Consultative DXA Reporting Improves Guideline-Driven Quality of Care—Implications for Increasing DXA Reimbursement

Brian Oppermann,1 William Ayoub,1 Eric Newman,1 G. Craig Wood,2 and Thomas P. Olenginski*,1

1Department of Rheumatology, Geisinger Health System, Danville & State College, PA, USA; and 2Geisinger Center for Health Research, Danville, PA, USA

Abstract

Since 2001, Geisinger Health System densitometrists have interpreted dual-energy X-ray absorptiometries (DXAs) in a guideline-driven, consultative fashion. We believe that this approach results in more patients receiving appropriate treatment. Recently, one of our DXA centers chose to stop consultative reporting, providing us an opportunity to review the care rendered with 2 different styles of DXA reporting formats: Consultative vs Results Only. In this retrospective chart review, 100 consecutive DXAs with Consultative reporting and 100 consecutive DXAs with Results Only reporting were identified. The electronic health record was reviewed for a 3-mo interval after DXA result to identify whether a prescription medication was prescribed per system guidelines. Logistic regression compared the proportion of patients receiving a prescription treatment between the 2 groups. The Consultative report group received more prescription treatment compared with Results Only format (72% vs 50%) after controlling for patients’ age and gender, odds ratio = 2.64, 95% confidence interval = 1.45–4.79 (p = 0.0014). Our study demonstrates that Consultative DXA reporting results in better care. Importantly, Consultative reporting takes additional time; yet, reimbursement for these efforts and expertise has been dramatically reduced. To appropriately reward the value of DXA testing and interpretation, Consultative reporting should be reimbursed at the previous higher reimbursement rate.

Key Words: Bisphosphonate; dual-energy X-ray absorptiometry (DXA); high-risk osteoporosis.

Introduction

Osteoporosis is defined as a systemic disease characterized by low bone strength and microarchitectural deterioration of bone, resulting in bone fragility and a consequent increase in fracture risk (1–3). Such fractures result in substantial morbidity, mortality, and cost (4). Patients with a previous fracture are 2–5 times more likely to have recurrent fractures than are those without fractures (5). Fortunately, pharmacologic intervention reduces spine and hip fractures by 40–60% (6). However, reported rates of osteoporosis treatment in patients with previous fracture have been relatively low, ranging from 20% to 30% (7–10). Dual-energy X-ray absorptiometry (DXA), the standard test to measure bone mineral density (BMD) with acceptable accuracy and precision (11), is widely available. The World Health Organization (WHO) has validated DXA as the best technique for measuring BMD in postmenopausal women and has established the definitions of normal BMD, low bone mass, osteoporosis, and severe osteoporosis based on a large cohort of postmenopausal women (12,13). In addition to measuring BMD, DXA is instrumental in estimation of fracture risk and monitoring of patients undergoing treatment (14).

In February 2006, the Deficit Reduction Act (DRA) was signed, and under section 5102, DXA was incorporated with cuts to outpatient imaging procedures. In January 2007, DXA
reimbursement was reduced 40% from $139.46 to $82.33 and will further decline to $35.48 (a total of 75% reduction) when the fee schedule is fully implemented in 2010. The DRA also includes reductions in reimbursement for performing vertebral fracture assessment (VFA), which by 2010 will have reimbursement reduced by 51%. Such reductions in reimbursement will have serious implications for physicians who perform DXA/VFA services, with many having to decide whether to continue to offer and perform these important clinical services.

It has been previously reported that clinicians prefer clinically oriented DXA reporting formats compared with reports that simply convey BMD and T-scores. A recent study by Drs. Binkley and Krueger (15) showed that most ordering physicians preferred DXA reports that included specific recommendations for secondary workup and pharmacologic treatment recommendations. Since 2001, hoping to improve the quality of clinical osteoporotic care throughout the Geisinger Health System, every DXA center interprets DXAs in a consultative driven fashion that is guideline driven (based on adopted recommendations from the National Osteoporosis Foundation [NOF] and WHO). Within Geisinger’s Mobile DXA Program, Sunderlin et al (16) reported that more than 70% of “high-risk” treatment-naive patients were placed on prescription treatment within 90 days of a Consultative DXA report. Additionally, Sunderlin et al (17) reported that 50% of patients whose DXA reports suggested laboratory tests to evaluate for secondary causes of bone loss had 1 or more tests performed. In that analysis, vitamin D deficiency was identified in 75% of patients who had testing (vitamin D deficiency defined as 25-hydroxyvitamin D level <30 ng/mL) (17). Newman et al (18) further reported that Consultative DXA reporting increased bisphosphonate use throughout the Geisinger Health System in a high-risk Glucocorticoid-Induced Osteoporosis Program (GIOP) population.

