

# Restrictive Anorexia Nervosa (RAN): Through a DEVELOPmental, not MENTAL, Lens

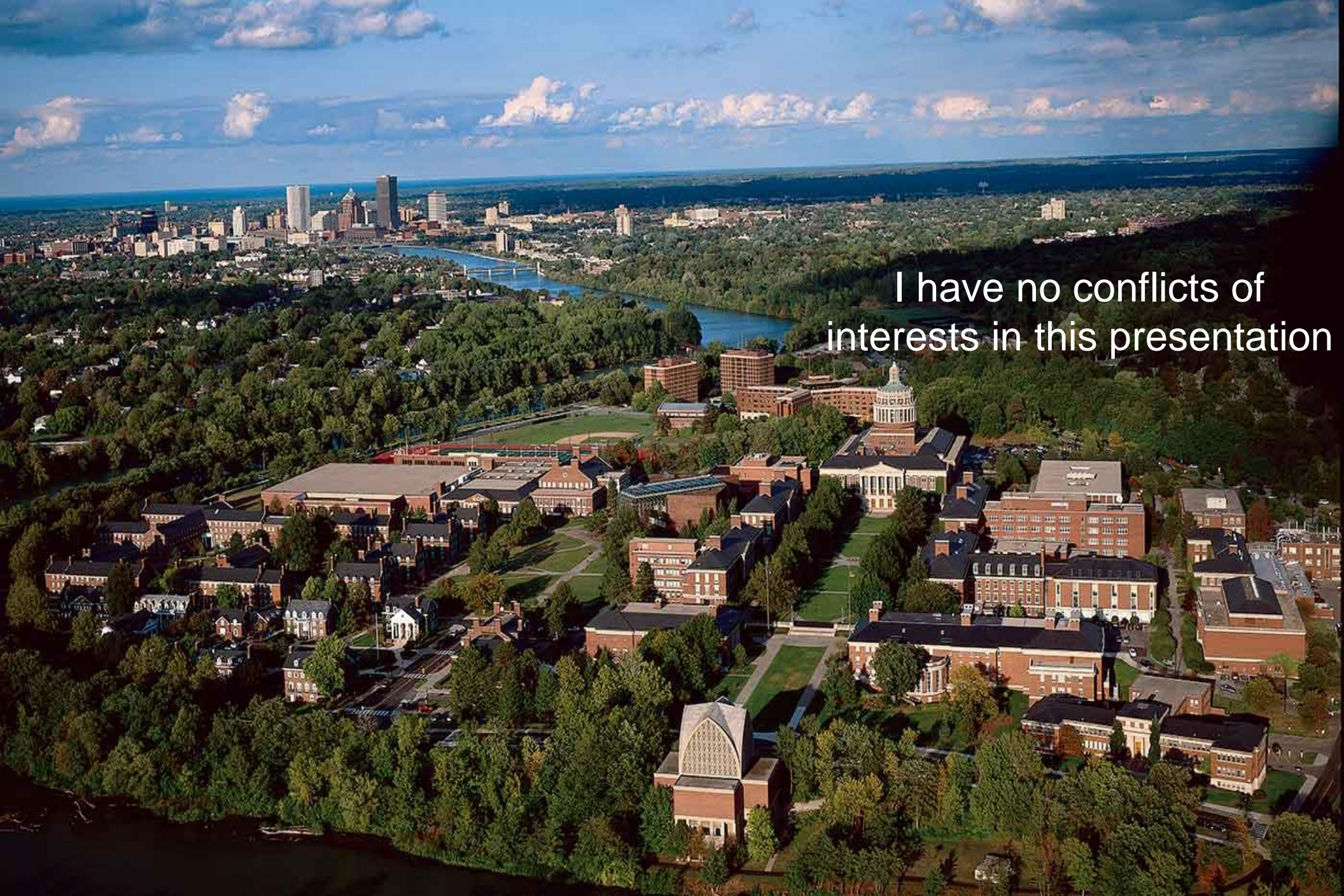
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Cigna Behavioral Health Series: Eating Disorders  
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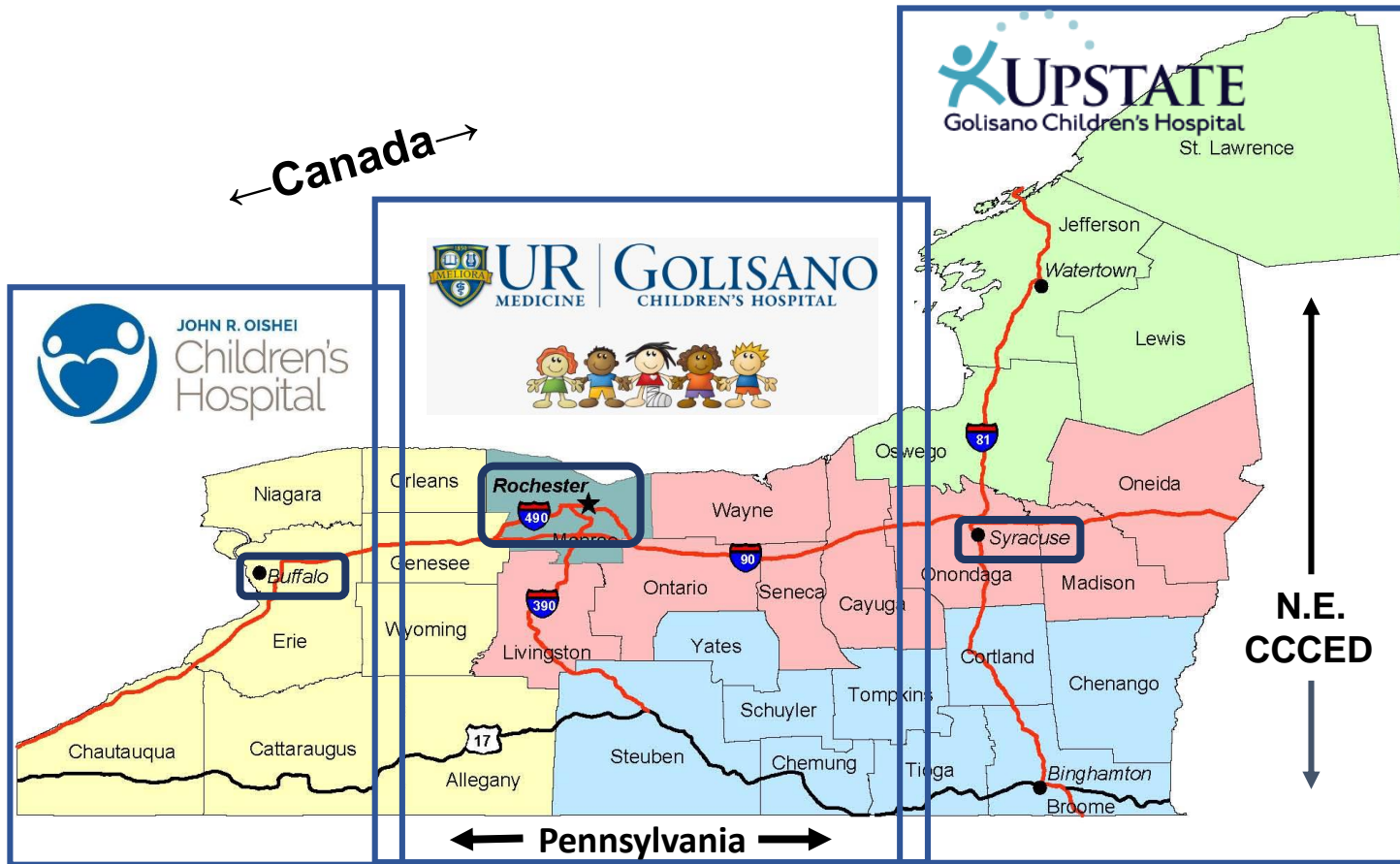




I have no conflicts of interests in this presentation



# Western New York Comprehensive Care Center for Eating Disorders Region Created By New York State Public Health Law Article 27-j\*



\* [www.newyork.public.law/laws/n.y.\\_public\\_health\\_law\\_article\\_27-j](http://www.newyork.public.law/laws/n.y._public_health_law_article_27-j)



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## Eating Disorders

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Whether you're affected by an eating disorder or know someone who is, these free seminars will give you information that may be helpful for you or someone you love.

