To calculate the **Potential Peak Sales** for nivolumab (Opdivo) in the specified indication across the US, EU5 (France, Germany, Italy, Spain, UK), China, and Japan, as well as the **$ value of 1% share of treated patients**, we need to make several assumptions and follow a structured approach. Since the exact indication and patient population aren't fully specified beyond "adult, solid tumor indications," I will assume this refers to a broad range of solid tumors where nivolumab is already approved or has potential (e.g., non-small cell lung cancer (NSCLC), melanoma, renal cell carcinoma (RCC), etc.). I'll also use publicly available data and reasonable estimates for market size, pricing, and penetration rates.

Step 1: Key Assumptions

1. **Treated Patient Population**: Estimate the total number of patients eligible for nivolumab in solid tumor indications in each geography. This includes patients with cancers like NSCLC, melanoma, RCC, etc., where nivolumab is approved or in late-stage development.

2. **Market Share**: As per the query, assume a 20% to 30% share of treated patients for nivolumab.

3. **Pricing**: Nivolumab's annual cost per patient varies by country due to differences in healthcare systems and pricing negotiations. Approximate annual costs are:

- US: ~$150,000 per patient

- EU5: ~$80,000–$100,000 per patient (average)

- Japan: ~$100,000 per patient

- China: ~$50,000 per patient (due to lower pricing and recent inclusion in National Reimbursement Drug List with discounts)

4. **Peak Sales Timeline**: Assume peak sales are achieved 5–7 years post-approval or expansion into new indications, reflecting market penetration and competition.

5. **Patient Population**: Based on cancer incidence and prevalence for solid tumors (e.g., lung, melanoma, kidney, etc.), and assuming only a subset are eligible for immunotherapy.

Step 2: Estimate Total Eligible Patient Population

Using cancer epidemiology data and the proportion of patients eligible for immunotherapy (e.g., PD-L1 positive or specific tumor types), approximate numbers of patients eligible for nivolumab are as follows (annual incident cases, adjusted for eligibility):

- **US**: ~300,000 patients (solid tumors like NSCLC, melanoma, RCC, etc.)

- **EU5**: ~350,000 patients (combined for France, Germany, Italy, Spain, UK)

- **China**: ~1,000,000 patients (higher cancer incidence, but lower access to high-cost drugs)

- **Japan**: ~100,000 patients

These are rough estimates based on cancer incidence data (e.g., GLOBOCAN) and immunotherapy eligibility (~20–30% of solid tumor patients for PD-1 inhibitors).

Step 3: Calculate Treated Patients with 20%–30% Market Share

- **US**: 300,000 × 20%–30% = 60,000–90,000 patients

- **EU5**: 350,000 × 20%–30% = 70,000–105,000 patients

- **China**: 1,000,000 × 20%–30% = 200,000–300,000 patients

- **Japan**: 100,000 × 20%–30% = 20,000–30,000 patients

Step 4: Calculate Potential Peak Sales

Multiply the number of treated patients by the annual cost per patient in each geography.

US:

- 60,000 patients (20%) × $150,000 = **$9.0 billion**

- 90,000 patients (30%) × $150,000 = **$13.5 billion**

EU5:

- 70,000 patients (20%) × $90,000 (average) = **$6.3 billion**

- 105,000 patients (30%) × $90,000 = **$9.5 billion**

China:

- 200,000 patients (20%) × $50,000 = **$10.0 billion**

- 300,000 patients (30%) × $50,000 = **$15.0 billion**

Japan:

- 20,000 patients (20%) × $100,000 = **$2.0 billion**

- 30,000 patients (30%) × $100,000 = **$3.0 billion**

Total Peak Sales (20%–30% Market Share):

- **20% Share**: $9.0B (US) + $6.3B (EU5) + $10.0B (China) + $2.0B (Japan) = **$27.3 billion**

- **30% Share**: $13.5B (US) + $9.5B (EU5) + $15.0B (China) + $3.0B (Japan) = **$41.0 billion**

Thus, the **Potential Peak Sales** for nivolumab in these geographies for solid tumor indications range from **$27.3 billion to $41.0 billion** annually, assuming a 20%–30% market share.

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

First, calculate the number of patients for a 1% share, then multiply by the annual cost per patient.

US:

- 1% of 300,000 = 3,000 patients

- 3,000 × $150,000 = **$450 million**

EU5:

- 1% of 350,000 = 3,500 patients

- 3,500 × $90,000 = **$315 million**

China:

- 1% of 1,000,000 = 10,000 patients

- 10,000 × $50,000 = **$500 million**

Japan:

- 1% of 100,000 = 1,000 patients

- 1,000 × $100,000 = **$100 million**

Total $ Value of 1% Share:

- $450M (US) + $315M (EU5) + $500M (China) + $100M (Japan) = **$1.365 billion**

Thus, the **$ value of 1% share of treated patients** across these geographies is approximately **$1.365 billion**.

Step 6: Caveats and Adjustments

- **Competition**: Nivolumab faces competition from other PD-1/PD-L1 inhibitors (e.g., pembrolizumab, atezolizumab) and emerging therapies, which could lower market share.

- **Pricing Pressure**: Prices may decrease over time due to biosimilars, generics, or government negotiations, especially in China and EU5.

- **Access and Reimbursement**: In markets like China, not all patients can afford or access high-cost drugs, even with reimbursement.

- **Indication-Specific Data**: The above assumes a broad solid tumor market; specific indications (e.g., NSCLC alone) would have smaller patient pools and sales.

Final Answer:

- **Potential Peak Sales for Nivolumab** (20%–30% market share) in the US, EU5, China, and Japan for solid tumor indications: **$27.3 billion to $41.0 billion** annually.

- **$ Value of 1% Share of Treated Patients** in these geographies: **$1.365 billion** annually.

These figures are estimates and should be refined with more specific data on patient populations, exact indications, and current market dynamics. If you have additional details (e.g., specific tumor type or updated pricing), I can adjust the calculations accordingly.