Energy Drinks: Lessons Learned from Military Populations

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COI

- Opinions are mine. They do not reflect official polidy of DoD, USU, DoN or any other federal entity
- No other conflicts

Background

- 4 of 5 Americans regularly use caffeine
- Half of US college students use ED
- ED users in the military are younger, of lower rank and have completed less formal schooling than those consuming other caffeinated beverages

Systematic Review-Adults

- "The findings from this review do not allow definitive dietary recommendations to be made regarding safe levels of ED consumption; caution should be exercised when consuming these drinks until further high-quality research is undertaken to substantiate findings"
  - Burrows, et al 2013. Nutr Rev 71(3): 135-148

Adolescents

- "Energy drinks have no therapeutic benefit, and many ingredients are understudied and not regulated. The known and unknown pharmacology of agents included in such drinks, combined with reports of toxicity, raises concern for potentially serious adverse effects in association with energy drink use. In the short-term, physicians need to be aware of the possible effects of energy drinks in vulnerable populations and screen for consumption to educate families. Long-term research should aim to understand the effects in at-risk populations. Toxicity surveillance should be improved, and regulations of energy drink sales and consumption should be based on appropriate research"

  - Seifert, et al. 2011. Pediatrics 127(3):511-528

Pediatrics

- “Although prior studies have examined the effects of caffeine in adolescents, energy drinks should be considered a novel exposure. The high doses of caffeine, often in combination with ingredients with unknown safety profiles, mandates urgent research on the safety of energy drinkuse in children and adolescents. Regulation of pediatric energy drink use may be a necessary step once the health effects are further characterized.”

- Wolk, et al. 2012 Curr Opin Pediatr 24(2): 243-51.

Military (uniquely at risk!)

- 45% of deployed consumed at least one ED daily
- 14% drinking **three or more a day**!
  - More likely to report sleeping ≤4 hours a night.
  - More likely to report sleep disruption related to stress
  - More likely to fall asleep on guard duty

"Service members should be educated regarding the potential adverse effects of excessive energy drink consumption on sleep and mission performance and should be encouraged to moderate their energy drink consumption in combat environments"

MMWR Nov 2012

Background

- Prospective survey to quantify energy drink/shot use in samples of active duty military members
  - Ascertain side effects
  - Determine reasons for use
  - Compare different military ‘communities’

