Cost of Cancer Care by Setting of Therapy

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Outpatient Chemotherapy Care Continues to Shift to Hospitals

- Over the past several years, the share of payments for chemotherapy has shifted to hospitals and away from office-based physicians
  - Part of the trend is due to hospitals acquiring physicians
  - Part of the trend may be due to efforts by hospitals to capture greater share
  - Part of the trend may be due to the increasing cost of chemotherapy drugs

- This shift has significant implications for payments by Medicare and commercial payers
  - Medicare reimburses hospitals and physicians the same fee for the same drug
    - Utilization differences between the settings results in total payment differences
  - Growing evidence suggests that hospitals receive higher reimbursement than physician offices from private payers for the same dose of the same drug

- These trends may complicate efforts by payers to both control spending as well as implement new payment models for oncologic care
  - As hospitals gain market share, their ability to command higher prices will put pressure on commercial premiums
  - New payment models will be built on existing fee structures, which could be skewed by other market factors
Medicare Payment for Chemotherapy Shifting to Hospitals

Proportion of Medicare Payments of Chemotherapy Drug Codes by Site of Service Among Medicare FFS Beneficiaries, 2005-2011

Year

2005: 74.4% OFFICE-BASED, 25.6% HOPD
2006: 74.6% OFFICE-BASED, 25.4% HOPD
2007: 72.1% OFFICE-BASED, 27.9% HOPD
2008: 71.3% OFFICE-BASED, 28.7% HOPD
2009: 69.8% OFFICE-BASED, 30.2% HOPD
2010: 66.5% OFFICE-BASED, 33.5% HOPD
2011: 63.0% OFFICE-BASED, 37.0% HOPD

Data Source: 5% Carrier and Outpatient SAF, 2001-2011

Avalere Study on Costs of Cancer Care by Setting

- Avalere Health analyzed data for the 2008-2010 period from four health plans for patients diagnosed with any form of cancer.
- We estimated total costs of care for cancer patients managed primarily in the office setting versus a hospital outpatient department (HOPD).
  - We used the place of service codes from chemotherapy or radiation therapy claims to identify the setting of care.
  - Patients needed to receive 60 percent or more of therapy in one setting to qualify for that setting.
  - If an episode did not meet the 60 percent requirement, it was excluded.
- The results compare the total per-patient per-month (PPPM) costs for each treatment episode from the initiation of chemotherapy.
  - Costs include inpatient and outpatient hospital, office, and pharmacy claims.
  - Costs include plan payments and patient liability (copays / co-insurance).
- For each patient, we created episodes based on service dates they received chemotherapy.
  - In most cases, an episode was defined as treatment for a single cancer type.
  - We defined the end of an episode as the lapse of treatment for at least 60 days.
  - We required a minimum of two claims to define an episode.
  - Chemotherapy was identified via a J-code or NDC for a chemotherapy drug or UB-04 revenue code for chemotherapy administration.
- We tested the results for the influence of:
  - Type of cancer.
  - Patient age and gender.
  - Prior history of cancer.
**Episode Demographics**

**Age Distribution**
- 70-79: 41%
- 80-89: 22%
- 60-69: 21%
- 50-59: 8%
- 0-49: 4%
- 90+: 4%

**Cancer Distribution**
- Prostate: 22%
- Lung: 14%
- Genitourinary System: 13%
- Breast: 11%
- Multiple Myeloma: 3%
- Ovarian: 3%
- Rectal: 3%
- Leukemia: 3%
- Hodgkins/Lymphoma: 11%
- Other: 9%
- Digestive System: 3%
- Colon: 5%

HOPD = Hospital Outpatient Department
Setting of Care by Patient Age


HOPD = Hospital Outpatient Department
Setting by Type of Cancer


HOPD = Hospital Outpatient Department
Overall Results Showed Higher Episode Costs in the Hospital Outpatient Setting

After risk adjustment, PPPM costs are higher for episodes of chemotherapy delivered in the HOPD setting


HOPD = Hospital Outpatient Department

Results are adjusted for age, gender, and prior history of cancer.
Top Cancers Demonstrated Lower Office Payments

