POST-TREATMENT ***FOLLOW-UP***

Although improvement by the end of residential treatment is often necessary for recovery, it is not sufficient: Clients must maintain improvements after they return home. Thus, post-discharge data collection is imperative for assessing treatment success. After a brief pilot study, Center For Discovery rolled out its Aftercare Program to collect such data: Via a licensed psychologist contacting adult clients and parents of adolescent clients 7 days, 30 days, 60 days, 90 days, 6 months, and yearly after discharge,[21] the Aftercare Program was designed to help protect the improvements made in treatment by providing support and resources, and to collect post-discharge follow-up data on eating disorder symptoms and behaviors. Since its inception, of the 1,695 residential eating disorder clients who have discharged[22] and thus were eligible for the Aftercare Program, 1,351 (79.7%) participated at one or more contact points. The 7-day contact point was simply to find out if the client had attended a Behavioral Health or Nutrition Therapy appointment within the seven days following discharge from Center For Discovery; 79.9% (*n* = 1,080) of clients had. On the remaining contact points (30 days, 60 days, 90 days, 6 months, 1 year, and 2 years post-discharge), data on clients' symptoms and behaviors were collected. Almost 65%[23] (64.1%; *n* = 1,086) of clients had full or partially completed data for one or more of these data collection points. The following stats are from the data collection point with the longest duration of follow-up for each participating client, with a mean of 154 days post-discharge:

Weight Restoration

At follow-up, for clients treated for AN or ARFID who were on weight restoration during treatment, the average reported weight was 95.4% TBW (*n* = 370), and 74.7% were reported to be within a healthy weight range[24] (*n* = 355). These results are more robust than others found in the literature, which have shown less than 55% of clients maintaining their weight after discharging.[25] However, for clients who weight restored to at least 90% TBW before discharging from Center For Discovery, the number of clients who were reported as being within a healthy weight jumped 12 percentage points to 86.3% (*n* = 272). This finding is in line with research that suggests that reaching weight maintenance before discharge increases the likelihood of maintaining the restored weight following discharge.[26]

Purge Behaviors

At follow-up, for clients treated for BN or AN-P, 72.1% (*n* = 245) were purging less than once per week (i.e., for BN, no longer meeting diagnostic criteria), and 58.8% (*n* = 200) were completely purge free the month before data collection. For those clients who remained in residential treatment until they were appropriate for a lower level-of-care, 75.1% (*n* = 169) were purging less than once per week, and the percentage who were completely purge free the month before data collection increased by almost 5 percentage points to 63.1% (*n* = 142). These recovery rates are strong; research suggests frequent purging behavior often remains present after discharge from a high level-of-care, that abstinence of purge behaviors increases as duration of follow-up increases (i.e., the rate of clients abstaining from these behaviors increase as time from discharge lengthens), and that abstinence rates can be less than 30% at follow-up.[27,28,29]

[21] For clients who were receiving intensive outpatient (IOP) or partial hospitalization (PHP) at Center For Discovery at one or more of the contact points, chart data were utilized instead of contacting the client/family.

[22] Discharged since the Aftercare Program launched; between 11/20/15 and 1/1/18

[23] 65% shows a low level of attrition relative to published studies on residential eating disorder treatment: In a comprehensive literature review, the average percent of follow-up data for residential eating disorder treatment was 37% (Friedman, K., Ramirez, A. L., Murray, S. B., Anderson, L. K., Cusack, A., Boutelle, K. N., & Kaye, W. H. (2016). A narrative review of outcome studies for residential and partial hospital-based treatment of eating disorders. *European Eating Disorders Review, 24*(4), 263-276.).

[24] Healthy weight range is defined as being reported by the adult client or the adolescent client's parent as either being "within a healthy weight range" (please note, this pertains to a minimum healthy weight; there is no way to define a maximum healthy weight) according to the client's treatment team or, when exact weight information was reported or (when applicable) collected from the Center For Discovery IOP or PHP chart, as weighing greater than 90% TBW.

[25] Bean, P., Welk, R., Hallinan, P., Cornella-Carlson, T., Weisensel, N., & Weltzin, T. (2008). The effects of a multidisciplinary approach to treatment in the recovery of males and females diagnosed with anorexia nervosa in the presence and absence of co-morbid obsessive compulsive disorders. *Journal of Groups in Addiction & Recovery, 3*(2-4), 305–321.

