Medical Device Opportunities
Asia & Japan

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Fuqua School of Business

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(Greg-san)
Asia Geography 101

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1.3 B</td>
</tr>
<tr>
<td>India</td>
<td>1.1 B</td>
</tr>
<tr>
<td>Indonesia</td>
<td>225 M</td>
</tr>
<tr>
<td>Pakistan</td>
<td>165 M</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>147 M</td>
</tr>
<tr>
<td>Japan</td>
<td>128 M</td>
</tr>
<tr>
<td>Thailand</td>
<td>63 M</td>
</tr>
<tr>
<td>South Korea</td>
<td>49 M</td>
</tr>
<tr>
<td>Malaysia</td>
<td>27 M</td>
</tr>
<tr>
<td>Taiwan</td>
<td>23 M</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>20 M</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>7 M</td>
</tr>
<tr>
<td>Singapore</td>
<td>4.7 M</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>300 M</td>
</tr>
</tbody>
</table>
### Changing Lifestyles

<table>
<thead>
<tr>
<th>Country</th>
<th>Per Capita Income (USD)</th>
<th>% of Males Who Smoke</th>
<th># of KFC's in 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1,740</td>
<td>67%</td>
<td>3,244</td>
</tr>
<tr>
<td>India</td>
<td>720</td>
<td>47%</td>
<td>105</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1,280</td>
<td>58%</td>
<td>396</td>
</tr>
<tr>
<td>Thailand</td>
<td>2,750</td>
<td>49%</td>
<td>410</td>
</tr>
<tr>
<td>Malaysia</td>
<td>4,960</td>
<td>49%</td>
<td>514</td>
</tr>
<tr>
<td>South Korea</td>
<td>15,830</td>
<td>65%</td>
<td>142</td>
</tr>
<tr>
<td>Singapore</td>
<td>27,490</td>
<td>32%</td>
<td>79</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>27,670</td>
<td>N/A</td>
<td>71</td>
</tr>
<tr>
<td>Japan</td>
<td>38,980</td>
<td>53%</td>
<td>1,140</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>43,740</td>
<td>24%</td>
<td>4,979</td>
</tr>
</tbody>
</table>

“One day we will have more restaurants and more profits in China than we do in the U.S.”

David C. Novak  
Chairman & CEO, YUM! Brands Inc.  
2006 Annual Report
China Healthcare Market

• Before 1980 nationwide healthcare coverage
• In 1980’s hospitals move market-oriented system
  - 65,000 hospitals focus on generating revenues/profits
  - Result: over delivery of sophisticated care/tests
  - > 50% of hospital revenues from drugs

• Insurance Coverage
  - 65-70% of patients have no insurance
  - Insurance only pays 60-80%

• Patients
  - Angry about corruption, high prices
  - 50% of patients do not seek treatment

• Government taking positive action
  - Expanding coverage, reducing prices, punishing corruption
Case Study - DES In China

• **2004**
  - Two U.S. competitors
  - Patient price $3,500
  - Rapid adoption rate

• **2010**
  - 3 Chinese, 3 U.S. competitors
  - 80% share by local manufacturers
  - 5 other local mfrs. registering
  - Patient price: $2,000 – $2,200
  - 95% adoption rate

• **Local Manufacturers**
  - Copy-cat older stent designs
  - Expats return home
  - Go direct, 30-50% lower price
  - Applying for CE Mark
China’s Medical Device Manufacturing Sector

• Special economic zones established
• Exports growing for high-labor content, OEM products/subassemblies
• Current challenges:
  - Quality system in place to meet FDA regs.
  - IP protection
  - Low volume production quantities
  - Corruption
  - Established China supplier base
  - Foreign imports perceived as premium products
  - Language
• Local manufacturers taking market share
Case Study - Pacemakers in China

- **Strategic Intent**
  - Manufacture older, de-featured pacemaker for China and developing markets
  - Demonstrate Metronic’s commitment to long-term leadership in China

- **Investment**
  - $10 million, 22,000 sq. ft. pacemaker plant opened outside of Shanghai in 1997
  - CHAMPION pacemaker produced for China and developing nations

