

# 'The little company that can disrupt healthcare'

Dr. Aki Alzubaidi and Christine Spraker believe lung cancer can consistently be diagnosed at an earlier stage with their revolutionary integrated digital health platform. Learn how they turned a dream into reality.

## Matrix Analytics



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# No stopping now:

## ‘We have too many lives to change’

*Matrix Analytics develops digital application program to help diagnose lung cancer*

**D**r. Aki Alzubaidi couldn't stop thinking about the patient, a man in his 30s who had never smoked, ran marathons and made good lifestyle choices — and whose lungs were riddled with nodules.

“It could've been me,” Alzubaidi, 38, remembered about the patient he befriended three years ago when he diagnosed the man's stage one lung cancer.

“That was a countdown timer,” said Alzubaidi, an interventional pulmonologist at National Jewish Health in Denver. “Just do it now. Run fast. And go as fast as you can and help people figure out how to solve this massively complex problem.”



*Christine Spraker, 37, and Dr. Aki Alzubaidi, 38, blended their respective talents in business development and the medical field to launch a digital registry and tracking program that leads to detecting lung cancer at an earlier stage.*

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Text by Ann Macari Healey — Photos by Paul DiSalvo



*Dr. Aki Alzubaidi, founder of Matrix Analytics, is an interventional pulmonologist with National Jewish Health in Denver. Christine Spraker, the company's president, has a background in sales and business development.*

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The problem: How to ensure that patients with lung nodules receive the proper follow-up care to help detect their development into lung cancer at an earlier stage. Lung cancer kills more people annually than breast, colon and prostate cancers combined.

So in early 2015, Alzubaidi founded Matrix Analytics and became its chief medical officer. Business partner Christine Spraker, 37, with a background in sales and business development, is president. And in June 2016, the Denver-based company launched

LungDirect — a digital registry and tracking program for patients with lung nodules — in a small rural hospital in Fruita, Colorado.

That was the first paying customer. Today, 11 healthcare agencies and institutions — from the Cleveland Clinic facilities across the country to uchealth in Denver to Community Hospital in Grand Junction — are using LungDirect.

The program, customers say, is helping save lives by keeping patients from falling through the cracks.

Community Hospital incorporated the software when its only pul-

monologist, Dr. Brent Woodson, noticed the care of quite a few patients was not being followed appropriately.

“It is so much easier to keep track of the patients,” Siarra Thorning, a registered medical assistant who works with Woodson, said of LungDirect. “Previously, I had to contact IT to run reports, which doesn’t necessarily guarantee accuracy. We have had several patients that we discovered were not being followed per Fleishner Criteria,” the clinically accepted guidelines for management of small lung nodules.

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## The challenge

Alzubaidi was working at a Glenwood Springs hospital when he began to realize that patients with a nodule or spot on their lungs often didn't receive the recommended follow-up care.

"Let's say you have a CT scan . . . and there was a breast lump," he said. "That would be followed by somebody, there would be ownership of that, somebody would know about it."

But not with lung nodules: According to several published studies, 70 percent of patients with lung nodules nationwide do not receive the recommended follow-up care.

The majority of lung nodules are detected incidentally, when a patient undergoes, for instance, a CT scan of the chest because a pulmonary embolism or another health issue is suspected, Alzubaidi and Spraker said. There might be no embolism, but the scan will show a nodule.

"There's a couple of different breakdowns now," Spraker said.

A radiologist will note the presence of a nodule, but the ER doctor may not mention it to the patient. The patient's primary care physician may or may not learn about the nodule, and if he or she does, then subsequent care

## How does LungDirect work?

LungDirect is an integrated digital health platform that allows clinicians to track patients with lung nodules and lung cancer throughout the healthcare system and ensure they are receiving appropriate follow-up care.

It identifies patients when they have the initial CT scan and pulls them into the registry, making the pulmonologist, primary care provider, nurse navigator — or any other end user — aware of the patients' diagnoses.

LungDirect automates letter



population follow-ups to the patient and ordering physicians, which some studies have shown increase appropriate follow-up by 50 percent. The program is built on the latest technology stack and can integrate into any Electronic Medical Record.

Simply making an end user aware of these patients increases the likelihood they will have the appropriate follow-up.

varies because guidelines are just that — and they come from different organizations and entities, Alzubaidi said.

"There's a lot of gray and no black and white," Spraker said. "These patients just tend to fall through the cracks."