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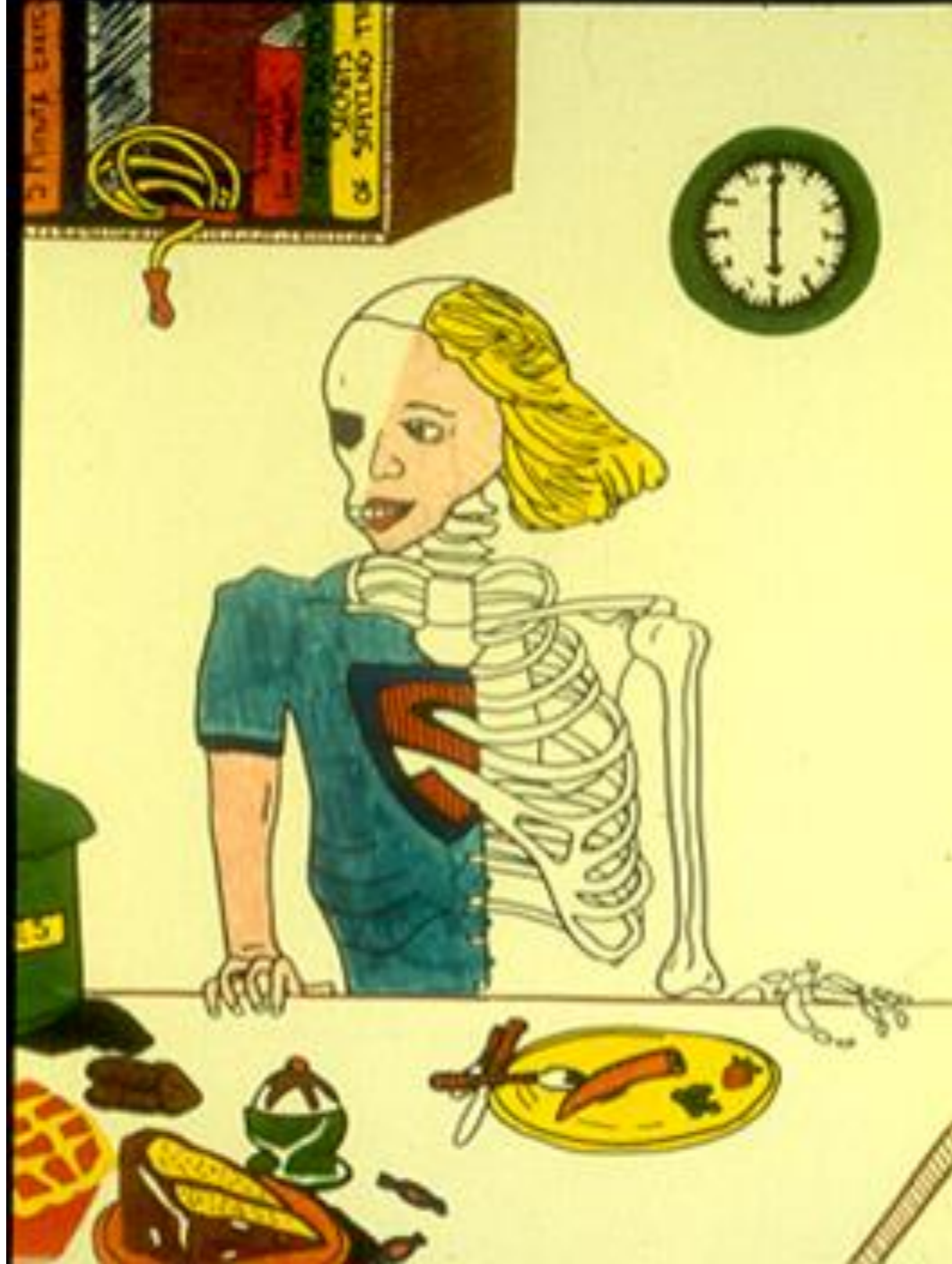
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