[26] Kaplan, A. S., Walsh, B. T., Olmsted, M., Attia, E., Carter, J. C., Devlin, M. J., ... & Parides, M. (2009). The slippery slope: Prediction of successful weight maintenance in anorexia nervosa. *Psychological medicine, 39*(6), 1037-1045.

[27] Gleaves, D. H., Post, G. K., Eberenz, K. P., & Davis, W. N. (1993). A report of 497 women hospitalized for treatment of bulimia nervosa. *Eating Disorders: The Journal of Treatment and Prevention, 1*(2), 134–146. This study reported that at 1-2 year follow-up, patients were purging an average of 5 times per week and only 25.4% were abstinent form purging.

[28] Bailer, U., de Zwaan, M., Leisch, F., Strnad, A., Lennkh-Wolfsberg, C., El-Giamal, N., ... & Kasper, S. (2004). Guided self-help versus cognitive-behavioral group therapy in the treatment of bulimia nervosa. *International Journal of Eating Disorders, 35*(4), 522-537.

[29] Schmidt, U., Lee, S., Perkins, S., Eisler, I., Treasure, J., Beecham, J., ... & Johnson-Sabine, E. (2008). Do adolescents with eating disorder not otherwise specified or full-syndrome bulimia nervosa differ in clinical severity, comorbidity, risk factors, treatment outcome, or cost? *International Journal of Eating Disorders, 41*(6), 498-504.

Binge Behaviors

At follow-up, for clients treated for BN or BED, 74.2% (*n* = 144) no longer met the diagnostic criteria for either BN or BED due to reduced binge behavior, and 57.7% (*n* = 112) were completely binge free the month before data collection. For those clients who remained in residential treatment until they were appropriate for a lower level-of-care, 81.5% (*n* = 110) no longer met the diagnostic criteria for either BN or BED, and the percentage who were completely binge free the month before data collection jumped by close to 10 percentage points to 65.9% (*n* = 89).

Recidivism

While Center For Discovery has always published the percentage of its clients who readmitted to Center For Discovery (see Readmission section below), it is only with the inception of the Aftercare Program that we have been able to determine the percent of clients who readmitted to a higher level-of-care (i.e., either residential or hospitalization) *at other programs* after completing treatment at Center For Discovery: At follow-up, of the 706 clients who completed[30] residential eating disorder treatment at Center For Discovery, 86.5% did not need to step back up to a higher level-of-care, at Center For Discovery *or any other program*, for eating disorder treatment.

READMISSION TO CENTER FOR DISCOVERY
RESIDENTIAL EATING DISORDER TREATMENT

Since Center For Discovery began treating eating disorders in 1999, we have treated over 4,200 clients at the residential level-of-care (*n* = 4,267 as of January 1, 2018). Of those clients, only 14.6% have readmitted to Discovery's residential eating disorder program anytime in the past almost 20 years. Examining residential eating disorder readmission rates since 2015, of the 2,035 clients, 13.3% readmitted within one year, 8.8% readmitted within 6 months, 6.3% within 90 days, and 3.1% within 30 days of discharge. Such readmission rates are significantly lower than those typically found for a higher level-of-care for eating disorders, which can be as high as 45.0% to 77.5%.[31,32]

CONCLUSION

At Center For Discovery, we are driven to provide the most effective, evidence-based treatment experience...and the statistics speak for themselves. Through all of our research endeavors, our mission is to continuously enhance our comprehensive program to provide best-in-class clinical outcomes; to give confidence to families, clients, and our treatment collaborators through our proven results; to work with insurance companies to obtain adequate length of care for our clients; and to lead the field in understanding treatment for eating disorders.

