

# Reliability and validity of past-12-month frequency Items as opening questions for the updated CRAFFT adolescent substance use screening system

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# Financial Support

Grants R01AA021904/R34AA023026 from the **National Institute on Alcohol Abuse and Alcoholism (NIAAA)**

Other support provided by:

- Grant R01AA022493 from NIAAA
- Grants #T71NC0009 (SKH) from the Maternal and Child Health Bureau, HRSA, USDHHS

# Disclosures / Funding

- **Conflict of interest statement:**
  - I have no commercial relationships to disclose
  - I will not be discussing any unapproved uses of pharmaceuticals or devices
  - My views do not necessarily reflect those of any of these bodies, or my academic institution

# Acknowledgements

## **Partnership for Adolescent Substance Abuse Research Site-PIs:**

Traci Brooks MD<sup>1,2</sup>, Laura Grubb MD MPH<sup>3</sup> Ronald Samuels MD<sup>4</sup>,  
Tom Silva MD<sup>5</sup>, Louis Vernacchio MD<sup>6</sup>, Wendy Wornham MD<sup>7</sup>

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Rhines, Jessica Tauber

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MA; <sup>5</sup>East Boston Neighborhood Health Center, East Boston, MA; <sup>6</sup>Longwood Pediatrics,  
Boston, MA; <sup>7</sup>Lexington Pediatrics, Lexington, MA.

# Background



**9 OUT OF 10**

**PEOPLE WITH ADDICTION  
STARTED USING SUBSTANCES  
BEFORE THEY TURNED 18**

Source: <http://www.centeronaddiction.org>



# A Brief Screener for Adolescents, 1999

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**PEDIATRICS**  
& ADOLESCENT MEDICINE

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## A New Brief Screen for Adolescent Substance Abuse

*John R. Knight, MD; Lydia A. Shrier, MD, MPH; Terrill D. Bravender, MD;  
Michelle Farrell; Joni Vander Bilt, MPH; Howard J. Shaffer, PhD*

**Source: Knight JR et al., 1999**

# Original CRAFFT Items

**C** Have you ever ridden in a CAR driven by someone (including yourself) who was “high” or had been using alcohol or drugs?

