“How to Operationalize and Contract for Population Health”
What’s the problem and what is the root cause?

• We spend almost twice as much as every other industrialized nation ($10,000 per capita) with relatively weak quality metrics to show for it (37th in overall health, 39th infant mortality, 36th life expectancy* etc.)

• We tolerate an unacceptable variation in quality, safety, service (240,000/450,000 deaths per IOM/OECD annually), and cost (up to 1000%)

• Our national debt is $15.2 trillion with a virtual debt of $65 trillion (24% SS, 16% interest on debt, 14% Medicare, 9% Medicaid)

• GAO: To balance the budget by 2040-cut federal spending by 60% or raise taxes 2.5 times

Quality shortfalls: Getting it right 50% of the time

Adherence to Quality

- Breast Cancer: 75.7%
- Prenatal Care: 73.0%
- Low Back Pain: 68.5%
- Coronary Artery Disease: 68.0%
- Hypertension: 64.7%
- Congestive Heart Failure: 63.9%
- Depression: 57.7%
- Orthopedic Conditions: 57.2%
- Colorectal Cancer: 53.9%
- Asthma: 53.5%
- Benign Prostatic Hyperplasia: 53.0%
- Hyperlipidemia: 48.8%
- Diabetes Mellitus: 45.4%
- Headache: 45.2%
- Urinary Tract Infection: 40.7%
- Ulcers: 32.7%
- Hip Fracture: 22.8%
- Alcohol Dependence: 10.5%

Adults receive about half of recommended care
- 54.9% = Overall care
- 54.9% = Preventive care
- 53.5% = Acute care
- 56.1% = Chronic care

Life expectancy at birth and health spending per capita, 2011 (OECD)(Preston Curve)

Life expectancy in years

1.1.3. Life expectancy at birth and health spending per capita, 2011 (or nearest year)

Information on data for Israel:
http://dx.doi.org/10.1787/888932315602.

Source: OECD Health Statistics 2013,
http://dx.doi.org/10.1787/health-data-en; World Bank for non-OECD countries.

Information on R²:
http://dx.doi.org/10.1787/888933060605.
Another “Root Cause” of United States Healthcare “Waste"
Unsustainable Costs…

• IOM: $765 B in waste ($310 B inefficient delivery, $210 B unnecessary services, $190 B excess administrative, $55 B missed prevention opportunities)
• Healthcare costs up 28% over past five years for large employers (e.g. higher cost/risk sharing)
• >25% of family income will go to healthcare; 20% cannot afford any care (2015): 51% cannot meet credit card debt and 44% of households are liquid asset poor (3 months)
• >75% of healthcare spending from chronic diseases based upon behavioral issues (50%)(exercise, eating, smoking, drinking, compliance with EBPs)
Disproportionate Costs…

• Top 1% make up 23% of healthcare costs (critical care and dying)($>90K/year)
• Top 5% make up 49% of healthcare costs (multiple chronic diseases)($>45K/year)
• Top 10% make up 64% of healthcare costs (chronic diseases)($>15K/year)
• Bottom 50% make up 3% of healthcare costs (healthy population)($>8K/year)
20th Century “Solution Shops”

- Independent autonomous physician model with hospital as ‘workshop’
- Lack of integration and alignment between specialties with fragmentation and inefficiencies
- Lack of integrated information network
- Expensive, cumbersome, with high probability of error (e.g. multiple hand-offs) and delayed diagnosis/treatment
- Reimbursement based upon units of service or cost (volume)
21st Century “Solution Shops”

- Integrated and organized healthcare network
- Completely aligned physicians working in collaborative multispecialty teams
- Evidence based approaches and processes (Watson decision analysis support)
- Lower cost with high reliability and more rapid and efficient development of diagnostic plan (e.g. solution)
- Reimbursement based upon a cost effective and successful ‘solution’/plan (value)

Examples: Mayo Clinic (coherent solution shop) and Cleveland Clinic (clinical institutes)
20th Century “Value Added Processes (VAPs)”

• Each physician provides a unique customized approach to manage a given diagnosis (solution)
• ‘Preference cards’ with wide variation in cost, quality, and outcomes (value)
• Institutional tolerance for significant variation based upon need for volume/revenue
• Reimbursement based upon unit volume of service
21st Century “Value Added Processes (VAPs) or Focused Factories”

- One collaborative and standardized evidence based approach for every significant diagnostic and therapeutic entity
- Value analysis committee (multidisciplinary) to minimize and simplify vendors, suppliers, and technology
- Reimbursement based upon evidence based ‘outcomes’

Example: Shouldice Hospital, Ontario, Heart Center (Cleveland Clinic)
21st Century “Value Added Processes (VAPs) or Focused Factories”

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Example: Shouldice Hospital, Ontario, Heart Center (Cleveland Clinic)
Chronic Disease-Big Numbers!

- 133 M-157M Americans with at least one chronic disease! (almost half) (25% of these with limited ADLs)
- 74.5 M with hypertension
- > 1 M MIs annually (#1 cause of death)(80% preventable)
- >33% Americans obese (#2 in world) and contribute to cancer (#2 cause of death)
- 24 M have diabetes (5X expected due to high sugar diets)
- >20% Americans smoke (greatest cause of premature death) (40% of CA preventable)
Chronic Diseases require “Facilitated Networks”

- Participants with a common clinical condition who share information, guidance, and support (e.g. AA, weight watchers etc.)
- Rely heavily on behavioral modification (e.g. smoking, eating, exercise, medications etc.)
- Business model based upon facilitation and operation of the network with membership fees (e.g. capitation)
- The traditional hospital/physician based practice counter productive
Everyone will be Disrupted!

