Opening Remarks

Operating and Financial Performance

Faculty Presentation: University of Iowa Osteoarthritis Research Program
Opening Remarks

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Operating and Financial Performance

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Commitment to Efficiency
We have seen a 20% growth in average midnight census from 2014-2019.
Inpatient Growth

Operating and Financial Performance

<table>
<thead>
<tr>
<th>Care Area</th>
<th>2014 Average Census</th>
<th>2019 Average Census</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Care</td>
<td>313</td>
<td>392</td>
<td>25.2%</td>
</tr>
<tr>
<td>ICU</td>
<td>79</td>
<td>88</td>
<td>11.4%</td>
</tr>
<tr>
<td>Behavioral Health</td>
<td>70</td>
<td>71</td>
<td>1.4%</td>
</tr>
<tr>
<td>ED</td>
<td>21</td>
<td>29</td>
<td>38.1%</td>
</tr>
</tbody>
</table>

Behavioral Health inpatient growth has been curbed by the introduction of the Crisis Stabilization Unit.
Inpatient Growth

Operating and Financial Performance

Occupancy Percentage by Care Area

<table>
<thead>
<tr>
<th>Care Area</th>
<th>2014 Occupancy</th>
<th>2019 Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU</td>
<td>84%</td>
<td>86%</td>
</tr>
<tr>
<td>General Care</td>
<td>92%</td>
<td>88%</td>
</tr>
<tr>
<td>Behavioral Health</td>
<td>98%</td>
<td>96%</td>
</tr>
</tbody>
</table>
Total ED volume is relatively stable but patient care hours are up due to increased number of admitted patients and boarding.
We have seen significant growth in surgical volumes over the past 5 years.
## Surgical Growth

Operating and Financial Performance

<table>
<thead>
<tr>
<th>Major Departments</th>
<th>FY15 Volume</th>
<th>FY19 Volume</th>
<th>FY15-19 Growth (Cases)</th>
<th>FY15-19 Growth (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gynecology</td>
<td>1,612</td>
<td>2,267</td>
<td>655</td>
<td>41%</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>2,706</td>
<td>3,528</td>
<td>822</td>
<td>30%</td>
</tr>
<tr>
<td>Dentistry</td>
<td>875</td>
<td>1,058</td>
<td>183</td>
<td>21%</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>7,162</td>
<td>8,411</td>
<td>1,249</td>
<td>17%</td>
</tr>
<tr>
<td>Surgery</td>
<td>7,371</td>
<td>8,462</td>
<td>1,091</td>
<td>15%</td>
</tr>
<tr>
<td>Urology</td>
<td>2,958</td>
<td>3,334</td>
<td>376</td>
<td>13%</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>3,213</td>
<td>3,590</td>
<td>377</td>
<td>12%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>3,793</td>
<td>3,946</td>
<td>153</td>
<td>4%</td>
</tr>
</tbody>
</table>

Surgical volume has increased 16% from FY15 to FY19, with the largest case volume increases in Neurosurgery, Orthopaedics, and Surgery.
Surgical Growth
Operating and Financial Performance

Surgical volumes continue to grow year-over-year

Volume up 6% through Q1 FY20, driven by:

- Orthopedics +15%
- Urology +10%
- Ophthalmology +10%
- Gynecology +8%

Steps taken to increase capacity

Improved access to Operating Rooms for surgical departments by creating additional capacity

- Opened 2 additional ORs in the Ambulatory Surgery Center
- Extended OR hours in Main Operating Room and Ambulatory Surgery Center

Improved efficiency by enhancing patient throughput

- Added 7 additional Post Anesthesia Care Unit (PACU) in the Main Operating Room to reduce rate of in-OR recovery
Surgical Growth
Operating and Financial Performance

**Total OR Hours**

- Total OR hours have grown by nearly 11,000 (14%) since 2015.
- Block Utilization in FY19:  
  - ASC: **78%**  
  - Main OR: **88%**  
  - SFCH: **74%**
Commitment to Quality
Infections Following Abdominal Hysterectomy

Deep and organ space infections

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY16</td>
<td>1.1</td>
</tr>
<tr>
<td>FY17</td>
<td>3.8</td>
</tr>
<tr>
<td>FY18</td>
<td>1.0</td>
</tr>
<tr>
<td>FY19</td>
<td>0.7</td>
</tr>
</tbody>
</table>
Financial Performance
Volume and Financial Highlights – FY20
Through September 2019