Methods

- 23-item survey
- Email distribution
- Qualitative/Descriptive

  - Promote student research

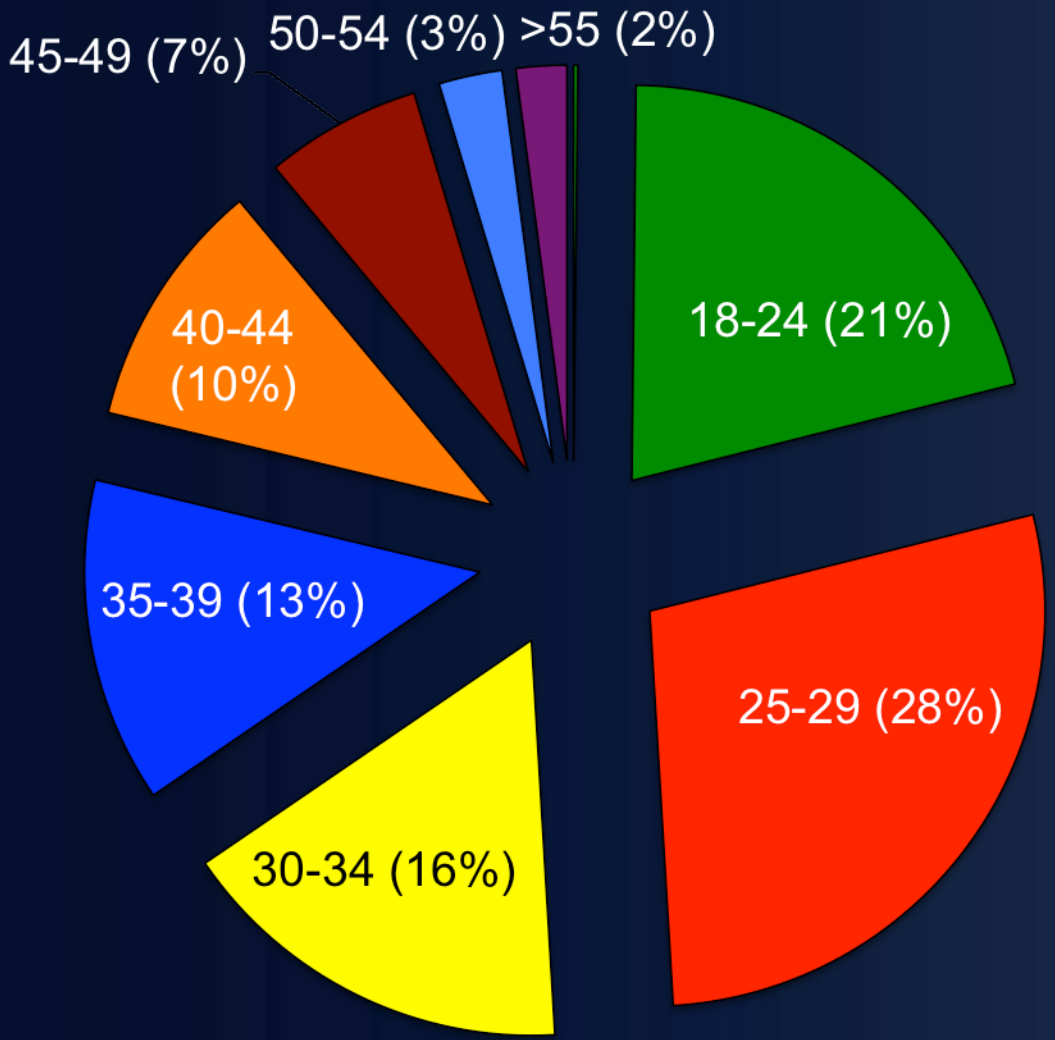
Preliminary Data

- Professional society (MD/DO; n = 131)
- Air Assault Base (n = 278)
- Graduate School (n = 169)
  - Faculty & Students

