig. 4). From our and others' evidence,<sup>13</sup> it seems that in severely disturbed patients a partial remission from AN, BN or BED to EDNOS may in the long-term mark an important step to full remission. In our sample, the short and intermediate remission rate in BN was higher than the estimate given in an overview by Keel and Mitchell.<sup>14</sup> The remission rate for AN in our sample was similar to that given in the overview by Steinhausen.<sup>15</sup>

Presently there is a discussion on the validity of the BED diagnostic category. Our data suggest that BED is not a partially remitted form of BN. The 12-year course of BED generally was about as severe as that of BN-P. Possibly there exists an additional subgroup of patients with BED as a precursor of BN. Applying advanced statistical procedures to a community sample, Striegel-Moore et al.<sup>16</sup> found three variants in the diagnostic spectrum of BN. The first class was very similar to BN as defined in DSM-IV, the second class included individuals with minor eating binges and purging behaviors, and the third class resembled BED, showing eating binges and no or minor compensatory behaviors.

Diagnoses sharing crossover from one diagnosis to another can be considered to be nosologically nearer than categories with no crossover between them. The diagnostic flux between BN and BED over time and the similarities in course and outcome of the two diagnoses point to common biological and psychological maintaining processes. Of special interest—also concerning etiological issues—is our clear finding that there was virtually no flux between AN and BED and that the long-term outcome of AN was much worse. On the other hand, a considerable portion of BN patients report a history of AN. Our limited analysis of AN sub-

types seemed to confirm the validity of the distinction of the subtypes of AN in DSM-IV. Concluding from this, a broad spectrum of ED diagnoses reaching from AN-R to AN-BP to BN to BED may be defined. Each category may represent a very severe ED in its own right with nosological nearness indicated by the order named. So AN may be nosologically nearer to BN than to BED. This would mean that BED is more than a useful marker of psychopathology as suggested by Stunkard and Allison.<sup>17</sup> AN-BP, BN, and BED may well be considered variants of a bulimic spectrum disorder. This distinction would be supported by the observed pattern of deaths in AN, which occurred exclusively in AN-BP. Another possibly useful dimension to be added to ED diagnosis and the distinction in bulimic spectrum disorders may be body weight ranging from underweight in AN to normal body weight in BN and BED and obesity in BN (partially) and (primarily) BED.

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