- Hospitals to ambulatory VAPs and retail outlets (e.g. MinuteClinic)
- Physicians (specialists to generalists) to mid-level practitioners and web-based services
- US based services to international medical tourism
- Commercial indemnity carriers to captive/self insurance programs with private exchanges
- Low end to high end disruption
- Centralized to decentralized (home based tele-monitoring wireless care)
- Patient/consumer centered and driven with 24/7 on demand access
Segmented Services for Different Populations:

1. Healthy individuals with transactional healthcare issues: e-health and 24/7 retail clinics (50,000 by 2020)
2. Individuals with chronic medical conditions: disease management with facilitated networks and home based tele-health monitoring services
3. Individuals with complex undiagnosed problems: Integrated solution shops
4. Individuals with significant acute/chronic conditions: Evidence based VAPs
5. Terminally ill individuals: Outpatient palliative care
Essential Operational Building Blocks of Population Health

1. Engaged and aligned stakeholders with at risk contracts
2. Build an integrated healthcare network together that makes clinical and operational sense
3. Palliative care, disease management, post-acute care/disease management
4. Retail medicine and e-health solutions
5. Health information exchange with enterprise data warehouse and clinical/business analytics
Fundamental Principles of Engagement and Alignment

Cultural alignment (the relationship) precedes….

Economic alignment (the contract) precedes…

Clinical alignment (at risk contracts)
What would Self-Employed and Employed Physicians be interested in?

1. Enterprise partnership
2. Hospital based revenue (leveraged contracts)
3. Access to GPO (supply chain costs)
4. Access to IT (HITECH)
5. Revenue cycle management (RCM) support
6. Access to investment capital
7. Access to preferential referrals
8. Input/increasing control at the highest levels of the organization
What are the non-negotiable quid pro quos of such a partnership?

1. Standardize regulatory quality, safety, service and cost effectiveness
2. Work with management to drive down operating costs
3. Work with management to achieve strategic goals/objectives (e.g. service culture, population health etc.)
Key Components of ‘At Risk’ Contracts with Physicians (Intermountain Health):

• Be willing to participate in ‘at risk’ contracts based upon strategic goals/objectives developed and approved by physicians and management
• Comply with clinical and business ‘best practices’ as determined by peer group/management (and be willing to be peer audited for exceptions)
• Agree to un-blinded transparency of all clinical and financial data/analytics
• Be willing to comply with value analysis process
• Disclose all potential conflicts of interest and accept determination of deliberative physician bodies
Align the System
Coordinating and Optimizing The Care Continuum
Key Population Health Clinical Operational Components:

1. Palliative Care for severe and life threatening conditions (1%)
2. Disease management programs to optimize quality/reduce costs (5%)
3. Post-acute care programs to support health
4. Retail medicine for healthy individuals with minor acute problems
5. E-health solutions for the healthy (50%)
Palliative Care is Far More than Hospice Care:

World Health Organization:

“An approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial, and spiritual.”

Examples: severe prematurity/developmental issues….CF, CHF, COPD, severe asthma, cancer, Alzheimer’s….and end of life.
Goal Discovery and Establishment is at the Core:

• Personal and life goals (HLE or QALYs v. LE or DALYs or YLDs)
• Values that are of greatest importance to an individual (e.g. autonomy, freedom, mobility etc.)
• Family’s personal and material resources (e.g. care giving, willingness (or not) to forego day to day obligations, financial, advanced directives
• Negotiation and reconciliation of goals/objectives that work for everyone
• Most objectives can be achieved (80%) within two days of interdisciplinary consultation and facilitation
What is the Business Argument?
Source: Morrison, RS et al., Archives of Internal Medicine, 2008

<table>
<thead>
<tr>
<th>COSTS</th>
<th>LIVE D/Cs</th>
<th>LIVE D/Cs</th>
<th>Δ</th>
<th>DEATHS</th>
<th>DEATHS</th>
<th>Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regular</td>
<td>Palliative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Day</td>
<td>$867</td>
<td>$684</td>
<td>(21%)</td>
<td>$1,515</td>
<td>$1,069</td>
<td>(29%)</td>
</tr>
<tr>
<td>Per Admission</td>
<td>$11,498</td>
<td>$9,992</td>
<td>(13%)</td>
<td>$23,521</td>
<td>$16,831</td>
<td>(28%)</td>
</tr>
<tr>
<td>Lab</td>
<td>$1,160</td>
<td>$833</td>
<td>(28%)</td>
<td>$2,805</td>
<td>$1,772</td>
<td>(37%)</td>
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<tr>
<td>Pharmacy</td>
<td>$2,223</td>
<td>$2,037</td>
<td>(8%)</td>
<td>$6,063</td>
<td>$3,622</td>
<td>(40%)</td>
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<tr>
<td>ICU Care</td>
<td>$6,974</td>
<td>$1,726</td>
<td>(75%)</td>
<td>$15,531</td>
<td>$7,755</td>
<td>(50%)</td>
</tr>
<tr>
<td>Died in ICU</td>
<td>18%</td>
<td>4%</td>
<td>(78%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Direct costs/day for patients who died and who received palliative care consultation compared to matched usual care patients (Morrison, RS et al. Arch Int Med 2008)
Managerial Components of Chronic Disease Management (inpatient and outpatient)

