Best Practices among the AOC
Ancillary lines of business that can help fund the academic missions

Imaging / X-Ray

Penn Medicine

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X-Ray Marketing Director
GE Healthcare

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Clinical Operations Director
UPENN

September 21st 2016
Fill the hospital ➔ Empty the hospital

2016-2026 Inpatient growth
- Overall: -3%
- Orthopedics: 6%
- Neuro: 8%
- Cancer: 1%
- Spine: -7%
- Breast Health: -8%
- Gen Med/Surg: -6%
- Cardio: -15%

2016-2026 Outpatient growth
- Overall: 15%
- Orthopedics: 11%
- Neuro: 15%
- Cancer: 22%
- Spine: 15%
- Breast Health: 4%
- Gen Med/Surg: 12%
- Cardio: 19%

Shift from high-cost acute settings accelerating

Source: Sg2 Impact of Change® Analysis
Orthopaedic X-Ray market

2016 Outpatient X-rays by Condition

- Complication of Device/Implant/Graft: 513
- Bone/Limb/Spine Congenital Anomaly: 535
- Hip Fracture: 699
- Orthopedic Aftercare: 1,525
- MSK Injury - Knee: 2,821
- MSK Injury - Pelvis/Hip/Femur: 6,478
- Other MSK Injuries & Conditions: 9,276
- MSK Injury - Shoulder/Elbow/Upper Arm: 10,195
- MSK Injury - Hand/Wrist/Forearm: 10,514
- Osteoarthritis: 11,708
- Musculoskeletal Injury - Lower Leg/Foot/Ankle: 22,771

13% volume growth over next decade from 77 million to 86 million

financial ownership ..ie ACOs , CJR, episodic products , consumerism

Prevalence osteoarthritis + shift joint replacement from IP to OP including revision procedures

Expansion of service channels .. Sports medicine, urgent care, pain management

Source: Sg2 Analytics calculator / Advisory Board Key considerations for JR bundled payments report
New Medicare Standards for Diagnostic X-ray Imaging Services

The H.R.2029 Consolidated Appropriations Act of 2016 was signed into law on December 18, 2015. Section 502 of title V Medicare and Medicaid Provisions creates a Medicare payment incentive for the transition from traditional X-ray imaging to digital radiography and other Medicare imaging payment provisions.

What are the HR 2029 Section 502 changes?

• Payment limitations for film X-ray imaging services 20% reduction in payment for the technical component of the service to the Medicare Physician Fee Schedule and Hospital Outpatient Prospective Payment System in 2017

• Phased-in payment limitations for computed radiography (CR) imaging services 7% initial reduction in payment for the technical component of the service to the Medicare Physician Fee Schedule and Hospital Outpatient Prospective Payment System in 2018

• Final payment limitation of 10% for the computed radiography technical component of the service to the Medicare Physician Fee Schedule and Hospital Outpatient Prospective Payment System in 2023

Radiology at Penn Orthopaedics

11 practices; 4 directly own their x-ray units & directly financially benefit

Total X-Rays All Sites in 2015: 13 418

Total units owned: 4
2015 Volume: 4,418 (32 %)

Opportunity
- Potential source of funding for clinical research or other academic mission

Key question for new sites …partnership or direct ownership?
PMUC site business case

Radiology unit not owned by UPENN

4700 standard radiographs

Overhead per x-ray would be 57.23%
Based on practices with directly owned radiology units
Overhead cost considerations for PMUC ownership

- 2 leased or purchased x-ray units
- Maintenance agreement
- Construction costs
- Additional rent
- 2 X-Ray Technicians
- 1 Technician Assistant
- Supplies
PMUC DR profit potential

<table>
<thead>
<tr>
<th>Exams</th>
<th>4700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment$^1$</td>
<td>$77</td>
</tr>
<tr>
<td>Revenue</td>
<td>$361k</td>
</tr>
<tr>
<td>Margin$^2$</td>
<td>$154k</td>
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</table>

$^1$ national estimated average payment of a “typical” radiographic based on procedure volume payment weighting
$^2$ based on current overhead costs of 57.23% at current owned facilities
What if it was all owned?