The fact that most lung nodules are benign lends to the problem, Spraker and Alzubaidi said.

"Most don't become malignant," Spraker said, ". . . and that's why there isn't an urgency to manage them."

But those that do develop into something usually develop into lung cancer.

At minimum, patients with nodules should have an annual CT scan to rule out any growth.

"You have a patient that comes in with late-stage cancer, and you see they have an old CT scan they never followed up on, until they started coughing," Alzubaidi said. "As soon as they start coughing or having symptoms, it's too late."

Alzubaidi decided he would track 100 percent of all patients with lung nodules in the Glenwood Springs hospital. He created algorithms to manage the patients and move them through recommended care.

"Early detection went from 25 percent of the time to almost 50 percent of the time in one year," Spraker said. "That was just doing the right thing with these nodules."

Imagine the difference a software program could make.

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**Christine Spraker**

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### The partnership

Alzubaidi met Spraker when she was selling navigational bronchoscopy, a device that helps doctors find and reach tumors in the lungs' periphery. As a top salesperson for an international medical technology development company, she understood the issues in the healthcare field and saw statewide trends, such as the breakdown in lung nodule follow-up care.

“She was the one who

understood the solution to the problem,” Alzubaidi said.

“He’s a brilliant man and he looks at problems in a way that most people don’t approach them,” Spraker said. “He not only sees the solution but he executes on creating that solution.”

They joined forces and started Matrix Analytics.

First, they found software engineers to start developing the software.

Alzubaidi worked full-time at his hospital jobs — he left Glenwood to join National Jewish Health in

June 2016 — waking at 4 a.m. to work with the software developers, many of whom lived in Pakistan, Colombia or eastern Europe. Week after week, they fine-tuned and revised.

By New Year’s Day 2015, an app for LungDirect could be downloaded onto phones. The software launch came on June 15, 2016 with the company’s first paying customer, Colorado Canyons Hospital & Medical Center in Fruita.

“It’s scary, it’s amazing — and

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## DID YOU KNOW?

➔ Lung cancer has been the leading cause of cancer deaths among men in the United States since the early 1950s. In 1987, it surpassed breast cancer to also become the leading cause of cancer deaths among women. With an estimated 155,870 deaths in 2017, it will account for one in four cancer deaths.

➔ Lung cancer is the second most commonly diagnosed cancer among men and women in the U.S. An estimated 222,500 new cases will be diagnosed in 2017, accounting for 25 percent of all cancer diagnoses.

➔ 18.1 percent of patients diagnosed with lung cancer survive five years.



*Sources: American Cancer Society, American Lung Association*

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extremely difficult,” Alzubaidi said of the process.

“Healthcare is really volatile — it’s really hard to sell into,” Spraker said. “There’s a lot of external dynamics that don’t allow us to move as quickly as we would like to move.”

The feedback has been

overwhelmingly positive.

“Our customers have given us instances of the many patients they’ve been able to track,” Alzubaidi said. “There’s obviously the number of cancers you catch at an early stage and those numbers are starting to come in, too. . . It’s extremely fulfilling.”

And, for those buying the registry, it’s affordable.

Depending on facilities, installing

LungDirect runs about \$50,000 with a \$36,000-a-year annual subscription fee.

The expense is “middle of the road,” said Alzubaidi, noting other programs cost about \$200,000 and more. “Our value is the best.”

### The funding

The biggest hurdle may have been finding the money to get the

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# WhippleWood provides consistency and heart

For Christine Spraker, WhippleWood's Allyson Kelley has been the constant in the chaos of a start-up business.

"She's seen everything from big wins to when we had \$400 in our bank account right before some of the big investors came in," said Spraker, president of Denver-based Matrix Analytics, which produces LungDirect, a digital registry that tracks and manages patients with lung nodules and lung cancer. "They have provided us not only that consistency, but also tax advice as we have grown . . ."

Kelley remembers the tough times — the conversations of "whether we can pay this . . . the week to week of not knowing if they were going to survive."

And she has become so invested in their success that it's not uncommon to hear her say "we" instead of "they"

when talking about the company.



**Kelley**

Kelley, a senior accountant at WhippleWood, began working with Matrix Analytics in 2015.

She does just about everything for the company: consulting, invoicing, Quickbooks, reconciling of money, distributions of interest accruals to investors, basically anything do to with money.

But the relationship is more than just accounting's technical aspects.

