Analyzing Patient Outcomes and Economic Impact of an Ambulatory Surgical Center: One World Surgery’s Holy Family Surgery Center, Honduras

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Chief Medical Officer and Co-Founder, One World Surgery
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Overview

• Who we are…

• Can HIC, best practice outcome surgical standards be achieved, on a medical mission basis, serving those who would otherwise not receive care?

• As ASC’s are achieving the Triple Aim (↓ cost, ↑ quality, ↑ Pt satisf.) in HIC’s, can this surgical delivery model be applied to address LMIC surgical delivery needs in a cost-effective way?

• Can this ASC model improve surgical access and build surgical infrastructure to serve the poor… outside traditional public service resource limited settings?
Who is Peter Daly?

- B.S., Univ of Notre Dame
- M.U., St. Luke’s, Chicago, IL
- MD, Mayo Clinic School of Med
- Orthopedic Surgery residency, Mayo Clinic Grad Sch of Med
- Shldr/Sports Med Fellowship, MGH, Harvard University
- Grp practice, St. Paul, MN, Summit Orthopedics
- Co-Founder One World Surgery
Surgical care focused on groups facing inequitable care: chronically under-served populations, those in acute crisis, conflict, or disaster settings.
Low and Lower-Middle Income Countries (LMIC’s)

Country Income Groups
- Low income - $1,045 or less
- Lower middle income - $1,046-$4,125
- Upper middle income - $4,126-$12,735
- High income: nonOECD - $12,736 or more
- High income: OECD - $12,736 or more

Year: 2015
Source: The World Bank Group
5 billion people lack surgical care worldwide.

“Surgery is the neglected stepchild of global public health” - Paul Farmer, MD

Why is Surgery Left Out?

• Focus on infectious disease
• Not a public health issue
• Lack of advocacy from surgeons
• Surgery too difficult
  – Too complex, too costly, low burden
The Reality

• Trauma deaths >> TB, Malaria, HIV combined – 90% in LMIC’s

• 2.9 million femur fx’s/yr

Understanding and Addressing the Global Need for Orthopaedic Trauma Care.
Agarwal-Harding, Kiran; von Keudell, Arvind; Zirkle, Lewis; Meara, John; MD, DMD; Dyer, George
DOI: 10.2106/JBJS.16.00323
Recent Initiatives

• **3 Major Publications in 2015:**

1. Disease Control Priorities, 3rd Ed. (DCP3)
2. World Health Assembly (WHA) Resolution 68.15
3. Lancet Commission on Global Surgery
Honduras

Honduras
Honduras --- Dec 2017

[Image: Crowd protesting with Honduras flag]

[Image: Burnt car with flames]

Honduras

- 66% of Hondurans living in poverty
- Rural areas 1/5 live in extreme poverty (<$1.90 per day)
- High crime rates


UN Office on Drugs and Crime. Honduras.
Honduras—status of Healthcare

• 30.1% of population receives no healthcare, 83% are uninsured
• Minimal access in rural areas
• 8.8 physicians and 3 nurses per 10,000 citizens compared to 26 and 94 in USA
• In 2005, per capita expenditure on healthcare $91 vs $6,350 in US

My journey is linked to Angela’s; NPH home

--NPH, Nuestros Pequenos Hermanos, “Our little Brothers and Sisters”; 
--500 children on the home 
--raised as a family 
--successful model x 64 years 

--9 yo Honduran girl 
--Two siblings at NPH Home with her 
--Chondroectodermal dysplasia
Angela’s Story
Who is One World Surgery?
Accelerating our Impact in Global Surgery

• Expand beyond medical missions---build surgical infrastructure and improving surgical access in LMIC’s.
• Develop partnerships with more companies, associations and universities
• Reach a broader audience and increase our fundraising avenues
• Expand our research and publish outcomes

Holy Family Surgery Center
Providing Surgical Solutions in Honduras

Global Surgical Platform: Best Practice Standards

- Effectiveness
- Cost-effectiveness
- Sustainability and training

“The more a program is linked to the local community, the better results in above metrics”
Shrime, et. al., 2015, WJS 39:10-20
1. Requires long term commitment by external participant (OWS)
2. Requires very committed, stable force in the country/location (NPH)
3. Requires educational and economic commitment to keep the talent in country