1. Collaborative and aligned practice models with strong care management
2. Criteria for identification based upon claims data and clinical analytics
3. Evidence based practice guidelines
4. Patient self-management education and empowerment
5. Process and outcomes measurement (clinical/business analytics)
6. Continual reporting, feedback, and involvement of all key stakeholders (e.g. patient/family, providers, payers, employers) in care modulations
Assign to Care Manager:

- Typically an APRN with public health background
- Serves as primary point of contact (navigator)
- Coordinates all healthcare collaborative relationships (e.g. physicians, home health, behaviorists, pastoral care etc.)
- Focuses on all symptoms, functionality, social/socio-economic, psychological, family issues
- Focuses on empowering the patient for self-management and developing action plans
## Evidence Based Practice
### Interventions and Measures for Colon Surgery (Intermountain)

<table>
<thead>
<tr>
<th>Evidence Based Intervention</th>
<th>Associated Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Education</td>
<td>% Enrollment</td>
</tr>
<tr>
<td>Early Mobilization after Surgery</td>
<td>% Activity/PT</td>
</tr>
<tr>
<td>Appropriate IV fluid administration</td>
<td>% Compliance with optimum fluid (inputs and outputs)</td>
</tr>
<tr>
<td>Narcotic sparing analgesia</td>
<td>Optimum non-narcotic pain management/scores</td>
</tr>
<tr>
<td>Early enteral nutrition</td>
<td>Diet administration, monitoring of flatus/bowel sounds/emesis</td>
</tr>
<tr>
<td></td>
<td>Operating and financial measures</td>
</tr>
</tbody>
</table>
Project Zero (St. Luke’s Health)

- Created to reduce surgical site infections for 2,000 spine and 2,000 joint surgeries
- Traditional infection rate 1.3% (national average 1.9%)
- Primary causes: excessive traffic through OR (case carts), particulate matter in ventilation system, excessive OR time with some surgeons, lack of data transparency among surgeons
- Increased cost of SSI: $31,182 v. $15,131 (106%)
# Process and Outcomes Measures (Intermountain)

<table>
<thead>
<tr>
<th>Enrolled</th>
<th>Non-Enrolled</th>
</tr>
</thead>
<tbody>
<tr>
<td>First tolerated meal: 1.40 days</td>
<td>First tolerated meal: 3.28 days</td>
</tr>
<tr>
<td>BM: 2.35 days</td>
<td>BM: 3.74 days</td>
</tr>
<tr>
<td>Emesis: 9.7%</td>
<td>Emesis: 12.5%</td>
</tr>
<tr>
<td>Average variable cost: $6,133</td>
<td>Average variable cost: $10,503</td>
</tr>
<tr>
<td>Average total cost: $11,808</td>
<td>Average total cost: $20,585</td>
</tr>
<tr>
<td>Net operating income: $3,510</td>
<td>Net operating income: $1,806</td>
</tr>
</tbody>
</table>
Bottom Line for all Colon Surgeries (Intermountain 1,675 patients):

- $1,200,200 annual savings
- LOS decreased from 8.44 to 6.75 days with equivalent or improved clinical outcomes
- Improved patient, family, and provider engagement and satisfaction scores
- Stimulated collaborative efforts in many other clinical areas
- Computer World Business Intelligence Award (2010)-Driving Process Change with BI
Project Zero (St. Luke’s Health)

Process changes: reduced traffic in OR, kept all OR carts in room, installed a high grade HVAC system with a HEPA filter to capture particulate matter, shortened OR time through analytics/feedback/assertive physician management

Results: Reduced SSI to 0.6% (280 fewer infections X $16,051 = $4,494,280 cost savings annually)
What’s the Problem? Drivers of Unnecessary Readmissions and ED Visits:

• Lack of a standardized discharge process with significant variation
• Lack of patient/family engagement (appropriate incentives)
• Unable to understand discharge instructions or medications (est. 77 M)
• Unable to afford discharge plan/medications
• Ineffective communication of discharge plan/medications
• Unaware of cost-effective alternatives to 911/ED
What’s the Problem? Drivers of Unnecessary Readmissions and ED Visits:

- 51% of discharges do not have timely follow up within 30 days (1000% more likely to be readmitted)
- Top four conditions: CHF/CAP (50%), COPD/Asthma (16%), Diabetes (13%)
- 75%-85% of admissions < 30 days are preventable
- 3% Medicare penalties for avoidable readmissions in a growing number of conditions
Acute Care ‘Best Practice”: Structured Transition Care Rounds (Yale New Haven Hospital System)

- The same process in every unit every day
- Same staff (MD/DO, RN, CM, RM, pharmacist) led by care manager/coordinator
- Structured interview with every patient (several minutes) regarding transition
- Occurs in afternoon (every day)
- Proactive utilization review and transitions planning
Population Health Management