Prostate Cancer

Lung Cancer

Genitourinary System Cancer

Breast Cancer


Results are unadjusted for age, gender, and prior history of cancer

HOPD = Hospital Outpatient Department

Months after initiation of chemotherapy in each X-axis

PPPM costs in each Y-axis
Subsequent Milliman Study Showed Similar Results

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Average Allowed Cost per Episode</th>
<th>Average Allowed Cost for all Sessions in an Episode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>POV</td>
<td>HOP</td>
</tr>
<tr>
<td>Metastatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSCLC</td>
<td>$82,849</td>
<td>$122,909</td>
</tr>
<tr>
<td>CRC</td>
<td>$122,300</td>
<td>$186,541</td>
</tr>
<tr>
<td>Breast</td>
<td>$115,308</td>
<td>$158,727</td>
</tr>
<tr>
<td>Adjuvant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSCLC</td>
<td>$44,769</td>
<td>$60,994</td>
</tr>
<tr>
<td>CRC</td>
<td>$79,058</td>
<td>$101,060</td>
</tr>
<tr>
<td>Breast</td>
<td>$57,809</td>
<td>$86,857</td>
</tr>
</tbody>
</table>


Allowed costs include payer costs and member cost sharing.

Episode includes all costs from first chemotherapy session to 30 days after last chemotherapy session unless more than a 3 month gap occurs after a chemotherapy session. Chemotherapy includes cytotoxic and biologic infusions. Session includes all costs on the day of a chemotherapy infusion.

NSCLC = Non Small Cell Lung Cancer     CRC = Colorectal Cancer     HCPCS: Healthcare Common Procedure Coding System

POV = Physician Office Visit     HOP = Hospital Outpatient
Milliman Analysis Found Significant Cost Differences in Drug Reimbursement

<table>
<thead>
<tr>
<th>HCPCS</th>
<th>Description</th>
<th>Cancer</th>
<th>POV</th>
<th>HOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>J9045</td>
<td>Carboplatin injection</td>
<td>NSCLC Metastatic</td>
<td>$387</td>
<td>$908</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Metastatic</td>
<td>$361</td>
<td>$925</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Adjuvant</td>
<td>$590</td>
<td>$831</td>
</tr>
<tr>
<td>J9055</td>
<td>Cetuximab injection</td>
<td>CRC Metastatic</td>
<td>$3,338</td>
<td>$7,363</td>
</tr>
<tr>
<td>J9171</td>
<td>Docetaxel injection</td>
<td>NSCLC Metastatic</td>
<td>$1,571</td>
<td>$4,955</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Adjuvant</td>
<td>$2,943</td>
<td>$5,682</td>
</tr>
<tr>
<td>J9201</td>
<td>Gemcitabine hcl injection</td>
<td>NSCLC Metastatic</td>
<td>$1,384</td>
<td>$3,018</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Metastatic</td>
<td>$1,297</td>
<td>$2,471</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Adjuvant</td>
<td>$1,235</td>
<td>$3,521</td>
</tr>
<tr>
<td>J9265</td>
<td>Paclitaxel injection</td>
<td>NSCLC Metastatic</td>
<td>$319</td>
<td>$937</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NSCLC Adjuvant</td>
<td>$271</td>
<td>$474</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Metastatic</td>
<td>$334</td>
<td>$998</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Breast Adjuvant</td>
<td>$288</td>
<td>$830</td>
</tr>
<tr>
<td>J9305</td>
<td>Pemetrexed injection</td>
<td>NSCLC Metastatic</td>
<td>$5,083</td>
<td>$9,750</td>
</tr>
</tbody>
</table>


NSCLC = Non Small Cell Lung Cancer  CRC = Colorectal Cancer  HCPCS: Healthcare Common Procedure Coding System
POV = Physician Office Visit  HOP = Hospital Outpatient
Recent IMS Analysis Provides Further Evidence

Hospital outpatient costs compared to physician office costs

Commercial Payment Methodologies Partly Explains Differences

- Medicare and many commercial payers require providers to submit specific HCPCS codes to receive payment for infused or injectable drugs.
- However, some payers allow hospitals to only submit Uniform Billing (UB-04) revenue codes for reimbursement
  - For example, a hospital may submit a bill with revenue code 0331 (chemotherapy-injected) and then receive a percentage of the charge included on the claim.
  - Physicians in an office setting cannot submit a revenue code as their only means of payment, and therefore must use a HCPCS code for reimbursement.

<table>
<thead>
<tr>
<th>Setting of Care and Type of Payment Code</th>
<th>Percent of episodes</th>
<th>Average PPPM for first month of chemotherapy episode</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOPD – revenue code</td>
<td>34%</td>
<td>$11,500</td>
</tr>
<tr>
<td>HOPD – J-code</td>
<td>66%</td>
<td>$9,700</td>
</tr>
<tr>
<td>Office – revenue code</td>
<td>&lt;1%</td>
<td>$4,400</td>
</tr>
<tr>
<td>Office – J-code</td>
<td>98%</td>
<td>$7,100</td>
</tr>
</tbody>
</table>

Importantly, if a payer only receives a revenue code for reimbursement, it does not know the specific drug or dosage provided to the patient.

