

## Cigarette Smoking: A Cardiovascular risk; Assessment and Intervention: Literature Review

Naglaa Hussein<sup>1,2\*</sup>, Matthew Bartels<sup>3</sup>

<sup>1</sup>Department of Physical Medicine, Rheumatology and Rehabilitation, Alexandria University, Alexandria, Egypt; <sup>2</sup>Department of Physical Medicine and Rehabilitation, Albert Einstein College of Medicine, New York, United States; <sup>3</sup>Department of Physical Medicine and Rehabilitation, Albert Einstein College of Medicine, Montefiore Medical Center, New York, United States

### ABSTRACT

Even though we don't know exactly which smokers will develop CVD from smoking, the best thing all smokers can do for their hearts is to quit. Smokers who quit start to improve their heart health and reduce their risk for CVD immediately. Within a year, the risk of heart attack drops dramatically, and even people who have already had a heart attack can cut their risk of having another if they quit smoking. Within five years of quitting, smokers lower their risk of stroke to about that of a person who has never smoked. However, studies have reported that smoking increases the risk of CVD beyond the effects of smoking on other risk factors. In other words, the risk attributable to smoking persisted even when adjustments were made for differences between persons who smoke and nonsmokers in levels of these other risk factors.

**Keywords:** Cigarette smoking; Cardiovascular risk; High density lipoprotein; Low-density lipoprotein

## INTRODUCTION

Cigarette smoking is the single most preventable cause of death and disability in USA and second major cardiovascular risk factor. It accounts for more than one out of every six deaths in US, i.e. approximately 400000 premature death per year [1].

These deaths are not only from heart diseases but a variety of other smoking related conditions including cancer, emphysema, pneumonia and stroke.

It has been attributed that 21% of all cardiovascular death and 30% of all cancer death can be attributed to cigarette smoking [1].

Smoking is associated with increased risk of cardiovascular events in patients with established disease including recurrent myocardial infarction, sudden death, re-stenosis after coronary angioplasty [2-4].

Smoking causes numerous problems within the cardiovascular system, for example, nicotine, the most important by product of smoking, causes catecholamine release, increasing heart rate and blood pressure and leading to an increased workload on the

heart. Nicotine also increases platelet activation and causes adverse effects on the lipoprotein profile, including High Density Lipoprotein (HDL) and increased oxidation of Low-Density Lipoprotein (LDL) which is believed to promote atherogenesis.

Carbon monoxide, another byproduct of smoking may inquire vascular endothelium and interfere with the ability of red blood cells to carry oxygen, thus reducing the amount of oxygen delivered to the heart muscles [2,5].

## ASSESSMENT

The identification of all smokers involved in secondary prevention is the first step in managing this risk factor. Screening systems that allow one to identify and document smoking status result in larger proportion of patients receiving interventions. Staff can most readily identify smokers through the use of health-risk appraisals, intake forms that collect information about risk factors, or through interviews that are often part of a history and physical exam. Smoking status should be documented and patients should be counseled in smoking cessation techniques and strongly administered to quit smoking at every opportunity. This can be very useful in cuing all health care professionals to address the smoking behavior [2].

**Correspondence to:** Naglaa Hussein, Department of Physical Medicine, Rheumatology and Rehabilitation, Alexandria University, Alexandria, Egypt, E-mail: naglaa.hussein@alexandriamedical.net

**Received:** May 26, 2021; **Accepted:** June 09, 2021; **Published:** June 16, 2021

**Citation:** Hussein N, Bartels M, Prince D (2021) Cigarette Smoking: A Cardiovascular risk; Assessment and Intervention: Literature Review. Int J Phys Med Rehabil. S5:005.

**Copyright:** © 2021 Hussein N, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## LITERATURE REVIEW

As noted in the clinical Practice Guideline Smoking cessation, however, smoking cessation intervention should not depend solely on formal assessments, as there is little information to show how treatment should be tailored based on these assessments [2,6].

Formal assessment refers to instruments such as questionnaires, clinical interviews, or physiological measures such as carbon monoxide or pulmonary function measures. Even limited information about the patient’s smoking history may be useful as part of behavioral counseling.

Assessment of the patient’s level of addiction may be helpful in determining the need for aids such as Nicotine Replacement Therapy (NRT). The most commonly used tool to measure smoking addiction is the eight-item Fagerstrom Tolerance Test of Nicotine Dependence [7]. which identifies smokers who are moderately or highly addicted to nicotine and may benefit from nicotine replacement therapy.

Signs of strong addiction include smoking more than 25 cigarettes per day, smoking within 30minutes of waking, or smoking when bedridden [8]. Asking such questions on a smoking history and may reveals individuals most in need of pharmacologic therapy. Finally, if patients find it particularly difficult to refrain from smoking during hospitalization, they may also benefit from such medication. This can be ascertained by a simple question such as the following [2]. How hard has it been for you not to smoke since you’ve been in the hospitals? (Table 1).

