



# BONE HEALTH IN FOCUS

A REPORT ABOUT  
**MULTIPLE MYELOMA'S**  
IMPACT ON BONES



# BONE HEALTH IN FOCUS

## THE SIGNIFICANCE OF BONE HEALTH IN PATIENTS WITH MULTIPLE MYELOMA

---

TODAY'S PATIENT WITH CANCER FACES A DAUNTING AMOUNT OF INFORMATION. SORTING THROUGH IT ALL AND DECIDING WHAT'S IMPORTANT CAN BE AN IMMENSE CHALLENGE. FOR THOSE WITH MULTIPLE MYELOMA, *BONE HEALTH* QUICKLY BECOMES THAT MOST IMPORTANT ISSUE ON THEIR AGENDA.

THIS REPORT AIMS TO FILL THE EDUCATIONAL GAP BY ILLUSTRATING THE SERIOUS CONSEQUENCES OF CANCER-RELATED BONE DISEASES, SPURRING IMPROVED COMMUNICATION BETWEEN PATIENTS WITH MULTIPLE MYELOMA AND THEIR HEALTHCARE PROVIDERS, AND INSPIRING ACTION TO IMPROVE BONE HEALTH IN PATIENTS WITH MYELOMA.

Many patients with cancer possess limited knowledge about their bone health during the course of their treatment. After being diagnosed with cancer, patients are understandably overwhelmed and often experience fear, anger, frustration, and confusion. They may not hear or understand everything a physician explains about treatment, or messages from their healthcare providers might not be clear. Before their diagnosis, patients have likely never heard some of the words and terms they are now discussing with their doctor, and this lack of understanding may contribute to the communication challenges.

Recognizing the importance of addressing bone health in cancer and the need for improved dialogue, a committee of prominent patient advocates and Amgen® formed a multidisciplinary steering committee to address the issue. The committee commissioned a survey in partnership with Harris Interactive to assess the communication between patients with cancer and physicians about bone health in cases involving either non-metastatic or metastatic cancer, and to determine awareness levels and concern about bone health and cancer. The results from the Harris Interactive Survey, along with in-depth interviews with patients with myeloma, are included in this report. For more information about the Harris Interactive Survey and the methodology it used please refer to page 16 of this report. This report aims to raise awareness, empower patients, and encourage a better patient-physician dialogue around the critical issue of bone health.

## THE SIGNIFICANCE OF BONE HEALTH IN PATIENTS WITH MULTIPLE MYELOMA

Myeloma is a cancer of the plasma cells in the bone marrow. The malignant plasma cells or myeloma cells accumulate in the bone marrow.<sup>1</sup> It is the second most common hematologic malignancy in the United States<sup>2</sup> and is characterized by a unique form of destructive bone disease which occurs in the majority of patients<sup>3</sup>.

While the disease can remain asymptomatic for many years, the most common presenting complaint in the symptomatic phase is bone pain<sup>1</sup> and 51 percent of patients with multiple myeloma who were not treated for bone lesions experienced an SRE within two years.<sup>4</sup>



**Skeletal-related events (SREs) can occur when bone has been weakened by cancer or cancer treatments. SREs include:**

Fracture

Spinal cord compression

The need for surgery or radiation to the bone

Further, most patients (80 percent) with myeloma present with bone pain as the predominant symptom.<sup>3</sup> Bone pain for patients with myeloma is often severe and constant, though it occasionally fluctuates in intensity for reasons that are unknown.<sup>3</sup>

Beyond the pain, patients with myeloma also have weakened bones. Bone lesions can lead to debilitating and costly skeletal-related events (SREs).<sup>3</sup> And some people with multiple myeloma also have a condition known as osteopenia (low bone density).<sup>3</sup> Thus, patients with myeloma bone disease are susceptible to fractures occurring either spontaneously or following trivial injury.<sup>3</sup> These pathological fractures often involve the vertebrae, ribs and long bones, but occasionally occur in other sites such as the sternum and pelvis.<sup>3</sup>

The Harris Interactive Survey found that 78 percent of patients with myeloma were told they may experience bone pain and patients also cited bone fractures (73 percent).<sup>5</sup> Fatigue was another common symptom of their multiple myeloma (58 percent).<sup>5</sup> The survey indicated that 85 percent of patients with myeloma experience some of these symptoms, with 68 percent of the respondents saying that these complications had either a major or moderate impact on their daily lives, restricting general mobility and activity.<sup>5</sup>