In summary, Center For Discovery's residential eating disorder treatment produces the following results:

- weight restoration of 2.2 lb per week
- 97.9% reduction in purge behaviors
- 99.3% reduction in binge behaviors
- clinically significant decreases in eating disorder pathology
- clinically significant increases in quality of life
- high levels of post-discharge data collection participation
- 79.9% of clients engaging in continued treatment within seven days post-discharge
- 86.3% of AN clients who discharged at or above 90% TBW maintaining their weight post-discharge
- 75.1% of clients with purge behaviors who completed treatment purging less than once per week post-discharge
- 81.5% of clients with binge behaviors who completed treatment bingeing less than once per week post-discharge
- 86.5% of clients who completed treatment not needing to step back up to Center For Discovery or any other program for a higher level-of-care (i.e., residential, hospital) for eating disorder treatment

[30] "Completed" is operationalized as being determined as appropriate for a lower level-of-care by the treatment team at discharge.

[31] Steinhausen, H., Grigoroiu-Serbanescu, M., Boyadjieva, S., Neumärker, K., & Metzke, C. W. (2008). Course and predictors of rehospitalization in adolescent anorexia nervosa in a multisite study. *International Journal of Eating Disorders, 47*(1), 29-36.

[32] Lay, B., Jennen-Steinmetz, C., Reinhard, & Schmidt, M. H. (2002). Characteristics of inpatient weight gain in adolescent anorexia nervosa: Relation to speed of relapse and re-admission. *European Eating Disorders Review, 10*(1), 22-40.

CENTER FOR DISCOVERY®
Transforming Lives

EATING DISORDER ***TREATMENT OUTCOMES***

Center For Discovery has collected data on almost 4,000 clients (*n* = 3,967) who received residential eating disorder treatment, beginning in 2006. Teaming with expert researchers[1], the de-identified data have been analyzed and presented to the field via the Academy for Eating Disorders (AED) International Conference, the Society for Adolescent Health and Medicine (SAHM) Annual Meeting, the Pediatric Academic Societies (PAS) Annual Meeting, and the American Psychological Association (APA) Annual Convention. In 2015, Center For Discovery's research collection process was expanded, new measures were added, and the Aftercare Program—which collects data post-discharge—was initiated. The following results, from the largest sample sizes in the field, are from data collected from clients who received residential eating disorder treatment at Center For Discovery between January 2015 and January 2018 (*n* = 2,035).

Sample Treated

Center For Discovery's average adolescent client was 14.8 years old and was treated for 39.5 days; Discovery's average adult client was 27.5 years old and was treated for 33.1 days. Over 65% of clients were treated for Anorexia Nervosa (AN; 46.6% for Anorexia Nervosa Restricting-type and 19.1% with Anorexia Nervosa Purging-type), 18.2% for Bulimia Nervosa (BN), 10.3% for an Other Specified or Unspecified Feeding or Eating Disorder (OSFED), 4.1% for Binge Eating Disorder (BED), and 1.7% for Avoidant Restrictive Food Intake Disorder (ARFID). Most clients identified as female (95.1%), 4.9% identified as male,[2] and 0.6% (12 clients) identified as transgender. 84.9% of clients identified as non-Hispanic; 15.1% of clients identified as Hispanic. 85.6% of clients identified as Caucasian/White, 5.9% identified as Biracial, 4.8% identified as Asian, 2.6% identified as African American/Black, 0.9% identified as American Indian or Alaska Native, and 0.3% identified as Hawaiian or Pacific Islander.

[1] Northwell and The Feinstein Institute for Biomedical Research

[2] The percentage of male-identifying clients is skewed low because adult residential facilities treat female-identifying clients only; when examining only adolescent residential facilities, the percentage of male-identifying clients increases to 7.9%.

This brochure reviews

a) Improvements made while at Discovery
   1) Weight Restoration
   2) Purge Frequency
   3) Binge Frequency
   4) Eating Disorder Pathology
   5) Quality of Life
b) Improvements maintained after Discovery
   1) Weight Restoration
   2) Purge Frequency
   3) Binge Frequency
   4) Recidivism
c) Discovery readmission rates

