Provider Ownership and the Diffusion of New Technologies

Stephen B. Williams, MD
Department of Urology
The University of Texas, MD Anderson Cancer Center
Outline

• Stark Law
• Urology as Model System for Provider Ownership
• Provider Ownership and Utilization of Imaging and Pathology in Urology
• Provider Ownership and Utilization of Radiotherapy in Urology
Understanding Provider Behavior

Provider

Pathology

Medical Oncologist

Radiation Oncologist

Imaging

Patient

Refer

Refer

Refer

Refer

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Stark Law

- Under federal law, it is generally illegal for a physician to refer Medicare or Medicaid patients for designated health services in which the physician has a financial interest.

- The federal law, also known as Stark II (named for Rep. Pete Stark [D-CA], its sponsor), prohibits many physician self-referral arrangements.

Mitchell J. Health Affairs, 2005.
Stark Law

- Enacted by Congress in 1993 to address many of the shortcomings of the federal antikickback statute.

- Under that statute, criminal, civil, or administrative liability can result if one knowingly and willfully offers to pay for, solicit, or receive any remuneration to induce referrals of items or services reimbursable under federal health programs.

Mitchell J. Health Affairs, 2005.
Stark Law-Exemptions

• Physician group practices are exempt for in-office ancillary services if the group practice meets specific criteria

• May self-refer if the services are personally performed or supervised by another physician in the same group practice

• Does not apply to specific types of facilities—in particular, ambulatory surgical centers and so-called whole hospitals

Mitchell J. Health Affairs, 2005.
### Provider Ownership

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
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<tbody>
<tr>
<td>• Improved access to care and dissemination of advanced technologies and services—the one stop shop.</td>
<td>• Potential for financially rather than clinically appropriate decision-making</td>
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<tr>
<td>• Patient convenience</td>
<td>• Potential for overutilization of expensive technologies and increase in health care spending</td>
</tr>
<tr>
<td>• Higher volume of patients treated may translate into superior outcomes</td>
<td>Nguyen PL. JCO, 2011.</td>
</tr>
</tbody>
</table>
Advanced Technologies-Provider Ownership in Urology

The State of the Urology Workforce and Practice in the United States

2014 AUA Annual Census

Practicing Urologists by AUA Section (United States Only)

(Data source: National Provider Identifier 11/2014 file; ABU certification files and AOA 3DO Directory)
Advanced Technologies-Provider Ownership in Urology

2014 AUA Annual Census
Advanced Technologies-Provider Ownership in Urology

Ownership in Medical Services and Equipment

Pathology: 18
CT scanner: 12
MRI: 1
IMRT: 10

2014 AUA Annual Census
Understanding Provider Behavior

- Pathology
- Medical Oncologist
- Radiation Oncologist
- Imaging

Provider

Refer

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Patient
The Prevalence Of Physician Self-Referral Arrangements After Stark II: Evidence From Advanced Diagnostic Imaging

Data from California suggest that physicians exploit exceptions in the Stark II law to continue to self-refer patients for imaging.

by Jean M. Mitchell

Mitchell J. Health Affairs, 2005.
Provider Ownership - Imaging

Prevalence of Diagnostic Imaging Providers By Self-Referral Status

- Self-Referral Nonradiologist (small/medium-size group)
- Self-Referral Nonradiologist physician (large group)
- Not Self-Referral Radiologist

Mitchell J. Health Affairs, 2005.
EXHIBIT 3
Diagnostic Imaging Used By Nonradiologist Physician Providers In Small Or Medium-Size Groups, By Type Of Self-Referral Arrangement, California, 2004

- MRI scans: 61% own equipment, 39% lease, time share, or pay-per-click arrangement.
- CT scans: 64% own equipment, 36% lease, time share, or pay-per-click arrangement.
- PET scans: 30% own equipment, 70% lease, time share, or pay-per-click arrangement.