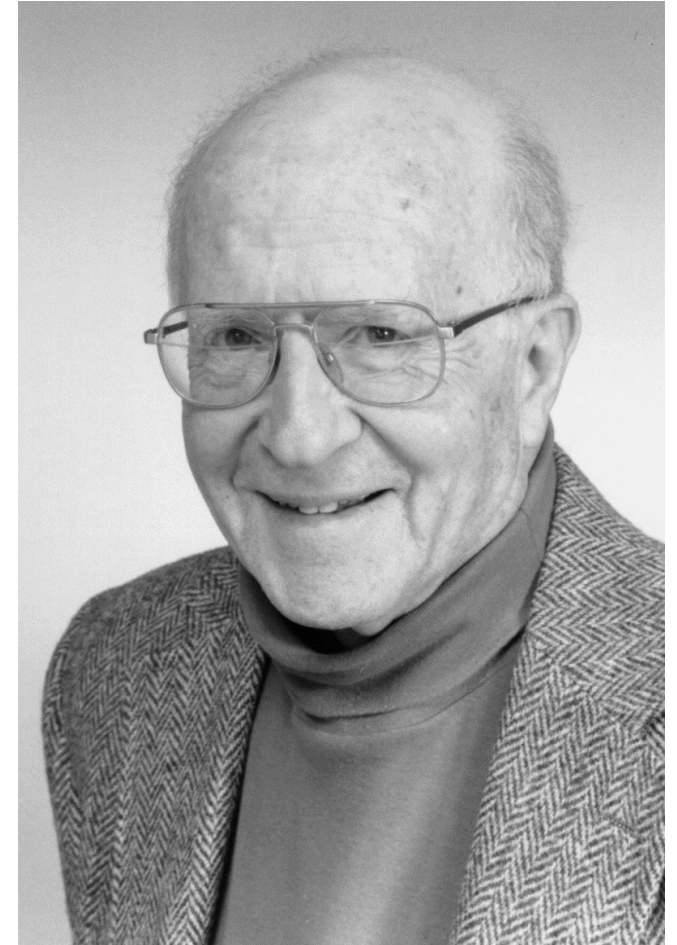
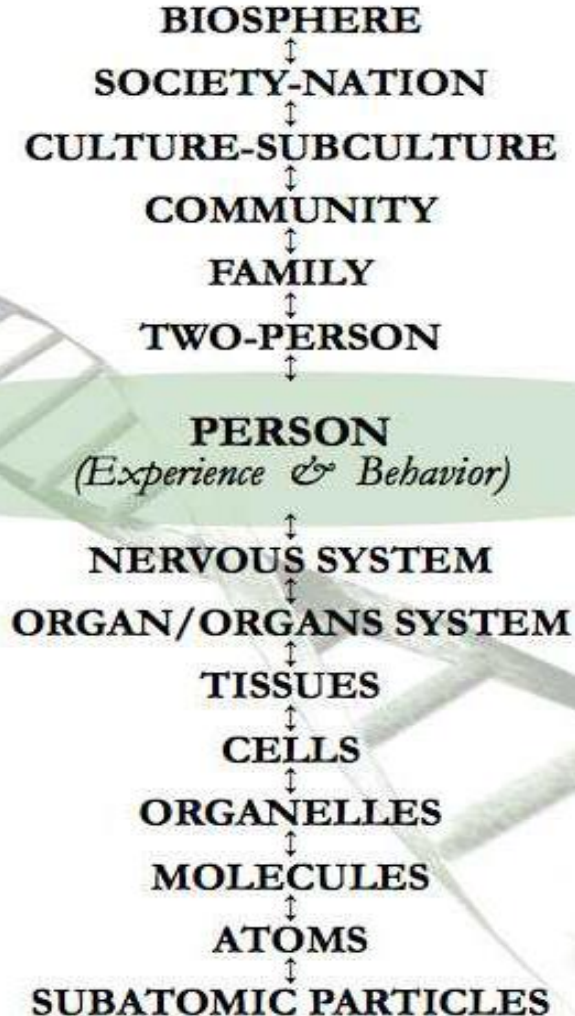
# Learning Objectives