Results--Demographics

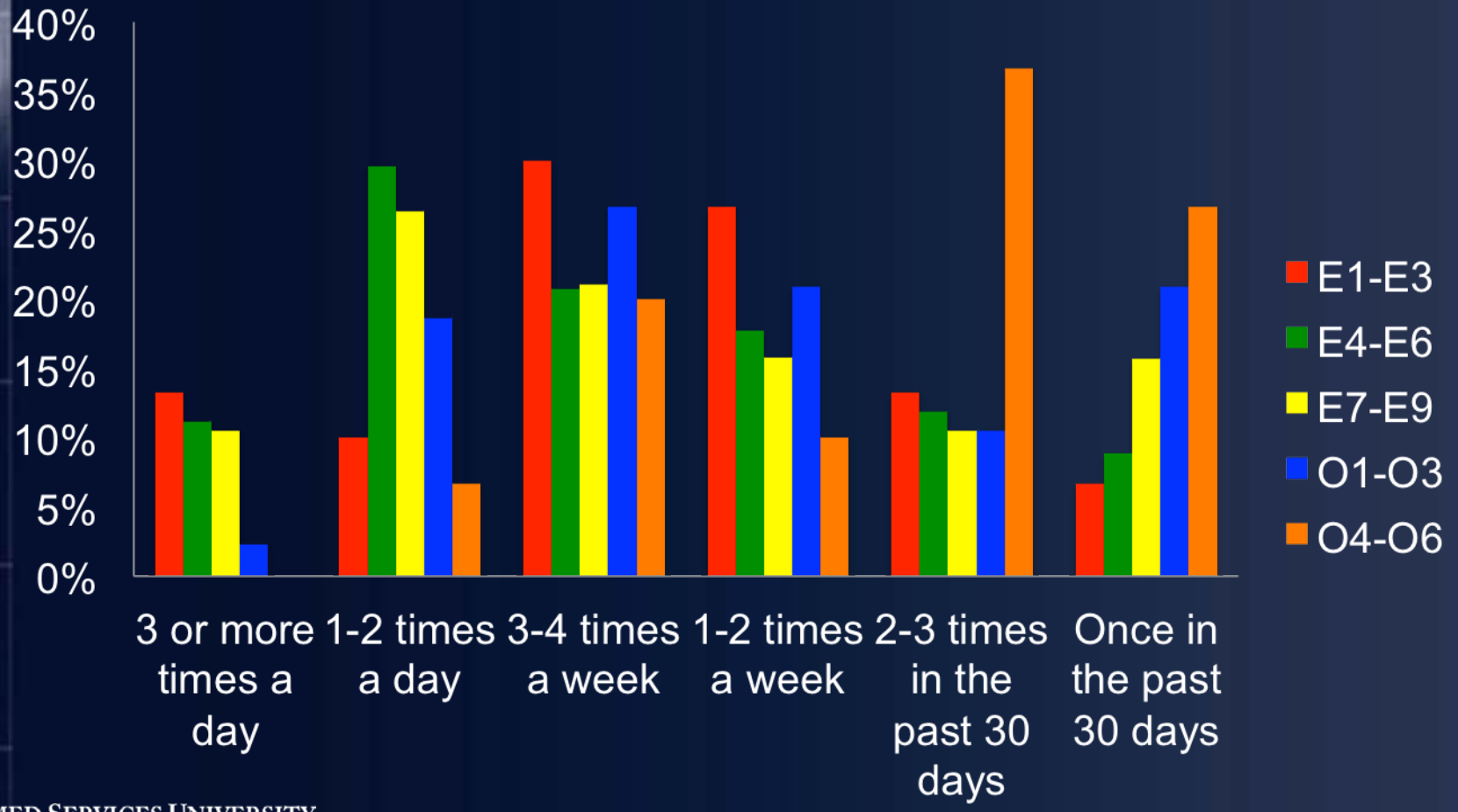
- 75% male
- 95% active duty
- 41% enlisted; 58% officer; 1% no data
- 63% Army; 18% Navy; 17% Air Force; 2% USMC; USCG; PHS