Recently, one of our DXA centers decided to stop Consultative DXA reporting and interpret in a Result Only fashion. This new DXA reporting format includes the raw data with a brief risk assessment but eliminated the detailed suggestions section, where uniform treatment recommendations are made in favor of a Web link reference. This Web link requires the ordering physician to navigate through various portals of the electronic health record (EHR) to obtain treatment or secondary workup recommendations. This divergence allowed us a unique opportunity to evaluate care rendered to patients in our health system comparing these 2 contrasting styles of DXA reporting: Consultative driven vs Results Only reporting. Given the landscape of declining DXA reimbursement, we felt that this comparative study was very timely and important. We hypothesized that Consultative reporting would result in a higher percentage of osteoporosis prescriptions written for high-risk, drug-naive patients. In our health system, high-risk DXAs are recommended treatment in accord with the 2008 NOF Clinician’s Guide to the Prevention and Treatment of Osteoporosis. Consistent with this publication, a patient’s DXA is interpreted as high risk in the following circumstances: (1) T-score at spine or total hip and femoral neck is −2.5 or worse in postmenopausal women or in men older than 50 yr; (2) patient has historical evidence of vertebral or hip fracture, has such evidence documented on X-ray or magnetic resonance imaging, or has VFA evidence of vertebral fracture; (3) FRAX major osteoporosis fracture probability is 20% or more and/or FRAX hip fracture probability is 3% or more in patients aged 50-90 yr whose T-score at hip or spine falls between −1.0 and −2.4; and (4) patient is chronic glucocorticoid user (prednisone dose 5 mg/d or greater) and T-score at spine or hip is −1.1 or worse. We submit that this style of DXA reporting is more time consuming, requires additional expertise, and is more adversely affected by the declining reimbursements previously described.

**Methods**

**Patient Selection**

In January 2008, one DXA center within the Geisinger Health System stopped Consultative reporting, instead interpreting the DXA results in a Results Only format. Our Mobile DXA Program continues to interpret DXAs in a Consultative, clinically oriented fashion. We sought to identify 100 consecutive patients from each group (Consultative DXA reporting vs Results Only DXA reporting) who were at high risk and treatment naive. Such patients would be recommended prescription therapy with Consultative reporting in the suggestions section of the DXA report (Fig. 1). In contrast, this section was removed in the Results Only DXA reports in favor of a Web link directing the physician reviewing the DXA report to a section of recommendations on osteoporosis care in our EHR. Patients were excluded from analysis if they were currently on approved osteoporosis therapy, if the DXA was ordered by one of the rheumatologists in our health system, or if the primary care provider was not a part of our EHR system (EPIC®, Verona, WI). This study was approved by the Geisinger Health System’s institutional review board. One hundred patients were identified in each group (Consultative vs Results Only reporting). Subsequently, the EHR was retrospectively reviewed to determine if prescription osteoporosis therapy was initiated in these patients within 90 d after the DXA was reported. The EHR was reviewed in the following sections: telephone encounters, medication prescription encounters, letters, clinic notes, and nursing notes. If prescription medication was not prescribed, the EHR was reviewed in an attempt to determine why this did not occur and also to identify if the decision not to treat was physician driven vs patient driven.

**Statistical Analysis**

The study was powered to detect a 20% difference between the 2 groups. Logistic regression was used to compare the proportion of patients receiving prescription medication between the 2 groups.

**Results**

The demographic characteristics for the patients in each group are listed in Table 1. Although the 2 groups were
similar in age, the Consultative group was slightly older (69.5 vs 66.2 yr of age, \( p = 0.05 \)). However, this age difference would not be expected to initiate any change in clinical osteoporotic care because the mean age of both groups was greater than 65 yr. There was no statistically significant difference in gender between the 2 groups. As shown in Table 1, there was a significantly higher percentage of patients in the Consultative reporting group that received prescription medication (72% vs 50%, \( p = 0.0014 \)). These observations document that clinicians followed the recommendations from the Consultative DXA reports more often than from the Results Only reports.

When reviewing the EHR in this study, it was noted that most patients who were not placed on prescription medication received their DXA results by letter (42% in Consultative group, 58% Results Only group). Notably, a small percentage of patients in both groups did not receive any communication about the DXA result (8% Consultative, 12% Results Only). Thus, most patients in both groups did not have direct physician contact (by either phone or clinic visit) to discuss their DXA results and treatment options. While reviewing the letters communicated to patients, an interesting observation was made. More patients in the Results Only format were sent letters reporting that their DXAs were normal and/or that no specific action needs to be taken (Table 2: 16% vs 7%), when in fact their DXAs were reported as high risk for fracture. One patient in the Consultative group and 3 patients in the Results Only group were on chronic glucocorticoid therapy, and 1 patient in the Results Only group had documented vertebral fractures by VFA. Our study was not powered to detect or analyze a statistically significant difference in these observations, but the EHR review indicated a trend where there was a “disconnect” between the Results Only report and the clinician’s subsequent “misinterpretation” as opposed to Consultative reporting (Table 2: 16% vs 7%).