Operating Margin
- Fiscal Year actual 7.0%, budget of 3.0%

Volume Change
- Year-over-year: Inpatient Discharges -3.7%, Acute Patient Days 0.7% Surgeries 5.3%, Clinic Visits 9.0%

Acuity
- September Case Mix Index continues to be high. 2.14 overall

Length of Stay Index
- Adult at .98
- Pediatrics at 1.06

Revenues
- 3.8% above budget year-to-date
  - Inpatient under budget 1.8%
  - Outpatient above budget 8.5%

Payer Mix
- Medicare Stable
  - FY19: 37.7%, FY20: 37.2%

Accounts Receivable
- Days in Net AR – 49.9 days

Salary Expenses
- 3.5% below budget year-to-date

Non Salary Expenses
- 2.3% above budget year-to-date
  - Supply and drug costs above budget
### Comparative Financial Results

Fiscal Year to Date September 2019, Dollars in Thousands

<table>
<thead>
<tr>
<th>NET REVENUES</th>
<th>Actual</th>
<th>Budget</th>
<th>Prior Year</th>
<th>Variance to Budget</th>
<th>Variance to Prior Year</th>
<th>Variance to Prior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Revenue</td>
<td>$476,928</td>
<td>$459,610</td>
<td>$416,342</td>
<td>$17,318</td>
<td>3.8%</td>
<td>$60,586</td>
</tr>
<tr>
<td>Other Operating</td>
<td>13,159</td>
<td>12,714</td>
<td>13,189</td>
<td>445</td>
<td>3.5%</td>
<td>(30)</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>$490,087</td>
<td>$472,324</td>
<td>$429,531</td>
<td>$17,763</td>
<td>3.8%</td>
<td>$60,556</td>
</tr>
</tbody>
</table>

| EXPENSES               |          |         |            |                    |                        |                        |                        |
|-----------------------|----------|---------|------------|--------------------|------------------------|------------------------|
| Salaries and Wages    | $204,842 | $212,284| $193,678   | ($7,442)           | -3.5%                  | $11,164                | 5.8%                   |
| General Expenses      | 225,197  | 220,087 | 193,834    | 5,110              | 2.3%                   | 31,363                 | 16.2%                  |
| Operating Expense     | $430,039 | $432,371| $387,512   | ($2,332)           | -0.5%                  | $42,527                | 11.0%                  |
| Cash Flow Operating   | $60,048  | $39,953 | $42,019    | $20,095            | 50.3%                  | $18,029                | 42.9%                  |
| Depreciation and Amortization | 25,597  | 25,869  | 25,571     | (272)              | -1.1%                  | 26                     | 0.1%                   |
| Total Operating Expense| $455,636 | $458,240| $413,083   | ($2,604)           | -0.6%                  | $42,553                | 10.3%                  |

| Operating Income       | $34,451  | $14,084 | $16,448    | $20,367            | 144.6%                 | $18,003                | 109.5%                 |
| Operating Margin %     | 7.0%     | 3.0%    | 3.8%       | 4.0%               | 3.2%                   |                        |                        |
| Gain (Loss) on Investments | 2,952   | 5,504   | 6,930      | (2,552)            | -46.4%                 | (3,978)                | -57.4%                 |
| Other Non-Operating    | (3,207)  | (3,596) | (2,897)    | 389                | 10.8%                  | (310)                  | -10.7%                 |
| Net Income             | $34,196  | $15,992 | $20,481    | $18,204            | 113.8%                 | $13,715                | 67.0%                  |
| Net Margin %           | 7.0%     | 3.4%    | 4.7%       | 3.6%               | 2.3%                   |                        |                        |

*Gain/(Loss) on Investments based on information available at close. Final investment return for this period is reflected in Fiscal Year to Date returns in the subsequent reporting cycle.*
# Key Metrics

## Financial Performance

<table>
<thead>
<tr>
<th></th>
<th>FY20 YTD Through September</th>
<th>Moody’s Median</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial Operations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Margin</td>
<td>7.0%</td>
<td>3.5%</td>
</tr>
<tr>
<td><strong>Financial – Liquidity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days Cash on Hand</td>
<td>201</td>
<td>265</td>
</tr>
<tr>
<td><strong>Financial – Leverage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debt to Capitalization</td>
<td>18.2%</td>
<td>26.0%</td>
</tr>
</tbody>
</table>
University of Iowa Osteoarthritis Research Program

J. L. Marsh, MD
Professor and Carroll B. Larson Chair
Department of Orthopedics and Rehabilitation
Osteoarthritis (OA) is joint pain and loss of function due to loss of joint cartilage. Worldwide, osteoarthritis is the leading cause of:

- Pain and loss of mobility in senior adults
- Permanent disability
- Health care expenditures

University of Iowa Health Care Department of Orthopedics Osteoarthritis Research Program

- 2002–2018: Three National Institutes of Health Program Grants
  Total Funding: $15M
- 2018–2022: Department of Defense Research Program Grant
  Total Funding: $10M
Post-traumatic Osteoarthritis (PTOA) is a particular type of OA caused by fracture or other joint injury.