Results-Age



Use in Past 30 days

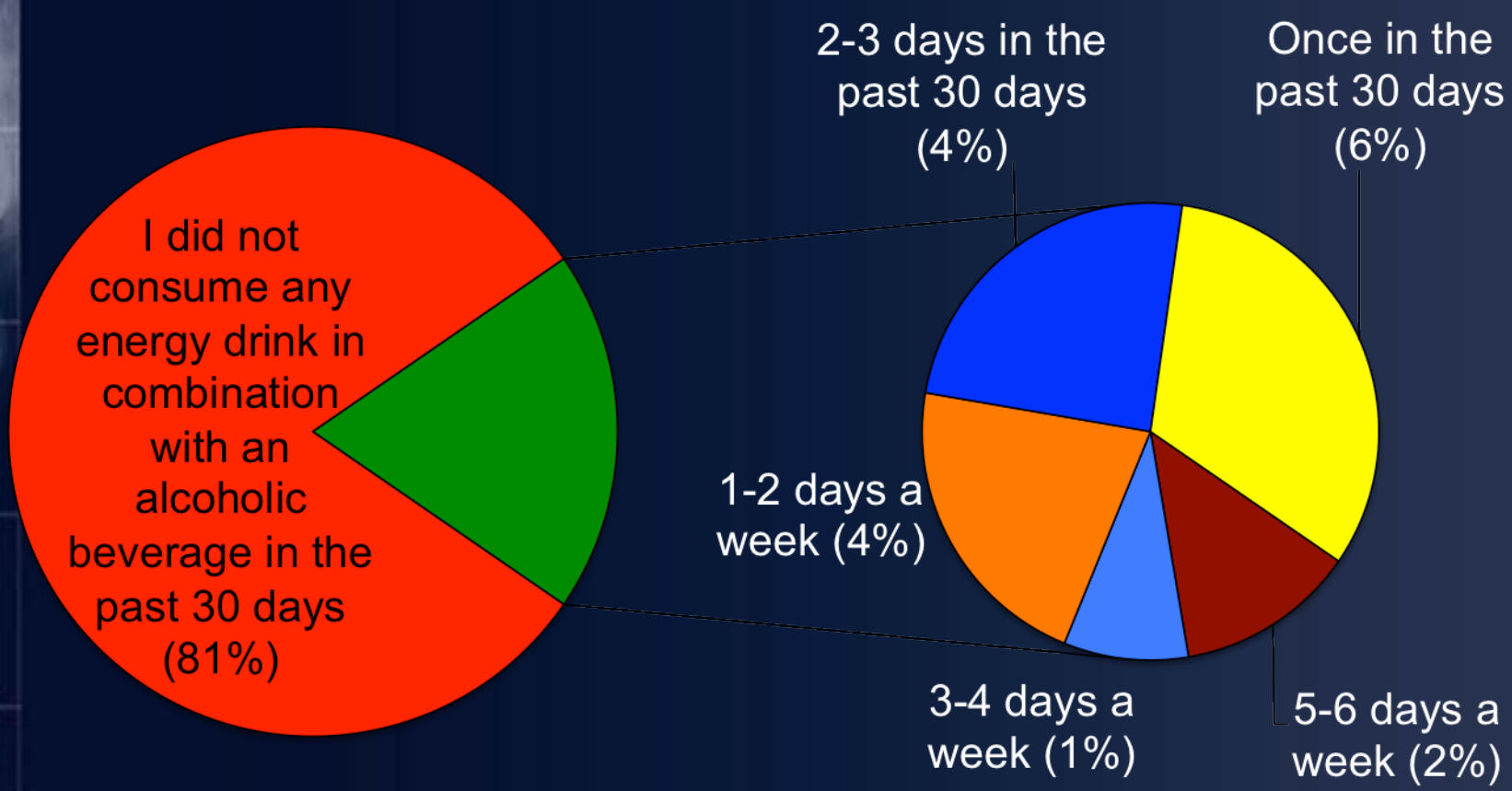
53% of respondents reported use in past 30 days