**Discussion**

Consultative DXA reporting resulted in significantly more patients receiving appropriate guideline-driven Food and Drug Administration (FDA)-indicated prescription osteoporosis therapy than those patients with Results Only reporting (Table 1). This correlates with previously reported analyses in our Mobile DXA Program (16) and data from our GIOP in which Consultative reporting led to higher percentages of prescription osteoporosis therapy rates in this high-risk population (18). Recently published work by Binkley and Krueger (15) shows that most clinicians prefer this Consultative, clinically oriented format of DXA reporting. It is important to appreciate that this study documents that a clinically oriented, Consultative DXA reporting format leads to a narrowing of an important care gap in osteoporosis management. Numerous studies (7–10) have indicated that only a small percentage of those viewed as high risk are placed on appropriate fracture-reducing osteoporosis therapies. The clinical significance of appropriate initiation of osteoporosis treatment cannot be overemphasized. One of our goals in DXA reporting was to try to make it easier for our primary care physician colleagues to do the right thing. The significantly increased rates of prescription osteoporosis medications initiated in high-risk, drug-naive patients document that we have accomplished this goal with Consultative DXA reporting.

While interpreting our data, a trend was noted in the Results Only group in that more DXA reports appeared to be

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**Table 1**

Demographics and Prescription Medications Ordered at 90 d as per Guidelines

<table>
<thead>
<tr>
<th>Patients</th>
<th>Consultative DXA reporting</th>
<th>Results only DXA reporting</th>
<th>( p ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample size, N = 200</td>
<td>100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Age, mean (SD)</td>
<td>69.5 (11.8)</td>
<td>66.2 (11.7)</td>
<td>0.05&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Gender (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>92</td>
<td>88</td>
<td>0.35&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Male</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Treatment prescribed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 mo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (%)</td>
<td>72</td>
<td>50</td>
<td>0.00142</td>
</tr>
</tbody>
</table>

<sup>a</sup>Abbr: SD, standard deviation.
<sup>b</sup>Two-sample T-test.
<sup>c</sup>Chi-square test.
misinterpreted by their ordering physician (Table 2). This data “disconnect” appeared to indicate that some patients who should have been recommended therapy were not. Additionally, some patients on chronic glucocorticoid therapy were not appropriately placed on bisphosphonates, per our system-driven guidelines. Others who were noted to have vertebral fracture also did not receive treatment. While making these observations, it is important to state that despite our efforts, we were unable to truly determine the reason for high-risk, drug-naive patients not being prescribed medications. Likewise, the influence of drug costs, preauthorizations, and other factors could not be determined and is a fertile ground for ongoing study. Most important, however, is the marked difference in the suggestions section between the 2 reports (Fig. 1) where the high-risk reports no longer have treatment recommendations (as in Consultative report) but instead refer physicians to a Web link that many physicians may choose not to access or may not realize that it exists. Currently when you try to access this link, you encounter an error message because the link is no longer available. Additionally, we have discovered that this link directed physicians and other users to the wrong section of our osteoporosis Web page. These observations point to the need to correct the Web link so that physicians and others are directed to the osteoporosis treatment guideline pages (recently corrected) and, most importantly, to have all DXA centers use Consultative DXA reporting format.

The difference in care rendered by physicians receiving DXA reports in the Consultative reporting group of patients suggests that one important solution to eliminate osteoporosis care gaps is to require Consultative DXA reporting. Our Mobile DXA physician users are very comfortable and oriented to this reporting format. The results shown in this study reproduce the findings in the report of Sunderlin et al (16,17) very closely. Guideline-driven treatment recommendations from Consultative DXA reporting are initiated by our physicians in more than 70% of high-risk, drug-naive patients.

It is ironic that we report this at a time when declines in DXA reimbursement are negatively affecting the quality of osteoporosis care. With the drop in reimbursement, many DXA centers are deciding to stop performing their services. Many centers have also decided not to use VFA. Appropriate access to DXA and the negative effects on osteoporosis care threaten our patients. Clearly, with documented declines in reimbursement, the added time and expertise to generate a clinical report, and other factors, we may see many more DXA centers revert to a Results Only DXA reporting format. Even more concerning would be for DXA centers to eliminate clinical DXA services because of fiscal constraints (this has been occurring throughout the country) threatened by such reduced DXA reimbursement.

Importantly, our results should be used to help lobby for DXA reimbursement to be returned to a higher reimbursement status. Most importantly, we hope that this information results in such appropriate increases in DXA reimbursement because Consultative DXA reporting leads to physician behavior that results in more appropriate use of FDA-approved prescription osteoporosis medications, which is now part of the Centers for Medicare & Medicaid Services Physician Quality Reporting Initiative quality benchmark (Measure 41: [OP]: Pharmacologic Therapy). Such action may reduce long-term costs by reducing fractures, the attendant morbidity and mortality, and other complications from osteoporosis. DXA reimbursement should be highest for those processes shown more likely to result in the clinically desired action—a higher proportion of patients placed on appropriate prescription therapies in osteoporosis care.

References