**R** Do you ever use alcohol or drugs to RELAX, feel better

**A** **Score = Number of “yes” answers (range 0-6)** yourself,

**F** Do you ever FORGET things you did while using alcohol or drugs?

**F** Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?

**T** Have you ever gotten into TROUBLE while you were using alcohol or drugs?



# Validity of the CRAFFT screen, 2002

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& ADOLESCENT MEDICINE

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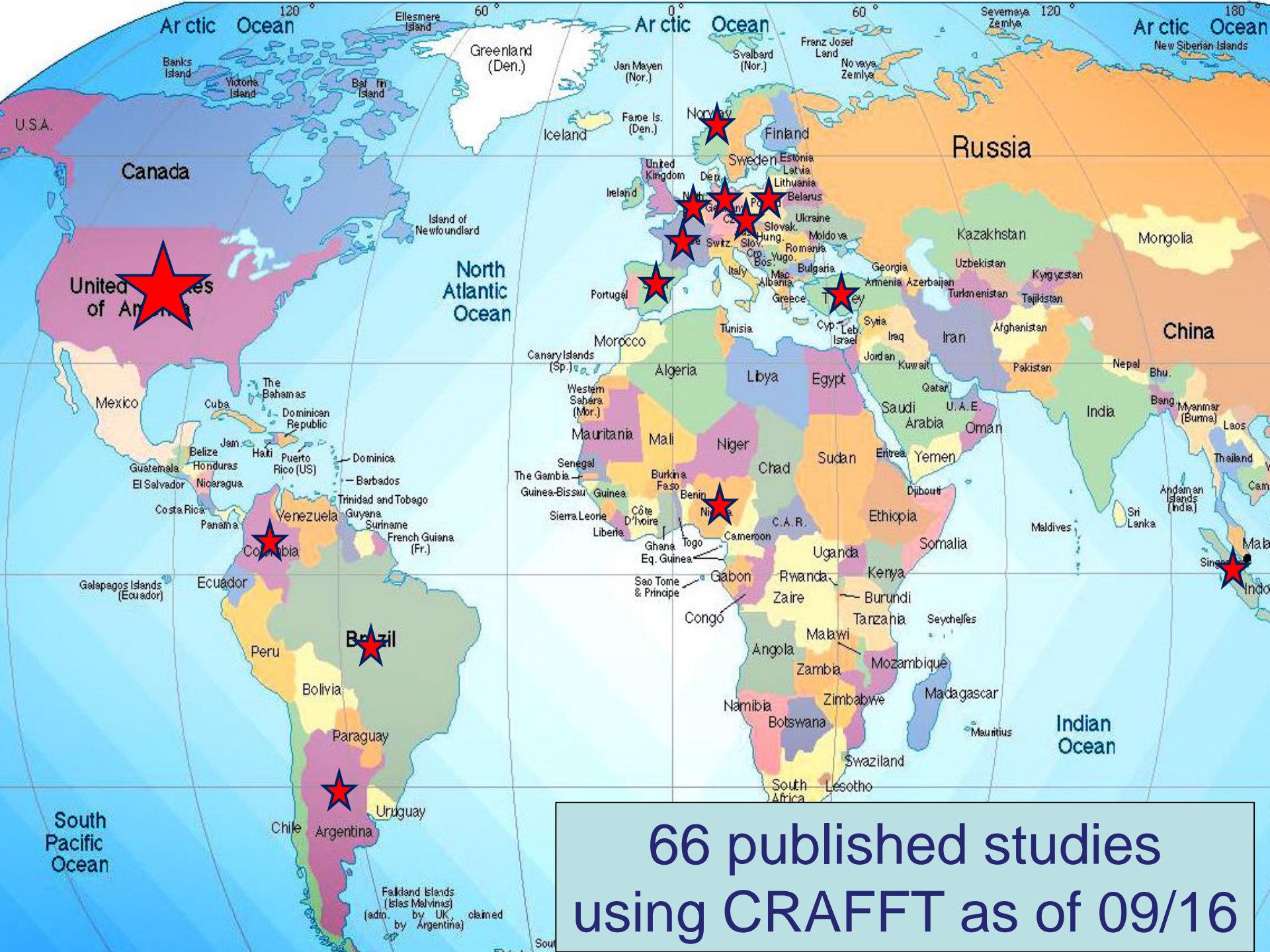
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## Validity of the CRAFFT Substance Abuse Screening Test Among Adolescent Clinic Patients

*John R. Knight, MD; Lon Sherritt, MPH; Lydia A. Shrier, MD, MPH;  
Sion Kim Harris, PhD; Grace Chang, MD, MPH*

**Source: Knight et al., 2002**



66 published studies  
using CRAFFT as of 09/16

## The CRAFFT Screening Questions

Please answer all questions honestly; your answers will be kept confidential

### Part A

During the PAST 12 MONTHS, did you:

Part  
During

1. Drink

2. Smo

3. Use

"any  
and

1. Drink any alcohol (more than a few sips)?

No




Yes




If you answered NO to ALL (A1, A2, A3) answer **only B1** below, then STOP.

If you answered YES to ANY (A1, A2, A3), answer **B1 to B6** below.

2. Smoke any marijuana or hashish?

3. Use anything else to get high?

("anything else" includes illegal drugs, over the counter and prescription drugs, and things that you sniff or "huff")

Part

1. Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?



2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?



3. Do you ever use alcohol or drugs while you are by yourself, or ALONE?



4. Do you ever FORGET things you did while using alcohol or drugs?



5. Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?



6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?



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In 2009, substance *use* opening questions added to ...