Reasons for Use

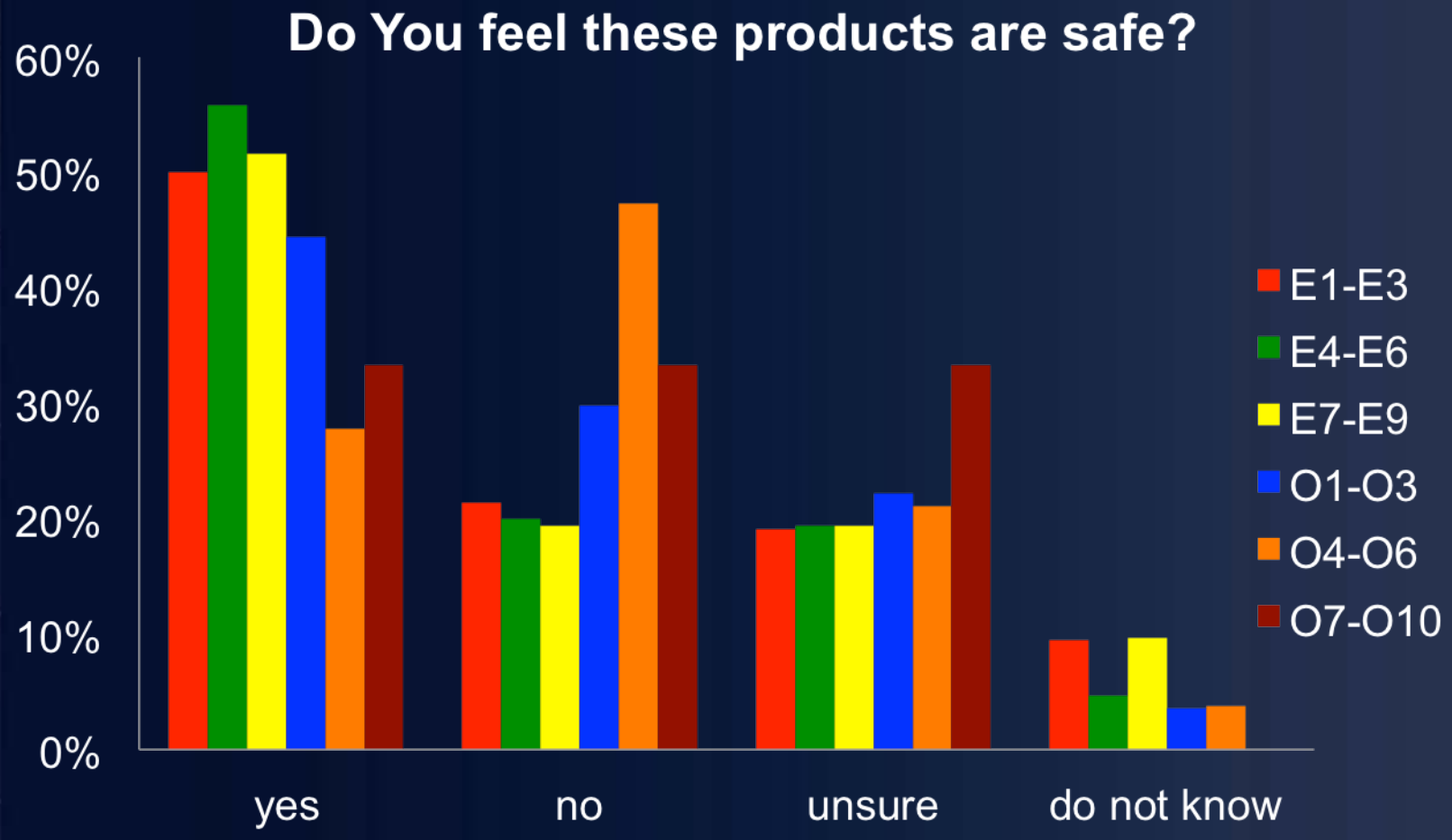
- Energy boost (45%)
- Mental alertness (36%)
- Refreshment (18%)
- Athletic performance (9%)
- Hydration (6%)
- Relaxation (4%)
- Weight Management (2%)

Use of Energy Drinks with Alcohol



AmED vs AMEDD??!!

Product Safety



Self-Reported Effects

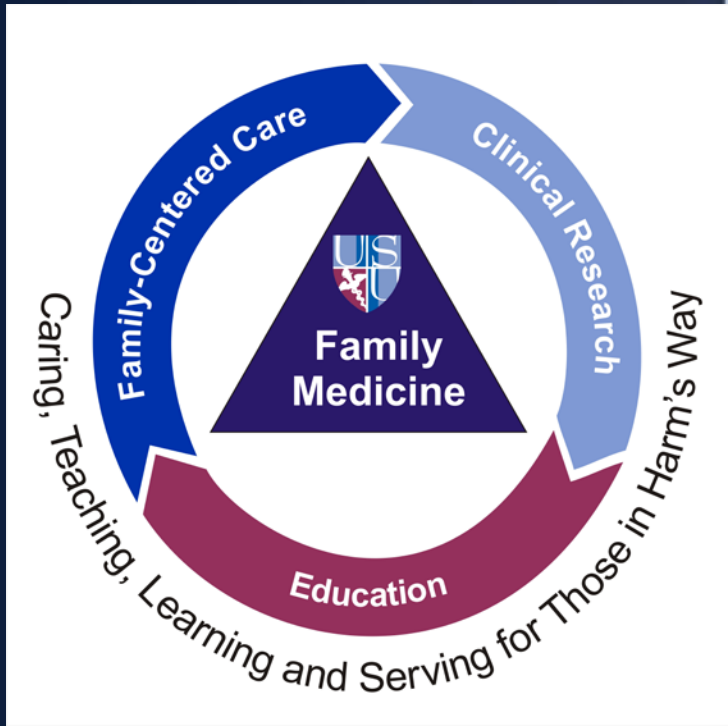
- None (37%)
- Increased mental alertness (36%)
- Increased HR (20%)
- Increased mental endurance (17%)
- Restlessness (14%)
- Difficulty sleeping (14%)
- Improved physical endurance (12%)
- Dehydration (10%)
- Nervousness (7%)
- Heart palpitations (6%)