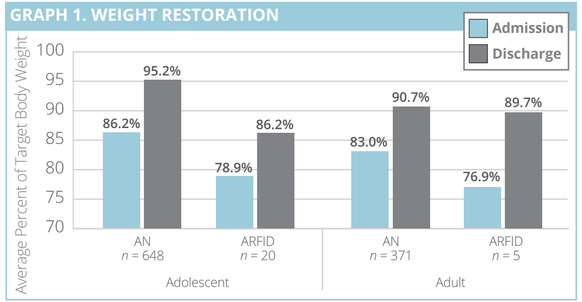
IN-TREATMENT ***IMPROVEMENTS***

Weight Restoration

Center For Discovery's treatment philosophy is strongly rooted in Health At Every Size®—weight is not a good indicator of health. The one exception to this rule is for clients who are weight suppressed and hence malnourished. These clients, usually diagnosed with AN or ARFID, require weight restoration to reduce the serious, potentially fatal, medical and psychological symptoms of malnutrition. Clients[3] diagnosed with AN, who began treatment with an average percent of minimum Target Body Weight (TBW) in the low to mid-80s, were able to weight restore to above an average of 90% of TBW **(see Graph 1)**. Reaching the benchmark of 90% of TBW, particularly for developing adolescents, is important for a number of reasons including a marked reduction of symptoms of malnutrition,[4] evidence that psychopathological symptoms can persist for years when weight restoration is incomplete,[5] and findings that show a stable relationship between 90% TBW at discharge and long-term weight maintenance.[6] With small sample sizes of adolescent and, especially, adult clients diagnosed with ARFID, findings should be interpreted with caution. However, the preliminary data suggest that clients with ARFID begin treatment at a more compromised body weight and that, whereas adults with ARFID weight restore in a similar timely manner as adults with AN, adolescents with ARFID have slower weight restoration.

Examining rate of weight restoration, clients with AN gained about 2 pounds (lb) per week (2.0 lb for adolescent clients; 1.9 lb for adult clients, which is equivalent to 10.4 lb of total weight gain for adolescents and 9.2 lb for adults) on average. The rate of weight restoration was more variable between adult and adolescent clients with ARFID—adolescent clients gained 1.6 lb per week on average (which is equivalent to 8.2 lb of total weight gain), whereas adult clients with ARFID gained 2.3 lb per week on average (which is equivalent to 13.9 lb of total weight gain). Thus, the average rate of weight restoration for all clients who needed to weight restore was 2.0 lb per week for the three-year period. However, examining just 2017, after a new initiative to begin to explore higher rates of weight restoration, the average rate of weight restoration for all clients (n = 385) who needed to weight restore increased to 2.2 lb per week. Such timely weight restoration is vital: Leading eating disorder researchers[5,7] cite slow and low weight restoration as dangerous, as it results in not just the eventual risk of bone disease and relapse but also a decline in motivation for recovery.

GRAPH 1. WEIGHT RESTORATION



[3] Clients who received at least 7 residential treatment days (as weight was measured once per week), who had at least one day of weight restoration, and who had %TBW data present for admission and discharge were included in this analysis. Mean lengths of treatment episode for this sample were as follows: adolescent AN, m = 45.8 days; adolescent ARFID, m = 36.3 days; adult AN, m = 39.6 days; adult ARFID, m = 39.8 days.

[4] Strober, M., Freeman, R., & Morrell, W. (1997). The long-term course of severe Anorexia Nervosa in adolescents: Survival analysis of recovery, relapse, and outcome predictors over 10-15 years in a prospective study. *International Journal of Eating Disorders, 22*(4), 339-360.

[5] Strober, M., & Johnson, C. (2012). The need for complex ideas in Anorexia Nervosa: Why biology, environment, and psyche all matter, why therapists make mistakes, and why clinical benchmarks are needed for managing weight correction. *International Journal of Eating Disorders, 45*(2), 155-178.

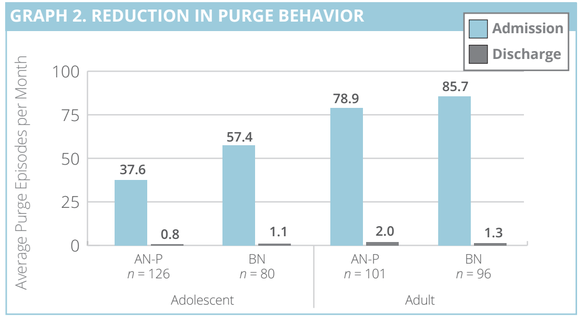
[6] Couturier, K., & Lock, J. (2006). What is recovery in adolescent anorexia nervosa? *International Journal of Eating Disorders, 39*(7), 550-555.