Dr. Agnes Binagwaho, Minister of Health, Rwanda
Surgery Can Fight Poverty

- Surgical care is vital to saving lives
- Enables patients to sustain their families
- Surgery has high ROI
- Without action, developing countries will lose $12.3 trillion

The Need Continues to Grow...
3,744 Patients on Clinic Waiting List | 1,362 Patients on Surgical Waiting List
The REAL Mission

To serve those who would otherwise not receive care.
Apply outpatient ASC learnings to LMIC setting--Honduras

ASC’s ---lower cost; focused facility; essential surgery, not emergent surgery
OWS’s Model to Address a Global Health Crisis

- Surgical brigades
- Casa Moscati Center for training
- Best Practice facility--Holy Family Surgery Center
Honduran Leadership & Sustainability: Impact

- Grew up on NPH Ranch
- Attended medical school in Honduras
- 3 year orthopedic surgery residency (5 residents per year in Honduras)
- Became Medical Director in 2014

“The definition of miracle is making the impossible, possible for someone.”
- Dr. Merlin Antunez
15 FT Honduran professional staff: 7 grew up on the NPH Children’s home
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<td>HFSC</td>
<td>1</td>
<td>53</td>
<td>149</td>
<td>260</td>
<td>211</td>
<td>83</td>
<td></td>
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<td>757</td>
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<tr>
<td>BREAST</td>
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<td>9</td>
<td>14</td>
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<td>DERMATOLOGY</td>
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<tr>
<td>ENT</td>
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<td>10</td>
<td>20</td>
<td>20</td>
<td>16</td>
<td>21</td>
<td>99</td>
<td>57</td>
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<td>9</td>
<td>11</td>
<td>46</td>
<td>48</td>
<td>98</td>
<td>137</td>
<td>186</td>
<td>152</td>
<td>195</td>
<td>882</td>
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<td>GYNECOLOGY</td>
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<td></td>
<td></td>
<td>12</td>
<td>8</td>
<td>11</td>
<td>22</td>
<td>25</td>
<td>19</td>
<td>97</td>
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<tr>
<td>OPHTHAL</td>
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<td></td>
<td>24</td>
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<td>ORTHO</td>
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<td>72</td>
<td>108</td>
<td>107</td>
<td>141</td>
<td>152</td>
<td>253</td>
<td>349</td>
<td>444</td>
<td>1657</td>
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<td>PODIATRY</td>
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<td>39</td>
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<td>59</td>
<td>98</td>
</tr>
<tr>
<td>UROLOGY</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>1</td>
<td></td>
<td></td>
<td>28</td>
<td>43</td>
<td></td>
<td>98</td>
</tr>
<tr>
<td>Grand Total</td>
<td>41</td>
<td>84</td>
<td>170</td>
<td>200</td>
<td>329</td>
<td>488</td>
<td>877</td>
<td>902</td>
<td>984</td>
<td>4075</td>
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</table>
Each patient meets with social worker, receive a ranking:

- A – could not afford surgery elsewhere
- B – have insurance or could pay for surgery elsewhere, but may take a long time to save funds
- C – patient has other options for care
- Also receive a clinical urgency rating
- All surgeries free of charge
2017 HFSC – meeting our targeted demographic

<table>
<thead>
<tr>
<th>Category</th>
<th>Target (% of surgeries)</th>
<th>Results*</th>
<th>Patients Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low resourced patients</td>
<td>60%</td>
<td>73%</td>
<td>A patients and NPH pequeños/as</td>
</tr>
<tr>
<td>Patients with urgent needs or no access in Honduras</td>
<td>25%</td>
<td>13%</td>
<td>B patients with high or moderate urgency (ranked 1 or 2)**</td>
</tr>
<tr>
<td>NPH Family</td>
<td>10%</td>
<td>2%</td>
<td>Employees and hermanos/as mayores</td>
</tr>
<tr>
<td>Outside target population</td>
<td>&lt;5%</td>
<td>4%</td>
<td>C patients (2%) and low urgency B patients (2%)</td>
</tr>
</tbody>
</table>