Mitchell J. Health Affairs, 2005.
PROSTATE CANCER

By Jean M. Mitchell

Urologists’ Self-Referral For Pathology Of Biopsy Specimens Linked To Increased Use And Lower Prostate Cancer Detection

Provider Ownership- Pathology

12-Core Prostate Biopsy

6 jars

Left

Right

Provider Ownership - Pathology

12-Core Prostate Biopsy

Areas of biopsy
Base (top)

Left
Right

$624

6 jars

Left

$1248

12 jars

Left

Right

Right

Provider Ownership - Pathology

**EXHIBIT 1**

Mean Number Of Pathology Specimens (Jars) Per Prostate Biopsy, By Urologist Self-Referral Status, 2005-07

- Non-self-referring urologists
- Self-referring urologists

Provider Ownership - Pathology

**EXHIBIT 4**

Percentage Of Biopsies With A Positive Diagnosis Of Prostate Cancer, By Urologist Self-Referral Status

- Non-self-referring urologists
- Self-referring urologists

Percent of prostate biopsy cases with a positive diagnosis of cancer

- 2005: 30%
- 2006: 28%
- 2007: 26%

Understanding Provider Behavior

- Pathology
- Medical Oncologist
- Radiation Oncologist
- Imaging
- Provider

- Patient

- Refer:
  - $?
  - $??
  - $
Urologists’ Use of Intensity-Modulated Radiation Therapy for Prostate Cancer

Jean M. Mitchell, Ph.D.

- Association provider ownership and utilization of IMRT
- 35 self-referring vs. 35 non-self-referring vs. 11 non-self-referring National Comprehensive Cancer Network (NCCN) urology groups
- Utilization of IMRT compared before and during ownership

Provider Ownership

A  Self-Referring Urologists in Private Practice versus Non–Self-Referring Urologists in Private Practice

Preownership period

Ownership period

Use of IMRT (%)

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Provider Ownership

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<td>14.3</td>
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<td>15.6</td>
<td>1.3</td>
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A Self-Referring Urologists in Private Practice versus Non–Self-Referring Urologists in Private Practice

Preownership period

Ownership period

Use of IMRT (%)

Non–Self-Referring Urologists (N=5404)
Self-Referring Urologists (N=13,929)
Non–Self-Referring Urologists (N=5113)
Self-Referring Urologists (N=14,319)

Self-referral growth
Growth
Baseline

14.3
15.6
17.9
13.1

13.1
14.3
15.6
17.9

Table 2. Treatment Provided for Men with Newly Diagnosed, Nonmetastatic Prostate Cancer in the 35 Matched Groups of Self-Referring and Non–Self-Referring Urologists in Private Practice, According to Self-Referral Status and Ownership Period.*

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Self-Referring Urologists in Private Practice</th>
<th>Non–Self-Referring Urologists in Private Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preownership Period (N = 13,929) Ownership Period (N = 14,319) Change P Value</td>
<td>Preownership Period (N = 5404) Ownership Period (N = 5113) Change P Value</td>
</tr>
<tr>
<td>IMRT delivery by self-referring group (%)</td>
<td>13.1 32.3 19.2 &lt;0.001</td>
<td>— — — —</td>
</tr>
<tr>
<td>IMRT delivery by other provider (%)</td>
<td>— 6.3 — —</td>
<td>14.3 15.6 1.3 0.05</td>
</tr>
<tr>
<td>Brachytherapy (%)</td>
<td>18.6 5.6 −13.0 &lt;0.001</td>
<td>18.9 17.9 −1.0 0.19</td>
</tr>
<tr>
<td>Prostatectomy (%)</td>
<td>17.7 16.6 −1.1 0.01</td>
<td>21.9 23.8 1.9 0.02</td>
</tr>
<tr>
<td>Androgen-deprivation therapy (%)</td>
<td>16.5 8.4 −8.1 &lt;0.001</td>
<td>15.6 11.4 −4.2 &lt;0.001</td>
</tr>
<tr>
<td>Active surveillance (%)</td>
<td>26.7 27.0 0.3 0.65</td>
<td>26.1 27.4 1.3 0.12</td>
</tr>
<tr>
<td>Other procedure (%)</td>
<td>7.3 3.9 −3.4 &lt;0.001</td>
<td>3.2 3.9 0.7 0.05</td>
</tr>
<tr>
<td>Time from diagnosis to treatment (days)</td>
<td>79.8±37.9 76.0±32.6 −3.8 &lt;0.001</td>
<td>78.8±38.1 78.0±36.2 −0.8 0.50</td>
</tr>
</tbody>
</table>

* Plus–minus values are means ±SD. For percentage data, change is shown in percentage points. Beneficiaries who underwent prostatectomy or brachytherapy may also have received adjuvant radiation therapy (external-beam radiation therapy or IMRT), but the definitive treatment was either brachytherapy or prostatectomy.

