EDITORIAL

Lung cancer screening in the healthcare system of Bosnia and Herzegovina

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ABSTRACT

Lung cancer incidence in Bosnia and Hercegovina is high. The implementation of evidence-based lung cancer screening based on low-dose computed tomography (LDCT) may detect lung cancer early and decrease mortality specific to lung cancer. However, LDCT receipt may be unsatisfactory in Europe due to a low distribution of scanners and radiologists or poor access to care. In this paper, we propose a framework for the implementation of lung cancer screening in primary healthcare of Bosnia and Herzegovina based on the United States Preventative Services Task Force recommendation from 2021 and the American College of Radiology Lung CT Screening Reporting & Data System from 2022.

Key words: early detection of cancer, low -dose computed tomography, lung neoplasms

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INTRODUCTION

Lung cancer is the second most diagnosed cancer; natural history simulation models estimated that an increase in deaths from lung cancer may be anticipated from 2015 to 2065 (1), despite the progressive increase in 3-year relative survival (2). Extensive scientific knowledge identified tobacco smoking as a major risk factor for lung cancer. Consequently, many efforts have been made to improve public's understanding of smoking-related risk and initiate different interventions to reduce smoking (3).

Statistics show that 40% of adults (47% of males, 32.8% of females) in Bosnia and Herzegovina (B&H) smoke daily (4). In 2018, 887 males and 323 females died of lung and bronchial cancer in the Federation of B&H (5), 457 males and 153 females in Republika Srpska (6). These alarming statistics call for urgent measures to map the targeting interventions to decrease the risk of cancer death in the whole country. The implementation of evidence-based lung cancer screening (LCS) detects lung cancer early and decreases mortality specific to lung cancer (7).

LUNG CANCER SCREENING

The National Lung Cancer Screening Trial (NLST) (8), Netherland-Leuvens Longkanker Screening ONderyoek (9), and Italian trials (10) reported a significant reduction in lung cancer-specific mortality from screening using low-dose computed tomography (LDCT) scan. In 2013 the United States Preventative Services Task Force (USPSTF) recommended annual screening for individuals aged 55 to 80 years with a 30 pack-year smoking history who currently smoke or had quit within the past 15 years (11), but then updated the recommendation in 2021 with a lower screening initiation age of 50 years and a smoking threshold of 20 pack-years (12). European position statement on lung cancer screening from 2017 recommended LDCT-based screening implementation and specific actions before the implementation could take place (13).

MODELS OF SCREENING AND REFERRALS

Required components of screening are smoking cessation interventions, shared decision-making (SDM), including discussing the harms and benefits of the screening, and annual low dose computed tomography. Electronic health record (EHR) data on smoking status and history are necessary to identify patients' eligibility for smoking cessation interventions or LDCT screening as well as to initiate SDM (12). The patient provided information is mostly used to derive smoking history; however, EHR is often not prepared to determine patients' eligibility and support the implementation of lung cancer screening due to the incomplete capture of pack-years or years since quitting.

Although LCS delivery varies between European countries, three delivery models have been previously identified. In the decentralized model, primary healthcare provides screening and referrals to LDCT, while centralized models build on the provider-creating capacity. Each of the two models has disadvantages, the former due to lack of uniformity in evaluation and barriers to introducing new services to health insurance, the latter due to lack of primary care engagement. A hybrid model based on the collaboration of family physicians and the providers of diagnostics and treatment has been delivered in the United Kingdom, and it is suggested to be more efficient than other models (14).

Still, the uptake of lung cancer screening is very low in European countries and can be attributed to factors at multiple levels; patient or intrapersonal, clinician or interpersonal, system and policy, and environmental level that need to be addressed before LCS could be implemented. Patient or individual attitudes toward screening and intention to screen are largely influenced by the awareness and knowledge of lung cancer screening, the concerns about cost of procedure, distrust in medical system, fear of radiation exposure, and fatalistic beliefs (15). Furthermore, stigma around smoking and lung cancer has an impact on prevention, screening, and early diagnosis of lung cancer. Negative perceptions of what other people think, self-blame or guilt due to the perceived stigma, and stigma-related unwillingness of patients to engage in discussions of lung cancer with medical professionals reduce involvement in prevention (16).

BARRIERS TO LUNG CANCER SCREENING

Clinician or interpersonal factors may include clinicians' low awareness of current recommendations and lack of existing clinical or payor performance metrics to encourage the delivery of