- Describe transformative features of adolescence: puberty, identity, autonomy & brain maturation linked to emergence of—and recovery from—RAN.
- Frame RAN as a DEVELOPmental (not solely MENTAL health) condition with serious biological, psychological and social effects.
- Focus on developmental assets of youth and families (e.g. Applied Positive Psychology) while treating associated anxiety, depression and obsessive/compulsive (O/C) traits.





# Biopsychosocial Approach: Hierarchy of Natural Systems



*Amer J Psychiatry. 1980:137*

# DSM-5 Diagnostic Criteria: Anorexia Nervosa

1. Restriction of energy intake relative to requirements, leading to a significantly low body weight in the context of age, sex, developmental trajectory, and physical health.
2. Intense fear of gaining weight or becoming fat, or persistent behavior that interferes with weight gain, although at significantly low weight.
3. Disturbance in the way one's body weight or shape is experienced; undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of low body weight.
4. Severity: Minimum level based on BMI (adults) or BMI%ile (children and adolescents), but may be increased by
  - a. Clinical symptoms
  - b. Degree of functional disability
  - c. Need for supervision

American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA, 2013



# RAN: Life Course Factors

- *Predisposing* (or protective) factors
  - Individual (biological, psychological, social)
  - Family (genetic, environment)
  - Environment (school, media, etc.)
- *Precipitating* factors
  - Puberty (hormonal and physical)
  - Transitions (self, family, friends)
  - Environment (school, media, relationships)
- *Perpetuating* factors
  - Biological (starvation, “addictive” behaviors)
  - Psychological (coping, stress reduction)

after Garfinkel, circa 1981

## **RAN: *Predisposing* Individual Factors**

- **Biologic (Anxiety, Mood, O/C traits or disorder)**
- **Dichotomous thinking**
- **Perfectionism (“Best little girl (boy) in the world”)**
- **Low self-efficacy**
- **Punitive self-regulation**

## **RAN: *Predisposing* Family Factors**

- **Genetic: Eating disorder, Anxiety, Mood, OCD**
- **Disordered eating, weight control habits**
- **Family health problems (e.g. obesity, diabetes)**
- **Perceptions about body image issues in family**
- **Teasing by fathers and brothers**



# RAN: *Predisposing Cultural Factors*

- Thin ideal (sports, clothing, etc.)
- “Meaning” of thinness
- Peer group interactions



2004

Lindsay  
Lohan



2006

# **Normal Adolescent Development as a *Precipitating Factor in RAN: Loss of Control***

- ***Puberty* (Tanner):** girl-to-woman, boy-to man, other
- ***Identity* (Erikson):** child-to-adult (define/be defined)
  - 1) Am I normal? (compared to others my age)
  - 2) Who am I, different from peers? (what makes me unique)
  - 3) Who am I, in relation to others? (relationships, jobs, etc.)
- ***Autonomy* (Gilligan ♀/Way ♂):** childhood-to-adulthood
  - *In A Different Voice / Deep Secrets (Crisis of Connection)*
- ***Thinking* (Piaget/Giedd):** reality vs expectations
  - Personal fable; Imaginary audience; Special status
  - Brain: Limbic-to-Frontal/Pre-Frontal circuits develop  
(Lizard brain → Wizard brain)

