

Assessing and Diagnosing SUD More Efficiently

Risk of overdose death



Available workforce to screen and assess



How can we maintain the precision of diagnoses, minimize patient burden, and *eliminate* clinical burden?

The Computerized Adaptive Test for Substance Use Disorder (CAT-SUD) is an adaptive test based on multidimensional item response theory.



CAT-SUD-E expands the original to assess seven specific drugs of abuse, current and past.

CAT-SUD started with a bank of 252 questions with five subdomains: SUD, psychological disorders, risky behaviors, functional impairment, social support	Calibrated item bank using bifactor IRT Model and reduced bank to 168 items	Adaptive administration based on item parameter estimates required an average of 11 items and took less than 2 minutes to complete ($r=0.91$ with 168 items)	Validated against structured clinical interviews based on Composite International Diagnostic Interview(SCID) SUD diagnosis (AUC = 0.85)
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CAT-SUD-E includes 168 questions + five additional yes/no questions for each substance used for up to two time-frames (past 30 days or lifetime):

1. When I stop using [substance], I get withdrawal symptoms.
2. In the past month have you spent a lot of time using, obtaining, or thinking about or craving [substance]?
3. In the past month have you or someone else wanted you to cut back on [substance]?
4. In the past month has [substance] caused problems for you or kept you from getting things done?
5. In the past month, have you used [substance] again and again, despite the harm it has caused?

Sample

n=275
ages 18-68
57% women



Median completion time

CAT-SUD-E:
3 mins 40 sec

SCID:
60 minutes

Results

Substance	AUC current diagnosis	AUC lifetime diagnosis
Alcohol	0.77	0.85
Cannabis	0.86	0.85
Opioid	0.90	0.95
Stimulant	0.91	0.96
Sedative	0.77	0.88
Hallucinogen	--	0.81
Nicotine	0.92	0.92

TAKEAWAYS

- ✓ The CAT-SUD-E improves detection of overall SUD and substance-specific SUD diagnosis using a web-based modality that is efficient, scalable, and flexibly implemented.
- ✓ The CAT-SUD-E achieved specific diagnosis and severity scores in under 4 minutes without the need for a trained clinician.
- ✓ This is important given the well-documented workforce shortages in behavioral health.

Sources: Hulvershorn, L. A., Adams, Z. W., Smoker, M. P., Aalsma, M. C., & Gibbons, R. D. (2022). Development of a computerized adaptive substance use disorder scale for screening, measurement and diagnosis—The CAT-SUD-E. *Drug and Alcohol Dependence Reports*, 3, 100047.