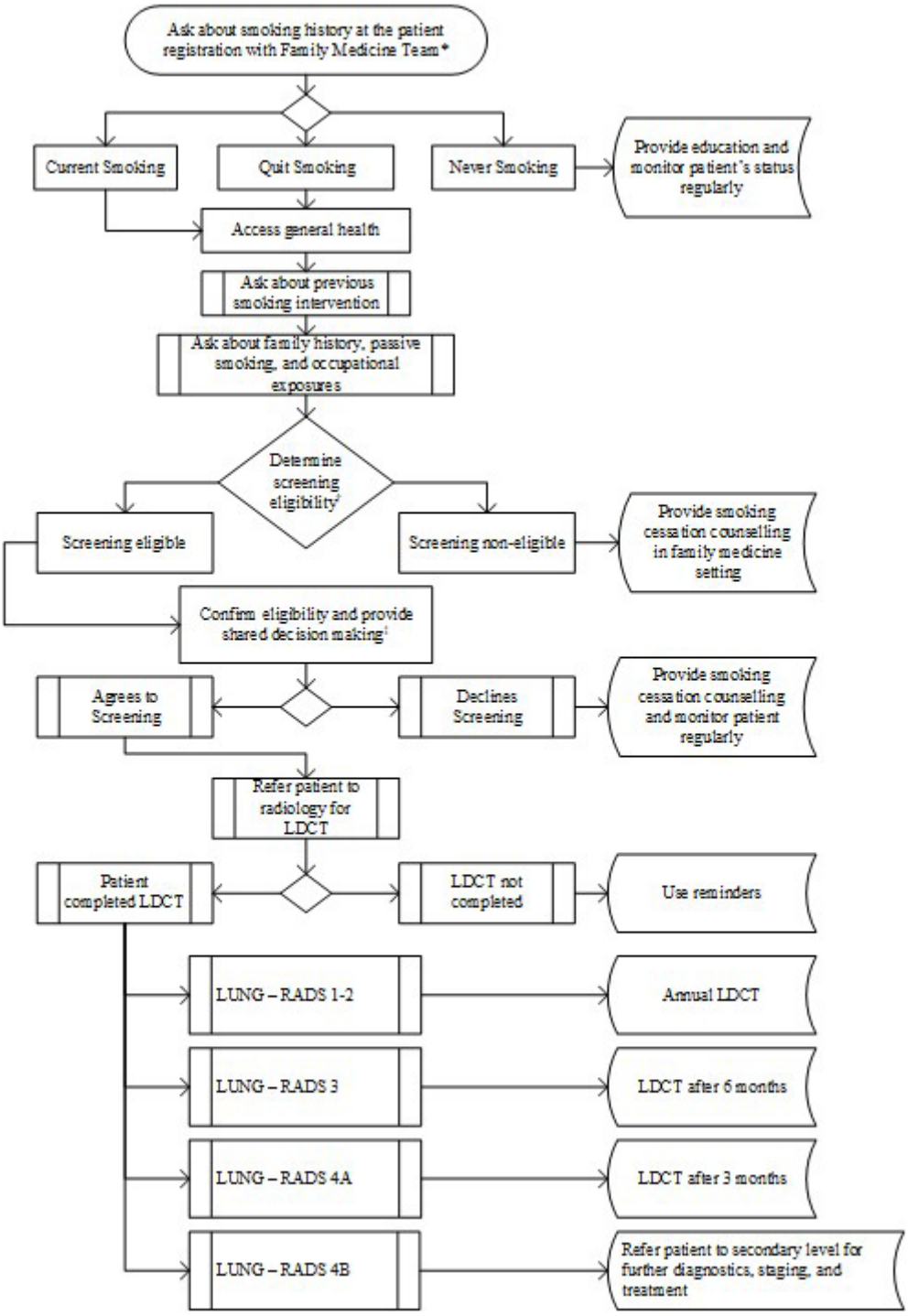

Figure 1. Framework for lung cancer screening

*Record pack-years and years since quitting; †Eligibility criteria are age of 50-80 years, a smoking threshold of 20 pack-years and/or have quit within the past 15 years-based on the United States Preventative Services Task Force (USPSTF) recommendation (12); ‡Discussion should include the patient's understanding of screening, benefits and harms of screening, barriers, costs, false-positive results, and readiness to make a decision. Shared-decision making discussion is performed only at the initial visit LDCT, low-dose helical computed tomography; Lung-RADS, lung CT screening reporting & data system

screening (17). Clinicians' adherence to clinical guidelines significantly impacts LDCT screening receipt. Most family physicians perceive LDCT screening reduces lung cancer mortality and think the currently available scientific evidence is sufficient to put screening guidelines into

practice (17). Despite this knowledge, research show a lack of concordance between clinical recommendations and screening practices (17). A previous study found that SDM may be poorly performed in clinical practice, particularly in the domain of potential harm explanation. Physicians commonly spend less than one-minute discussing screening with LDCT, which provides little time to explain the harms of the procedure and reach common ground with a patient (18).

Although missing and inaccurate smoking history has a negative impact on the delivery of lung cancer screening, the initiative to integrate smoking cessation intervention and SDM into primary care workflow and measure them with qualitative metrics could assist the implementation of clinical guidelines for lung cancer screening in B&H.

FREMEWORK FOR IMPLEMENTING LUNG CANCER SCREENING IN BOSNIA AND HERZEGOVINA

Lung cancer screening should follow a framework that explains the process and clarifies the role of each multidisciplinary team member, recently recommended by Rendle et al. (19). After determining eligibility, patients who fulfil criteria for screening should undergo assessments of health, lung cancer risk, smoking cessation interventions, and SDM. If a patient chooses to undergo screening, LDCT is ordered (32). To standardize LDCT reporting, facilitate management and outcome monitoring, the American College of Radiology developed Lung CT Screening Reporting & Data System (Lung-RADS). According to their guidelines, LDCT exam should be coded from 0 to 4 by looking at the nodule with the highest suspicion degree in this way: 0-incomplete, 1-negative, 2-benign, 3-probably benign, 4A-suspicious, 4B-very suspicious, 4X-3 or 4 with additional imaging findings suspicious of lung cancer, and S-significant or potentially significant (20). Here, we propose an intentional framework to improve lung cancer screening for patients at risk in Bosnia and Herzegovina (Figure 1).

The LCS framework implementation success will depend on collaboration between governmental officials, health insurance funds, institutes for public health, and primary and secondary healthcare. Moreover, the research should be performed continuously to determine the best lung cancer screening practice model in the country.

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Conflicts of interest: Nothing to declare.

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