**Individuals who enter a LC screening program have a high baseline quality of life, however the report of an abnormal screening can lower the quality of life and increase the use of imaging.**

*Mazzone PJ, Obuchowski N, Fu AZ, et al; Quality of Life and Healthcare Use in a Randomized Controlled Lung Cancer Screening Study. Ann Am Thorac Soc. 2013; 4:324-9.*

Question

In participants who choose to enter into a LC screening program, does an abnormal screening finding effect the quality of life and use of healthcare resources?

Methods

**Design:** The screening study was a randomized, placebo-controlled trial. Patients in the intervention arm underwent screening chest x-rays, read with the assistance of computer aided detection.
**Allocation:** Equal
**Follow-up period:** 5 years
**Setting:** Single-center with four locations in the US
**Patients**: 1,424 asymptomatic current or former smokers ages 40-75 with at least a 10-pack year smoking history, a first degree family member with lung cancer, or the diagnosis of chronic obstructive pulmonary disease (COPD).
**Measurements:** EuroQol-5 dimension (EQ5D), University of California San Diego shortness of breath questionnaire, St. George's Respiratory Questionnaire (SGRQ), Paper Standard Gamble questionnaire (PSG)
**Outcomes:** Change in QOL measures following the notification of an abnormal screening study, difference in QOL and healthcare use between cases and controls, and comparison of healthcare use between those with an actionable lung nodule and those without an actionable lung nodule.

Main Results

Following the notification of the presence of a lung nodule (n=25), there was a significant change toward poorer QOL (EQ5D: 0.88 vs. 0.94, P = 0.02; SGRQ symptoms: 34.0 vs. 25.7, P = 0.005, PSG: NS). There were more chest images performed within 6 months of screening in those notified of a screen detected nodule (25.5 vs. 9.3%, P = 0.002).

## Conclusion

Individuals choosing to participate in a LC screening program have a higher QOL at baseline than the general US population. Notification of a screen detected abnormality results in increased use of chest imaging and a decrease in QOL.

## Commentary

The study by Mazzone and colleagues has three main findings that fall in line with all screening trials: 1.) people who enter screening trials are healthier; 2.) a positive screen results in more testing; and 3.) positive screens negatively effect patient psyche.

The healthy volunteer effect of screening trials is a described phenomenon in which there is a self-selection of better-educated, more health-conscious persons with better access to medical care. (1) It is true in this study as evidenced by a baseline QOL in the study population higher than that of the general US population. In the National Lung Cancer Screening Trial (NLST), the largest randomized controlled trial published to date on lung cancer screening, this effect is also apparent. The demographics of those enrolled in the NLST are significantly different from the estimated 8 million people in the US meeting NLST entry criteria. (2) The patients enrolled in NLST were younger, less likely to be current smokers, less ethinically diverse and more educated than persons who would participate in a broad based LC screening.

Mazzone and collegues also found that a positive screening test resulted in more imaging studies. Similarly, in the low dose CT arm of the NLST, 27% of subjects had at least one screen-detected nodule, 96% of which did not turn out to be due to cancer. (3) The target for screening is not an actual lung cancer per se, but a pulmonary nodule that may represent an early lung cancer. By this criterion, the vast majority of screen-detected nodules are ultimately found to be benign. Unlike colon cancer screening in which an abnormality can be biopsied/excised at the time of colonoscopy screening (4), a screen-detected nodule cannot be assessed pathologically at the time of detection and requires either additional imaging or an invasive procedure.

While the majority of screen-detected nodules in the NLST were managed by serial monitoring, the psychological harms of a positive test result should not be underestimated. In this study, a patient with a positive screen had a significant decrease in quality of life. In another qualitative analysis, it was shown that most patients interpret a pulmonary nodule to mean cancer when the actual risk of malignancy is very low. (4) The way the results are communicated and discussion of magnitude of risk are critical factors in how patients are able to cope with the news of a new indeterminate nodule. (4, 5) This has also been demonstrated in those with false positive results from both breast and prostate cancer screening. A study of women recalled for diagnostic assessment following a mammogram found that those with abnormal findings reported an increase in level of concern regarding cancer, which was sustained even a month after a negative result had been determined. (6) Similarly, men with false-positive screening results had increased prostate cancer-related worry and problems with sexual function. (7, 8)

Most recently, the United States Preventive Task Force (USPTF) published its recommendation giving LC screening with LDCT a grade B recommendation.(9) The USPTF found adequate evidence to screen asymptomatic patients aged 55-80 with significant tobacco use history. Their assessment was that the moderate net benefit of screening depends on the accuracy of image interpretation and the resolution of most false-positive results without invasive procedures. (10) As large scale screening is implemented, it must be recognized that a number of false positives will be identified which may lead to patient anxiety and distress particularly if the results and absolute risks are not explained properly. The potential end results of the LC screening test should be a part of counseling a patient to undergo LC screening including detailed discussions of risk and the possibility of a false-positive screen.(11)

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