SPEED PROJECT

Sport & Prevention of Emerging Eating Disorders

ANOREXIA NERVOSA

Diagnosis and Treatment Pathways

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Definition

- **Caloric intake restriction relative to needs, resulting in a significantly low body weight** (weight below the minimum normal or minimum expected)
- **Intense fear of gaining weight or becoming fat** or persistent behavior that interferes with weight gain, even when significantly underweight
- **Disturbance in the way body weight or shape is experienced** with undue influence of body weight or shape on self-evaluation, or persistent failure to recognize the seriousness of the current low body weight

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Subtypes

- With RESTRICTING: weight loss through fasting, dieting, excessive exercise (no binge eating/purging in the last 3 mesi)
- With BINGE EATING/PURGING: recurrent episodes in the last 3 months of self-induced vomiting, use of laxatives, diuretics, etc…
- Frequent cross-over between subtypes

N.B.: purging behaviors ≠ compensatory behaviors (e.g., increased physical activity after a meal considered ritenuto abbondante)

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BMI (Body Mass Index)

Normal weight in adults is defined as a BMI (body mass index) between 18.5 and 24.9 kg/m^2.
Underweight is defined as a BMI below 18.5 kg/m^2 and is classified as mild, moderate, severe, or extreme.

In children, reference values are growth curves.

The DSM-5 defines this as "significantly low weight relative to age, sex, and development," not a fixed cut-off threshold

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Clinical Features

- Gradual onset: progressive **reduction in food intake** (low-calorie diet or digestive difficulties, illness, depression, surgery or trauma, stressful life evnti, cambiamenti di vita.)
- Reduction of caloric intake: smaller portions and/or elimination of certain foods.

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Clinical Features

- Concerns **about body shape and weight** become progressively **obsessive**: they do not decrease with weight loss, but intensify as weight drops.
- Frequent **excessive exercise, body or weight checking, calorie counting, spending hours eating and/or cutting food into tiny pieces.**

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- Often **lack of insight** into the illness and **resistance** to treatment.
- Depressive symptoms may be present: (depressed mood, social withdrawal, irritability, insomnia…).

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- **Obsessive-compulsive symptoms**: ideational preoccupation with food, collecting recipes or hoarding food, perfectionism. Obsessive symptoms also worsen due to the reduction in caloric intake and weight loss.
- In patients with **AN with purging behaviors, the prognosis is worse**: more frequent medical complications, higher rates of impulsive behaviors, self-harm, and substance abuse.

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Warning Signs

Warning signs that may indicate the presence of an eating disorder include significant weight loss, irrational fear of gaining weight, preoccupation with weight and body shape, the adoption of extreme and rigid dietary rules especially when these signs are associated with mood changes, social withdrawal, anxiety, gastrointestinal disorders.

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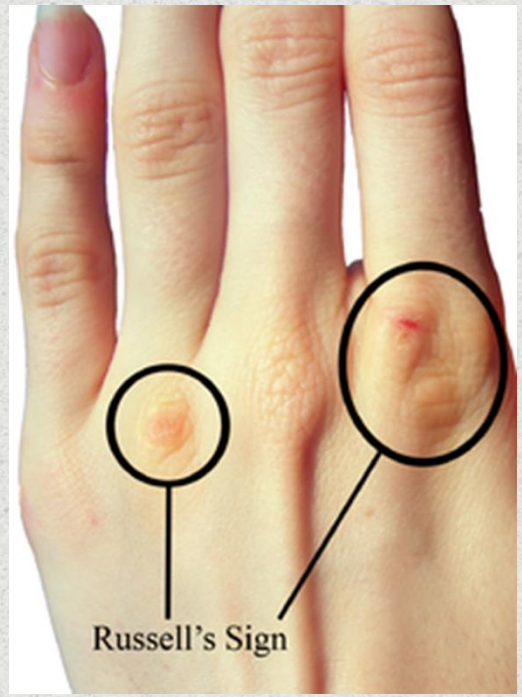
Reading the Body's Signals

- Heavy, dark clothing
- Lanugo, yellowish skin tone
- Dry, flaky skin
- Acrocyanosis (pallor of extremities)
- Slowed movements
- Reduced facial expression
- Stooped posture
- Russell's sign