## CAROLE

**(myeloma patient, diagnosed 1987)**

*The main thing about bone complications, that I tell people, is not to ignore the pain, because from my own experience in 22 years, I've learned that if you're getting bone pain in a specific area, with multiple myeloma, you need to address that. You need to have some testing done, or a skeletal survey done, to see if in fact you are having something going on with that bone.*

The risk of fractures may explain why in the Harris Interactive Survey 98 percent of hematological oncologists who treat patients with myeloma discuss the need to treat and delay the onset of SREs with their patients, and the majority (67 percent) discuss the need to treat pain.<sup>5</sup>

## CAROLE

(myeloma patient, diagnosed 1987)

*Well, in the beginning, the pain was excruciating. I will tell you that. And the way the tumor was wrapped around my spinal cord, they weren't even sure if I would have mobility from the neck down, or paralysis of both arms. After that, they took the tumor out, and then an orthopedic surgeon took bone out of my hip and rebuilt the seventh vertebra, I was pretty good for about six years. I was very mobile. I've worked through the whole time, and basically that was fine.*

Ninety-nine percent of hematologists and oncologists surveyed by Harris Interactive reported treating myeloma with intravenous (IV) bisphosphonates.<sup>5</sup> However, a recent retrospective analysis of claims data showed that 45 percent of patients remained untreated.<sup>6</sup> Treatment is very important as 51 percent of patients with myeloma who are not treated for bone lesions experience an SRE within 21 months.<sup>4</sup>

Hypercalcemia, which is caused by bones breaking down and releasing too much calcium into the blood, occurs mainly in patients with advanced disease. It is accompanied by characteristic distressing signs and symptoms, including bone pain.<sup>3</sup> Hypercalcemia can also be exacerbated by acute renal failure that frequently complicates the course of the disease.<sup>3</sup>

In a 2007 study, 3,049 patients with cancer were evaluated for pathologic fractures, and 513 of those with multiple myeloma had the highest fracture incidence (43 percent).<sup>7</sup> Studies have shown that in many types of cancer, pathologic fracture was correlated with the risk of death.<sup>7</sup> The additional risk demonstrates that patients should be vigilant and do all they can to avoid fractures.

*According to Jan, a myeloma patient, "...in the two years leading up to my diagnosis, I broke bones in both legs, which was highly unusual for me. I had never broken a bone in my life."*

# CURRENT TREATMENTS, UNMET NEEDS FOR MANAGING THE EFFECTS OF MYELOMA ON BONE

## BISPHOSPHONATES

The majority of drugs used to treat bone complications slow the destructive breakdown of bone, making them more resistant to fracture. Among these compounds are bisphosphonates, which are an effective treatment for bone complications in patients with multiple myeloma.

Intravenous bisphosphonates have been shown to reduce multiple myeloma-related bone complications by delaying the time to a first SRE and reducing the risk of developing a subsequent bone complication.<sup>4</sup> It is recommended that in multiple myeloma patients bisphosphonates are given for at least 15 minutes every three to four weeks.<sup>8</sup>

FAMILIARITY WITH “SKELETAL-RELATED EVENTS” IS ONLY 42 PERCENT<sup>5</sup> AMONG PATIENTS WITH MULTIPLE MYELOMA, EVEN THOUGH INCIDENCE RATES OF BONE DISEASE IS NEARLY 100 PERCENT<sup>9</sup>

The National Comprehensive Cancer Network (NCCN) guidelines recommend the use of intravenous (IV) bisphosphonates for all patients with myeloma who have bone disease.<sup>10</sup>

The American Society of Clinical Oncology (ASCO) recommendations include the following:

- Patients with multiple myeloma who experience bone loss or fractures of the spine from osteopenia (lower bone density that leads to weaker bones) should receive IV bisphosphonates every three to four weeks.<sup>8,11</sup>
- Bisphosphonate treatment should be given monthly for two years. At two years, the clinician should strongly consider stopping treatment with the bisphosphonate. Treatment should begin again if the myeloma comes back and new bone problems develop.<sup>11</sup>
- Because bisphosphonates can affect the kidney, the level of creatinine (a measure of kidney function) should be checked before each dose. Other lab tests may also be done. The physician may need to adjust the bisphosphonate doses according to these results.<sup>8,11,12</sup>