*80 patients overall (8% overall) did not have a formal social work ranking and are excluded from this analysis

**60 B patients (42% of B patients) did not have a clinical urgency ranking but were included in this category
### Research: 2017 Pt. Satisfaction/U.S. comparison

#### Patient Satisfaction

<table>
<thead>
<tr>
<th></th>
<th>HFSC</th>
<th>ASCA (1663 ASC’s in U.S.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey return rate</td>
<td>70% (ofc visit or phone calls)</td>
<td>36.5% (email/letter)</td>
</tr>
<tr>
<td>Pt approval rating</td>
<td>9.78/10</td>
<td>8.15/10</td>
</tr>
<tr>
<td>Likelihood of recommending Ctr</td>
<td>97.75%</td>
<td>85.9%</td>
</tr>
<tr>
<td>Rate Quality from patient’s percept’n</td>
<td>9.9/10</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Immediate Outcomes—U.S. ASC comparisons

<table>
<thead>
<tr>
<th>2017 (ytd) metrics</th>
<th>VHSC (23 hr) (MN)</th>
<th>HFSC (23 hr) (Honduras)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On time preop abx</td>
<td>99.55%</td>
<td></td>
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<tr>
<td>Infection rate</td>
<td>0.33% (includes deep infection)</td>
<td>0.5% (superficial only)</td>
</tr>
<tr>
<td>ASC cases who had an ER/Hospital visit &lt; 24hrs postop</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Nausea/vomiting requiring admission</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>VTE (venous thromboembolism) &lt; 30 days postop</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Occurrences</td>
<td>0.5% (66/1212)</td>
<td>0.02% (7/398)</td>
</tr>
</tbody>
</table>
2017 Cost-Effectiveness / Economic Impact Analysis

- **Methods**
  - Cost effectiveness calculated by disability-adjusted life years (DALYs) averted
  - DALY averted measured by WHO Disability Assessment Scale (WHODAS), 12-question survey
  - Total economic benefit calculated by Value of a Statistical Life (VSL)
  - VSL year (VSLY) in Honduras = $17,534

- **Results**
  - 580 patients completed WHODAS before surgery and 3 months post-op
  - Mean disability improved from 27.5% to 6.8% (decrease of 20.7%)
  - Mean DALY averted from surgery: 3.88
  - Cost per DALY averted: **$342.70**
  - Projected benefit in 1 year of surgical center operations: **$276.9 million**
Surgery intervention Cost per DALY averted: $327.47

– Not as cost-effective as:
  • bed nets for malaria ($6.48 - $22.04/DALY)
  • standard childhood vaccinations ($12.96 - $25.93/DALY)
  • more cost-effective than More cost-effective than:

– More cost-effective than:
  • Medical tx for Ischemic Ht Disease ($500-$700/DALY)
  • Antiretroviral tx for HIV ($450-$650/DALY)

--Appropriate intervention for Honduras (middle-income country; low rates of malaria and strong vaccine coverage compared with Sub-Saharan Africa)
Can HIC-Best Practice outcome surgical standards for ASC’s be achieved, on a medical mission basis, serving those who would otherwise not receive care? – YES!

- <1% infection rate
- 9.8/10 pt. approval rating
- Low occurrence rate (0.02%)
Summary

• As ASC’s are achieving the Triple Aim (cost, quality, Pt satisf.) in HIC’s, can this surgical delivery model be applied to address LMIC surgical delivery needs in a cost-effective way?
  – YES!
  • **Cost** per DALY averted more cost-effective than medical treatment for ischemic heart disease and antiretroviral therapy for HIV;
  • **Quality and Pt. satisfaction** consistent with HIC (U.S.) ASC standards
Recommendations

- Strive for a fully integrated program with a committed in-country partnership
- Identify obstacles and offer collaborative work toward solutions
- Include local education and economic effort
- Pursue a platform you can control to apply Best Practice standards—build de novo vs. gain governance influence at existing facility
- Utilize medical industry benchmarking (U.S. or local) and gather data to measure your outcomes
Thank you