

# **Biobehavioral Research**

## ***A Collaborative Partnership in Research Focused on Obesity and Bariatric Surgery***

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# In the news...



## Weight loss surgery tied to increase in drinking

Published October 16, 2012

Los Angeles Times | ARTICLE COLLECTIONS

## Gastric bypass and alcohol: mix with caution

March 10, 2011 | Melissa Healy, Los Angeles Times

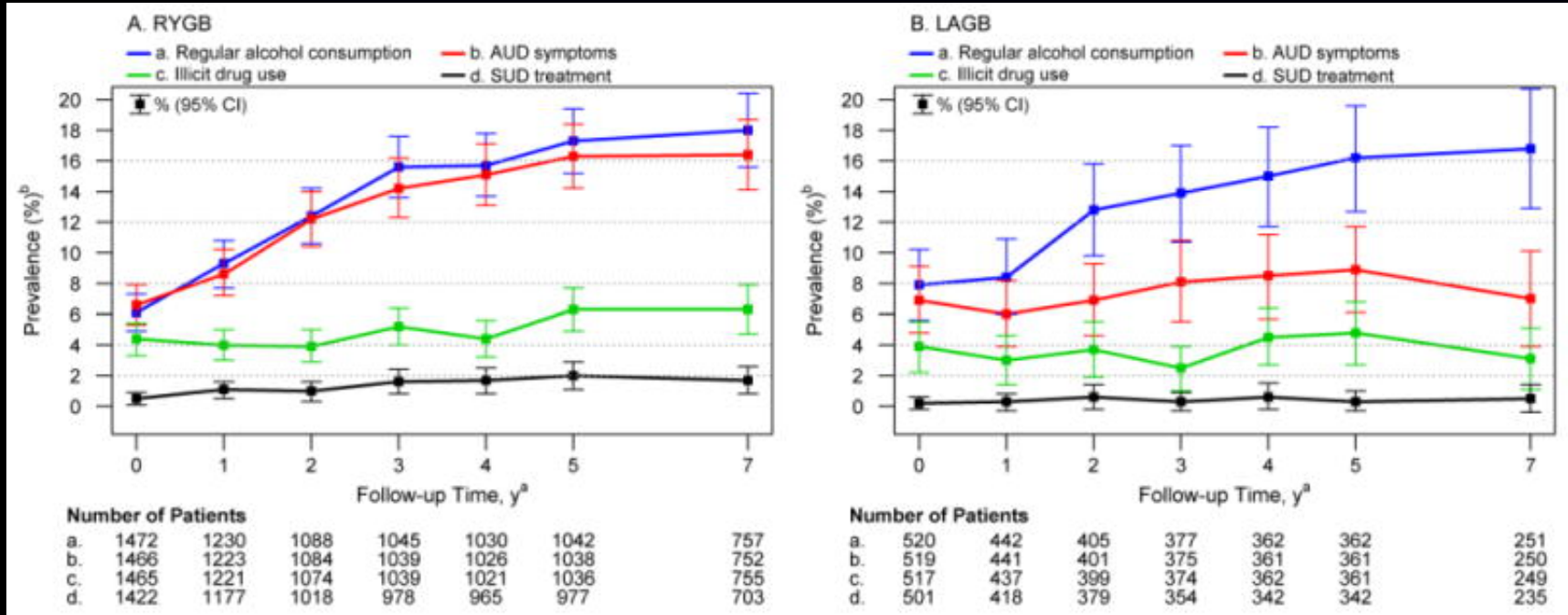
By CBS News Staff CBS News June 18, 2012, 2:33 PM

**Gastric bypass surgery may double a patient's risk for alcohol problems**

# AUD Prevalence

- King et al., 2012 – LABS-2 Data - JAMA
  - AUDIT used to determine AUD
    - Preop: n=106 (7.6%)
    - 1Yr Post-op: n=101 (7.3%)
    - 2Yr Post-op: n=133 (9.3%)\*
      - \* statistically significant increase from baseline and from one year
  - 7.9% of participants without preoperative AUD had postoperative AUD