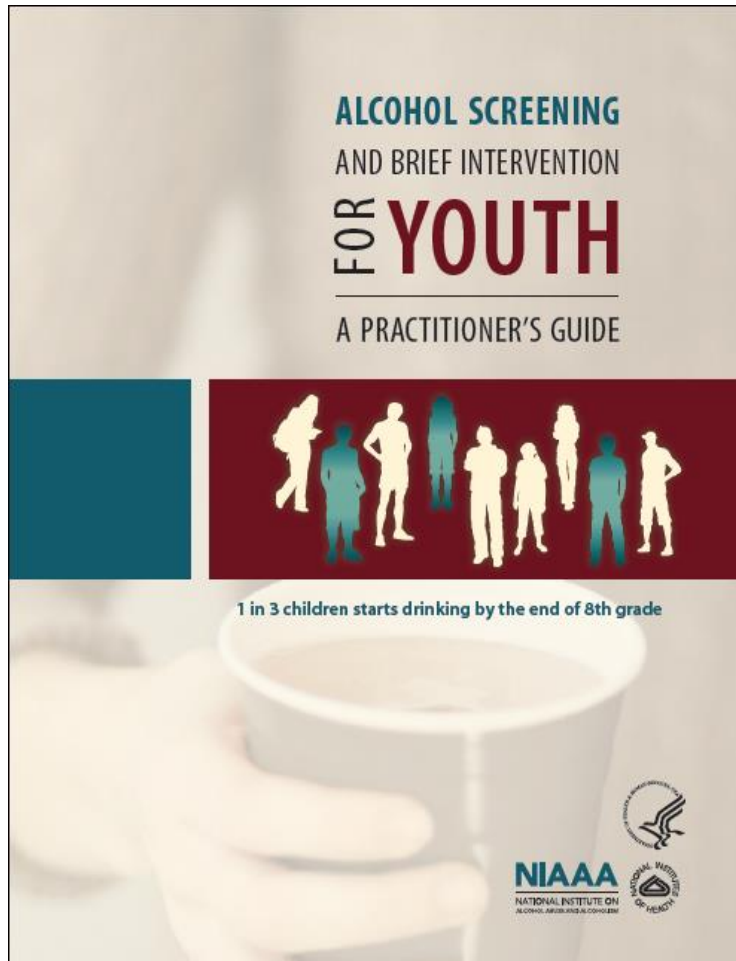
- Increase efficiency and clarity
- Facilitate early intervention

# Validity of “Yes”/”No” Opening Questions by Screening Mode, 2014

	Sensitivity		Specificity	
	%		%	
	iPad	Clinician	iPad	Clinician
Alcohol	62.1	69.0	98.1	96.3
Tobacco	86.0	86.0	98.0	96.0
Cannabis	72.0	79.2	100	99.1

Source: Harris et al., Substance Abuse, 2016;37(1):197-203

# NIAAA Youth Alcohol Screening Guide, 2011



2-item alcohol screener  
for youth

- Have friends who drank in past year?
- Own past-year *number of days* of drinking (frequency)

Item order varies by age group

# The appeal of frequency screening items

- Implicitly conveys expectation that behavior occurs; therefore...
  - May be less prone to social desirability bias and more sensitive than yes/no questions\*
- Captures use-frequency information that can aid clinician assessment and counseling