Pathway of Care

Health Plans and Payers

Acute Care

Community-Based Care

Retail Pharmacy

Physician Clinic

Ambulatory Procedure Center

Wellness & Fitness Center

Diagnostic/Imaging Center

Urgent Care Center

Recovery & Rehab Care

Inpatient Rehab

Senior Nursing Facility

Outpatient Rehab

Community Health Screening

Home Care
Typical Strategic Partners (accounts for 15%-20% of total costs):

- Outpatient facilities, clinics, and practices (e.g. FQHCs)
- Nursing homes/long term care facilities
- Acute rehabilitation (IRFs) and sub-acute rehabilitation facilities (SNFs)
- Home health
- Employers
- E-health
Variation in Post-Acute Spending

Geographic Variation in Spending on Post-Acute Care, MS-DRG 291 Heart Failure and Shock with Major Complications

<table>
<thead>
<tr>
<th>Location</th>
<th>Ratio to U.S. Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ridgewood, NJ</td>
<td>2.02</td>
</tr>
<tr>
<td>Hudson, FL</td>
<td>1.37</td>
</tr>
<tr>
<td>Lancaster, PA</td>
<td>1.21</td>
</tr>
<tr>
<td>Raleigh, NC</td>
<td>0.60</td>
</tr>
<tr>
<td>Owensboro, KY</td>
<td>0.59</td>
</tr>
</tbody>
</table>

Legend:
- Therapy
- LTC Hospital
- Inpatient Rehab.
- Home Health
- Skilled Nursing

Average spending:
- ~$7,956
- ~$5,379
- ~$4,769
- ~$2,368
- ~$2,336
Post-Acute Care Process Principles:

1. The greatest impact on optimizing post-acute care is to optimize pre-acute care (pre-operative risk assessment, home health interventions etc.)

2. Overseen by a care manager (not a primary physician) to coordinate with all key stakeholders and partners

3. Must have complete transparency of the entire network with real time data/analytics to enable real time interventions by providers (usually APNs and Pas)
Optimizing Admission through Pre-Operative Risk Assessment Clinics:

• Optimize outcomes/costs by minimizing pre-operative risks
• Collaboration between internists/pediatricians/anesthesia/care manager (8 patients/day/provider X 3) (ASAs 2-4)
• Significantly reduce same day cancellations
• Common issues: obesity with sleep apnea, difficult airways and obstruction, undiagnosed atrial fibrillation and cardiac valve issues, diabetes
• Reduces: cost per case, likelihood of readmission, follow up ED visits, post-acute morbidity/mortality rate (> $1,000,000 cost reduction annually)
Operational Goals in Post-Acute Care:

1. Contract with strategic partners through a single healthcare network
2. Develop clinical/business goals/objectives with at risk contracts to memorialize and HIE/analytics to measure and provide feedback
3. Standardize evidence based approaches to admissions, discharges, transitions of care, and ambulatory/home health based care management
4. Modulate contracts based upon outcomes
How did ‘Patients’ become ‘Consumers?’

• Cost/risk shifting from defined benefits to defined contribution ($338B (2014) to $413.5B (2019) out of pocket expenses)
• High deductible policies and health savings accounts (HSAs)
• Squeezed out of the traditional market (25% of disposable family income)
• Frustrated and ‘value starved’ from complexity, cost, and physician/hospital centered system
What do “Consumers” want and need?

• Value transparency (quality/cost) (The Surgery Center of Oklahoma)
• 24/7 access from anywhere
• Responsiveness to ‘market driven’ (as opposed to ‘sales driven’) demand
• Reasonable margins based upon real (and not fabricated or cost shifted) costs with optimization of cost structure
• Standardized evidence based practices and elimination of non-value added variation (quality/safety)
• Outstanding and responsive service!
Retail Clinics

• Predicted to grow to 50,000 outlets by 2020
• Staffed by APRNs under medical directorships
• 36 high volume/low risk diagnoses and treatments (URI, OM, bronchitis, rash without fever etc.) with strict compliance to protocols and medical consultation
• No charge for consultation and referral
• Increasing use of lower cost diagnostics
E-Health: Most Common Uses

- Urgent care (e.g. URI, UTI, rash, flu etc.)
- Chronic medical management
- On demand inpatient consults (e.g. rural areas)
- Emergency department case flow (MSE)
- Home healthcare services
- Post discharge/surgical care
- Behavioral health
- Contribute physicians to national pool
Coalitions that are essential in population health:

- Physicians (‘patient centered, physician led, professionally managed’)
- Payers and employers (dynamic contracts with shared risk)
- Community based resources-public health, nursing homes/SNFs, home health, EMS, FEMA, schools, etc. (dynamic contracts with shared risk)
- Shared information with collaborators and competitors
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Why are Business and Clinical Analytics Essential?

