Objective: To determine the use of treatment and prevention practices in postmenopausal women who have received the results of an osteoporosis screening.

Methods: Telephone survey to follow-up with women who underwent dual-energy x-ray absorptiometry scanning at a community-wide osteoporosis screening project. Participants categorized by their scan results as having normal bone mineral density or low bone mineral density were asked about their osteoporosis treatment and prevention practices since receiving their scan results.

Results: Two hundred nineteen women were interviewed. Calcium supplement use increased significantly in both groups (P=.002). There was no significant difference in the number of women using alendronate sodium, calcitonin, and selective estrogen receptor modulators before and after screening. Both groups reported increases in exercise levels and dairy intake, but the difference was not statistically significant.

Conclusions: Our results indicate that the use of over-the-counter calcium supplements increases after osteoporosis screening. However, the use of treatments that require a physician prescription does not increase after screening regardless of the patient’s bone mineral density status.

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The availability and declining cost of reliable bone mineral density (BMD) tests, such as dual-energy x-ray absorptiometry (DEXA), has enhanced the ability of primary care physicians to screen for and diagnose osteoporosis and osteopenia. Promising medical treatments for patients with low BMD provide further incentive to carry out BMD screening in the populations most at risk.1–8

Osteoporosis screening in the older female population through community centers, living facilities, and health fairs is an effective tool in identifying low BMD in women at high risk for osteoporosis and osteopenia.9 To gain the maximum advantage from such screening programs, patients must be made aware of the importance of following up a diagnosis of low BMD with their primary care physicians to determine the best treatment and prevention options. In addition, the primary care physician should initiate a treatment plan involving appropriate recommendations for lifestyle modification and/or pharmacologic intervention.

Previous studies have been at odds as to whether a diagnosis of low BMD is an effective incentive for patients to follow up with their primary care physicians for treatment guidelines. In a review of studies examining clinical practices in osteoporosis treatment, Siris et al10 reported that physicians in general are not evaluating patients with fractures for osteoporosis, nor are they prescribing calcium, vitamin D, or pharmacologic therapy to reduce future risk of fracture. The authors further reported that only 5% to 39% of patients with fractures received appropriate screening and treatment for osteoporosis despite clinical guidelines supporting the use of therapy.10 Noncompliance with recommendations after densitometry can make widespread screening ineffective and inefficient.10 We hypothesize that a large number of women who have received a diagnosis of either osteoporosis or osteopenia do not receive the follow-up care or guidance needed to prevent fractures.

The purpose of our study was to determine what, if any, action was taken by patients after being screened for osteoporosis.

Methods
We undertook a telephone-based follow-up survey of postmenopausal women who had participated in a large community-based osteoporosis screening project that was conducted by our group.5 Subjects were from the general public and self-referred when the screening was made available at local senior centers, living facilities, and health fairs. The original study was conducted to increase access to BMD testing in the elderly population. Bone mineral density testing and coun-
counseling on osteoporosis and osteopenia were provided to 635
female residents of senior facilities from January through
December 1999. Screening was conducted using DEXA.
Patients were assessed for risk, screened for BMD, and referred
for follow-up care. In addition to diagnostic assessment,
patients received lifestyle counseling, recommendations for
calcium intake, and recommendations for follow-up with their
primary care physicians for treatment or prevention practices.

Between August and November 2001, we conducted a
follow-up study of the community-based screening project,
approved by the institutional review board of Synergy Med-
ical Education Alliance (Saginaw, Mich). We contacted subjects
by telephone to obtain current information on their progress
since the screening. The present study focused on the post-
menopausal women who were found to have either normal or
low BMD based on the following t score classifications of low
BMD from the World Health Organization11:

- Normal BMD: 2.5
- Osteopenia: -1 to -2.5
- Osteoporosis: < -2.5

We categorized the women into two groups according to their
screening results: normal BMD and low BMD (osteopenia or
osteoporosis). Questions assessed whether the participants
had engaged in any osteoporosis treatment or prevention
practices since receiving the screening results, including use of
over-the-counter calcium supplements, physician-prescribed
medications (alendronate sodium, calcitonin, hormone replace-
ment therapy [HRT], and selective estrogen receptor modu-
lators), and dairy intake and exercise. We compared the data
from the initial screening project with the data collected during
the follow-up survey. (There were no baseline data on dairy
intake and exercise.) Data were analyzed using a Pearson χ²
-test to determine the significance of differences in nominal
data between proportions of two groups.

Results

A follow-up telephone survey was administered to 234 older
women (age range, 59-86 years; mean, 74.9 years) who par-
ticipated in the initial BMD screening program. We were
able to obtain status and follow-up information for 219 of the 234
women. The normal BMD group comprised 77 (35.2%)
women, and the low BMD group comprised 142 (64.8%) women.

Women With Normal Bone Mineral Density

In the group with normal BMD, there was a statistically sig-
ificant increase in the use of calcium supplementation (92 [42.1%]
before screening vs 156
[71.3%] after screening; P<.001). The use of HRT decreased
significantly (P<.001) after screening, with just 25 (11.7%)
women using HRT compared with 52 (23.9%) before screening.
In addition, women with normal BMD were significantly
more likely to report HRT use than those with low BMD (17
[22.7%] vs 9 [6.3%; P<.001). There was no significant difference in
the use of alendronate, calcitonin, and selective estrogen
receptor modulators before and after screening. Although we
did not have a baseline for comparison, 75 (34.4%) women
reported an increase in exercise, and 46 (21.1%) reported an
increase in dairy intake since the screening. There was no sig-
nificant difference in the reported increase in exercise or dietary
intake between the group with normal BMD and the group
with low BMD.