Composite findings

- ED use common (> 50%)
- Frequent ED (>1/day) use more common in lower ranks
- 20% of respondents AmED use
- Drinks/shots were consumed primarily to boost energy and increase mental alertness
- Tachycardia, restlessness and sleep difficulties most common adverse side effects
- Lower ranks more likely to think safe

Physician Cohort

- Same 23 item survey and methodology
- 131 of 1997 primary care physicians
  - ACGME 80hr week



Results (Physician cohort)

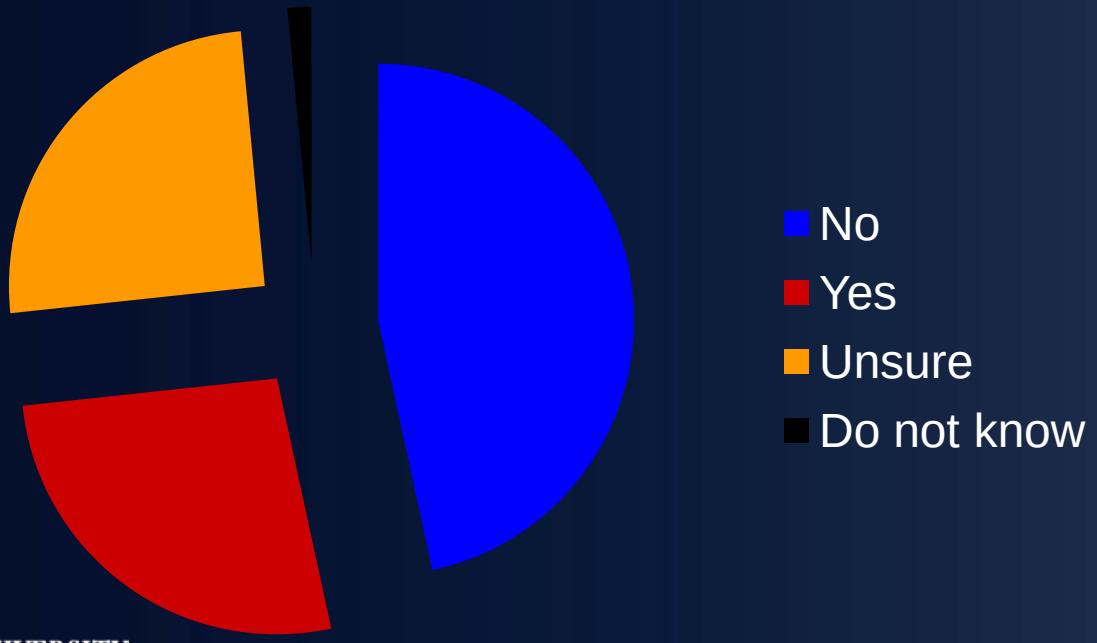
- 27% prior use of ED/ES (vs >50%)
- Reasons for use
  - Energy boost (21%)
  - Mental alertness (18%)
  - Refreshment (5%) audience participation
  - Athletic performance (5%)
  - Hydration (2%)
  - Weight management (2%)

Results (Physician cohort)

- Side Effects
  - None (44%)
  - Increased mental alertness (21%)
  - Increased mental endurance (10%)
  - Palpitations (7%)
  - Increased HR (6%)
  - Sleep difficulty (7%)
  - Restlessness (5%)
  - Increased physical endurance (4%)
  - Nervousness (4%)
  - Headaches (4%)

