LEXINGTON, Ky. (May 30, 2014) -- A multidisciplinary team of doctors, researchers, and informaticists at the University of Kentucky is working to improve identification of lung cancer patients who are eligible to participate in clinical trials for novel treatments.

Clinical trials are critical for advancing research into new and better treatments for patients, and the need for improved treatment of lung cancer is dire: Lung cancer is the leading cause of cancer death worldwide. Its burden is especially significant in the Commonwealth, where rates of lung cancer incidence and mortality are the highest in the country. In Appalachian Kentucky, the situation is even worse, with incidence rates nearly twice the national rate.

Despite high rates of lung cancer, less than 1 percent of lung cancer patients enroll in clinical trials. This is partly due to the difficult and tedious business of identifying and recruiting patients who are eligible for trials, a task currently conducted by research staff who manually reviews patient information for a multitude of (often complex) eligibility factors. The process is time consuming and inefficient, with studies showing that manual identification can overlook up to 60 percent of eligible patients. Furthermore, patient eligibility can vary by study and change over time.

And, unfortunately, the severity of the disease also contributes to the exceptionally low rates of lung cancer patient enrollment in clinical trials. Lung cancer is often diagnosed so late that the median survival time is only eight months, leaving little time for patients to explore treatment options or for doctors to identify patients who are eligible for novel therapeutic interventions offered through clinical trials.

The combination of the burden of lung cancer in Kentucky and the urgency of identifying patients who are eligible for clinical trials motivated Dr. Eric Durbin and his team to devise a more efficient method for screening patient eligibility. Durbin, an assistant professor in the division of biomedical informatics at the UK College of Public Health, is the director of the Cancer Research Informatics Shared Resource Facility at the UK Markey Cancer Center and director of cancer informatics at the Kentucky Cancer Registry.

With pilot funding from the Kentucky Lung Cancer Research Program (KLCRP), Durbin and his team are leveraging the rich and unique electronic data sources managed by the UK Center for Clinical and Translational Science (CCTS), the UK Institute for Pharmaceutical Outcomes and Policy (IPOP), the Markey Cancer Center, and the Kentucky Cancer Registry (KCR), which is housed at UK, to design, develop, pilot, and evaluate an innovative, electronic informatics system to automatically identify patients who are eligible for clinical trials. The outcomes of the automated identification system will then be compared to those of the manual identification methods. If successful, the automated system could dramatically increase the speed, completeness, and efficiency of identifying patients for lung cancer clinical trials.

“The need for improvement was pretty obvious, and my colleagues and I thought it would be an ideal project for KLCRP pilot funding,” said Durbin, who is the principal investigator on the project. “We’re trying to leverage existing and new electronic data sources to improve the efficiency of the identification and recruitment process.”

The pilot project will specifically focus on identification of eligible patients at the UK Markey Cancer Center. Due to its designation as National Cancer Institute, Markey offers unique clinical trials that are only available through NCI centers.

“Clinical trial recruitment is critically important to the Markey Cancer Center if we’re going to get lifesaving therapeutics to our patients,” said Dr. Susanne Arnold, associate professor in medical oncology and radiation medicine at the Markey Cancer Center and member of the project team. “It’s also how we make progress in cancer treatment.”
It is particularly important to identify and recruit clinical trial participants from the entire pool of eligible patients in order to remove any potential bias from the study results and to ensure that the findings are applicable to the general population. Additionally, under-recruitment in underserved populations, such as Kentucky's Appalachian residents, can be perceived as unequal access to the most cutting-edge treatments and technologies.

"We want to ensure that all patients have the opportunity to enroll in clinical trials," said Durbin.

The two-year project is currently in its seventh month, and the team is in the discovery phase of evaluating the multiple data sources and testing different query methods. In addition to using discrete data elements, such as lab values, the team is utilizing natural language processing methodology to incorporate more conceptual data, such as patient performance status, from the qualitative notes that doctors make in their medical records.

"We are combining discrete data elements with natural language processing approaches to extract complete information," said Durbin. "This is a very important area of informatics."

The objectives of the project align perfectly with the mission of the Kentucky Lung Cancer Research Program, who funded the project and whose mission is to reduce the burden of lung cancer in Kentucky.

"A critical component to reducing this burden is clinical research," said Dr. Nathan Vanderford, assistant director for research at the Markey Cancer Center and the center's liaison to the Kentucky Lung Cancer Research Program.

"The potential to greatly improve enrollment in studies will ultimately translate into improved lung cancer detection, diagnosis, and treatment in the future."

Vanderford recognizes the distinctive capacity of Durbin's team to capitalize on the robust data, expertise, and technology available at UK. In addition to the wealth of electronic health data at UK, the Kentucky Cancer Registry (KCR) is housed at the university by legislative mandate. The KCR operates a population-based electronic pathology reporting system that captures 90 percent of all histologically confirmed cancer cases in Kentucky within days of diagnosis.

"We are very uniquely situated in terms of the data sources and technology we have at UK. And this team is uniquely skilled to do this project. They have a significant number of years of experience and are very familiar with all the data sources. We're very cutting edge in being able to apply all these different data sources to achieve our objective in a much better way," he said.

While the pilot project focuses specifically on lung cancer patients at Markey Cancer Center, the automated identification system could be easily applied to a broad range of cancers and other disease conditions in the future.

"What's really exciting about Dr. Durbin's study is that it has the potential to greatly improve clinical research not only in lung cancer but in other cancers and disease conditions as well," said Vanderford.

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