Comment

While use of HRT decreased in our cohort, the use of calcium
supplementation increased in both groups and was signifi-
cant for the entire cohort. During screening, nonprescription
calcium supplementation was recommended to all women
and emphasized to those at high risk. In addition, women
with low BMD were referred to their primary care physicians
for follow-up to begin prescription therapy; whether they took
this step and whether they received guidance and/or pre-
scriptions for therapy was not studied. There were no signif-
icant increases in the use of any therapy that needed a pre-
scription. Based on these results, it appears that the immediate
recommendation of nonprescription therapy is more effective

Women With Low Bone Mineral Density

As in the group with normal BMD, there was a significant
increase in the use of calcium supplements in women with low
BMD (64 [45.4%] vs 111 [78.5%; P=.001). The decrease in HRT
use in this group was statistically significant (30 [21%] vs 9
[6.3%; P=.003). There was no significant difference in the
number of women using alendronate, calcitonin, and selective
estrogen receptor modulators before and after screening.
Finally, 44 (31%) women in this group reported an increase in
exercise, and 33 (23%) reported an increase in dairy intake
(Figure 2).

Results for Entire Cohort

Overall, there was a statistically significant increase in the use
of calcium supplementation (92 [42.1%] before screening vs 156
[71.3%] after screening; P<.001). The use of HRT decreased
significantly (P<.001) after screening, with just 25 (11.7%)
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icant increases in the use of any therapy that needed a pre-
scription. Based on these results, it appears that the immediate
recommendation of nonprescription therapy is more effective
in increasing compliance with treatment and prevention. A question for additional studies is whether patients would be more likely to use prescription therapy if prescriptions were given as soon as screening results were obtained. If other prevention or treatment strategies were as readily available to the public without a physician prescription or physician oversight, we probably would have seen increases in their use as well.

Participants reported a statistically significant decrease in HRT use after receiving the results of their BMD scan even though HRT as prevention or treatment for low BMD has been shown to reduce bone loss and increase BMD in the spine and hip, thereby reducing the risk of hip and spinal fractures in postmenopausal women. It is important to note that this study took place prior to changing guidelines on HRT use, so it is unlikely that the decrease was a response to new guidelines recommending the discontinuation of HRT. Although we did not explore the reasons for discontinuing HRT, there are several areas for further study that could provide explanations for the decrease in HRT use that we observed. These areas include determining whether subjects understood the protective nature of HRT, whether they were concerned about side effects of HRT, whether the level of information that physicians provide to patients regarding the importance of therapy is adequate, and whether patients felt continued HRT use was necessary as they aged.

There was no statistically significant increase in the use of prescription therapy, probably because the physicians participating in the screening project relied on participants to make appointments with their primary care physicians for follow-up. Either the patients did not take this step or their physicians did not adequately prescribe treatment.

There may be several reasons why patients do not engage in treatment or prevention practices after receiving their screening results. We did not investigate the financial status of our patients, but it may be possible that some individuals were not financially able to bear the costs of following up with physicians or paying for prescriptions. It may be possible that patients were not motivated to follow-up because they did not understand the results of the screening or the importance of therapy. This issue could be resolved by providing more extensive patient education on osteoporosis. Finally, physi-

Figure 1. Women with normal bone mineral density (n=77). Patient compliance with recommended osteoporosis treatment and preventive therapies. HRT indicates hormone replacement therapy; SERMs, selective estrogen receptor modulators. The asterisk [*] indicates that there were no baseline values for exercise and dairy intake.
found that 40% of women with low BMD were not using HRT at an 8-month follow-up as recommended by their physicians. The current controversy and recommendations on the use of HRT may make HRT a less likely treatment for osteoporosis. Ryan et al conclude that screening should not be widely recommended until improved compliance with recommendations is demonstrated.

Studies have also shown that screening increases compliance. Torgenson et al studied the effect of an osteoporosis screening program on HRT use. They found that screening for low BMD in a sample of perimenopausal women significantly increased their use of HRT. In addition, they found that increasing age was significantly associated with a decrease in the recommendation and use of therapy. Another study identifying treatment practices in patients with acute hip fracture reported that only 3.5% of patients were treated for osteoporosis.

Hsieh et al found that few women take measures to prevent osteoporosis despite believing that it is a serious condition. Ryan et al studied compliance with recommendations to use HRT in postmenopausal women following screening for osteoporosis. Their results indicate that screening leads to an immediate increase in HRT use among women who are at high risk for osteoporosis. However, they also found that 40% of women with low BMD were not using HRT at an 8-month follow-up as recommended by their physicians. The current controversy and recommendations on the use of HRT may make HRT a less likely treatment for osteoporosis. Ryan et al conclude that screening should not be widely recommended until improved compliance with recommendations is demonstrated.

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tion by physicians to help patients understand the results of bone densitometry is a critical component in the initiation of therapy after densitometry. The authors also found that the use of HRT and bisphosphonates by women increases after they receive a diagnosis of osteoporosis from bone densitometry screening.

Future studies by our group will be aimed at discovering physician and patient attitudes about osteoporosis and the importance of treatment and prevention. Results of these investigations may be used to determine if there is a better way to educate physicians and patients about low BMD and treatment and prevention practices.

While screening programs have proven effective in identifying patients with low BMD, whether it leads to the initiation of therapy should be a factor in evaluating the efficacy of such programs. Combining public health education with readily available treatment options should be integral parts of effective screening programs and will likely lead to increased patient compliance.

**Figure 3.** Entire study population (N=219). Patient compliance with recommended osteoporosis treatment and preventive therapies. HRT indicates hormone replacement therapy; SERMs, selective estrogen receptor modulators. The asterisk [*] indicates that there were no baseline values for exercise and dairy intake.

References