• Reactive (Excel spreadsheets with data) to proactive (actionable information)
• Isolated (silos) to aligned (shared) information
• Confidential to transparent/un-blinded information
• Reflect/analyze to manage/predict/redesign in real time
Add Predictive Modeling to Analytics:

• **Purpose:** Shortens the time between an adverse event and a successful intervention

• **Predictive Risk Models:** Ranks individuals from the greatest probability of disease onset/exacerbation to the least probability by taking into account:
  - Age/sex
  - Illness burden/co-morbidities
  - Types/frequencies of medications

• **Index** calculated based upon expected ‘risk’
# Profitability Analysis – Top 10 Service Lines Based on Cases

<table>
<thead>
<tr>
<th>Group Item</th>
<th>Cases</th>
<th>ALOS</th>
<th>CMI</th>
<th>Total Charge</th>
<th>Actual Payment</th>
<th>Variable Cost</th>
<th>Contrib Margin</th>
<th>Fixed Cost</th>
<th>Net Income</th>
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<tbody>
<tr>
<td>Cardiology</td>
<td>762</td>
<td>3.93</td>
<td>1.1831</td>
<td>$33,047</td>
<td>$10,434</td>
<td>$4,629</td>
<td>$5,806</td>
<td>$4,132</td>
<td>$1,674</td>
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<tr>
<td>Pulmonary</td>
<td>550</td>
<td>4.82</td>
<td>1.0604</td>
<td>$24,490</td>
<td>$7,325</td>
<td>$3,094</td>
<td>$4,231</td>
<td>$3,367</td>
<td>$585</td>
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<tr>
<td>Gastroenterology</td>
<td>409</td>
<td>4.08</td>
<td>0.9821</td>
<td>$22,316</td>
<td>$8,606</td>
<td>$2,603</td>
<td>$6,003</td>
<td>$3,125</td>
<td>$2,878</td>
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<td>Orthopedics</td>
<td>333</td>
<td>5.03</td>
<td>1.5032</td>
<td>$41,769</td>
<td>$15,453</td>
<td>$6,525</td>
<td>$8,928</td>
<td>$5,472</td>
<td>$3,456</td>
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<td>Neurology</td>
<td>211</td>
<td>4.84</td>
<td>1.0767</td>
<td>$30,755</td>
<td>$10,422</td>
<td>$3,539</td>
<td>$6,883</td>
<td>$3,982</td>
<td>$2,901</td>
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<tr>
<td>Oncology</td>
<td>78</td>
<td>6.26</td>
<td>1.5324</td>
<td>$40,191</td>
<td>$12,856</td>
<td>$5,440</td>
<td>$7,416</td>
<td>$5,326</td>
<td>$2,090</td>
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<td>Open Heart</td>
<td>71</td>
<td>7.62</td>
<td>4.4933</td>
<td>$99,785</td>
<td>$36,582</td>
<td>$16,118</td>
<td>$20,463</td>
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<td>$7,374</td>
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<tr>
<td>Neurosurgery</td>
<td>62</td>
<td>5.95</td>
<td>2.5563</td>
<td>$107,339</td>
<td>$56,313</td>
<td>$19,907</td>
<td>$36,406</td>
<td>$14,459</td>
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<tr>
<td>Thoracic Surgery</td>
<td>39</td>
<td>16.08</td>
<td>8.2561</td>
<td>$171,837</td>
<td>$67,212</td>
<td>$24,448</td>
<td>$42,764</td>
<td>$23,492</td>
<td>$19,272</td>
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<tr>
<td>Oncology Surgery</td>
<td>25</td>
<td>6.88</td>
<td>2.3670</td>
<td>$80,085</td>
<td>$31,16</td>
<td>$11,583</td>
<td>$19,733</td>
<td>$11,811</td>
<td>$7,922</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>2,540</strong></td>
<td><strong>4.80</strong></td>
<td><strong>1.4143</strong></td>
<td><strong>$369,12</strong></td>
<td><strong>$131,26</strong></td>
<td><strong>$5,220</strong></td>
<td><strong>$7,906</strong></td>
<td><strong>$4,879</strong></td>
<td><strong>$3,027</strong></td>
</tr>
</tbody>
</table>