# **RAN: *Perpetuating Factors***

- **Biological reinforcement of physical changes**
  - Primary: “Mind numbness”, eventual loss of appetite
  - Secondary: Loss of menses (females)
  - Brain threat/reward circuits with low intake
- **Psychological reinforcement of behaviors**
  - Primary gain: Action oriented behavior, “mastery”
  - Secondary gain: positive reinforcement of weight loss
  - Brain threat/reward circuits reinforced with low intake



## Affected Biological Systems

- Brain & Peripheral Nerves
- Skin & Hair
- Heart & Blood Vessels
- Blood (Red, White, Platelets)
- Liver
- GI: motility & absorption
- Endocrine (hypothalamic)
  - Thyroid
  - Growth hormone
  - Adrenal
  - Gonads
- Muscles & Bones

Kreipe RE. Assessment of Weight Loss in the Adolescent. Ross Labs. Columbus, OH 1988. Artist: Christopher Lyons, MD

# RAN: Low Energy Intake → Low Metabolism



- Low BP, pulse, temperature (conserve reduced energy)
- Low blood flow to hands (cold, blue, slow color return)
- Absent menstrual periods
- Growth of body hair (lanugo)
- *Hibernation*



**Week 1:**

- Wt. 91#;
- S.G. 1.018;
- HR: 62 →70;
- 36.9°C

Weekly visits



**Week 5:**

- Wt. 91#;
- S.G. 1.020;
- HR: 44→82
- 35.3°C



**Recheck Wt.  
(observed) and  
physical exam**





# Heart Function and Energy Status

- Physical examination
  - Low heart rate (low energy intake)
  - Cold hands/feet (energy conservation)
  - Slow color return after pressure (↓ blood flow)
  - Blue extremities (↓ oxygen in hemoglobin)
  - Positional change in pulse (>25 beats/min)
- Autonomic nervous system malfunction\*
  - Sympathetic/parasympathetic tone imbalance
  - Pulse increases dramatically from lying down to standing or with exercise.

\* Kreipe et al: *Inter J Eat Dis* '94;16:159-65

## Tips: Malnutrition and Low Metabolism

- Symptoms are evidence of body compensating for inadequate energy intake
- Symptoms are related to regulatory controls in the *brain*, not directly related to the *heart*.
- Can double increase in calories and still be 50% lower than maintenance energy needs.
- Must first meet metabolic needs for activity in daily living & “non-exercise activity thermogenesis” before new tissue is created.

## Non-exercise activity thermogenesis (NEAT)

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Non-exercise activity thermogenesis (NEAT) is the energy expended for everything we do that is not sleeping, eating or sports-like exercise. It ranges from the energy expended walking to work, typing, performing yard work, undertaking agricultural tasks and fidgeting. Even trivial physical activities increase metabolic rate substantially and it is the cumulative impact of a multitude of exothermic actions that culminate in an individual's daily NEAT. It is, therefore, not surprising that NEAT explains a vast majority of an individual's non-resting energy needs.

Epidemiological studies highlight the importance of culture in promoting and quashing NEAT. Agricultural and manual workers have high NEAT, whereas wealth and industrialization appear to decrease NEAT.

Physiological studies demonstrate, intriguingly, that NEAT is modulated with changes in energy balance; NEAT increases with overfeeding and decreases with underfeeding. Thus, NEAT could be a critical component in how we maintain our body weight and/or develop obesity or lose weight.

The mechanism that regulates NEAT is unknown. However, hypothalamic factors have been identified that specifically and directly increase NEAT in animals. By understanding how NEAT is regulated we may come to appreciate that spontaneous physical activity is not spontaneous at all but carefully programmed.