[7] Steinhausen, B. C. (2002). The outcome of Anorexia Nervosa in the 20th century. *American Journal of Psychiatry, 159*(8), 1284-1293.

Purge Reduction

Center For Discovery provides the necessary structure for a swift cessation of purging (i.e., self-induced vomiting), a behavior that can have fatal consequences[8] and that can be difficult to extinguish in lower levels-of-care. On average, clients[9] diagnosed with either AN-P or BN who were exhibiting purge behavior upon admission—upwards of 3 times per day for adult clients with BN **(see Graph 2)**—were able to reduce these behaviors by 97.9% on average. Furthermore, most clients (76.1%) had completely ceased purging the 30 days prior to discharge.

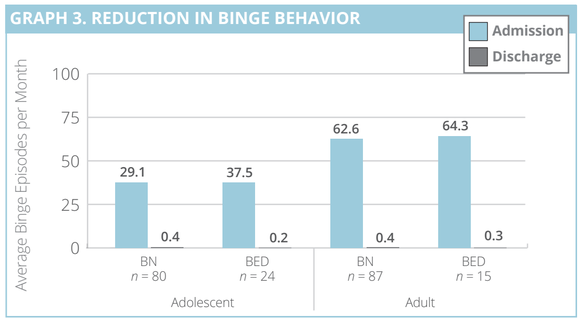
GRAPH 2. REDUCTION IN PURGE BEHAVIOR



Binge Reduction

Binge eating is often a difficult eating disorder behavior to cease completely, as it is on the same spectrum as normal eating and can even be socially sanctioned at times.[10] However, with a focus on Health At Every Size and Intuitive Eating, Center For Discovery helps clients[11] diagnosed with BN and BED who have binge behaviors on admission—over two times per day for adult clients **(see Graph 3)**—to drastically reduce binge behaviors, with a 99.3% reduction of bingeing on average and with the vast majority of clients (93.8%) having completely ceased bingeing the 30 days prior to discharge.

GRAPH 3. REDUCTION IN BINGE BEHAVIOR



[8] Forney, K. J., Buchman-Schmitt, J. M., Keel, P. K., & Frank, G. K. W. (2016). The medical complications associated with purging. *International Journal of Eating Disorders, 49*(3), 249-259.

[9] Clients who had a treatment length of at least 30 days (as purging behavior was measured for a 30-day increment), who endorsed purging behavior on admission, and who had purge data for discharge were included in this analysis. One outlier was removed from the adolescent AN-P sample. Mean lengths of treatment episode were as follows: adolescent AN-P, m = 48.2 days; adolescent BN, m = 43.2 days; adult AN-P, m = 48.9 days; adult BN, m = 40.6 days.

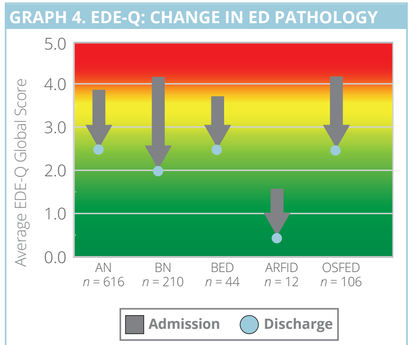
[10] Satter, E. (2018). Adult eating and weight. Retrieved from http://ellynsatterinstitute.org/how-to-eat/adult-eating-and-weight/

[11] Clients who had a treatment length of at least 30 days (as bingeing behavior was measured for a 30-day increment), who endorsed bingeing behavior on admission, and who had binge data present on discharge were included in this analysis. Mean lengths of treatment episode were as follows: adolescent BN, m = 42.4 days; adolescent BED, m = 40.1 days; adult BN, m = 40.9 days; adult BED, m = 45.6 days.