# Profitability Analysis – Pulmonary Service Line – DRG Profile

<table>
<thead>
<tr>
<th>DRG Description</th>
<th>Cases</th>
<th>ALOS</th>
<th>CMI</th>
<th>Total Charge</th>
<th>Actual Payment</th>
<th>Variable Cost</th>
<th>Contrib Margin</th>
<th>Fixed Cost</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>193 - Simple pneumonia &amp; pleurisy w MCC</td>
<td>174</td>
<td>5.51</td>
<td>1.1291</td>
<td>$26,671</td>
<td>$7,579</td>
<td>$3,423</td>
<td>$4,156</td>
<td>$3,664</td>
<td>$492</td>
</tr>
<tr>
<td>192 - Chronic obstructive pulmonary disease w/o CC/MCC</td>
<td>160</td>
<td>4.42</td>
<td>0.9557</td>
<td>$21,604</td>
<td>$5,547</td>
<td>$2,680</td>
<td>$2,867</td>
<td>$2,916</td>
<td>($49)</td>
</tr>
<tr>
<td>202 - Bronchitis &amp; asthma CC/MCC</td>
<td>44</td>
<td>3.34</td>
<td>0.8093</td>
<td>$16,879</td>
<td>$5,154</td>
<td>$2,039</td>
<td>$3,115</td>
<td>$2,274</td>
<td>$841</td>
</tr>
<tr>
<td>177 - Respiratory Infections &amp; inflammations w MCC</td>
<td>32</td>
<td>8.63</td>
<td>1.7331</td>
<td>$44,912</td>
<td>$11,045</td>
<td>$5,891</td>
<td>$5,154</td>
<td>$6,196</td>
<td>($1,042)</td>
</tr>
<tr>
<td>203 - Bronchitis &amp; asthma w/o CC/MCC</td>
<td>29</td>
<td>2.21</td>
<td>0.6199</td>
<td>$13,212</td>
<td>$6,396</td>
<td>$1,473</td>
<td>$4,922</td>
<td>$1,641</td>
<td>$3,281</td>
</tr>
<tr>
<td>189 - Pulmonary edema &amp; respiratory failure</td>
<td>28</td>
<td>5.71</td>
<td>1.5310</td>
<td>$35,841</td>
<td>$11,874</td>
<td>$4,736</td>
<td>$7,137</td>
<td>$5,408</td>
<td>$1,729</td>
</tr>
<tr>
<td>176 - Pulmonary embolism w/o MCC</td>
<td>17</td>
<td>6.06</td>
<td>1.3229</td>
<td>$35,974</td>
<td>$15,370</td>
<td>$4,510</td>
<td>$10,860</td>
<td>$4,965</td>
<td>$5,896</td>
</tr>
<tr>
<td>204 - Respiratory signs &amp; symptoms</td>
<td>14</td>
<td>3.00</td>
<td>0.6386</td>
<td>$20,350</td>
<td>$3,970</td>
<td>$2,190</td>
<td>$1,780</td>
<td>$2,538</td>
<td>($758)</td>
</tr>
<tr>
<td>205 - Other respiratory system diagnoses w MCC</td>
<td>12</td>
<td>4.83</td>
<td>0.9106</td>
<td>$19,355</td>
<td>$7,097</td>
<td>$2,607</td>
<td>$4,490</td>
<td>$2,866</td>
<td>$1,624</td>
</tr>
<tr>
<td>194 - Simple pneumonia &amp; pleurisy w CC</td>
<td>12</td>
<td>2.00</td>
<td>0.7043</td>
<td>$11,445</td>
<td>$9,413</td>
<td>$1,434</td>
<td>$7,979</td>
<td>$1,556</td>
<td>$6,423</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>150</td>
<td>4.82</td>
<td>1.0604</td>
<td><strong>$24,490</strong></td>
<td><strong>$7,325</strong></td>
<td><strong>$3,094</strong></td>
<td><strong>$4,231</strong></td>
<td><strong>$3,367</strong></td>
<td><strong>$865</strong></td>
</tr>
</tbody>
</table>

# Profitability by Physician – DRG 193 – Simple Pneumonia

<table>
<thead>
<tr>
<th>Physician</th>
<th>Cases</th>
<th>ALOS</th>
<th>CHS</th>
<th>Total Charge</th>
<th>Actual Payment</th>
<th>Variable Cost</th>
<th>Contrib Margin</th>
<th>Fixed Cost</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>MULLA</td>
<td>10</td>
<td>4.80</td>
<td>1.1291</td>
<td>$27,050</td>
<td>$8,512</td>
<td>$3,076</td>
<td>$5,436</td>
<td>$3,487</td>
<td>$1,949</td>
</tr>
<tr>
<td>NIASH</td>
<td>7</td>
<td>4.00</td>
<td>0.7054</td>
<td>$17,779</td>
<td>$1,404</td>
<td>$2,618</td>
<td>($1,214)</td>
<td>$2,896</td>
<td>($4,110)</td>
</tr>
<tr>
<td>HAVZL</td>
<td>6</td>
<td>5.17</td>
<td>1.1291</td>
<td>$28,205</td>
<td>$10,785</td>
<td>$3,410</td>
<td>$7,375</td>
<td>$3,535</td>
<td>$3,840</td>
</tr>
<tr>
<td>BHAAS</td>
<td>5</td>
<td>2.40</td>
<td>0.7054</td>
<td>$11,428</td>
<td>$2,248</td>
<td>$2,136</td>
<td>$112</td>
<td>$2,624</td>
<td>($2,513)</td>
</tr>
<tr>
<td>MULKE</td>
<td>5</td>
<td>7.40</td>
<td>1.1291</td>
<td>$30,042</td>
<td>$5,431</td>
<td>$4,165</td>
<td>$1,266</td>
<td>$4,207</td>
<td>($2,941)</td>
</tr>
<tr>
<td>NEMST</td>
<td>5</td>
<td>7.40</td>
<td>1.1291</td>
<td>$25,596</td>
<td>$5,417</td>
<td>$3,865</td>
<td>$1,552</td>
<td>$3,796</td>
<td>($2,245)</td>
</tr>
<tr>
<td>AHSAZ</td>
<td>4</td>
<td>5.25</td>
<td>1.1291</td>
<td>$27,154</td>
<td>$9,862</td>
<td>$3,306</td>
<td>$6,556</td>
<td>$4,017</td>
<td>$2,539</td>
</tr>
<tr>
<td>AKIMU</td>
<td>4</td>
<td>2.00</td>
<td>0.7054</td>
<td>$8,830</td>
<td>$5,347</td>
<td>$1,695</td>
<td>$3,652</td>
<td>$2,043</td>
<td>$1,609</td>
</tr>
<tr>
<td>CHIUG</td>
<td>4</td>
<td>2.25</td>
<td>0.7054</td>
<td>$12,654</td>
<td>$3,807</td>
<td>$2,160</td>
<td>$1,647</td>
<td>$2,640</td>
<td>($993)</td>
</tr>
<tr>
<td>KABIO</td>
<td>4</td>
<td>8.50</td>
<td>1.1291</td>
<td>$39,054</td>
<td>$5,532</td>
<td>$4,620</td>
<td>$913</td>
<td>$4,891</td>
<td>($3,979)</td>
</tr>
<tr>
<td>Total:</td>
<td>178</td>
<td>4.58</td>
<td>1.0148</td>
<td>$21,935</td>
<td>$7,005</td>
<td>$2,888</td>
<td>$4,117</td>
<td>$3,128</td>
<td>$989</td>
</tr>
</tbody>
</table>