# 7-Year Follow-Up - LABS



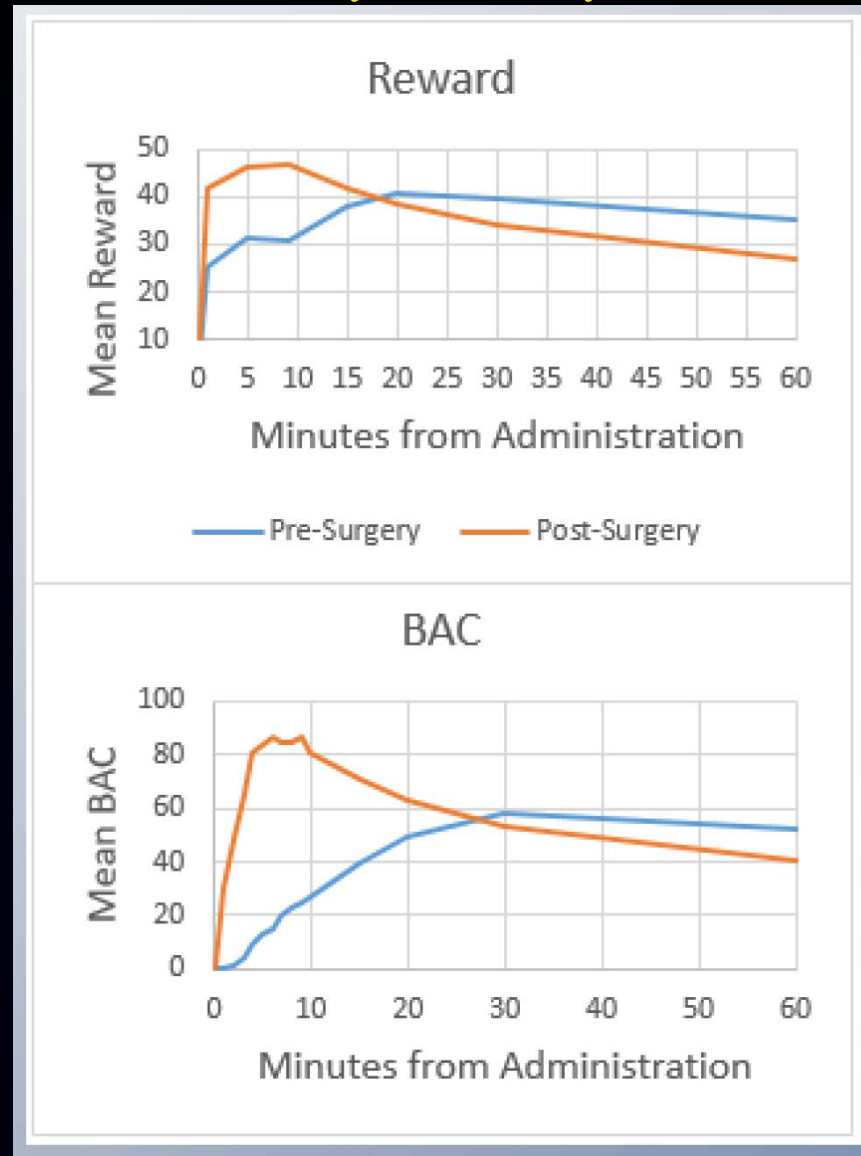
King et al., 2017 - SOARD

# Research in Fargo on AUD

- R03, NIH, 2009
  - Steffen & Engel
    - Ecological momentary assessment and laboratory Assessment to Evaluate the Development of AUD
- R01, NIH, 2014
  - Steffen (NDSU) & Engel (Sanford CBR)
    - Laboratory-based assessment of the pharmacokinetics and impairment associated with alcohol consumption.

# Engel, Steffen, et al. 2020

Presented at the *Obesity Society* annual meeting



# Where to Next...

- Mechanisms for this finding are currently largely unknown.
- Competing Continuation of R01
- Sanford Profile/NDSU funded collaboration
  - Drs. Steffen, Engel, Williams
  - Evaluating alcohol-related reward and naturalistic drinking patterns (SCRAM)

Figure 9. SCRAM



# The “Microbiome”

- Trillions of microorganisms (microbiota or microbes) made up of thousands of species of bacteria, fungi, parasites, and viruses (aka “bugs”) .
- Largest numbers are in the intestines – particularly the colon.
- Other organ systems have their own microbiome – it is not a phenomenon isolated to the intestine/gut.
- The microbiome consists of both symbiotic and pathogenic organisms.
  - Research is often focused on dysbiosis - unfavorable shifts in the microbiome due to disease, diet, drugs, etc.



