[MUSIC PLAYING]

**DAVID LARSON:** Colorectal cancer ravages the lives of 150,000 patients a year. And the opportunity to utilize things outside of colonoscopy, the DNA testing, is an opportunity to improve the compliance of screening and hopefully eradicate a disease.

**JOHN KISIEL:** One of the most important and recent innovations in colorectal cancer screening is the multitarget stool DNA test. That's a safe, noninvasive, easy to use, patient friendly test that was actually co-developed by the Mayo Clinic. From the stool sample that the patient sends into the clinical laboratory, we assay for several DNA mutations, we assay for several methylated DNA markers, and we also assay for fecal hemoglobin, a marker of hidden blood loss. Those markers are then put into a logistic algorithm, which calculates a score and gives the patient and the doctor a positive or negative result.

When a doctor issues a prescription for the multitarget stool DNA test, an order is sent directly to the clinical laboratory in Madison, Wisconsin, who then has a switchboard that contacts the patient, asks them some simple and straightforward questions, and then arranges for a kit to be sent directly to their home. The patient produces their sample, puts it back into a shipping container, which is then sent by courier back to the clinical lab, and then the doctor receives a result to share with the patient. This is a test that can be done in the safety and comfort of a patient's own home. The specimen is shipped through the mail. There's no bowel preparation, no dietary or medication restrictions that are required for the test, and therefore, it makes it pretty easy to use.

**DAVID LARSON:** Colon cancer is preventable, and it starts with screening. We want to make sure that everyone that's of the appropriate age is screened for colon cancer because it's probably one of our most preventable diseases.

**JOHN KISIEL:** The traditional screening method for colorectal cancer in the United States is colonoscopy. Unfortunately, about one in three individuals who are eligible for colorectal cancer screening aren't getting screened by any test at all. Colonoscopy is inconvenient. It requires bowel prep, it requires time off from work, they need to get a ride to and from the exam because they have to get sedated. And I think the onus is on us as clinicians and scientists to try to bring new innovations to the clinic space for those patients in order to really try to improve the rates of

participation in programmatic screening.

**DAVID LARSON:** The survival rates for colorectal cancer are, again, completely curable. Stage 1 disease is somewhere between 85% and 95% for colon and rectal disease, all the way to Stage 4, which is metastatic disease. Here at Mayo Clinic, the survival rates are somewhere between 25% and 40%.

**JOHN KISIEL:** Patients that have a positive multitarget stool DNA test result, they'll all need to undergo colonoscopy. But really, something that would require the level of surgical attention may only be seen in a quarter of patients or fewer.

**DAVID LARSON:** There are many advances here at Mayo Clinic regarding minimally invasive surgery, and they include the formats of robotic surgery and laparoscopic surgery. The benefits over traditional surgery, which was open surgery-- large incisions-- are now that very small incisions can be used on almost every case. Our teams are used to very complex problems and solving them. Proton beam is very unique, and it's an opportunity for patients at the Mayo Clinic. I think the real benefits are to be able to target tumors specifically, and eliminate the collateral damage that radiation can produce.

The other alternative is intraoperative therapy, which uses electrons as opposed to protons. And this is a huge opportunity for patients with very complex tumors. Today, more than 7,000 patients have been treated by our enhanced recovery pathways, and these pathways decrease complication risks by more than 50%, and lead to lower lengths of stay, improved recovery, and, really, an opportunity for patients to return to their normal, daily activities in a faster pace.

**JOHN KISIEL:** One of the other things that we'd like to offer patients in the future are noninvasive surveillance tests. So those high risk groups that may not be good candidates for multitarget stool DNA testing right now are not going to be left out in the cold. We're working very hard to develop new molecular based diagnostics that are specialized and tailored to those populations. We just need some more time to validate those, but that's in the future.

**DAVID LARSON:** My hope would be that these new tests possess the opportunity for patients to eliminate colorectal cancer completely. It is rare, I would say, that we have nothing to offer the patient. So I continually encourage those individuals to call often, call with any question. We're happy to answer their questions, certainly happy to help their patients.