**Ligament injury**
- Up to 40% of injuries lead to OA
- 10 years or greater following ligament injury

**Severe joint fractures**
- Hip > 45% OA
- Knee > 45% OA
- Ankle > 70% OA

Often within 2 years after injury

PTOA is progressive and irreversible
Impact of PTOA
University of Iowa Osteoarthritis Research Program

Some Facts about PTOA

- More than 12% of all OA from joint injuries
- More than 6 million people – annual cost of $15 billion
- Most frequent disabling condition leading to medical discharge in military personnel
- Impairment due to ankle PTOA equal to end-stage kidney disease and congestive heart failure
- Severe disease ten years earlier than patients with severe OA due to other causes

University of Iowa Publications on Impact

- PTOA Caused by Battlefield Injuries is the Primary Source of Disability in Warriors. JAAOS, 2012.
Goal of Research Program

University of Iowa Osteoarthritis Research Program

Prevention of PTOA by identifying new interventions for early treatment of injured joints.

To accomplish this goal, we needed to answer three questions:

1. Who is at risk of PTOA?
2. What biological events cause PTOA?
3. Can we alter the biology to prevent these events?
1. Who is at risk of PTOA

University of Iowa Osteoarthritis Research Program

By calculating Fracture Surface Area (CT Scan) we determine Fracture Energy

(a) 
(b) 
(c) 

How badly is this broken?

The more pieces, the higher the energy.
Fracture Energy Predicts 2 year PTOA Risk

University of Iowa Osteoarthritis Research Program

Consider biologic intervention?

88% concordance

Tibial Plafond Fracture Patients

OA Absent (KL≤1)
OA Mild (KL=2)
OA Severe (KL≥3)
2. What biological events cause PTOA?

University of Iowa Osteoarthritis Research Program

Replicate severe ankle fracture in human ankles from below knee amputations

Measure whether cartilage cells survive or die after this impact.
2. What biologic events cause PTOA?

University of Iowa Osteoarthritis Research Program

Immediate

1 day post-impact

2 days post-impact

Red = Dead Cell
Green = Viable Cell

Minimal initial cell death

Progression over 48 hours

Toxins released from injured cells!
Amobarbital NAC Counteract Injury Effects

University of Iowa Osteoarthritis Research Program

Cartilage Injury

Amobarbital (Inhibits ROS)

Toxins From Mitochondria

NAC (detoxify ROS)

Oxidative stress

Cell death/malfunction

PTOA

Focal Injury to Cartilage Surface

No Treatment

Amo or NAC

Red = ROS/dead  Green = live
3. Can we alter the biology to prevent these events?

University of Iowa Osteoarthritis Research Program

Animal Model that Closely Simulates Human Closed IAF
(Joint Size, Articular Cartilage Thickness, Loading, Allow Treatments used in Patients)

Hock Joint Similar to Human Ankle Joint
Yucatan Mini-Pig 70 Kg –

Both NAC and Amobarbital injected into injured joints prevented or minimized PTOA at 6 months after fracture.
Immediate Treatment of Joints with Amobarbital or n-acetylcysteine (NAC) Delays the onset of PTOA

Histology @ 6 months post-fracture
**Next Steps**

University of Iowa Osteoarthritis Research Program

**DOD Focused Program Award:** Translating Metabolic Responses to Mechanical Insult into Early Interventions to Prevent PTOA.

**PROJECT 1**
Two center phase I/II clinical trial of amobarbital in patients with IAF

**PROJECT 2**
Assessing PTOA risk and methods to promote healing and remodeling in joints with high risk of PTOA.

**PROJECT 3**
Combining amobarbital with long-term gene therapy to supplement joint lubrication

**PROJECT 4**
Advance basic understanding of Mitochondrial-ROS-PTOA Pathway to develop treatments for spectrum of joint injuries

**GOAL:**
By the end of this study, we will have an injectable biologic that will help prevent PTOA in a wide range of injured joints.
Thank You