# **Low Weight and Refeeding Syndrome**

- **Complication of eating excessive calories after significant weight loss and low metabolism**
- **WW II studies of male research subjects who were “starved” and refed in laboratory setting**
- **Changes in mental status, temperature, fatigue, circulation and heart function as early signs**
- **Congestive heart failure, pancreatic hemorrhage as late signs.**



A F.E.A.S.T.  
FAMILY GUIDE TO THE  
**NEUROBIOLOGY  
OF EATING  
DISORDERS**

F.E.A.S.T. FAMILY GUIDE SERIES  
2<sup>ND</sup> PRINTING - JULY 2014

**PUZZLING SYMPTOMS**  
EATING DISORDERS AND THE BRAIN

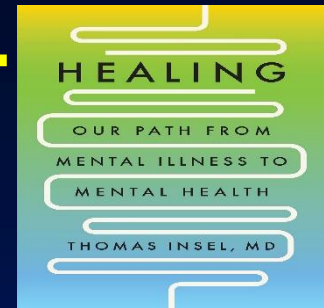
- ✓ Often, a young person has certain traits since early childhood that had nothing to do with food or eating that are early signs.
- ✓ Looking back, most families will remember that the patient had one or more of the following traits even as a young child: anxious, sensitive, obsessive, perfectionist, impulsive, difficult to soothe.
- ✓ These personality traits may indicate differences in brain function that put young people at special risk of developing eating disorders.

- ✓ If they stop eating enough for their growth needs or activity level, their restricted eating can lead to dramatic changes in the brain.
- ✓ Once started, it can be difficult for the young person to get “back to normal” without help.
- ✓ Because of the unique way the person’s brain and body responds to limited nutrition, the longer they are malnourished, the harder it becomes to eat normally again.
- ✓ For some young people a cycle of delaying meals, over-eating, and purging also sets in.
- ✓ Recent work using brain imaging, cognitive testing, and studies of the brain nerve cell functioning to begin to identify some of the key brain mechanisms, pathways and chemical signals underlying eating disorders.
- ✓ While individual pathways to the development of eating disorder are many and may vary from person to person, the key similarities in thoughts and behavior seen in eating disorder patients seem to indicate similar brain disturbances.

- ✓ **How big we feel not only depends on our physical senses but also on our beliefs, memories and emotions.**
- ✓ **It is possible that this information may not be being processed accurately by the brain.**
- ✓ **In fact, some recent imaging work tends to show altered function of the parietal, and related regions of the brain, which are known to regulate body perception.**
- ✓ **The brain is constantly learning and changing. Restoring healthy eating and weight, along with psychotherapy, skills-building, and a supportive environment, can help eating disorder symptoms improve or go away.**
- ✓ **While many underlying traits present since childhood, such as perfectionism or anxiety, may still exist after recovery, they are often manageable, or respond to specific psychotherapy or drug treatments.**
- ✓ **The earlier the intervention, the higher the chance of success, but there is always hope for successful recovery.**

# "Lessons That I Wish I Knew Before" ..

## Dr. Tom Insel, Director of NIMH



- “Clueless” as a parent
- Language matters: Mindful of labels; insight more important than weight or family history.
- Eating disorders...grow insidiously and slowly from one’s temperament, best to identify & treat early.
- Family disorders...providing context to development AND resolution, with focus on expressing emotion.
- Most...go on to do spectacular things as adults, using the very traits that may have taken them into the...eating disorder.