Eating Disorder Pathology

Experts in the field suggest that eating disorders extend beyond physical symptoms and behaviors, and that eating disorder pathology may remain after physical symptoms have remitted.[6] Therefore, to get a comprehensive understanding of progress toward recovery, Center For Discovery utilizes the Eating Disorder Examination – Questionnaire (EDE-Q)[12] at admission and at the end of treatment. On average, all clients,[13] regardless of diagnosis, were able to meaningfully decrease eating disorder pathology **(see Graph 4)**. Clients diagnosed with AN, BN, BED, or OSFED entered treatment with scores on the cusp of, or above, 2 standard deviations from the mean, indicating that these clients were experiencing worse eating disorder pathology than over 90% of the population.[14] All clients, on average, discharged with scores within one standard deviation from the mean, indicating that their scores were no longer elevated to a clinical level. Although clients with ARFID entered treatment close to the normed mean for eating disorder pathology, discharge scores evidenced improvements nonetheless. In total, 87.0% of clients showed a decrease in eating disorder pathology at the end of treatment.

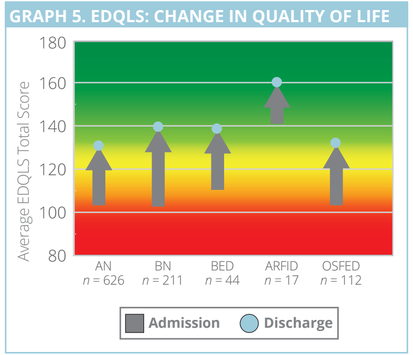
GRAPH 4. EDE-Q: CHANGE IN ED PATHOLOGY



Quality of Life

Eating disorders, especially those severe enough to require residential treatment, greatly impair functioning and quality of life. In recent years, there has been a call to define recovery, not only in terms of symptom and pathology remission, but also in terms of quality of life.[15,16] To support this conceptualization, clients[17] completed an Eating Disorder Quality of Life Scale (EDQLS)[18] upon admission and again on discharge to assess the impact of the eating disorder on quality of life[19] and to track improvement. All clients, on average, entered treatment with depressed quality of life and discharged from treatment with scores indicating meaningful improvements **(see Graph 5.)**. Overall, 86.8% of clients showed an increase in quality of life, which is high compared to research suggesting that only 63.5% of residential eating disorder clients show meaningful increases in eating disorder related quality of life.[20]

GRAPH 5. EDQLS: CHANGE IN QUALITY OF LIFE



[12] Fairburn, C., Cooper, Z., & O'Connor, M. (2008). Eating disorders examination (16 ED). In C. Fairburn (Ed.) *Cognitive behavior therapy and eating disorders.* (Appendix II). New York: Guilford Press.

[13] Clients who had a treatment length of at least 7 days, who completed the measure within 72 hours of both admission and discharge, and who scored greater than or equal to 0.34 (1 SD better than the non-clinical sample) were included in this analysis.

[14] Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*(4), 363-370. The non-clinical, community-normed mean for the global score is 1.55 (SD = 1.21), 1 standard deviation from the mean is 2.76 and 0.34, and 2 standard deviations from the mean is 3.97 and 0.

[15] de Vos, J. A., LaMarre, A., Radstaak, M., Bijkerk, C. A., Bohlmeijer, E. T., & Westerhof, G. J. (2017). Identifying fundamental criteria for eating disorder recovery: A systematic review and qualitative meta-analysis. *Journal of eating disorders, 5*(1), 34.

[16] Engel, S. G., Adair, C. E., Las Hayas, C., & Abraham, S. (2009). Health-related quality of life and eating disorders: A review and update. *International Journal of Eating Disorders, 42*(2), 179-187.

[17] Clients who had a treatment length of at least 7 days and who completed the measure within 72 hours of both admission and discharge were included in this analysis.

[18] Adair, C. E., and Marcoux, G. C, (2008). Eating Disorders Quality of Life Scale (EDQLS): *Administration and Scoring Manual.* Adair Marcoux Informetrics.

[19] Adair, C. E., Marcoux, G. C., Cram, B. S., Ewashen, C. J., Chafe, J., Cassin, S. E., ... Brown, K. E. (2007). Development and multi-site validation of a new condition-specific quality of life measure for eating disorders. *Health and Quality of Life Outcomes, 5*(1), 23.

[20] Twohig, M. P., Bluett, E. J., Cullum, J. L., Mitchell, P. R., Powers, P. S., Lensegrav-Benson, T., & Quakenbush-Roberts, B. (2016). Effectiveness and clinical response rates of a residential eating disorders facility. *Eating Disorders, 24*(3), 224-239.