### Cost Accounting Analytics –
Cost Variance Analysis to Best Practice

<table>
<thead>
<tr>
<th>Physician</th>
<th>Total Cases</th>
<th>ALOS</th>
<th>CML</th>
<th>Xrays/Case</th>
<th>Dir Var Cost/Case</th>
<th>% ED Cases</th>
<th>% Re-Admits</th>
<th>% Disch-Home</th>
<th>% Disch-Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>MULLA</td>
<td>10</td>
<td>4.80</td>
<td>1.1291</td>
<td>2.00</td>
<td>$3,969</td>
<td>50.0</td>
<td>30.0</td>
<td>70.0</td>
<td>30.0</td>
</tr>
<tr>
<td>NJASH</td>
<td>7</td>
<td>4.00</td>
<td>0.7054</td>
<td>0.86</td>
<td>$3,369</td>
<td>28.6</td>
<td>14.3</td>
<td>85.7</td>
<td>14.3</td>
</tr>
<tr>
<td>HAVZL</td>
<td>6</td>
<td>5.17</td>
<td>1.1291</td>
<td>1.00</td>
<td>$4,239</td>
<td>83.3</td>
<td>0.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>BHAAS</td>
<td>5</td>
<td>2.40</td>
<td>0.7054</td>
<td>1.60</td>
<td>$2,863</td>
<td>80.0</td>
<td>0.0</td>
<td>100.0</td>
<td>0.0</td>
</tr>
<tr>
<td>MULKE</td>
<td>5</td>
<td>7.40</td>
<td>1.1291</td>
<td>1.20</td>
<td>$4,922</td>
<td>100.0</td>
<td>0.0</td>
<td>60.0</td>
<td>40.0</td>
</tr>
<tr>
<td>NEMST</td>
<td>5</td>
<td>7.40</td>
<td>1.1291</td>
<td>1.80</td>
<td>$4,638</td>
<td>60.0</td>
<td>20.0</td>
<td>60.0</td>
<td>40.0</td>
</tr>
<tr>
<td>AHSAZ</td>
<td>4</td>
<td>3.25</td>
<td>1.1291</td>
<td>1.25</td>
<td>$4,500</td>
<td>75.0</td>
<td>25.0</td>
<td>50.0</td>
<td>50.0</td>
</tr>
<tr>
<td>AKIMU</td>
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<td>2.00</td>
<td>0.7054</td>
<td>1.00</td>
<td>$2,272</td>
<td>100.0</td>
<td>0.0</td>
<td>100.0</td>
<td>0.0</td>
</tr>
<tr>
<td>CHIOUG</td>
<td>4</td>
<td>2.25</td>
<td>0.7054</td>
<td>0.75</td>
<td>$2,919</td>
<td>100.0</td>
<td>0.0</td>
<td>100.0</td>
<td>0.0</td>
</tr>
<tr>
<td>KABINO</td>
<td>4</td>
<td>8.50</td>
<td>1.1291</td>
<td>2.75</td>
<td>$5,715</td>
<td>75.0</td>
<td>25.0</td>
<td>25.0</td>
<td>75.0</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>178</strong></td>
<td><strong>4.58</strong></td>
<td><strong>1.0148</strong></td>
<td><strong>1.30</strong></td>
<td><strong>$3,651</strong></td>
<td><strong>74.2</strong></td>
<td><strong>12.9</strong></td>
<td><strong>70.8</strong></td>
<td><strong>29.2</strong></td>
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</tbody>
</table>


What if 6 of the Top 10 physicians achieved a Direct Variable “cost per case” equal to the BEST PRACTICE of their peers?

<table>
<thead>
<tr>
<th>Cost Reduction</th>
<th>Increase in Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,251 – Cost Reduction per Case</td>
<td>100% – Reduction in Re-Admissions</td>
</tr>
<tr>
<td>50% - Cost Reduction %</td>
<td>79% - Increase in Home Discharges</td>
</tr>
<tr>
<td>$76,534 – Total Cost Reduction</td>
<td></td>
</tr>
</tbody>
</table>
Population Health Contracting Methodology:

1. Identify a population of covered lives
2. Develop clinical and business analytics to assess clinical and financial risk
3. Risk stratify all covered lives into functional sub-populations
4. Develop a clinical and business plan to address each sub-population’s targeted outcomes
5. Monitor, measure, and modify plans
Risk Stratify All Covered Lives into Functional Sub-Populations

<table>
<thead>
<tr>
<th>Sub-Population</th>
<th>% of the Population</th>
<th>% of Cost</th>
<th>Annual Cost (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Illness</td>
<td>3%</td>
<td>29%</td>
<td>$54,444</td>
</tr>
<tr>
<td>Multiple Chronic Illnesses</td>
<td>7%</td>
<td>23%</td>
<td>$14,232</td>
</tr>
<tr>
<td>At Risk</td>
<td>10%</td>
<td>19%</td>
<td>$7,728</td>
</tr>
<tr>
<td>Stable</td>
<td>30%</td>
<td>22%</td>
<td>$3,168</td>
</tr>
<tr>
<td>Healthy</td>
<td>50%</td>
<td>7%</td>
<td>$660</td>
</tr>
</tbody>
</table>
Population Health Contracting Methodology:

