[Julie] You’re listening to the Slice of MIT podcast, a production of the MIT Alumni Association.

If you’re one of the 60 percent of people in the US that have anxiety about going to the dentist, just hearing that this podcast has something to do with dentistry might have made your heart start to race. Have no fear, though. Today we’re going to talk about some really positive things happening in the dental industry—I can’t promise that it will dispel your fears the next time you’re due for an exam, but from an environmental perspective, it’s some very promising stuff. Also, spoiler alert—dentistry produces a LOT of mercury pollution in our wastewater, and our guest today—Omar Al-Midani—says his company has a solution. Stay tuned.

[Omar] So the EPA has done many studies saying that 50 percent of all the mercury that goes into our wastewaters comes from dentistry. I’ve checked that fact multiple times. It’s crazy.

[Julie] That’s Omar. He got his master’s from MIT’s AeroAstro department in 1998, and you may be wondering how did he go from AeroAstro to dental supplies? Let’s just say his career path was anything but linear. Turns out he also had a stint in there in finance—we’ll get to that later.

The eco-dentistry pursuit started when a friend from high school who was working in dental supplies mentioned his desire to start a business in the field. The two realized the incredible amount of waste in the dental industry and saw a market need, so they cofounded PureLife. When Omar came across the mercury issue, he was stunned. The toxic heavy metal can be found in our air and in our water and poses serious health risks. A small portion of mercury contamination is caused by natural sources, like volcanic eruptions and emissions from the ocean, but contamination is largely caused by human emissions from fuels, raw materials, and industrial processes.

[Omar] Mercury in dentistry comes from mercury fillings, and when I mention that to people they say, "Well, people don't do that anymore; they do composite fillings." Fifty percent of dentists still use mercury fillings, and so when they operate on the patients some particles leach out into the water.

[Julie] You may be surprised by this—I was. I always just assumed dentists stopped using mercury in fillings, since it’s known to be toxic. Known by most as “silver” fillings, dental amalgam is a mixture of metals like liquid mercury and a powdered alloy composed of silver, tin, and copper.

[Omar] If you have a mercury filling and you go and see a dentist that doesn’t even put in mercury fillings himself…it releases some particles of mercury into the water…a little bit of contamination. One drop of mercury, if you will, can contaminate millions of tons of water.

[Julie] Omar’s company has one of the only solutions to preventing this contamination, creating a filter—called an amalgam separator—to stop the mercury from making its way into the water stream after leaving a dental station.
[Omar] We provided mercury solutions in the last year for 2,000 dental practices. We expect we'll do 20,000, which is going to be about a third of the market, when this is all said and done. So it feels really good.... The whole thing will be eradicated. The whole problem will be eradicated in three years. We feel very confident about that.

[Julie] They feel confident now, but it took a lot of hard work and dedication, and more than five years, to get to this point.

[Omar] We are an industry where a lot of the focus is return on investment, like most businesses. Why are you spending 20 percent of your time, 30 percent of your time on something that brings you less than one percent of your revenue? A lot of our competitors, but also a lot of our business partners and our friends and some of our employees, a lot of them actually, especially a lot of the sales people, "Why are you asking us to push this product? I get the whole environmental thing, but nobody cares." We tried to explain, "Well, look, we need to have a mission, we need to. And by the way, this will work and people will want that. This is how you get new customers. And they'll stay with you on that basis."

...At the end of the day, why are we doing this? You got to feel happy about what you're doing. Is it just to make a dollar? But when it happened, it was almost sort of, "I told you so."

[Julie] Okay, so let’s back up for a second. When Omar says when “it” happened, I want to clarify what he’s talking about. The EPA instated a rule in 2017 that requires most dental practices nationwide to adopt solutions that can capture dental amalgam waste, preventing its release to sewer systems. Before this passed, it was up to each practice whether to make this a priority or not. Now, suddenly, PureLife’s solution became a necessity for many dental offices—compliance for most dentists must be reached by July 2020. The product, which the company engineered in collaboration with an Austrian research and development team, also includes its unique software management platform, which helps to ensure compliance through features like automatic monthly mercury checks. Another factor that sets the tool apart, Omar says, is that PureLife’s newly developed business model allows it to sell the product at a discounted rate. The only other real solution on the market, he says, is about 5–10 times more expensive.