**Note:** Table excludes episodes identified via National Drug Codes (NDC)

Hospital Charges for Drugs Often Exceed ASP by 3-5x

- Hospitals and physicians submit a charge for every service provided, including drugs administered to patients in the outpatient setting
  - Charges often have little relationship to actual costs

- The mark-up of charges over costs can vary by a range of factors
  - Hospitals have suggested that the markup over the cost of the product reflects overhead and other under-reimbursed services provided by the hospital

- Reimbursement methodology can also play a role in the mark-up
  - Hospitals may receive a percentage of their submitted charges from commercial payers
  - Physicians often receive a fee schedule amount, especially for drugs

### Median mark-up over ASP

<table>
<thead>
<tr>
<th></th>
<th>Darbepoetin (non-ESRD)</th>
<th>Gammagard</th>
<th>Infliximab</th>
<th>Pegfilgrastin</th>
<th>Bevacizumubab</th>
<th>Oxaliplatin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>4.9x</td>
<td>4.1x</td>
<td>3.5x</td>
<td>3.4x</td>
<td>3.4x</td>
<td>3.1x</td>
</tr>
<tr>
<td>Physicians</td>
<td>3.1x</td>
<td>2.4x</td>
<td>1.6x</td>
<td>2.0x</td>
<td>1.7x</td>
<td>2.1x</td>
</tr>
</tbody>
</table>

ASP: Average Sales Price
Source: Avalere analysis of 2011 Medicare Hospital Outpatient Claims Data & are National and State Healthcare Common Procedure Coding System (HCPCS) Aggregate Report, Calendar Year 2012
Patient Out-of-Pocket Adds Layers of Complexity

- Patient costs are often determined by plan benefit design, which may focus more on setting of care rather than type or cost of care
  - Some plans use a flat co-payment for any care received in a hospital or physician office
  - Co-pays or co-insurance often focused on “in-network” versus “out-of-network”, not cost of drug provided by provider
  - Out-of-pocket caps (in commercial insurance) or supplemental payers (e.g., Medigap plans for Medicare enrollees) also play a role in limiting patient’s costs
- While plan designs are changing, the lessened impact on patients’ costs reduces a plan’s ability to influence provider selection

<table>
<thead>
<tr>
<th>Therapy</th>
<th>$ difference / dose paid by payer</th>
<th>$ difference / dose paid by patient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HOP v MD Office</td>
<td>HOP v MD Office</td>
</tr>
<tr>
<td>Alemtuzumab</td>
<td>6,251</td>
<td>-10</td>
</tr>
<tr>
<td>Bevacizumab</td>
<td>6,298</td>
<td>312</td>
</tr>
<tr>
<td>Cetuximab</td>
<td>2,764</td>
<td>374</td>
</tr>
<tr>
<td>Epirubicin</td>
<td>1,231</td>
<td>-2</td>
</tr>
<tr>
<td>Fulvestrant</td>
<td>1,054</td>
<td>-9</td>
</tr>
<tr>
<td>Leuprolide Acetate</td>
<td>1,756</td>
<td>121</td>
</tr>
<tr>
<td>Mitoxantrone</td>
<td>991</td>
<td>116</td>
</tr>
<tr>
<td>Pertuzumab</td>
<td>5,792</td>
<td>0</td>
</tr>
<tr>
<td>Rituximab</td>
<td>4,330</td>
<td>398</td>
</tr>
<tr>
<td>Trastuzumab</td>
<td>2,354</td>
<td>35</td>
</tr>
</tbody>
</table>

Points for Consideration

- Costs of care by setting vary based on a range of factors
  - Patient acuity no doubt plays a role, although difficult to demonstrate using claims data
  - Growing evidence demonstrates that hospitals receive higher payment from commercial payers for the same dose of the same drug

- Reimbursement process may play a role in the payment differences
  - If commercial plans are paying hospitals based solely on submission of a revenue code, it limits the ability of the plan to negotiate payments on specific drugs
  - Revenue codes also limit the ability of a plan to design and implement any form of oncology-focused payment reform such as pathways or bundles

- Patient costs may play less of a role
  - In Medicare, many patients will have supplemental coverage, shielding them from any differences in co-insurance costs
  - In traditional commercial (employer) plans, patient costs often dictated by network status and not total treatment costs
  - In the new Marketplace, total patient spending cap could limit patient costs