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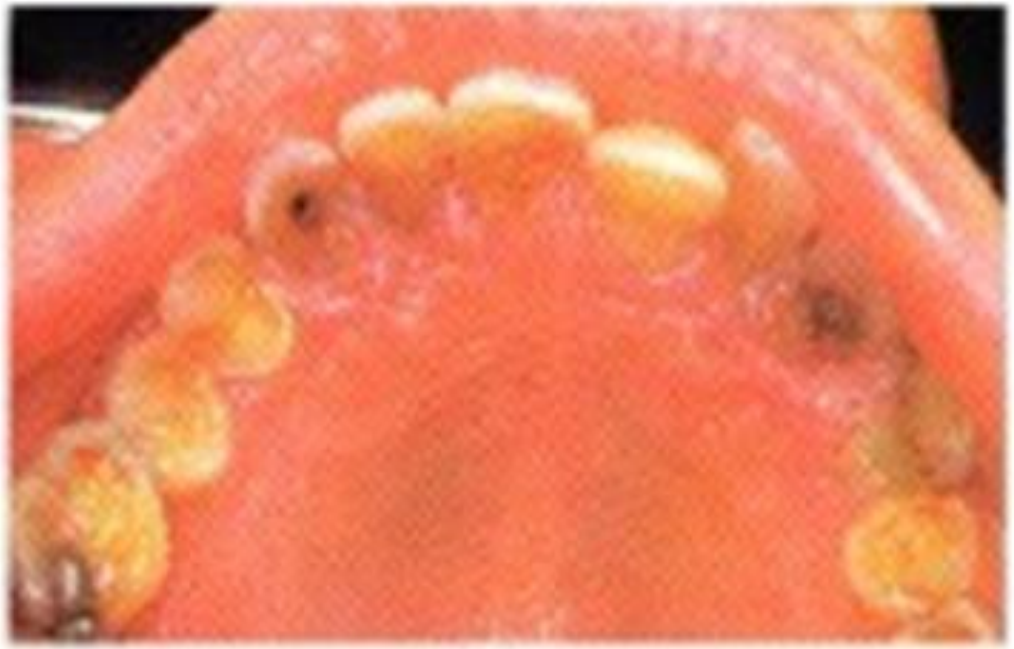

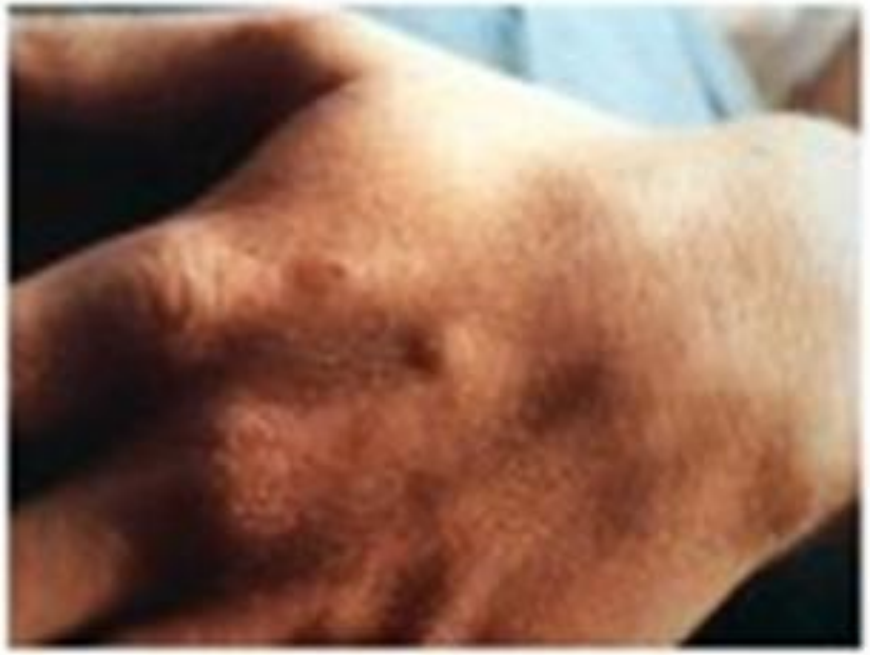

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Medical Complications in AN

- Leukopenia, reduced T-helper cells
- Anemia
- Hypercortisolemia (stress and lipolysis)
- Cerebral atrophy
- Osteoporosis (reduced estrogen production, IL-6)

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Percentage weight loss of organs in malnutrition

- liver 8%
- kidneys 10-15%
- spleen 15%
- heart 15-20%
- brain unchanged or reduced
- adrenal glands 15-20%
- thyroid unchanged
- pituitary slight increase

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Stress and Eating

- Fasting triggers **hyperactivation of the hypothalamic-pituitary adrenal stress axis**: elevated CRH and cortisol (stress hormone) suppress appetite.
- In some forms of stress characterized by behavioral inhibition, **noradrenergic system activation may prevail** over the HPA axis. In these cases, CRH inhibition may reduce appetite suppression, promoting anxiousity and disorganized hunger.