\* Couper M et al., Soc Sci Comput Rev 2012;31(3)322-345

# Study Rationale

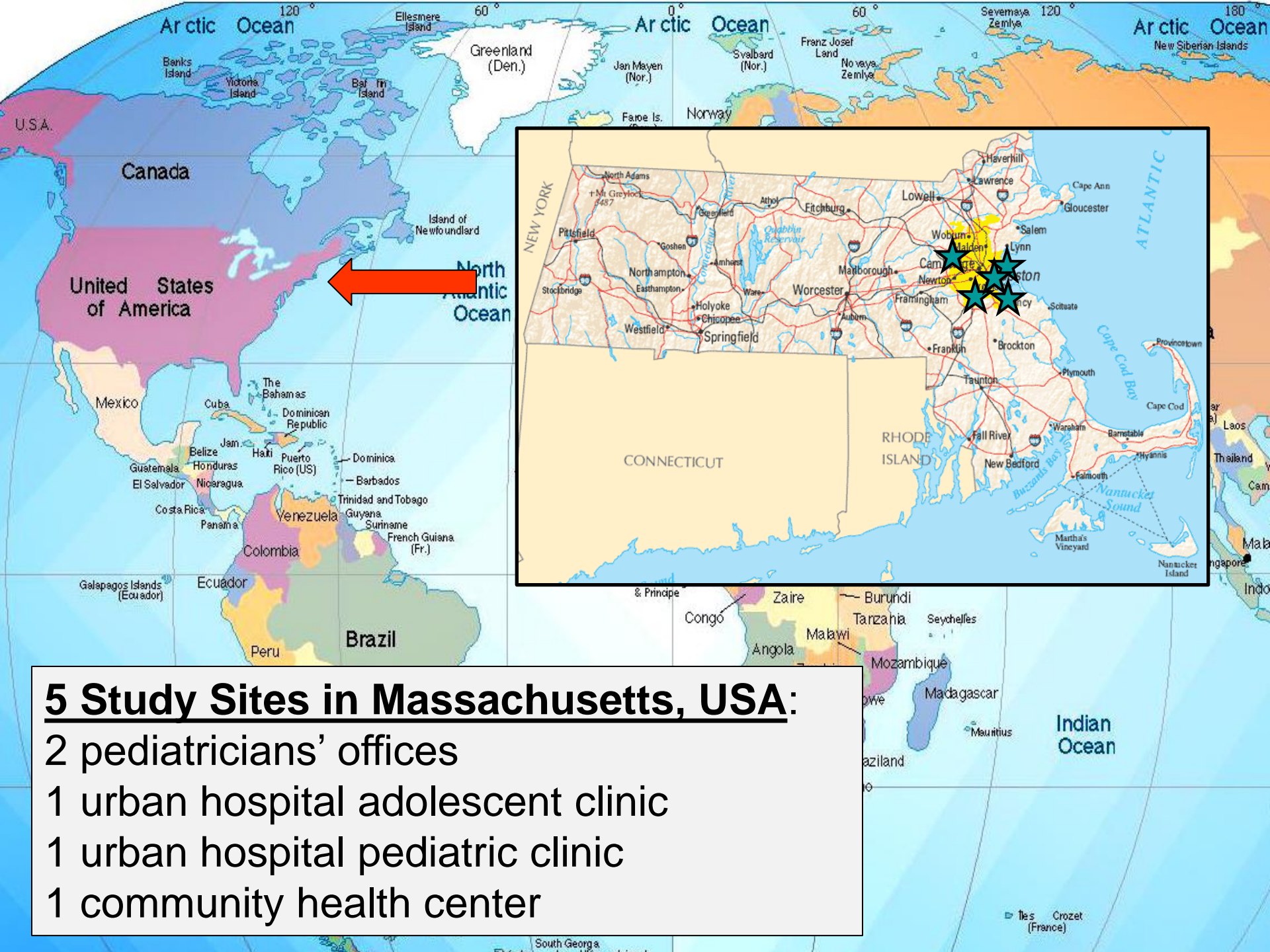
- Little is known about how reliable and valid\* responses are to substance *use-frequency* screening items among adolescents seeing their primary care provider (PCP)

\*Compared to a criterion measure of use-frequency, not of a substance use problem or disorder

# Study Objective

- Evaluate test-retest reliability and criterion validity of past-12-month number of use-days screening items when administered to adolescents presenting for a well-visit
- Hypothesis: Use-frequency items will have higher sensitivity for detecting any use than yes/no items from prior study





## **5 Study Sites in Massachusetts, USA:**

- 2 pediatricians' offices
- 1 urban hospital adolescent clinic
- 1 urban hospital pediatric clinic
- 1 community health center