[Omar] Honestly, the first month of starting the company we uncovered that issue, and we thought to ourselves, "Wow, we could actually, if we were established, we could donate that solution to everybody and it wouldn’t cost that much. Why isn’t everybody jumping on that?" How many times do you have, in history, a chance to make a huge impact and it’s not going to cost you $10 billion? In this case, the whole solution can be solved for a few tens of millions of dollars, and so while we didn’t have the pockets to donate that, we actually built a product that was going to be extremely cheap to use.

The mission of the company is really about making eco-friendly solutions affordable—to improve the health care industry while also improving the environment.

[Julie] Beyond mercury, the company provides solutions that cut back on waste and are safer, cleaner, greener products. And it has recently expanded from dentistry into the broader medical industry.

[Omar] The first initial part of PureLife we decided we’re going to be green. We’re going to be eco-friendly. What does that mean exactly? We’re not sure, but we’re going to figure it out. We did a lot of research to figure out what is wrong in dentistry. What is wrong in health care right now? The big part is there is a lot of disposables. Now, disposable, it's important. That’s what you need. You’re not going to have a cloth full of blood and wash it. Nobody wants that. So, instead of trying to be a green company
that's trying to do health care, we're a health care company that's trying to be as green as possible. In the disposable, we looked for alternatives. Instead of plastics, we looked to incorporate biodegradable plastics.... When we look at cleaners, there's a lot of cleaners out there, especially in Europe, that are much healthier than the ones we have here. The ones we have here have known cancer-causing agents. There are alternatives that are cheaper even that do not have any cancer-causing elements, no chemicals even registered with the EPA, so we started going in that direction in terms of promoting these products, researching these products.

The people that really care about, it's the patients and their staff. For example, our surface disinfectant came about after we actually searched for it and commissioned some research from the universities and so on, because there is a lot of green washing out there. There is a lot of product that claims something. This is a medical scenario. We really have to know what we're bringing to market. We were getting feedback from a lot of the staff at a doctor's office...saying, "We're spraying stuff all day long. We're inhaling these fumes. Is that even good?"...So that gave us the energy to say, "You know what? If we can find a solution in surface disinfection—" We weren't sure that we could find such a solution out there. But we did.

[Julie] PureLife did the study with Tufts University School of Dental Medicine. They took seven products that claimed to be eco-friendly, some from the US and Canada and some from Europe, not knowing if the results would even produce one that was eco-friendly and effective. The study was completely blind and, in the end, did find one to be an eco-friendly and effective product, sort of to their surprise.

[Omar] The product that we got, this is not ours, but we got the exclusive—we brought it from Canada, we spent a lot of money researching and getting the test to prove that it was good—just got received the number-one mark from the highest authority in dentistry. It said that it was a thousand times more effective than the number-one brand on the market. A thousand times more effective, and that in the US it is the only product that truly does disinfection. Everything else cannot be called a surface disinfectant. Those claims were so bold that we're not even making them in marketing, because it sounds completely ludicrous.

[Julie] PureLife started as a distributor of existing dental products and has evolved over the years. Today, the company works with many vendors, influencing their products and manufacturing, where it can, to help align with PureLife's mission, and even manufacturing some of the products directly through PureLife.

[Omar] We are now maybe manufacturing about a third of our products....

A product that is ours, for example, is a strategic area where we focused on is waste management. From the container to the actual recycling to the software, the whole system is ours.

Another third has our brand name and has been influenced in some way. For example, we import gloves from Malaysia, but we have switched the factory to use biofuels, and we are also using all recyclable materials in that box.

The way we're planning to evolve is to continue to evolve more into manufacturing, but more those products that we believe are strategic to the mission.
[Julie] I want to take a moment here to mention that this podcast was published in April 2019, in celebration of Earth Day. Omar is one of so many MIT graduates who are using their degrees to make a better world by protecting the health of our planet.

It's big news when inventive, eco-friendly solutions turn out to be cost-efficient as well. But Omar brings a dose of reality to this conversation when he points out that PureLife actually loses money on some of its products for the good of the planet. The example Omar gives to illustrate this is a dental bib. You know, those paper things the hygienist clips around your neck so you don't drool down your shirt? PureLife was working with a manufacturer that had an idea for a new version.

[Omar] This manufacturer came to us and said, "Look we have a different additive that we can put into our product to make it eco-friendly. We've thought about you. It doesn't make much economic sense so nobody's going to do it. Is that interesting to you guys?" We looked at it and we crunched some numbers and we said, "Look, yes, we can make it work. We're going to absorb some of the cost, you're going to absorb some of it, but the good news is instead of just carrying that product, we're going to make a huge campaign on it." That worked out. That was one of the examples where our value proposition is we help some of these manufacturers take risk in terms of being a little bit greener because we are the platform to help them become greener. Instead of incurring some costs and seeing if the market buys it, we absorb most of that cost and we put in the entire marketing effort to get the market excited, and then it's easy for them to offer it to other people.