Addiction scale	
1	Very Easy
2	Easy
3	Moderately hard
4	Hard
5	Very hard

**Table 1:** How hard has it been for you not to smoke since you’ve been in the hospitals?

Patients, who score 4 or 5, especially if they are having withdrawal symptoms, may relapse early in the post discharge recovery period unless pharmacologic therapy is instituted [9].

A smoking history may provide additional information useful in counseling about smoking. Determining the patient’s past experience with serious attempts to quit and length of cessation, success with previous smoking interventions, previous use of pharmacological therapies can be helpful in planning an appropriate intervention. Documenting whether other household members smoke may help determine the patient’s

level of support. While little research has evaluated the benefit of antidepressants for smoking cessation, individuals with a history of depression have more difficulty quitting than those without such a history [10]. Therefore, measuring, depression using standardized questionnaire as part of a clinical evaluation of psychological status, may be useful in counseling and determining the need for antidepressant therapy [11]. How much are you troubled now by feeling miserable or depressed? (Table 2).

Level of support	
Hardly slightly	1,2,3
Moderately	4,5
Markedly	6,7
Extremely	8,9

**Table 2:** How much are you troubled now by feeling miserable or depressed?

Patients scoring a 5 or greater may have problems with depression and require further evaluation. Finally, patients who consume large amounts of alcohol or who abuse alcohol and also smoke, find it difficult to quit smoking. History of alcohol use and abuse should also be documented since there level of ability to quit smoking is influenced [2].

## INTERVENTION

Many interventions have been applied to help cardiac patients quit smoking [12-14].

In general exercise training alone as part of rehabilitation has not been shown to impact smoking cessation rates in this population [15,16]. Interventions that target smoking behavior and include both education and counseling have been shown to be successful. While some of the highest rates of smoking cessation have been noted in patients who suffer cardiovascular disease, smoking relapse rates following hospitalization for an MI or Coronary Artery Bypass Graft Surgery (CABGS) are approximately 50% (30).

Moreover, the rate of smoking cessation is significantly lower for a patient who has established cardiovascular disease but has not sustained an event. For examples, the rates of smoking cessation in those with single vessel disease or those having undergone coronary angioplasty, who are receiving smoking intervention, approximately 25 or 35% [12,13]. Finally, while some of the greatest cessation rates in smoking have occurred in structured behavioral programs, the majority of patients’ success does not occur without three or four serious attempts. Thus, offering education and reinforcement for quitting is important on a continual basis [2,17].

At a minimum, all the health care professionals involved in secondary prevention can help people to quit smoking by:

Identifying them as smokers at every encounter.

Asking if they are willing to make an attempt to quit as shown in the assessment section.

Aiding the smoker in using such interventions as self-help materials and strong advice about the need for quitting and

Arranging for follow-up either in person or *via* telephone.

Because the risk of recurrent events is extremely high in patients who continue to smoke, follow-up of patients who choose not to quit is extremely important.

Contracting with patients to limit the number of cigarettes they smoke per day, aggressively modifying other cardiovascular disease, and ensuring that patients are well protected with other interventions know to affect prognosis, such as Angiotensin Converting Enzyme (ACE) inhibitors, anti-hypertensive agents, antiplatelet agents, beta blockers, estrogen, estrogen, lipid lowering medications, may improve overall survival and in time may alter their perspective on quitting smoking [2,18].

Other areas requiring counseling include:

Weight gain

Frequent withdrawal symptoms that may determine the need for nicotine replacement therapy.

Difficulty in quitting in association with alcohol use.

The presence of other family members and friends who smoke within the patient's social network.

The psychological craving associated with quitting which occurs through urges, and

The loss associated with giving up cigarettes [19].

## DISCUSSION

Exercise may also provide support to the attempt to quit. It may also improve psychological well-being, minimize weight gain and withdrawal symptoms.

For these reasons, active participation in exercise rehabilitation should be advocated. Pamphlets, videotapes and audiotapes developed by numerous organizations such as American Heart Association, American Lung Association and The American Cancer Society can be helpful in supplementing counseling and should be used to reinforce information provided by program specialists [2,20].

The patch continue to be preferable for most individuals due to sustained systemic release of nicotine. However, many individuals who prefer the oral stimulation of the gum, or who failed with the nicotine patch or have had severe skin reaction, may benefit from nicotine gum.

Bupropion HCL is another pharmacologic aid that also shows promise in helping with cessation, especially in patients who experience signs of depression upon quitting [21].

Follow-up with smokers increases the success intervention. The clinical Practice Guideline Smoking cessation clearly shows that four to seven person-to person contacts are especially effective in

increasing smoking cessation in clinical practice settings [22]. Other studies have shown very effective cessation rates when four to five telephone contacts have been used for follow up of patients with CHD [12,13,23].