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Fasting

Nutritional practice characterized by the complete abstinence from all nutrients for a defined period of time.

It differs from caloric restriction, in which caloric intake is reduced by 25 to 40%, but the frequency and regularity of meals are maintained.

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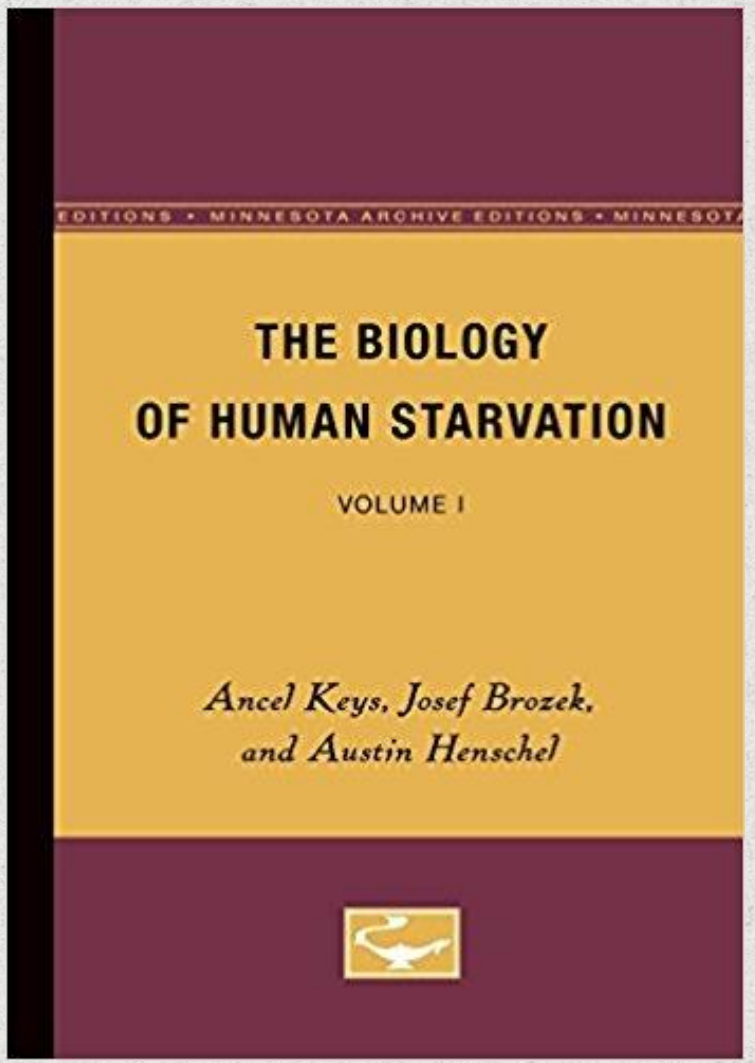

History of Nutrition

They Starved So That Others Be Better Fed: Remembering Ancel Keys and the Minnesota Experiment

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The Johns Hopkins School of Medicine, Baltimore, MD

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The *Minnesota Starvation Experiment* is the most important study evaluating the effects of caloric restriction and weight loss in normal-weight people

The study was conducted by Ancel Keys et al. at the University of Minnesota

More than 100 men volunteered for the study as an alternative to military service; the **36 selected men** had the best physical and psychological health, as well as the strongest commitment to the study's objectives.

During the first **three months** of the experiment, volunteers ate normally while their behavior, personality, and eating patterns were monitored.

Figure: Cover of the recruitment brochure for the *Minnesota Starvation Experiment*. May 27, 1944.

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During the following **six months**, participants were subjected to a restriction corresponding to approximately half of their initial caloric intake; this regimen resulted in an average loss of approximately **an approximate loss of 25% of their initial body weight.**

The six months of weight loss were followed by **three months of nutritional rehabilitation**, during which the men were gradually re-fed normally. A subgroup was followed for nearly **nine months** after normal nutrition had resumed.

Most results were reported for only 32 men, as four of the participants had withdrawn during or at the end of the caloric restriction phase.