Results: Physician knowledge

- 47% felt ‘not safe’; 25% unsure of safety



Summary Findings (Physician Cohort)

- Physician use lower
- Side effects and reasons for use similar
- Some use despite safety concerns

Limitations

- Poor response rate
- ? Generalizability

Shared Lessons

- Youth/adolescent ‘high-risk’ population
- Reasons for use are predictable
  - Motivational interviewing?
- Side effects are predictable
  - ***Where there is smoke there is fire!***
- Role of Patient Centered Medical Home
  - Access to care; anticipatory guidance

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NATURAL MedWATCH™

Adverse Event Report

November 10, 2012

Describe the Adverse Event that Occurred:

Pt reported he missed the N.O. Amplified with Lightning Energy Drink because he did not have any water in his room. After 25 minutes of lifting in the gym, he experienced swollen lips, swollen throat and difficulty breathing. Pt denied chest pain. Pt was hospitalized overnight and discharged back to his unit.

Outcomes that apply to this adverse event:

Hospitalization, either initial or prolonged

Date of event: 11/8/12

List any relevant laboratory data (e.g. liver function tests, renal function, WBCs, etc.):

Upon admission: glucose 217, BUN22, Creat 1.7, Na 133, Cl 96, Mg 1.5, CK 453. Labs 7 hours later were WNL.

Ingredients: Thiamine , Riboflavin, Niacin, Vitamin B6 , Folic Acid, Vitamin B12, Biotin, Pantothenic Acid , Calcium, Potassium , Betaine, Beta-Alanine, L-Leucine, L-Isoleucine, LValine, L-Arginie, L-Citrulline Malate, Yohimbe , Grape Seed , Dicreatine Malate, Creatine Ethyl Ester HCI, Guanidinoacetate, Creatine , L-Arginine , L-Glycine, LMethionine, Caffeine Anhydrous, Medium Chain Triglycerides, L-Carnitine

USAF Energy Drink Survey Schmidt et al 2008

3. Why do you prefer your favorite brand?

These statistics are percentages of responses for only those who reported energy drink usage.

- I prefer the way it tastes **69.49%**
- This one gives me more energy than other brands I've tried **4.66%**
- My friends drink this brand **2.54%**
- I like the way the can looks **0.42%**
- This drink has the highest "cool" factor **1.69%**
- Other **21.19%**

Please list other reasons here:

Examples include price, availability, and health reasons such as lower calories, less jitters, more vitamins, etc.

4. How long have you consumed energy drinks?

- A few months **8.37%**
- 1-3 years **37.02%**
- 4-6 years **18.63%**
- more than 6 years **6.46%**
- I do not regularly consume energy drinks **28.52%**

1. How often do you consume "energy drinks" such as Red Bull, Monster, Viper, etc? (Please select. If you answered "never" you may skip to item #9).

377 Total Surveys are included in this summary

Never	38.46%
Rarely (less than 1 per week)	30.50%
Occasionally (1-6 per week)	23.61%
Regularly (1-2 per day)	5.57%
Frequently (>3 per day	1.33%

61.01% Report Energy Usage with 30.50% reporting Usage at Least once per Week.

2. Please rank-order your top three brands. If you only drink one or two brands, only name one or two.

First Choice	223 Responses
Monster	32.29%
Red Bull	30.04%
Rockstar	10.31%
Full Throttle	7.17%
Rip It	2.69%
Amp	2.69%
Sobe No Fear	3.14%
XS	2.24%
Starbucks Shots	0.90%
Other	8.52%
Second Choice	**159 Responses**
Monster	21.38%
Red Bull	35.22%
Rockstar	13.84%
Full Throttle	8.81%
Rip It	1.89%
Amp	1.89%
Sobe No Fear	4.40%
XS	0.00%
Starbucks Shots	2.52%
Other	9.43%
Third Choice	**61 Responses**
Monster	24.59%
Red Bull	27.87%
Rockstar	6.56%
Full Throttle	13.11%