

Jennifer O'Loughlin<sup>1-3</sup>, Gisèle A. Contreras<sup>2</sup>, Daniel Rodriguez<sup>4</sup>, Joseph R. DiFranza<sup>5</sup>

<sup>1</sup> Centre de recherche du CHUM, <sup>2</sup> University of Montreal, <sup>3</sup> Institut national de santé publique du Québec, <sup>4</sup> University of Pennsylvania, <sup>5</sup> University of Massachusetts

## Context

- Nicotine withdrawal, and compulsion to use tobacco resulting from withdrawal, are the core clinical features of nicotine dependence (ND).
- Some ND measures show little content overlap with these core clinical features.

## Objective

- To review the content of available ND measures for youth to determine the extent to which they measure the core clinical features of ND

## Method

- A literature search identified 27 articles published in 2000-10 that assessed ND measures in adolescents or young adults.
- A consensus process among the authors was used to establish if each item in each measure assessed withdrawal or compulsion, or if the item tapped other aspects of cigarette smoking including tolerance, harm, triggers for smoking, cigarette use patterns, prioritizing smoking, perceived utility, or attitudes about smoking.

## Results

- Of 14 measures identified, three (Hooked on Nicotine Checklist, Latency to Withdrawal, Withdrawal Symptom Cluster) measured the core clinical features of ND
- Six measures (Autonomy Over Smoking Scale, DSM IV, Dimensions of Tobacco Dependence Scale, ICD-10 Tobacco Dependence, ND/Cravings Symptom Cluster, Nicotine Dependence Syndrome Scale) assessed withdrawal/compulsion and other aspects of smoking
- Five measures (Fagerström Test for Nicotine Dependence, Modified Fagerström Tolerance Questionnaire, Nicotine Dependence Scale for Adolescents, Self-Medication Symptom Cluster, Stanford Dependence Index) had few or no withdrawal/compulsion indicators.

**Table 1. Scales that measure withdrawal/compulsion**

Hooked on Nicotine Checklist (1)	Item Content
Have you ever tried to quit but couldn't? (yes, no)	Withdrawal/compulsion
Do you smoke now because it is really hard to quit? (yes, no)	Withdrawal/compulsion
Have you ever felt like you were addicted to tobacco? (yes, no)	Withdrawal/compulsion
Do you ever have strong cravings to smoke cigarettes? (yes, no)	Withdrawal/compulsion
Have you ever felt like you really needed a cigarette? (yes, no)	Withdrawal/compulsion
Is it hard to keep from smoking in places where you are not supposed to, like school? (yes, no)	Unclassifiable
When you tried to stop smoking... (or when you haven't used tobacco for a while...) (yes, no)	
Did you find it hard to concentrate because you couldn't smoke? (yes, no)	Withdrawal/compulsion
Did you feel more irritable because you couldn't smoke? (yes, no)	Withdrawal/compulsion
Did you feel a strong urge or need to smoke? (yes, no)	Withdrawal/compulsion
Did you feel nervous, restless or anxious because you couldn't smoke? (yes, no)	Withdrawal/compulsion
Withdrawal Symptom Cluster (2)	
Think about the times when you have cut down or stopped using cigarettes or when you haven't been able to smoke for a long period (like most of the day). How often did you experience the following? (never; rarely; sometimes; often)	
Feeling irritable	Withdrawal/compulsion
Feeling restless	Withdrawal/compulsion
Feeling nervous, anxious or tense	Withdrawal/compulsion
Trouble concentrating	Withdrawal/compulsion
Feeling a strong urge or need to smoke	Withdrawal/compulsion
Trouble sleeping	Withdrawal/compulsion

**Table 2. Example of a mixed scale**

DSM-IV (3)	Item Content
Compared to when you first started smoking do you need to smoke more now in order to feel satisfied or get the same effect? (not at all; a little bit; somewhat; quite a bit)	Tolerance
Do you find you can smoke more without experiencing effects like nausea, lightheadedness, or dizziness? (not at all; a little bit; somewhat; quite a bit)	Tolerance
When you stop, cut down, or go without smoking now, how much do you experience the following? (not at all; a little bit; somewhat; quite a bit); Feeling sad, blue, or depressed; Difficulty sleeping; Frustrated or angry (or feeling irritable); Feeling tense or anxious; Difficulty concentrating; Restlessness or impatience; Increased appetite or weight gain	Withdrawal/compulsion
How often do you smoke now to keep from feeling this way or to stop feeling this way? (not at all; a little bit; somewhat; quite a bit)	Pattern
How often do you smoke even though you promise yourself you won't? (not at all; a little bit; somewhat; quite a bit)	Pattern
How often do you smoke more frequently or for more days in a row than you intend? (not at all; a little bit; somewhat; quite a bit)	Pattern
How often do you try to stop or cut down on your smoking but are unable to do so? (not at all; a little bit; somewhat; quite a bit)	Withdrawal/compulsion
How often do you have periods of several days or more when you chain-smoke, that is, start another cigarette as soon as you finish one? (not at all; a little bit; somewhat; quite a bit)	Pattern
How often do you give up or greatly reduce important activities now (like sports, work, or spending time with friends and family) so you can smoke? (not at all; a little bit; somewhat; quite a bit)	Priority/Harm
How much does tobacco currently cause you any physical problems like coughing, difficulty breathing, lung trouble, or problems with your heart or blood pressure? (not at all; a bit; somewhat; quite a bit)	Harm
How much does tobacco currently cause you any emotional problems like irritability, nervousness, restlessness, difficulty concentrating, or depression? (not at all; a little bit; somewhat; quite a bit)	Harm

**Table 3. Scale with no items that measure withdrawal/compulsion**

Modified Fagerström Tolerance Questionnaire (4)	Item Content
How many cigarettes a day do you smoke? (<1; 1-15; 16-25; >25)	Pattern
Do you inhale? (never; sometimes; always)	Unclassifiable
Do you smoke more during the first 2 hours of the day than during the rest of the day? (no; yes)	Pattern
How soon after you wake up do you smoke your first cigarette? (<30 min; >30 min but before noon; in the afternoon or evening)	Pattern
Which cigarette would you hate to give up? (first one in the morning; any other before noon; any other in the afternoon or in the evening)	Pattern
Do you find it difficult to refrain from smoking in places where it is forbidden? (no; yes)	Unclassifiable
Do you smoke if you are so ill that you are in bed most of the day? (no; yes)	Pattern/Harm

## Reflections

- Existing measures vary widely in the degree to which they assess the known clinical features of ND.
- Attempts to assess ND indirectly in youth by measuring other aspects of smoking may result in inaccuracy if items are endorsed for reasons other than ND
- No existing measure assesses the full spectrum of clinically recognized features of ND

## References

- Wheeler KC, Fletcher KE, Wellman RJ, DiFranza JR. Screening adolescents for nicotine dependence: the Hooked On Nicotine Checklist. *J Adolesc Health* 2004; 35: 225-230.
- O'Loughlin J, DiFranza J, Tarasuk J, et al. Assessment of nicotine dependence symptoms in adolescents: a comparison of five indicators. *Tob Control* 2002; 11: 354-360.
- Dierker L, Donny E, Tiffany S, et al. The association between cigarette smoking and DSM-IV nicotine dependence among first year college students. *Drug Alcohol Depend* 2007; 86: 106-114.
- Prokhorov A, De Moor C, Pallonen U, et al. Validation of the modified Fagerstrom Tolerance Questionnaire with salivary cotinine among adolescents. *Addict Behav* 2000; 25: 429-433.