[Julie] Many companies don't choose the eco-friendly option because they assume that means more expensive, so Omar's company actually takes some losses to drive widespread adoption.

[Omar] As a company, we've had to make the commitment of, when it is more expensive, we absorb the difference. How does it make sense? Well it eats up into our profits a little bit, but not enough to make a huge difference, and at the very least, we stand out. So now we are known as the company who actually cares about these things. We also try to be very honest in explaining how we are eco-friendly per product. In some cases it's just a bit of recycling material and it doesn't really matter. We'll say, "Look, we tried our best, but it's a bit more recycling material." In some of the cases we've removed all the bad chemicals, all the cancer-causing chemicals, and it's perfectly good for you. So there's both extremes, and in some cases we were not able to do anything. So we say, " We will not be able to do anything on this product, but it's carbon offset." So just being very transparent with the doctors, because these are smart, educated people...we are really just a health care company that's trying to do our best, and it's an evolving proposition.

[Julie] Now, let's circle back to the topic of how Omar went from AeroAstro, to finance, to clean tech.

[Omar] While I loved what I learned in school, when I got exposed to it in terms of industry, it felt a bit foreign to me. It felt less entrepreneurial.... So I got attracted to going to finance just because of the excitement, and they were getting engineers in and scientists and so on.
When I went into finance I covered a lot of technology companies so I did a lot of...I was doing equity research as a stock analyst. I covered many tech companies—Hewlett Packard, IBM, and so on. I realized that I was really jealous of the people running the businesses and starting the businesses. And the questions, the deep analysis, and the critiques of their businesses—that wasn’t me. I wanted to be the guy doing it, not the guy critiquing it or analyzing it. I realized I really wanted to start my own business, and after several years in finance, being in the department, there was somebody who gave me a business plan on a clean tech project where they needed help in terms of management, help fundraising, and so on. That’s when I made the leap. That’s how I got into clean tech, because it leveraged some of the work experience that I had, but it really brought me into tech and starting a company, which is something I’ve always wanted to do.

[Julie] So, Omar’s first startup didn’t work out, but when his high school friend approached him with the idea, he already had the startup itch and knew he wanted to do it again.

[Omar] The advice to anyone trying to start their own company, what I’m going to say is probably not original. We’ve heard it a lot of times, but it’s just get started. Don’t overthink it.

So starting a company, people get locked into overanalyzing, overplanifying. Everything is going to change. You have to get started, you have to get the momentum, and you have to be willing to change course. Really, you have to understand that the risk of starting a company is not huge. If you fail, again, you will learn something. It’s a free MBA, it’s desirable by companies. You will look better to another company, or to most companies, for doing what you’ve done. You will learn more about yourself. You will learn more in case you want to do a second startup.

[Julie] Something that helped him with the entrepreneurial mindset and prepared him for failing and trying again, says Omar, were the lessons he learned as a graduate student.

[Omar] What I did at MIT as a graduate student, working with micro rockets...I had to come up with my own problems to solve. I had to think about where I wanted to take the research, and there was a lot of lonely times where you were in your bubble...and you have to figure it out. I think being an entrepreneur is similar to that, where you’re not always getting someone—yes, you have an advisor at MIT, but the advisor is not there 24/7, and that’s how it is being an entrepreneur. Sometimes you don’t know if you’re going in the right direction, but you have to believe in yourself, you have to try it out, and then you’ll get some input from the market, from the customer, whatnot....

I think the research was very helpful in preparing me. One thing about MIT is because of my network of friends that I still know from MIT or that I hear about just loosely. There is what I call a healthy peer pressure of keeping up with everybody, and so there’s that drive. I went to MIT because I work real hard to get to the best school for the subject that I liked, and that has set an expectation on myself ever since of, "I need to do something with my life."

[Julie] PureLife celebrates its 10-year anniversary this year, and the company continues to grow—with offices in Santa Monica, California (where Omar lives), Texas, and soon an office launching on the East Coast, where much of its market is located.
[Julie] A big thanks to Omar for sharing his story with us and for his commitment to offering products that are focused on best serving the health of people and the planet.

We’d love to hear from you. Tweet us your thoughts on this episode to at mit underscore alumni.

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