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Exams(^3)</td>
<td>8000</td>
</tr>
<tr>
<td>Payment(^1)</td>
<td>$77</td>
</tr>
<tr>
<td>Revenue</td>
<td>$616k</td>
</tr>
<tr>
<td>Margin(^2)</td>
<td>$263k</td>
</tr>
</tbody>
</table>

\(^1\) national estimated average payment of a “typical” radiographic based on procedure volume payment weighting

\(^2\) based on current overhead costs of 57.23% at current owned facilities

\(^3\) 13418 total exams less the 4418 already completed on owned assets
Other Opportunities with Radiology

New CMS reimbursement rule will require investment in upgrading equipment to DR

New technology available with DR will provide higher reimbursement
Does digital x-ray answer all your clinical questions?

Does this patient have a problem?

How severe is it?

Displacement?

How should I treat it?

Was surgery successful?

Is bone union occurring?
Orthopedic Trauma Pathway

Detection
Assessment
Treatment Planning
Treatment Evaluation
Healing / Monitoring

Does this patient have a problem?

X-ray
No Fracture

DTS Image Stack

DTS Slice
Acetabular Fracture
Orthopedic Trauma Pathway

Detection

Assessment

Treatment Planning

Treatment Evaluation

Healing / Monitoring

How severe is the injury? How should I treat it?

X-ray

Indeterminate Displacement

DTS Image Stack

DTS Slice

Significant Displacement >2mm

Plan Surgery
Orthopedic Trauma Pathway

Detection  Assessment  Treatment Planning  Treatment Evaluation  Healing / Monitoring

Was surgery successful?

- X-ray: Indeterminate
- VolumeRAD Image Stack
- VolumeRAD Slice: No joint space invasion
Orthopedic Trauma Pathway

Detection → Assessment → Treatment Planning → Treatment Evaluation → Healing / Monitoring

Is bone union / healing occurring?

X-ray
Appears healed

DTS Image Stack

DTS Slice
Non-union
Digital Tomosynthesis (DTS) Optimizes Imaging Tradeoffs

<table>
<thead>
<tr>
<th>X-ray</th>
<th>DTS</th>
<th>CT</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Low Dose</td>
<td></td>
<td>- Higher Dose</td>
</tr>
<tr>
<td>+ Fast Workflow</td>
<td></td>
<td>- Slower Workflow</td>
</tr>
<tr>
<td>+ Low Cost</td>
<td></td>
<td>- Higher Cost</td>
</tr>
<tr>
<td>- Poor Measurements</td>
<td></td>
<td>+ Accurate Measurements</td>
</tr>
<tr>
<td>- Diagnostic Quality</td>
<td></td>
<td>+ High Diagnostic Quality</td>
</tr>
<tr>
<td>- Low Confidence</td>
<td></td>
<td>+ Higher Confidence</td>
</tr>
</tbody>
</table>

DTS opens the door to the 3rd dimension
Volumetric images from your X-ray system

Digital tomosynthesis provides multiple images of the anatomy in a single sweep at a low dose, including chest, abdomen, extremities and spine bringing 3 dimensional imaging to the radiographic suite

Helps support clinical diagnosis by removing overlying structures, enhancing local tissue separation, and providing depth information about the structure of interest

In recent discussions with GE, The American College of Radiology (ACR) brought up potential use of CPT code 76100 or APC 5522 when reporting a digital tomosynthesis in conjunction with thoracic & musculoskeletal exam

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# DTS Reimbursement Advisory

## 2016 Medicare Reimbursement for Procedures Related to DTS X-Ray Services

<table>
<thead>
<tr>
<th>CPT(^3)/HCPCS Code</th>
<th>Physician Office</th>
<th>Facility</th>
<th>Ambulatory Surgery Center*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Reimbursement Component</td>
<td>Medicare Physician Fee Schedule Payment(^a)</td>
<td>APC</td>
</tr>
<tr>
<td>CPT 76100 Radiologic examination, single plane body section (e.g., tomography), other than with urography</td>
<td>Professional ((-26)^*)</td>
<td>$32.22</td>
<td>5522</td>
</tr>
<tr>
<td></td>
<td>Technical ((-TC)^{**})</td>
<td>$60.87</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>$93.09</td>
<td></td>
</tr>
<tr>
<td>CPT 76499 Unlisted diagnostic X-Ray procedure</td>
<td>Professional ((-26))</td>
<td>Carrier Priced</td>
<td>5521</td>
</tr>
<tr>
<td></td>
<td>Technical ((-TC))</td>
<td>Carrier Priced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Global</td>
<td>Carrier Priced</td>
<td></td>
</tr>
</tbody>
</table>

*Professional \((-26)\) - The professional component is the interpretation of the results of the test. When the professional component is reported separately, the service may be identified by adding modifier "26".*

**Technical \((-TC)\) - The technical component is the equipment and technician performing the test. This is identified by adding modifier "TC" to the procedure code identified for the technical component change.*

Some payers may recommend the unlisted CPT code 76499 to report this service. As stated above, it is always recommended to check with your individual payer for coding requirements.