Figura: Copertina dell'opuscolo di reclutamento per il *Minnesota Starvation Experiment*. 27 maggio 1944.

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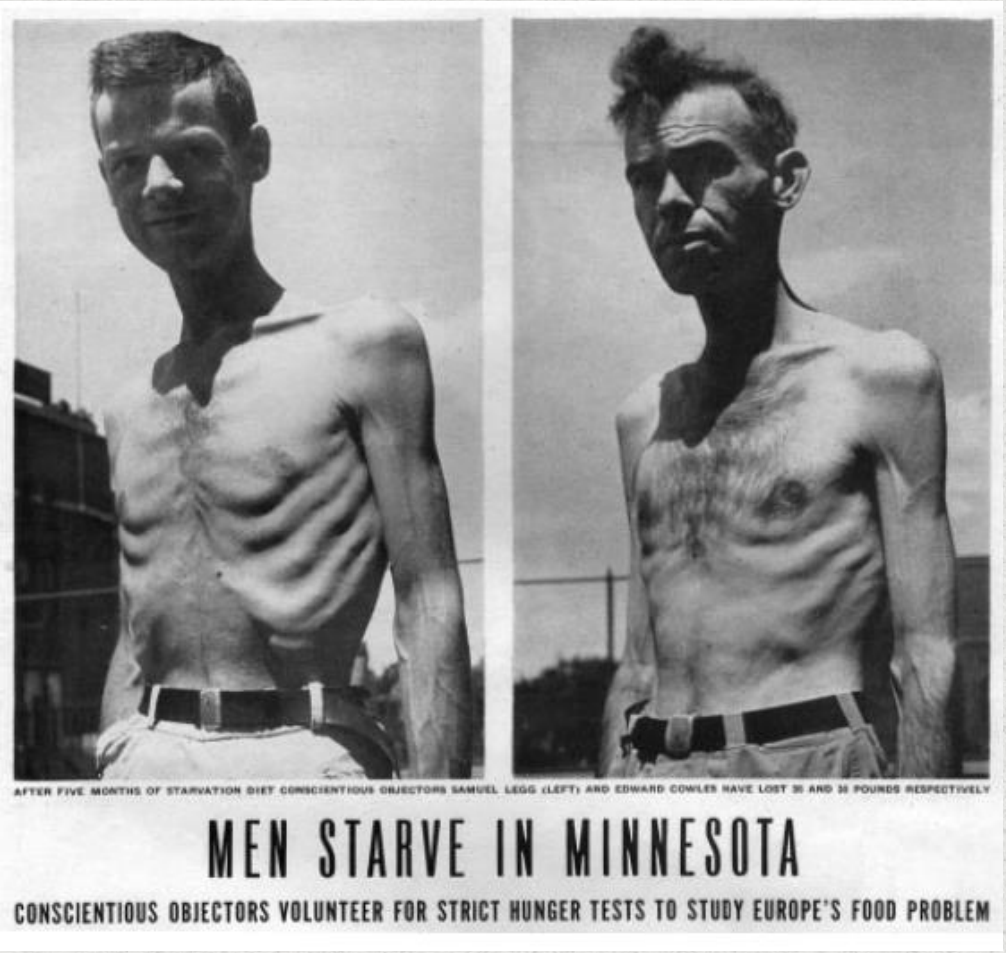

Changes in Eating Behavior

Toward the end of the caloric restriction period, the volunteers:

- spent two hours eating a meal that previously took them only a few minutes.
- spent hours planning how to divide their daily food ration.
- nineteen of them began reading cookbooks and collecting recipes.
- there was an increase in coffee and tea consumption (>15 cups) or large amounts of liquids (water and soups);
- they mixed foods in unusual ways, with a notable increase in the use of salt and spices.
- chewing gum consumption — up to 40 packs per day for some participants —smoking and nail-biting increased markedly.

Many of these changes persisted throughout the 12 weeks of weight recovery.

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During the caloric restriction phase, all participants reported an **increase in hunger**; some managed to tolerate it, while for others it became an intense preoccupation, ultimately becoming insopportabile.

Several of the conscientious objectors were unable to adhere to the diet and experienced **binge eating episodes**, followed by self-reproach and self-deprecation.

During the weight recovery phase, when offered large amounts of food, many participants **lost control of their appetite, eating more or less than needed**

Even after 12 weeks of rehabilitation, increased hunger was reported immediately after a large meal.