# Microbiome Gut-Brain Axis

*“The microbes in the gut send messages in the brain and are able to influence cognition, mood, executive function, emotional regulation, stress response, pain, and social behavior.”*

# NIDDK Funding - 1R01AA022336-01A1 & 3R01AA022336-01A1S1

- RFA issued by NIDDK - 2016
  - Psychosocial and Behavioral Mechanisms in Bariatric Surgery (R01)
- “Mechanisms that Predict Weight Trajectory after Bariatric Surgery: the Interactive Roles of Behavior and Biology” (R01DK112585-01)
  - Grant focused on the intersection of behavior and biology – “Biobehavioral”

# 1R01AA022336-01A1 & 3R01AA022336-01A1S1

- Data Collection Centers & Investigative Team

- Sanford Center for Biobehavioral Research/North Dakota State University – Fargo, ND

- Kristine Steffen (Grant PI)
    - Ross Crosby (Co-Investigator - Biostatistician)
    - James Mitchell (Co-Investigator - Bariatrics)

- Cleveland Clinic Lerner College of Medicine at Case Western Reserve University – Cleveland, OH

- Leslie Heinberg (Grant PI)

# 1R01AA022336-01A1 & 3R01AA022336-01A1S1

## • Data Collection Centers & Investigative Team

### – University of North Carolina – Chapel Hill, NC

- Christine Peat (Co-Investigator – Psychological Assessment)
- Ian Carroll (Co-Investigator – Microbiome)

### – University of North Carolina – Charlotte, NC

- Anthony Fodor (Co-Investigator – Metagenomic Sequencing)

### – Brown University, Providence, RI

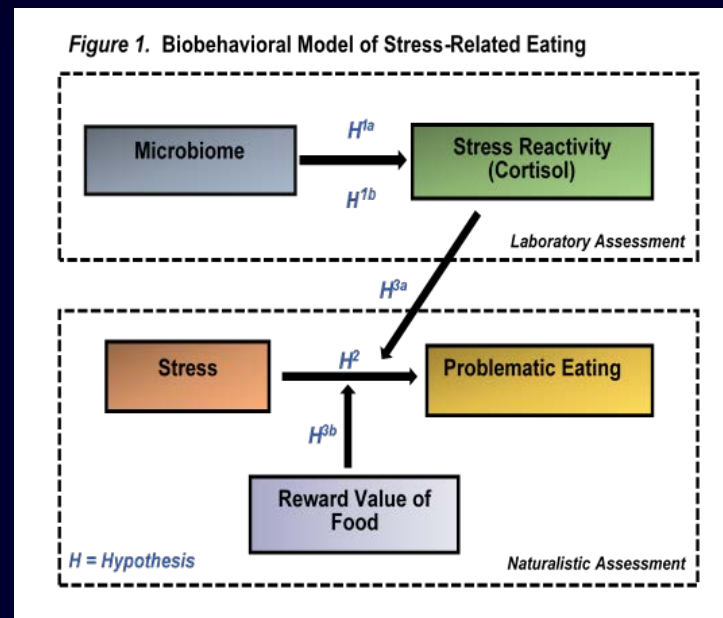
- Dale Bond (Co-Investigator – Physical Activity)

### – Kent State University, Kent, OH

- John Gunstad (Co-Investigator – Cognitive Functioning)

# What's Next?

- Collaborative R01 in data analysis evaluating the relationship of the microbiome with Anorexia Nervosa
  - Partnership between UNC (Ian Carroll), Sanford CBR (Wonderlich) and NDSU (Steffen)
- Collaborative R01 focused on the intersection between behavior and biology between NDSU and Sanford CBR
  - Steffen, Engel, Schaefer, Williams, Crosby, Wonderlich



# What's Next?

- R01 Competing Continuation – June 2021
  - The microbiome appears related to weight outcomes...how?
  - Evaluate the combined contribution of the microbiome and behavioral variables to energy balance and weight outcomes following surgery.
- R01 Animal Study – October 2021
  - Collecting pilot data with Cleveland Clinic.
  - Colonize germ free mice with human microbiome to evaluate the impact on weight and psychiatric status.

# Thank You!

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