### Coverage Policies
Medicare carriers may issue Local Coverage Decisions (LCDs) addressing the requirements that must be met for services to be covered. It is strongly recommended that physicians review these LCDs or contact their local payers to inquire about these requirements. Medicare LCDs may be found at this link: [http://www.cms.gov/medicare-coverage-database/](http://www.cms.gov/medicare-coverage-database/)

With respect to private payers, some may rely on Medicare reimbursement policies, while others consider alternative information. Therefore, it is important to consult with individual private payers regarding DTS coverage.

### Payment
For payment, it is essential that each claim be coded appropriately and supported with adequate documentation in the medical record. Consult payers for specific documentation requirements.
PMUC w/ DTS follow up for 5% exams

<table>
<thead>
<tr>
<th>Exams</th>
<th>4700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment&lt;sup&gt;1&lt;/sup&gt;</td>
<td>$82</td>
</tr>
<tr>
<td>Revenue</td>
<td>$385k</td>
</tr>
<tr>
<td>Margin&lt;sup&gt;2&lt;/sup&gt;</td>
<td>$164k</td>
</tr>
</tbody>
</table>

<sup>1</sup> national estimated average payment of a “typical” radiographic based on procedure volume payment weighting

<sup>2</sup> based on current overhead costs of 57.23% at current owned facilities
What if it was all owned?

Exams $3$

Payment $1$

Revenue

Margin $2$

8000

$82

$656k

$280k

1 national estimated average payment of a “typical” radiographic based on procedure volume payment weighting
2 based on current overhead costs of 57.23% at current owned facilities
3 13418 total exams less the 4418 already completed on owned assets
Potential to change payback model

**Assumptions**

| Days of Operation per Month | 20 |
| Total Daily Procedures      | 20 |
| Avg. Reimbursement (per procedure) | $77 |
| Avg. Reimbursement for Contrast (if any) | $0 |
| Average Variable Costs (per procedure) | $0 |
| % of Procedures that use Contrast | 0% |
| Annual % Change in Number of Procedures | 0% |
| Annual % Change in Reimbursement Rates | 0% |
| Annual Operational and Other Fixed Costs | $210,000 |
| Percent of Revenue not Collected | 6% |

**Annual Cash Flow**

Adjusted case assumes 5% DTS increase REIMB to $82

<table>
<thead>
<tr>
<th>Year</th>
<th>Base</th>
<th>Adjusted (based on customer's inputs – see page 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>-$237,576</td>
<td>-$215,016</td>
</tr>
<tr>
<td>Year 2</td>
<td>$102,424</td>
<td>$124,984</td>
</tr>
<tr>
<td>Year 3</td>
<td>$102,424</td>
<td>$124,984</td>
</tr>
<tr>
<td>Year 4</td>
<td>$102,424</td>
<td>$124,984</td>
</tr>
<tr>
<td>Year 5</td>
<td>$102,424</td>
<td>$124,984</td>
</tr>
</tbody>
</table>

| Payback Period (Months) | **40** |
| Avg. Discounted Monthly Cash Flow | **$1,994** |
| Net Present Value | **$101,776** |
| Avg. Breakeven Procedures per Day | **18** |

| Avg. Discounted Monthly Cash Flow | **$3,622** |
| Net Present Value | **$199,449** |
| Avg. Breakeven Procedures per Day | **16.9** |
Summary

Orthopaedic x-ray volumes will grow 13% over next decade

Require new financial models and channel strategies for growth

HR 2029 effective Jan 1 2018 and will reduce CR reimbursement

Penn Medicine potential to generate $260k+ in support academic mission with x-ray

Digital tomosynthesis intermediary imaging solution that can improve clinical and financial outcomes