Normalization of eating habits occurred in most cases only after approximately five months of rehabilititazione, but in a subgroup, excessive food consumption continued.

No discriminating factor was identified between those who normalized their eating and those who continued to consume enormous quantities of food; there were **enormous individual differences in response to malnutrition**.

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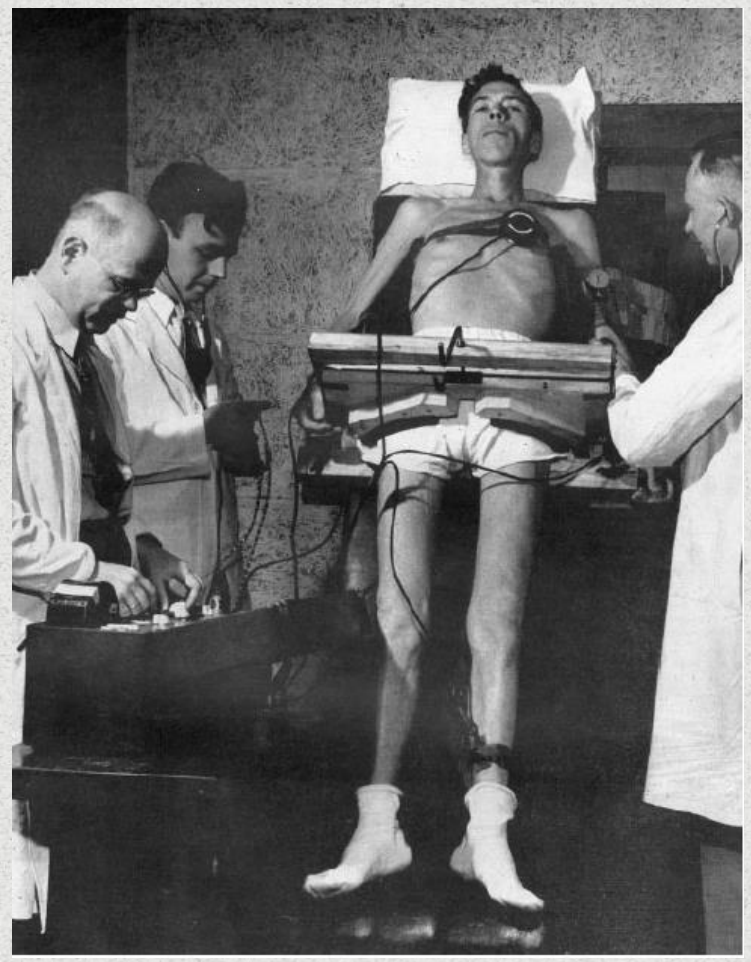

Emotional Changes

Many participants, despite being psychologically healthy at the outset, showed significant emotional chmotive.

Some went through transient or prolonged periods of depression; occasionally a **state of euphoria emerged, followed by depression**.

Although all volunteers had shown high stress tolerance before the study, many of them exhibited frequent signs of **irritability and outbursts of anger**. In many participants, **anxiety** was highly evident; apathy became common.

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The *Minnesota Multiphasic Personality Inventory* (MMPI) — a well-known personality questionnaire — found that during caloric restriction there was an **increase in depression, hysteria, and hypochondria, the so-called "neurotic triad,"** commonly observed in neurotic individuals. These emotional disturbances did not resolve immediately, but persisted for many weeks. During the caloric restriction phase, moreover, two of the volunteers developed **psychotic-level disturbances**, and one of them cut off three of his fingers in response to his distress.

The study shows that emotional responses to caloric restriction vary considerably from person to person, and that personality does not determine the emotional response to food deprivation. Since emotional difficulties do not resolve immediately during rehabilitation, it may be hypothesized that these disturbances are linked to tali alterazioni siano legate ai **low body weight levels** rather than caloric restriction. The study suggests that many psychological disturbances observed in underweight individuals with eating disorders may simply be the result of malnutrition.

