To estimate the **Potential Peak Sales** for lutetium Lu 177 dotatate (Lutathera) in the indication of somatostatin receptor (SSTR)-positive gastroenteropancreatic neuroendocrine tumors (GEP-NETs) in the US, EU5 (France, Germany, Italy, Spain, UK), China, and Japan, as well as the **$ value of 1% share of treated patients** in these geographies, we need to follow a structured approach. Since specific data such as exact patient numbers, pricing, or market penetration rates may not be publicly available in full detail, I will outline the methodology and provide a reasonable estimate based on available information and assumptions.

Step 1: Define the Target Population

- **Indication**: SSTR-positive GEP-NETs (including foregut, midgut, and hindgut neuroendocrine tumors) in adults and pediatric patients (12 years and older).

- **Geographies**: US, EU5, China, Japan.

- **Prevalence/Incidence**: GEP-NETs are rare tumors. According to literature, the incidence of NETs is approximately 6-7 per 100,000 people annually in the US and EU, with GEP-NETs constituting a significant portion. China and Japan may have slightly different epidemiology due to genetic and environmental factors, but data is less robust.

- **US**: ~170,000-200,000 prevalent cases (based on historical data and SEER database estimates for NETs).

- **EU5**: ~150,000-180,000 prevalent cases (based on population size and similar incidence rates).

- **China**: ~300,000-400,000 prevalent cases (larger population, but lower diagnosis rates due to healthcare access).

- **Japan**: ~40,000-50,000 prevalent cases (smaller population, high diagnosis rates).

- **Eligible Patients**: Not all prevalent cases are SSTR-positive or eligible for treatment with Lutathera (e.g., due to disease stage or other factors). It is estimated that ~50-60% of GEP-NET patients are SSTR-positive and may be eligible for peptide receptor radionuclide therapy (PRRT) like Lutathera.

- **Pediatric Patients**: Pediatric cases (12 years and older) are a small fraction of the total, likely <5% of the patient population, as GEP-NETs are extremely rare in children.

Step 2: Estimate Treated Patients

- **Assumption**: Only a fraction of eligible patients receive treatment due to factors like access to therapy, reimbursement, and physician/patient preference. Based on the query, we assume a **20-30% share of treated patients** for Lutathera among eligible patients.

- **Estimated Eligible Patients** (SSTR-positive and suitable for PRRT):

- US: ~85,000-120,000

- EU5: ~75,000-108,000

- China: ~150,000-240,000

- Japan: ~20,000-30,000

- **Treated Patients (20-30% share)**:

- US: ~17,000-36,000

- EU5: ~15,000-32,400

- China: ~30,000-72,000

- Japan: ~4,000-9,000

Step 3: Pricing and Treatment Cost

- **Cost of Lutathera**: The drug is administered in 4 cycles (one every 8 weeks). In the US, the cost per cycle is approximately $47,500 (based on historical data and reports), leading to a total cost of ~$190,000 per patient for a full course. Pricing in other regions is typically lower due to healthcare system differences:

- EU5: ~$120,000-$150,000 per patient (varies by country due to reimbursement and pricing negotiations).

- China: ~$80,000-$100,000 per patient (lower pricing, limited access).

- Japan: ~$130,000-$160,000 per patient (similar to EU, high reimbursement but smaller market).

Step 4: Calculate Potential Peak Sales

Peak sales are calculated as the number of treated patients multiplied by the cost per patient. We will use the midpoint of the 20-30% share range (25%) for simplicity and provide a range based on pricing variations.

- **US**:

- Treated patients (25%): ~26,250

- Cost per patient: $190,000

- Peak Sales: ~$4.99 billion (range: $3.23B-$6.84B for 20-30% share)

- **EU5**:

- Treated patients (25%): ~23,625

- Cost per patient: $135,000 (midpoint)

- Peak Sales: ~$3.19 billion (range: $1.8B-$4.86B for 20-30% share)

- **China**:

- Treated patients (25%): ~52,500

- Cost per patient: $90,000 (midpoint)

- Peak Sales: ~$4.73 billion (range: $2.4B-$7.2B for 20-30% share)

- **Japan**:

- Treated patients (25%): ~6,250

- Cost per patient: $145,000 (midpoint)

- Peak Sales: ~$0.91 billion (range: $0.52B-$1.44B for 20-30% share)

- **Total Peak Sales (across geographies)**:

- Midpoint estimate (25% share): ~$13.82 billion

- Range (20-30% share): ~$8.0B-$20.34B

Step 5: Calculate $ Value of 1% Share of Treated Patients

The 1% share of treated patients corresponds to 1% of the eligible patients being treated with Lutathera. Using the midpoint of eligible patients and pricing:

- **US**:
- 1% of eligible patients: ~1,025 (midpoint of 85,000-120,000)
- Cost per patient: $190,000
- $ Value of 1% share: ~$194.75 million

- **EU5**:
- 1% of eligible patients: ~915 (midpoint of 75,000-108,000)
- Cost per patient: $135,000
- $ Value of 1% share: ~$123.53 million

- **China**:
- 1% of eligible patients: ~1,950 (midpoint of 150,000-240,000)
- Cost per patient: $90,000
- $ Value of 1% share: ~$175.5 million

- **Japan**:
- 1% of eligible patients: ~250 (midpoint of 20,000-30,000)
- Cost per patient: $145,000
- $ Value of 1% share: ~$36.25 million

- **Total $ Value of 1% Share (across geographies)**: ~$530.03 million

Summary

1. **Potential Peak Sales for Lutathera in GEP-NETs (20-30% share of treated patients)**:
- US: $3.23B-$6.84B (midpoint ~$4.99B)
- EU5: $1.8B-$4.86B (midpoint ~$3.19B)
- China: $2.4B-$7.2B (midpoint ~$4.73B)

- Japan: $0.52B-$1.44B (midpoint ~$0.91B)

- **Total**: $8.0B-$20.34B (midpoint ~$13.82B)

2. **$ Value of 1% Share of Treated Patients**:

- US: ~$194.75M

- EU5: ~$123.53M

- China: ~$175.5M

- Japan: ~$36.25M

- **Total**: ~$530.03M

Caveats and Assumptions

- **Epidemiology Data**: Patient numbers are estimates based on literature and may vary with updated studies or diagnostic improvements.

- **Pricing**: Pricing is based on US figures and adjusted for other regions; actual costs may differ due to negotiations, reimbursement, or generics/competition.

- **Market Share**: The 20-30% share is an assumption as per the query; actual penetration may depend on competition (e.g., other PRRTs or therapies) and access.

- **Pediatric Impact**: Pediatric patients are a small fraction and unlikely to significantly impact total sales.

These estimates provide a high-level view and should be refined with more specific data on patient populations, real-world pricing, and market dynamics if available. If you have additional data or specific assumptions, I can adjust the calculations accordingly.