- **Outcome**
  - Chinese doctors/patients did not want low-end pacemaker
  - Facility not running at capacity, primarily used for public relations
India Healthcare Market

- **Hospitals**
  - 16,000, 70% public/30% private
  - Large hospital groups (Apollo, Fortis)
  - Government sector is low on quality & availability

- **Insurance coverage**
  - 90% pay out-of-pocket
  - 10% covered by private insurance or government reimbursement

- **Patients**
  - Shop for best price, negotiations common
  - Funds “pooled” among family members

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cost in India</th>
<th>Cost in USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary Bypass</td>
<td>$6,600</td>
<td>$60,000</td>
</tr>
<tr>
<td>Bone marrow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>transplant</td>
<td>26,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Liver transplant</td>
<td>40,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>8,000</td>
<td>29,000</td>
</tr>
<tr>
<td>Knee replacement</td>
<td>6,500</td>
<td>22,000</td>
</tr>
<tr>
<td>Cosmetic Surgery</td>
<td>2,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>
Medical Tourism In India

**International Patient Services**

- **Initial screening** to diagnose and assess the nature and severity of the ailment
- **Telemedicine evaluation** and recommendation
- **Travel arrangements** made for transfer to Delhi on a turnkey basis includes:
  - visa, ticketing, pick up at airport, money transfer and exchange, ATM withdrawals
- Where existing, **international insurance** cover will be respected.
- Diagnosis and treatment at the hospital
- Arrangements for the return journey
- Recover in comfort:
  - Large comfortable rooms
  - Global standards for hygiene/infection control
  - World class hospital

Dr. Ashok Seth
Chairman & Chief Cardiologist
India Case Study

• Cardiac surgery in India
  - 70% done off-pump (beating heart)
  - CABG cost $7,000

• Business case
  - Establish direct sales force
  - Stabilizer ASP: $950
  - Expected market share: 22% - 40%
  - Yearly OPEX investment: $105-115K
  - Incremental revenue/yr: $225K-690K

• Outcomes
  - Entered business in 2003
  - Stabilizer reuse: 25-30 times
  - Exited business in 2005
  - Lesson: Understand market dynamics!
Japan Healthcare Market

• Hospitals
  - 8,883, public/private mix
  - Equal access across Japan
  - Average hospital stay: 39.1 days
  - Complex dealer network

• Insurance coverage
  - Universal coverage for all citizens
  - Patients pay 10 - 30% of cost
  - Aging population & stagnant economy taxing system

• Patients
  - Hold doctors in high esteem, lawsuits rare
  - Not vocal advocates for medical technology
Product Approvals in Japan Require Patience

- **Product approvals**
  - Unpredictable and time consuming
  - Local trial data often required
  - New technology not rewarded

- **Reasons for long delays**
  - Too few, experienced reviewers (29 - PMDA, 300 - FDA)

- **Market impact**
  - Companies not enthusiastic about introducing new technology
  - High velocity product development companies impacted most
  - Big loser is patients, leading edge technology not available or generations behind
Japan Case Study

• Carotid Artery Stenting
  - Minimally invasive alternative to carotid endarterectomy
  - Clear advantages over endarterectomy
  - Approved in U.S. in 2004

• Conducted Japan clinical trial
  - 60-patient multi-year trial

• Business case did not justify filing
  - Lengthy & uncertain approval process
  - New technology reimbursement
  - Increased costs of doing business (PAL)

• Outcome
  - Japanese patients do not have access to leading edge technology
Are Asian Patients & Physicians Different?

• Patients
  - Normally pay for product in Asia
  - Growing middle class in most countries
  - May shop around for best deal
  - Malpractice lawsuits extremely rare
  - Great unmet medical need among poor
  - Hold physicians in high regard

• Physicians
  - High percentage with international training and work experience
  - “Jack-of-all-trades”
  - Will push for lower prices
  - Eager to learn new techniques/procedures
  - Usually not questioned on clinical recommendations
  - Approachable and friendly
“Things are changing so fast that, if you haven’t been to Asia and Japan this year, you haven’t been to Asia and Japan.”