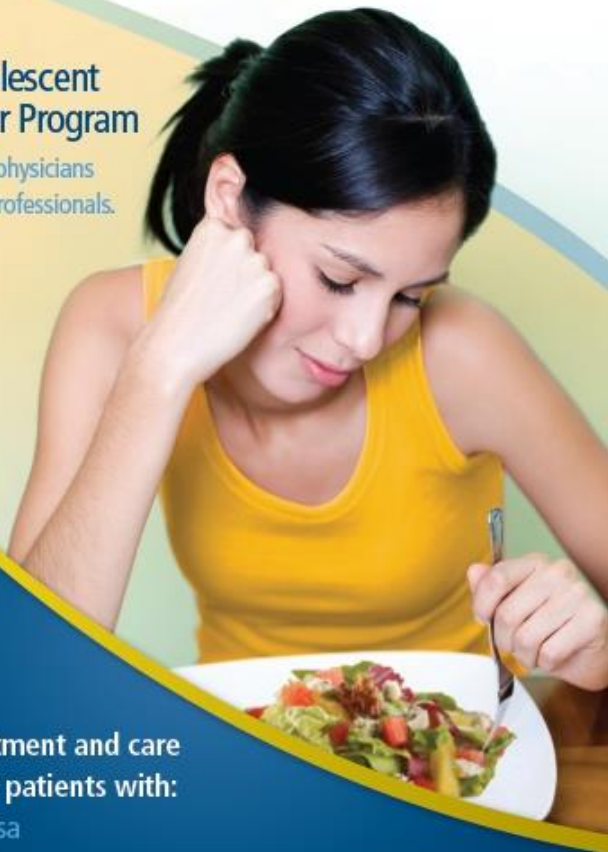


## Summary

- **DSM-5 diagnostic criteria for R.A.N. are less stringent and pejorative, with no weight threshold, and severity is based on thorough clinical assessment.**
- **R.A.N. tends to emerge as an adaptive response to developmental processes of adolescence: puberty, identity, autonomy and brain circuitry maturation.**
- **Dysfunctional brain circuitry, not family dynamics, accounts for much dysfunctional behavior in A.N.**
- **Improvement in metabolism, circulation, and bone health depend on adequate nutrition: Food=Medicine.**
- **Family-based treatment focused on strengths and intra- and inter-personal connections holds promise.**

## Child and Adolescent Eating Disorder Program

A brief summary for physicians  
and other referring professionals.



Evaluation, treatment and care  
coordination for patients with:

- Anorexia nervosa
- Bulimia nervosa
- Eating disorders, not otherwise specified  
(including early or atypical conditions)

# Questions, Comments, Observations

# References—all available free, on-line

- The work of Janet Treasure and colleagues in the “new Maudsley approach” remains the standard of evidence-based treatment for adolescents and families affected by RAN: [www.thenewmaudsleyapproach.co.uk/](http://www.thenewmaudsleyapproach.co.uk/)
- Herpertz-Dahlmann et al. ‘Therapists in action’—Home treatment in adolescent anorexia nervosa: A stepped care approach to shorten inpatient treatment. *European Eating Disorders Review* 2021; Vol.29 (3): 427-442.
- Ganci et al. Exploring alternatives for adolescent anorexia nervosa: adolescent and parent treatment (APT) as a novel intervention prospect. *Journal of Eating Disorders*, 2021; Vol.9 (1): 1-67.
- Lock et al. Feasibility Study Combining Art Therapy or Cognitive Remediation Therapy with Family-based Treatment for Adolescent Anorexia Nervosa. *European Eating Disorders Review* 2018; Vol.26 (1): 62-8.
- Eisler et al. A pragmatic randomized multi-center trial of multifamily and single family therapy for adolescent anorexia nervosa. *BMC Psychiatry* 2016; Vol.16 (1): 422-436.

# References—all available free, on-line

- **Olivo et al. Brain and cognitive development in adolescents with anorexia nervosa: A systematic review o.f FMRI studies. Nutrients 2019; Vol.11 (8): 907**
- **Accurso et al. Is weight gain really a catalyst for broader recovery?: The impact of weight gain on psychological symptoms in the treatment of adolescent anorexia nervosa. Behavior Research Therapy 2014; Vol.56: 1-6.**
- **Accurso et al. Attitudes Toward Family-Based Treatment Impact Therapists' Intent to Change Their Therapeutic Practice for Adolescent Anorexia Nervosa. Frontiers in Psychiatry 2020; Vol.11: 305-**
- **Dimitropoulos et al. Therapist adherence to family-based treatment for adolescents with anorexia nervosa: A multi-site exploratory study. Euro Eating Disorders Rev 2020; 28:55–65.**
- **Goldstein et al. The Effectiveness of Family-Based Treatment for Full and Partial Adolescent Anorexia Nervosa in an Independent Private Practice Setting: Clinical Outcomes. Inter J Eating Disorders 2016; Vol 49 (11):1023–26.**