[MUSIC PLAYING]

THORVARDUR HALFDANARSON: PNETs, or a pancreatic neuroendocrine tumors are less than 10% of pancreatic malignancies. Although, they are becoming more common and tend to be much slower growing than pancreatic adenocarcinoma. We know that there are probably about 1 per 100,000 per year. So, it's a rare tumor. But because patients with [INAUDIBLE] tumors can live for many years, that the prevalence of the tumor, that is the number of patients actively dealing with the tumor at any given time it's actually fairly high, because the survival is months longer than for pancreatic adenocarcinoma.

Occasionally, these pancreatic neuroendocrine tumors can make insulin, which makes your blood sugar drop. And you will have symptoms from that. They can make a hormone called gastrine, which causes your stomach acid to go up, and eventually may result in stomach ulcers and severe diarrhea. Other pancreatic neuroendocrine tumors can make different chemicals. There's a hormone called VIP, or vasoactive intestinal peptide, that can cause severe diarrhea. That would be very unusual. So sometimes these tumors just make hormones. And it's the hormones that make you sick, not the tumor itself.

Sometimes the tumors just grow to be large and start causing pain by pushing on nerves at the pancreas. So the pancreas or that part of the body is a busy place. There's a lot of nerves running up and down there, blood vessels. So sometimes the tumors can start pushing on the nerves, causing pain. And sometimes patients just have a quiet, small pancreatic neuroendocrine tumor that has spread to the liver, and the liver is starting to fill up with metastases. And that may cause pain on its own, or abdominal fullness, or even occasionally a mass in the abdomen that the patient feels himself or herself.

We are increasingly seeing those diagnosed at the early stages, oftentimes incidentally, meaning that patients come in for other reasons than necessarily the tumor. They have a CT, let's say for a kidney stone or something, and there's a tumor in the pancreas. So you get the diagnosis, and then we have to complete the staging. And now, we use a special imaging called the Gallium 68 [INAUDIBLE] path imaging. And that binds to the tumor cells and literally lights them up, almost as if we're painting the tumors in the body. And then, it's coupled with a diagnostic quality contrast enhanced MRI of the upper abdomen.

In terms of the hopeful things going on in pancreatic neuroendocrine tumors, I think the PRRT, or peptide receptor radionuclide therapy with Lutetium 177 is probably the most promising treatment out there. Essentially, a drug that recognizes the tumor cells that is coupled with a therapeutic radionuclide, we inject this intravenously. This circulates around the body and sticks to the tumor cells and radius indirectly. This treatment results in tumor shrinkage in probably as high as 20% to 30% of the patients. And also, it stabilizes the tumor and a majority of them, sometimes even for years.

So the side effects of PRRT are generally very mild. There can be some nausea with the treatment at the time of administration, which is more related to the IV fluids that were given to protect the patient's kidneys. The question is really when to give it, because Lutathera is not like one size fits all. Who are the ideal candidates for Lutathera? Who are the candidates for chemotherapy? Who should have surgery? But any given time, there are many patients with neuroendocrine tumors out there. And I think that's where we can contribute as neuroendocrine tumor specialists.

Patients with neuroendocrine tumors who are seen at large volume specialized centers seem to do better than the average patients out there. If you look at the national cancer databases for pancreatic neuroendocrine tumors, the average survival in there is probably no more than four to five years for patients with pancreatic neuroendocrine tumors. And we know for patients here, it is much higher. What we have to offer at Mayo is a very thorough multidisciplinary approach. The key here to success is to get all of the team members involved early on, so we can make a treatment decision that works best for that particular patient.