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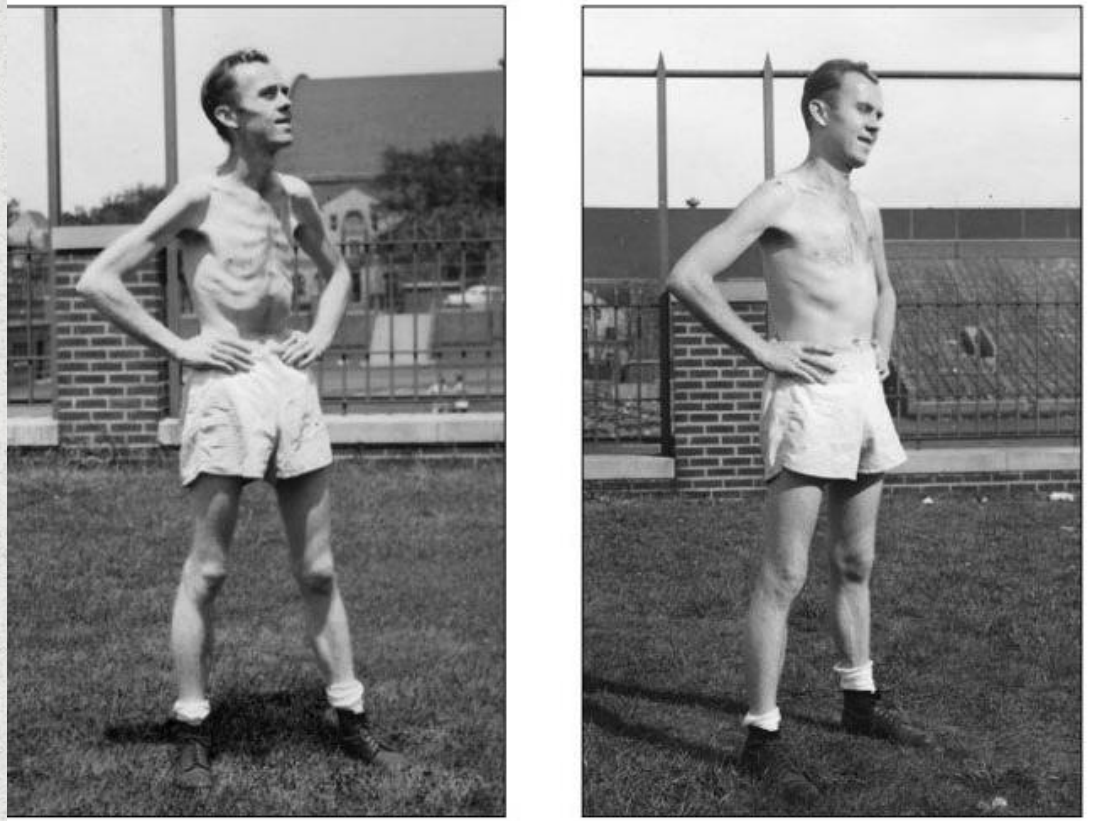
Physical Activity

In general, the men responded to caloric restriction with a **reduction in physical activity**. They became tired, weak, inattentive, and apathetic, and complained of a lack of energy. The volunteers' movements became noticeably slower.

Some attempted to lose more weight by trying to **burn more energy in order to obtain a larger bread ration or avoid having their portions reducedrazioni**. This behavior is similar to the practice of some individuals with eating disorders who believe that if they exercise more strenuously they are allowed to eat a little more. The difference is that for those with eating disorders, the caloric restriction is self-imposed.



Dan Miller during the twenty-fourth week of starvation, and during the recovery period. Miller's 24.5 percent weight loss was typical. *Courtesy of Henry Scholberg*

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Body Weight

After the weight loss phase of at least 25% of initial body weight, participants underwent many months of refeeding that brought them back on average to their original weight, increased by 10%; they then gradually returned to the weight levels they had before the experiment.

Minnesota Starvation Experiment: Value and Limitations

What it demonstrates

Malnutrition can produce:

- obsessiveness;
- depression;
- ritualistic behavior;
- social withdrawal.

What it does NOT demonstrate

It does not explain:

- body image disturbance;
- ego-syntonic nature of the symptom;
- the identity function of weight control.

Malnutrition **does not fully account for** the psychopathology of anorexia.

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Anorexia Nervosa

- It is not only a disorder of weight
- It is not only a cognitive disorder
- It cannot be explained by malnutrition alone
- It is a complex, biopsychosocial disorder

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Treatment: NICE 2017 - Adults

Ongoing support: provide support to all people with anorexia nervosa under specialist care, regardless of the specific treatment being received.

Key elements of support:

- **Psychoeducation:** provide accurate information about the nature of the disorder.
- **Monitoring:** ongoing monitoring of weight, physical/mental health, and risk factors.
- **Multidisciplinary Approach:** coordination among the various services involved.
- **Involvement:** include family members or caregivers in the care pathway (when appropriate).

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