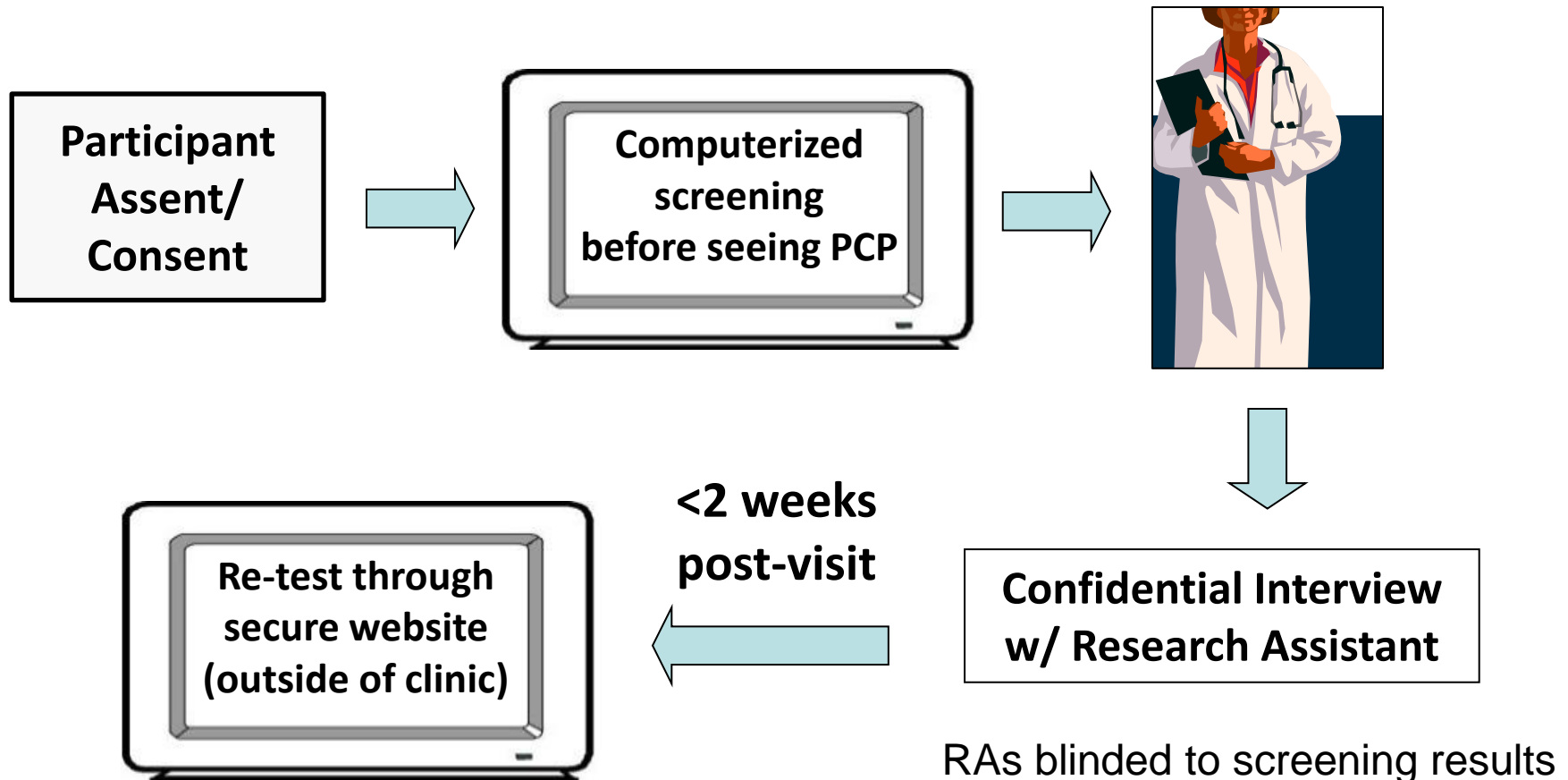
# Sample Recruitment

- Consecutively recruited age-gender-balanced convenience sample of English-speaking 12-18 year-olds presenting for annual well-visit (February 2015 to August 2016)
- Informed assent for 12- to 17-year-olds; consent for 18-year-olds
- \$15 store gift card for baseline assessment
- IRB approval from all participating sites, with waiver of parental consent