## CONCLUSION

While many pharmacologic aids have been used in the past with smoking cessation, the use of nicotine replacement therapy continues to increase cessation rates when combined with other interventions such as behavioral counseling. Both the transdermal patch and nicotine chewing gum have been safe in patients with CHD except in unstable angina. Moreover, while never advocated, continued smoking and use of the patch has not been shown to increase untoward events in patients with established CHD.

## REFERENCES

1. Mc Ginnis JM. Actual causes of death in the united states. JAMA 1993;270(10):2207-2212.
2. AACVPR Promoting health and Preventing disease. Guidelines for cardiac rehabilitation and secondary prevention Programs. 3rd Edition, 1999.
3. Galan KM, Deligunol U, Kern MJ, Chaitman BR, Vandormael MG: Increased frequency of restenosis in patients continuing to smoke cigarettes after acute percutaneous transluminal angioplasty. Am J Cardiol. 1988;6(8):260-263.
4. Mulcahy R. Influence of cigarette smoking on morbidity and mortality after myocardial infarction. Br Heart J.1983;49(3):410-415.
5. Mc Gill HC. The cardiovascular pathology of smoking. Am Heart J. 1988;115(1):250-257.
6. Spielberger C, Gorsuch R, Luschene R. Manual of the state trait anxiety inventory, Palo Alto, CA: Consulting Psychologist Press, 1970.
7. Fagerstrom KO. Measuring of physical dependence to tobacco smoking with reference to individualization of treatment. Addict Behav. 1978;3(3-4):224-235.
8. Taylor CB, Houston Miller N, Haskel WL, Debusk RF. Smoking cessation after myocardial infarction: The effects of exercise training. Addiction Behavior 1988;13(4):331-335.
9. Berkman L, Syme SL. Social networks, host resistance, and mortality: A nine year follow up study of Alameda County residents. Am J Epidemiology 1979;109(2):186-204.
10. Glassman AH, Helezer JE, Covey LS, Gottler LB, Stentner F, Tipp JE, Johnson J. Smoking, Smoking cessation, and major depression. JAMA. 1990; 264(12):1546-1549.
11. Taylor CB, Miller NH, Smith PM, Debusk RF. The effect of home based, case-managed, multifunctional risk- reduction program on reducing psychological distress in patients with cardiovascular disease. J Cardiopulm Rehab. 1997;17(3):157-162.
12. Miller NH, Smith PM, DeBusk RF, Sobel DS, Taylor CB. Smoking cessation and hospitalized patients: Results of a randomized trial. Arch Inten Med. 1997;157:409-415.
13. Ockene J, Kristeller JL, Goldberg R, Ockene I, Merriam P, Barrett S, Pekow P, Hosmer D, Gianelly R. Smoking cessation and severity of disease: The Coronary artery Smoking Intervention Study. Health Psychol. 1992;11(2):119-126.
14. Taylor CB, Miller NH, Killen JD, Debusk RF. Smoking cessation after myocardial infarction: Effects of a nurse-managed intervention. Ann of Int Med. 1990;113(2):116-123.

15. Wenger NK, Froelicher ES, Smith LK. Cardiac Rehabilitation clinical practice Guideline No 17. Rockville, Md: US department of health and human services, Public Health service, Agency for health Care Policy and Research and the National Heart, Lung and blood institute; October 1995. AHCPR publication no. 96-0672
16. Burling TA, Singleton EG, Bigelow GE, Baile WF, Gottlieb SH. Smoking following myocardial infarction: A Critical review of the literature. *Health psychol.* 1984;3(1):36:1-5.
17. Kottke TE, battista RN, DeFries GH, BrekkeMI. Attributes of successful smoking cessation interventions in medical practice. A meta-analysis of 39 controlled trials. *JAMA.* 1988; 259:2883-2889.
18. Marlatt GA, Gordon JR Jr (Eds.). *Relapse prevention: maintenance strategies in the treatment of addictive behaviors.* New York: Guilford Press, 1985.
19. Miller NH, Smith PM: Smoking cessation. IN: American College of Sports Medicine: Resource Manual for Guidelines for exercise Testing and Prescription, 3rd ed J Roitman, Senior Editor, Baltimore: Williams and Wilkins.1998
20. Benowitz NJ. Drug therapy: Pharmacologic aspects of cigarette smoking and nicotine addiction. *N Engl J Med.* 1988;319(20): 1318-1330.
21. Hurt RD, Sachs DPL, Glover ED, Offord KP, Dale LC, Khayrallah MA, et al. A comparison of sustained- release bupropion and placebo for smoking cessation. *N Engl J Med.* 1997;337(17):1195-1202.
22. The smoking cessation Clinical Practice Guideline Panel and Staff: The Agency for Health Care Policy and Research smoking cessation clinical Practice Guideline. *JAMA.* 1996;275(16): 1270-1280.
23. DeBusk RF, Miller NH, Superke HR, Dennis CA, Thomas RJ, Lew HT, Berger WE 3rd, Heller RS, Romph J, Gee D, et al. A case management system for coronary risk factor modification following acute myocardial infarction. *Ann Intern Med.* 1994;120(9):721-729.