Kelley and Spraker have a standing weekly 1 p.m. Wednesday phone call to review transactions, stay on top of cash flow, make sure financials look good. Some calls last 10 minutes, others 30.

And, Spraker said, "anytime I have a question I can email her

and she knows a way, has a team of resources that basically we don't have."

In the early days, Spraker and Matrix Analytics' founder, Dr. Aki Alzubaidi, also leaned on Kelley's 15 years of experience in banking and finance to help decide what payments could wait, which ones couldn't.

"Allyson has been incredible," Spraker said. "She's had a strong finger on the pulse since the beginning. She's able to see trends and recognize inconsistencies."

Kelley, for her part, feels like a team member.

Spraker "texts me when they have a success," she said. "A couple of times a month I hear about a new client about to sign on that we're going to have to start invoicing . . . Things are moving and it's really exciting to be a part of it."

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company off the ground.

Spraker and Alzubaidi are both married with young families. Spraker, a Denver native, and her husband, Josh, have two children, 6 and 8 years old. Alzubaidi, originally from Virginia, and his wife, Melissa, welcomed their second child Aug. 30.

But they each drew from their

own bank accounts to get started.

"There's been a lot of penny-pinching and tightening up," Spraker said.

Family and friends also invested. The company received a grant from the Colorado Office of Economic Development and International Trade and won \$50,000 from the Prime Health Challenge.

Three investors each gave \$250,000: George Conrades,

former CEO of Akamai Technologies, was the first. Then came Zach and Chancy Love of Denver. And, finally, businessman and investor Mark Cuban, known for his role on "Shark Tank."

Cuban's investment came after two years of weekly emails from Alzubaidi, who spent almost every Saturday morning sending emails to any and every potential investor who could bring value to the company.

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“You name ‘em, I’ve emailed ‘em,” he said.

Bill Gates. The Koch brothers. He met with Google Ventures. But he really wanted Cuban’s participation.

“He is involved with deep learning and is big into artificial intelligence,” Alzubaidi said, “and I thought he would bring tremendous resources to our company — and marketability as well.”

So he kept after Cuban, emailing any possible address connected to him.

“I have a solution for lung cancer,” Alzubaidi wrote. “I want to develop an app. Can you recommend a good developer?”

One day, Cuban responded: “Wish I could help. Can’t you find a local software developer you trust?”

After that, Alzubaidi kept Cuban updated, asked questions every now and then. Sometimes, Cuban would answer. Then one Saturday, the email conversation continued for two hours. At the end, Cuban said: “This is research, not business.”

“That was a big statement to us,” Alzubaidi said. “We’d always talked about the research, not business. We had to change it to being a



‘Just do it now ... go as fast as you can and help people figure out how to solve this massively complex problem.’

**Dr. Aki Alzubaidi,**  
on the urgency to develop a solution

business.”

In February, Cuban invested in LungDirect.

“I like what LungDirect is doing,” Cuban said in an email response to why he decided to buy in. “I was impressed with their ability to reduce healthcare costs, save lives and leverage technology — and extend their intelligence to other health issues. Once they got some traction, it made it a no-brainer.”

## The future

Today, Matrix Analytics has 15 employees — three are domestic, the rest live overseas. They work in software development, customer success, technical support, sales, business development and marketing. There are plans for expansion, to solve other health issues, in the future.

But for now, the company is in a growth stage, focusing on commercialization of LungDirect.

“We’re out of the early chaotic start-up phase where we’re just scrambling to make a minimally viable product and get it out

## TO LEARN MORE

Visit Matrix Analytics at [www.matrix-analytics.com](http://www.matrix-analytics.com) and LungDirect at [www.lungdirect.com](http://www.lungdirect.com)

there,” Spraker said. “Now, we’re ready to become a real business.”

It hasn’t been an easy road.

“There’s a reason why most start-up companies fail, and it truly is because it’s just really hard and you have to have a good team and a lot of faith and tenacity,” Spraker said. “I think we have a good mix of that.”

She and Alzubaidi also are fueled by the passion to make a difference.

“It’s really hard,” Alzubaidi said. “But it’s the best thing I’ve ever done.”

“We can’t stop — we have too many lives to change and too much impact to make,” Spraker said. “We talk about sea change a lot, and having the right group of people with the right knowledge to really make an impact. And we think we’re that small little company that can disrupt healthcare and the way that things are currently done.”