



Technical/Special note

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## Does the Fagerstrom Nicotine Dependency Test suit every smoker in the waiting room?

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### ABSTRACT

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Fagerstrom Nicotine Dependency Test (FNTD) is a vital test in smoking cessation services. It determines the nicotine addiction level of the patients. The test consists of six items, and a smoker can get a score between 1 to 10. A higher score indicates a higher level of dependency. The result of this test is one of the key components that we use to determine and discuss the best possible individualized cessation strategy (life style modifications, motivation interview, nicotine replacement therapy or other drugs) with patients according to evidence-based medicine principles. It is known that FNTD is a very effective tool for primary care and has several advantages over other self / physician-rated tests. However in several cases we have encountered several flaws and problems in each of the six items with extreme or unusual cases in our experiences. Also such problematic cases are not uncommon in our patient population. To our experience clinicians have to question every item of FNTD with special care in order to prevent and misjudge. This condition may be resulted to under- or over-rate dependency levels of the smokers. In this short report we attempt to share and discuss some of these problematic situations and our own experiences.

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As academics specializing in the field of family medicine, one of our most difficult tasks in the context of health promotion activities is assisting with smoking cessation. We employ a behavioral change model for our patients and determine the best cessation strategy through discussion with them. We use evidence-based practice (best available knowledge, experience and patient choices) in order to take effective clinical decisions. The Fagerstrom Test for Nicotine Dependence (FNTD) constitutes an important part of "best available knowledge" as we prefer to intensify our approach (adding drugs for cessation) as levels of dependency increase. In providing smoking cessation

services for our patients we routinely use FTND face-to-face while collecting information concerning subjects' smoking history. This six-item test is rated between 0 to 10 and indicates the subject's level of nicotine addiction (Heatherton et., 1991). The result of this test is one of the key components that we use to determine and discuss the best possible individualized cessation strategy (life style modifications, motivation interview, nicotine replacement therapy or other drugs) with patients according to evidence-based medicine principles (Anczak and Nogler., 2003; Cahill et al., 2013; Stead et al., 2013). Although there are data suggesting that the FNTD correlates with self-rated

addiction, some withdrawal symptoms and frequent urges to smoke, we have noted some flaws and problems in using this test with different patient profiles (Heatherton et al., 1989; Chabrol et al., 2005).

The first item in the test is "How soon after you wake up do you smoke your first cigarette?" Nicotine and its metabolites are known to be detoxified by the renal system during sleep, and a smoker's lowest nicotine level will usually be in the mornings. However, this level (the nicotine metabolite ratio) depends on several factors, including race and CYP2A6 enzyme activity rate (Ross et al., 2016). This item tests the patient's withdrawal symptoms based on these data. However, we have been surprised to note that, contrary to expectations, some of our very heavy smokers (>30 cigarettes/per day) do not smoke immediately after they wake up. This situation correlates with patients who wake up and smoke during the night. It may be that due to nicotine boosts at night, these patients' base blood nicotine levels never drop sufficiently to produce cravings just after they wake up. In addition, the perception of time in the morning on the part of some of our patients (mostly retired people) is shaped by the idea of breakfast, and it is not unusual for them to state in reply to this question that they do not smoke until after breakfast (something they are proud of), instead of citing a specific time period. In this case we try to establish what time they usually have breakfast. The second item concerns refraining from smoking in prohibited places. Although this item is intended to test craving symptoms, some smokers interpret it as referring to their attitude to smoking prohibitions and

restrictions. Many smokers adopt a defensive posture toward this question and merely respond that they do not break the law. The fourth item, which asks how many cigarettes smokers smoke a day, may not elicit the amount of nicotine in fact consumed over the day. Several of our patients (mostly women) use light cigarettes, which contain lower nicotine levels, but they nevertheless smoke a greater number of cigarettes in order to achieve a specific daily dose of nicotine. This item is also imprecise in terms of smokers who use e-cigarettes, pipes, cigars or hookahs or those who simply do not inhale deeply. Additionally, some smokers in Turkey buy unprocessed tobacco from shops and roll their own cigarettes with no filters. The fifth item inquires into intensive smoking in the first two hours of the day. Some of our very heavy smokers are people who work at night (such as police officers, security staff, firefighters and health workers). University students who study at night also tend to smoke more at night than in the day. These subjects' carbon dioxide measurements do not correlate with their FNTD scores in our clinic.

As a clinician we prefer to use face-to-face tests instead of lab tests (urine cotinine) or carbon dioxide measurements in order to establish a relationship of trust with our patients. Although the FNTD is a very effective tool (highly valid, reliable and simple) for primary care and has several advantages over other self / physician-rated tests, in several cases we believe that it under- or over-rates dependency levels. Our experience is that it may not be free of all imperfections or include all possible situations in smoking addiction.

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