# Test-retest sample and method

- Invited age-gender-balanced subsample of participants to complete re-test (n=394 invited); oversampled users
- Sent secure weblink for re-test to participant's email within 2 weeks of baseline visit, with up to 3 reminders (76.6% response)
- Re-test assessed same time period as baseline
- Additional \$10 online gift card for retest

# Study Flow Diagram



# Frequency Screening Items

- During the past 12 months, on how many days...
  - did you drink more than a few sips of beer, wine, or any drink containing alcohol?
  - did you smoke any cigarettes or use any other tobacco product?
  - did you use any marijuana (pot, weed, hashish)?
  - did you use any prescription medication that was not prescribed to you or more than was prescribed to you (for example, prescription pain or ADHD pills)?
  - did you use anything else to get high?

# Screening Program Screenshot

CRAFTT :: Interactive

These next questions ask about **YOU**.  
During your **LIFETIME**:

On how many days did you drink more than a few sips of beer, wine, or any drink containing alcohol?

1 2 3

4 5 6

7 8 9

0

< Back

# Criterion Validity Measure

- Confidential past-12-month Timeline Follow-Back (TLFB) interview by trained research assistant in private clinic room
  - Well-established substance use assessment method using calendar to aid recall
  - Adolescent disclosure of sensitive behaviors enhanced when confidentiality is assured

# Data Analysis

## Criterion validity:

- Any past-12-month use: Sensitivity/specificity percentages
- # of past-12-month use days: Intra-class correlation coefficients (ICC) using two-way mixed effects model (SPSS)

## Test-retest reliability of screening items:

- ICCs for each set of time 1 and time 2 vars



# Early Results



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# Participant Characteristics

	<b>Total sample (N=844) %</b>	<b>Test-retest sample (n=302) %</b>
Girls	50.6%	55.3%
Age (mean $\pm$ SD years)	14.8 $\pm$ 1.9	15.2 $\pm$ 1.8
Race		
White non-Hispanic	44.8%	53.7%
Black non-Hispanic	10.4%	8.7%
Hispanic	29.7%	24.0%
Asian	8.4%	6.7%
Other/Multi-race	6.7%	7.0%
Parent highest education level $\geq$ college/university	72.4%	74.1%

# Validity – Any Past-12-Month Use

	<b>TLFB Criterion % Any</b>	<b>Screening item % Any</b>	<b>Sensitivity % (95% CI)</b>	<b>Specificity % (95% CI)</b>
Alcohol	21.8%	20.3%	78.7 (72.2-84.0)	95.9 (94.1-97.2)
Tobacco	7.7%	5.0%	61.5 (49.3-72.4)	99.7 (99.0-99.9)
Cannabis	11.8%	11.1%	85.9 (77.5-91.4)	98.9 (97.9-99.5)
Any Substance	23.9%	23.6%	81.6 (75.6-86.4)	94.5 (92.5-96.1)

- Medications and other drug use not analyzed due to low numbers




# Validity – # of past-12-month use days

	<b>TLFB Criterion Mean <math>\pm</math> SE</b>	<b>Screening item Mean <math>\pm</math> SE</b>	<b>ICC (95%CI)</b>
Alcohol	1.34 $\pm$ 0.21	1.40 $\pm$ 0.21	.55 (.51-.60)
Tobacco	2.33 $\pm$ 0.87	2.02 $\pm$ 0.79	.81 (.79-.83)
Cannabis	3.33 $\pm$ 0.85	2.71 $\pm$ 0.77	.80 (.77-.82)

So what  
about our  
hypothesis?