Provider Ownership

Treatments According to Self-Referring Status and Ownership Period

- IMRT
- Brachytherapy
- Prostatectomy
- Active Surveillance

Legend:
- Red: Pre Self Referring
- Blue: Post Self Referring
- Green: Pre Not Self Referring
- Orange: Post Not Self-Referring

Table 4. Linear Probability and Logistic-Regression Difference-in-Differences Estimates Predicting Receipt of IMRT for the Comparison of Self-Referring Urologists in Private Practice with Non–Self-Referring Urologists in Private Practice. *

<table>
<thead>
<tr>
<th>Estimate</th>
<th>Beneficiary Treated by Self-Referring Urologist during Ownership Period</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear probability marginal effect</td>
<td>16.4 percentage points</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Logistic-regression marginal effect</td>
<td>16.9 percentage points</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Logistic-regression odds ratio (95% CI)</td>
<td>2.79 (2.53–3.08)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* The sample of 38,765 patients included all beneficiaries treated by physicians in private practice from 35 self-referring urology groups that began billing Medicare for IMRT at some point during the period from January 1, 2005, through January 15, 2010, and those treated by physicians in private practice from 35 matched non–self-referring urology groups that did not bill Medicare for IMRT. All regression models included the age of the beneficiary at the time of the cancer diagnosis, indicator variables to distinguish year of diagnosis, indicator variables to identify the presence or absence of specific coexisting conditions, and indicator variables to control for the urology group that treated each beneficiary. CI denotes confidence interval.

• Referral by urologists to IMRT services in which they have a financial interest is associated with increased use of IMRT

• Limitations include:
  – Tumor characteristics and risk stratification
  – Physician characteristics
  – Perceptions of profitability
  – Radiotherapy commonly being utilized as preferred treatment

Provider Ownership - Radiotherapy

Comparative Effectiveness Research on Cancer in Texas (CERCIT) is a statewide resource for outcomes and comparative effectiveness research funded by The Cancer Prevention Research Institute of Texas (CPRIT), RP101207.

Project PI: Karen Hoffman, MD, MPH, MS
Provider Ownership-Methodology

- Data source
  - Linked Texas Cancer Registry-Medicare data
  - 2004-2009
  - 17,982 men with non-metastastic prostate cancer

- Diagnosing urologist determined using claims

- A total of 13 integrated urology practices identified via prior survey (Jhaveri PM et al, IJROBP 2012).
Provider Ownership-Methodology

• Primary objective
  – Determine how urologist ownership interest influence decision to treat or not treat prostate cancer
  – Determine if this varied by patient risk group
Trend of Patients in Integrated Practices (Trend Test $P<0.001$)
Utilization of Treatment in Favorable Risk Patients

- Increased utilization of treatment (OR 1.89: 95% CI, 1.33-2.69, p<0.001) with IMRT more commonly used (OR 1.45: 95% CI, 1.15-1.84, p=0.002) among integrated practice for favorable risk patients
• Increased utilization of treatment (OR 2.07: 95% CI, 1.32-2.07, p=0.002) with IMRT more commonly used (OR 1.53: 95% CI, 1.24-1.88, p<0.001) among integrated practice for unfavorable risk patients
Overall Summary: Provider Ownership

- Prior research have shown varying practice patterns according to provider ownership.
- Radiotherapy and in particular IMRT are being increasingly utilized in urology for the treatment of prostate cancer.
- Prior research have demonstrated increased utilization of IMRT for treatment of prostate cancer according to self referral practice patterns.
- Provider ownership may result in varying utilization patterns of IMRT for treatment of prostate cancer independent of tumor biology.
Understanding Provider Behavior

Favorable Risk Prostate Cancer

Patient

Integrated Inappropriate Use = Bad Outcome

Radiation Oncologist
Understanding Provider Behavior

Unfavorable Risk Prostate Cancer

Surgery

Medical Oncologist

Patient

Refer

Refer

Integrated Appropriate Use = Good Outcome

Radiation Oncologist
Understanding Provider Behavior

Health Policy Reform to Guide Appropriate Utilization

\[ \text{Surgery} \rightarrow \text{Patient} \rightarrow \text{Surgery} \]

\[ \text{Medical Oncologist} \rightarrow \text{Patient} \rightarrow \text{Medical Oncologist} \]

\[ \text{Radiation Oncologist} \rightarrow \text{Patient} \rightarrow \text{Radiation Oncologist} \]
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