

## Higher-Calorie Diets for Patients with Anorexia Nervosa Shorten Hospital Stays

### Revised Refeeding Regimen Results in Speedier Recovery, Major Savings, UCSF, Stanford Study Shows

The standard-of-care for patients with eating disorders when they are admitted to the hospital for malnutrition is to initiate a low-calorie feeding plan and bump up calories slowly. But a new study led by UCSF Benioff Children's Hospitals and the Stanford University School of Medicine indicates that patients get well faster with the opposite approach: providing more calories and increasing them quickly.

In what is believed to be the largest randomized clinical trial ever to examine refeeding approaches, researchers divided inpatients into two groups. Of the 111 who completed the study, 51 adolescents and young adults consumed 1,400 calories on day one, with increases of 200 calories every other day. In the second group, 60 adolescents and young adults consumed 2,000 calories on day one, with increases of 200 calories each day. In both groups, any uneaten food was replaced by a calorie-equivalent quantity of high-energy liquid formula.

The researchers found that medical complications that had prompted their admissions, such as low blood pressure and bradycardia, or slow or irregular heart rhythm, were more quickly restored in the higher-calorie group, resulting in shorter, less expensive, hospital stays.

"In the past, these patients stayed in the hospital for weeks on end and usually lost weight initially," said first author Andrea Garber [1], PhD, RD, chief nutritionist for the UCSF Eating Disorders Program [2] and a professor of pediatrics in the Division of Adolescent Medicine. "We wanted to see if increased calories would improve these outcomes and still maintain safety," she said, noting that despite the long hospitalizations, studies show that almost half of these patients are readmitted within one year.

Among the patients in the study, which published in *JAMA Pediatrics* [3] on Oct. 19, 63 had anorexia nervosa and 48 had atypical anorexia nervosa [4], a newer diagnosis affecting people of normal weight, or even those who are overweight or obese, whose rapid weight loss leads to the same health conditions.

## Fears of Refeeding Syndrome Drive Lower-Calorie Eating Plans

The rationale for lower-calorie refeeding goes back to World War II, when deaths were documented in starved prisoners-of-war who were fed too quickly. These deaths resulted from so-called refeeding syndrome, which causes a dangerous shift in fluids and electrolytes leading to delirium and heart attack. However, in preliminary work, the authors showed that lower-calorie refeeding contributed to slow weight gain and long hospital stays, poor outcomes that are now recognized as ?underfeeding syndrome.?

The study participants, whose average age was 16 and of whom 91 percent were female, were monitored for weight and vital signs, as well as blood measurements of electrolytes, such as phosphorous, potassium and magnesium, that at low levels signal refeeding syndrome. Both patient groups had lost an average of 21 percent of their body weight over a duration of about 15 months.

The researchers found no difference in electrolyte abnormalities between the two groups, indicating that higher-calorie refeeding was not associated with increased safety concerns. Additionally, they found that patients on the higher-calorie diet reached medical stability three days earlier than those on the lower-calorie diet. This disparity was especially evident in bradycardia, which was reversed 4.5 days earlier in the higher-calorie group. The latter group also gained weight faster, ?which is important because it sets a good recovery pathway for the long road ahead,? Garber explained.

## **Shorter Hospital Stays Mean Significant Savings**

Since the higher-calorie group was able to stabilize earlier, they were well enough to be discharged on average at eight days, versus 12 days for the lower-calorie group. This yielded significant savings in hospital charges, the amount a hospital bills the insurance carrier. Charges averaged \$57,168, for each lower-calorie patient, compared with \$38,112 for each higher-calorie patient.

The clinical trial is continuing to track patients for 12 months after admission to determine whether there are any differences in remission between the two refeeding groups. ?We are eager to find out if the benefits in hospital are sustained over time,? said Garber. ?We want to avoid a situation in which shorter stays create a revolving door of more frequent readmissions, undoing early good outcomes and hospital cost savings.?

The findings are timely, Garber added. ?Our inpatient programs are operating at maximum capacity; the isolation, uncertainty and anxiety of COVID-19 is amplified for our patients. We believe that this faster and more efficacious approach will reduce the upheaval of hospitalization during an already stressful time.?

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*UCSF Benioff Children's Hospitals are two leading Bay Area children's hospitals with longstanding commitments to public service. UCSF Benioff Children's Hospital San Francisco [10] and UCSF Benioff Children's Hospital Oakland [11] both have leading pediatric residency programs, unique pediatric subspecialty fellowship programs, a research base for the next generation of discoveries, and expertise in pediatric clinical care, public policy and patient advocacy.*

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## **Links**

[1] <https://profiles.ucsf.edu/andrea.garber>

[2] <https://eatingdisorders.ucsf.edu/>

[3] [https://jamanetwork.com/journals/jamapediatrics/fullarticle/2771984?guestAccessKey=ab4daff8-05dc-47b0-b239-](https://jamanetwork.com/journals/jamapediatrics/fullarticle/2771984?guestAccessKey=ab4daff8-05dc-47b0-b239-dcbecc6c62b&utm_source=For_The_Media&utm_medium=referral&utm_campaign=ftm_links&)

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[4] <https://www.ucsf.edu/news/2019/11/415871/anorexia-nervosa-comes-all-sizes-including-plus-size>

[5] <https://profiles.ucsf.edu/daniel.legrange>

[6] <https://nahic.ucsf.edu/about/who-we-are/adams/>

[7] <https://profiles.ucsf.edu/sara.buckelew>

[8] <https://profiles.ucsf.edu/vanessa.machen>

[9] <https://profiles.ucsf.edu/leslie.wilson>

[10] <https://www.ucsfbenioffchildrens.org/>

[11] <http://xn--ucsf%20benioff%20childrens%20hospital%20oakland-h803a/>

[12] <https://womenshealth.ucsf.edu/subsite/coe>

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