# Yes/No vs. Frequency opening questions: Comparison of Sensitivity

	Computer self-administered	
	Yes/No* (2014 study)	Frequency (Current study)
Alcohol	62.1	78.7 
Tobacco	86.0	61.5 
Cannabis	72.0	85.9 

\*Harris et al., Substance Abuse, 2016;37(1):197-203

# Preliminary Findings

- For alcohol and cannabis, past-12-month frequency items administered on computer showed better sensitivity for identifying users (compared to yes/no items in prior study)
- Specificity was high for all frequency items (few false positives)

# Preliminary Findings cont'd.

- Validity of # of days of use low for alcohol (found higher mean days on screener compared to TLFB)
- Test-retest reliability for frequency items high (ICC range .84-.96)



# Study Caveats

- STILL COLLECTING AND CLEANING DATA
- Rates of tobacco and other drug use too low in this study so unable to evaluate
- Findings may not be generalizable to other adolescent populations
- Criterion measure based on self-report

# Preliminary Conclusion

- Similar to adult studies, (Smith PC et al., 2009, 2010), frequency items appear to be reliable and valid substance use screening items for adolescents seen in primary care

# Are frequency items enough?

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## Validity of Brief Screening Instrument for Adolescent



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*JAMA Pediatr.* Author manuscript; available in PMC 2014 December 18.

Published in final edited form as:

*JAMA Pediatr.* 2014 September ; 168(9): 822–828. doi:10.1001/jamapediatrics.2014.774.

### An Electronic Screen for Triaging Adolescent Substance Use by Risk Levels

Sharon Levy, MD, MPH, Roger Weiss, MD, Lon Sherritt, MPH, Rosemary Ziemnik, BS, Allegra Spalding, BA, Shari Van Hook, MPH, and Lydia A. Shrier, MD, MPH

Adolescent Substance Abuse Program, Boston Children's Hospital, Boston, Massachusetts (Levy, Ziemnik, Van Hook); Division of Developmental Medicine, Boston Children's Hospital, Boston, Massachusetts (Levy, Sherritt, Ziemnik, Van Hook); Department of Pediatrics, Harvard