1. Identify a population of covered lives
2. Develop clinical and business analytics to assess clinical and financial risk
3. Risk stratify all covered lives into functional sub-populations
4. Develop a clinical and business plan to address each sub-population’s targeted outcomes
5. Monitor, measure, and modify plans
Develop a Clinical and Business Plan to Address each Sub-Population’s Targeted Outcomes:

**Advanced Illness:** palliative care program and intensive disease management, home health

**Multiple Chronic Diseases:** intensive disease management, nurse navigator (UM/RM), medical home, monitor clinical/business analytics, home health

**Chronic Disease and At Risk:** medical home, registry, nurse navigator, home health, facilitated networks

**Healthy:** Tele-health with apps, retail outlets to manage minor acute episodes, personalized health maintenance
Interventions must be Staged and Realistically Planned for (Geisinger Clinic):

3-6 months: transitions of care management to reduce readmissions, case management for high risk patients to reduce primary admissions and ED visits

6-12 months: case management for lower risk patients to reduce primary admissions/ED visits, pharmacy management to reduce utilization and increase generic use

1-2 years: nursing home case management to reduce primary readmissions/ED visits, efficient use of specialists/ancillary personnel to reduce cost/case, reduce unnecessary testing

3-5+ years: low risk chronic disease optimization with nurse navigators and patient registries, preventive care and wellness programs
# Predictive Modeling: Predictive Summary

<table>
<thead>
<tr>
<th>Department</th>
<th>Employee</th>
<th>Spouse</th>
<th>Dependent</th>
<th>Total</th>
<th>% of Total</th>
<th>Selected (All)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPC/ERG</td>
<td>4</td>
<td>0</td>
<td>14</td>
<td>18</td>
<td>47.37 %</td>
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</tr>
<tr>
<td>Otolaryngology</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>7</td>
<td>18.42 %</td>
<td></td>
</tr>
<tr>
<td>Dermatology</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>15.79 %</td>
<td></td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>15.79 %</td>
<td></td>
</tr>
<tr>
<td>Orthopedics &amp; Rheumatology</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>13.16 %</td>
<td></td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>13.16 %</td>
<td></td>
</tr>
<tr>
<td>Pulmonology</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>4</td>
<td>10.53 %</td>
<td></td>
</tr>
<tr>
<td>Psychiatry</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>7.89 %</td>
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</tr>
<tr>
<td>Urology</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>5.26 %</td>
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</tr>
<tr>
<td>Endocrinology</td>
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<td>0</td>
<td>1</td>
<td>2</td>
<td>5.26 %</td>
<td></td>
</tr>
<tr>
<td>Infectious Diseases</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.63 %</td>
<td></td>
</tr>
<tr>
<td>Cardiology</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.63 %</td>
<td></td>
</tr>
<tr>
<td>Hematology</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2.63 %</td>
<td></td>
</tr>
<tr>
<td>Late Effects, Environmental Trauma and Poisonings</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.63 %</td>
<td></td>
</tr>
<tr>
<td>Neonatology</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.63 %</td>
<td></td>
</tr>
<tr>
<td>Neurology</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2.63 %</td>
<td></td>
</tr>
<tr>
<td>No Known Conditions</td>
<td>0</td>
<td>1</td>
<td>8</td>
<td>9</td>
<td>23.68 %</td>
<td></td>
</tr>
<tr>
<td><strong>Total Unique Members</strong></td>
<td>5</td>
<td>1</td>
<td>32</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Total Members</td>
<td>13.16 %</td>
<td>2.63 %</td>
<td>84.21 %</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Total Annual Low: $27,020 | $25 | $42,490 | $69,535
*Total Annual High: $37,900 | $210 | $55,280 | $93,390
% of Total High: 40.58 % | 0.22 % | 59.19 %
Stage the Transition from FFS to Risk Based Contracting:

1. **Align with all key facilities and providers** before everything

2. Build the integrated network **together** (all solutions must make clinical and operational sense)

3. **Focus on opportunities to lower cost structure first** (labor, supply chain, palliative care, inpatient disease management) (**MUST HAVE ANALYTICS!**)

4. **Grow new sources of revenue second** (e-health solutions, contracts for domestic/international medical tourism, focused factories (VAPs), solution shops etc.)

5. **Grow the ambulatory population health infrastructure third** as you move into risk based contracting (e.g. post-acute care, ambulatory disease management, retail medicine, home health, etc.)

6. **Exit fee for service last** and focus completely on health optimization and prevention of disease
A Final Thought:

“You cannot cut your way to success. Build a new clinically integrated enterprise based upon cost-effective health ($5T) rather than disease ($2.8T), quality adjusted life years rather than life years, patients/consumers rather than providers/enterprise, and you will be far more likely to succeed.”
Questions, Discussion, and “Next Steps”
Thank You for Joining Us!

Jon Burroughs, MD, MBA, FACHE, FAAPL
jburroughs@burroughsheathcare.com;
603-733-8156