NIH-PA Author Manuscript

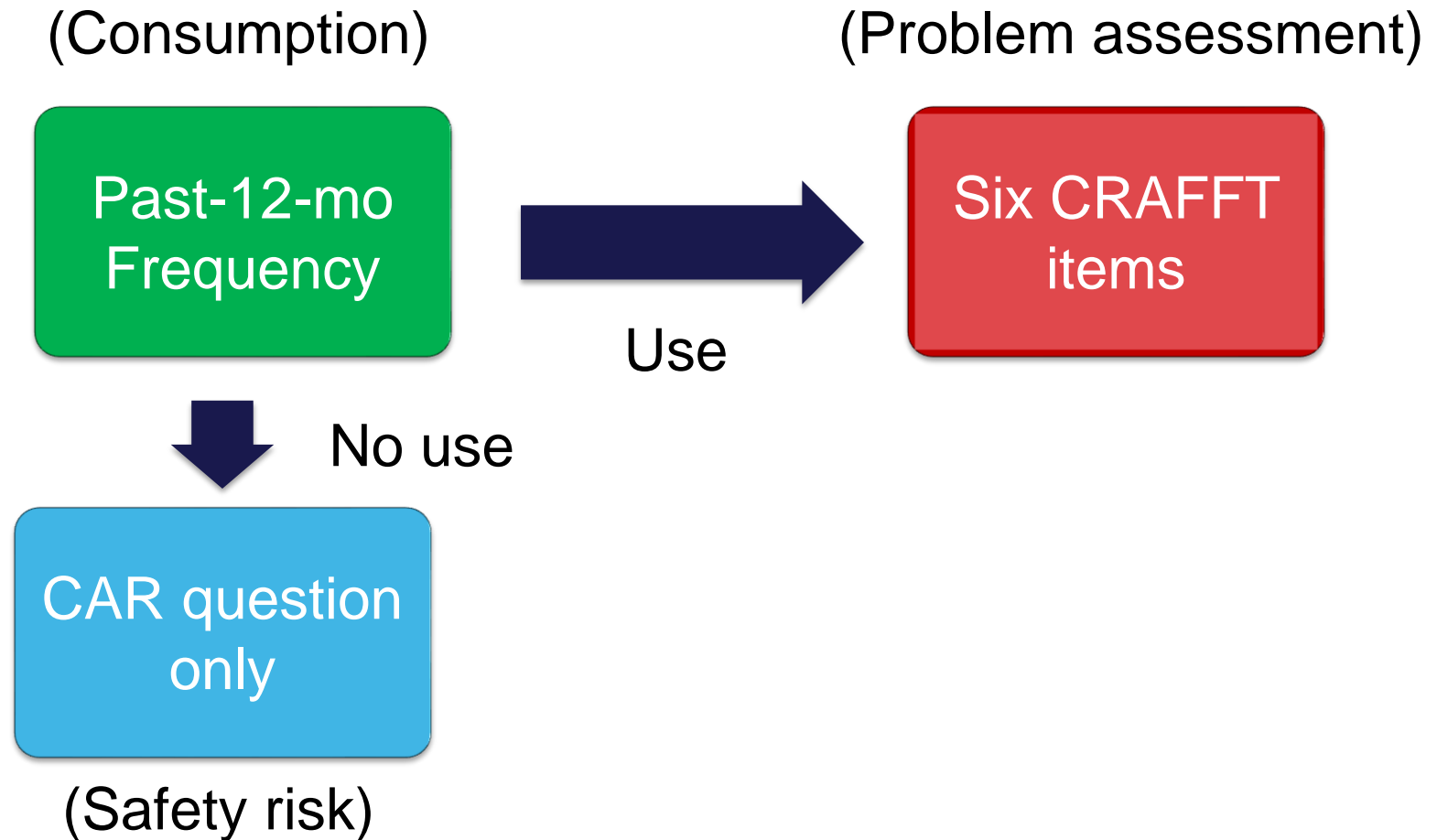
PEDIATRICS



Journal  
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# CRAFFT 2.0 Screening System



# The CRAFFT Questionnaire (version 2.0)

To be completed by patient

Please answer all questions **honestly**; your answers will be kept **confidential**.

During the **PAST 12 MONTHS**, on how many days did you:

1. Drink more than a few sips of beer, wine, or any drink containing alcohol? Put "0" if none.

# of days

2. Use any **marijuana** (pot, weed, hash, or in foods) or "**synthetic marijuana**" (like "K2" or "Spice")? Put "0" if none.

# of days

3. Use **anything else to get high** (like other illegal drugs, prescription or over-the-counter medications, and things that you sniff or "huff")? Put "0" if none.

# of days

## READ THESE INSTRUCTIONS BEFORE CONTINUING:

- If you put "0" in **ALL** of the boxes above, **ANSWER QUESTION 4, THEN STOP.**
- If you put "1" or higher in **ANY** of the boxes above, **ANSWER QUESTIONS 4-9.**

- |   | No                       | Yes                      |
|---|--------------------------|--------------------------|
| 4. Have you ever ridden in a <b>CAR</b> driven by someone (including yourself) who was "high" or had been using alcohol or drugs? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Do you ever use alcohol or drugs to <b>RELAX</b> , feel better about yourself, or fit in?                                      | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Do you ever use alcohol or drugs while you are by yourself, or <b>ALONE</b> ?  | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Do you ever <b>FORGET</b> things you did while using alcohol or drugs?   | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Do your <b>FAMILY</b> or <b>FRIENDS</b> ever tell you that you should cut down on your drinking or drug use?                   | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Have you ever gotten into <b>TROUBLE</b> while you were using alcohol or drugs?  | <input type="checkbox"/> | <input type="checkbox"/> |

# CRAFFT 2.0