- Osteonecrosis of the jaw is an uncommon but potentially serious side effect of bisphosphonate use. Before treatment, patients should receive a thorough dental examination, and any tooth or mouth infections should be treated. While receiving bisphosphonate treatment, patients should avoid having any invasive dental work done, such as dental surgery, and take good care of their teeth, mouth and gums, if possible.<sup>8,11</sup>
- Although not indicated for use in pain, bisphosphonates are sometimes used to treat pain from bone disease. Bisphosphonates may be used along with other standard methods, such as radiation therapy, pain medication, or surgery for bone fractures, to relieve pain.<sup>11</sup>
- According to some clinical guidelines, bisphosphonates are not recommended for patients with one bone tumor (solitary plasmacytoma), smoldering (asymptomatic) myeloma, or indolent myeloma.<sup>11</sup>

According to the Harris survey, while nearly all hematological oncologists treating patients with myeloma prescribe bisphosphonates, only slightly more than half (55 percent) of those surveyed are satisfied (44 percent) or very satisfied (11 percent) with current treatments to address bone lesions and related complications in their patients.<sup>5</sup>

IF BRIAN GOT SICK IN 2008 INSTEAD OF 1988, HE'D BE ALIVE AND WOULDN'T HAVE SUFFERED FROM SUCH DEBILITATING BONE DISEASE. NOW IT'S NOT UNUSUAL FOR PEOPLE TO EXPERIENCE LONG-TERM REMISSIONS OVER 10, 15 YEARS.<sup>13</sup> IT'S HARD TO KNOW IF WE'LL FIND A CURE, BUT WE BELIEVE MYELOMA IS BECOMING A TREATABLE, CHRONIC DISEASE. WE'VE COME A LONG WAY. SUSIE NOVIS, FOUNDER OF THE INTERNATIONAL MYELOMA FOUNDATION, DISCUSSING MEDICAL PROGRESS SINCE HER HUSBAND, BRIAN, PASSED AWAY DUE TO MULTIPLE MYELOMA.

# PATIENTS WITH MULTIPLE MYELOMA SPEAK OUT ABOUT BONE HEALTH

---

The emotional consequences of any cancer diagnosis can be difficult to manage. When the cancer affects the bone, the emotional repercussions can increase exponentially.



## JACK\*

---

In 1995, Jack, now 60 years old, was diagnosed with medullary plasmacytoma. Since then, the San Jose, California, native has experienced peripheral neuropathy and porous bones due to aggressive treatment protocols.

Jack had a local oncologist in San Jose as well as an oncologist at the Myeloma Institute at the University of Arkansas in Little Rock, where his autologous stem cell transplants were conducted and where he felt comfortable with the expertise he found there. After his third stem cell transplant (allogeneic), he was put in touch with a myeloma specialist at Stanford University, whom he has seen for the last 10 years. “All my doctors are good; they’re important relationships. And don’t forget how important nurses are. They know your history and operational needs.” From the beginning, Jack had a number of bone scans and was made aware of bone loss and treatments, and he’s thankful that his scans are all stable now.

“I’m a support group facilitator so I help answer questions and help others (as well as myself) through the process,” he says. “There’s always an opportunity to learn what’s new. The patient is his or her own best advocate. There’s a lot of research to review, questions to ask, seminars to attend, and online sources to access.”

---

\*Patient testimonials were collected separately from the Harris Interactive Survey and are not affiliated with Harris International.



## PAULA\*

---

Paula, 62, a resident of Branchberg, New Jersey, was diagnosed with solitary plasmacytoma in 1999, including a cytoma (cell tumor) in her femur near her hip joint, a tumor in her spine, and later in three new bones – arm, chest and another location in her spine. She also has experienced bone brittleness and thinning with an accompanying fear of fractures.

Paula is treated by a myeloma specialist connected to a large suburban medical center and a local oncologist who prescribes medications, including bone treatments.

“After 10 years, my doctors are very attentive, but it’s getting to the point where they know I’m an active patient and will ask questions as needed. They treat me like the educated patient I am.”

Paula’s doctors introduced her to bone issues and treatments early, and she’s been scanned and tested regularly. On the other hand, she says, “Oncologists are so driven to win the war against cancer, sometimes supportive care issues are less important. They focus on treating the cancer and are less focused on treating the side effects.” Because she has run a support group since 2005 for the International Myeloma Foundation, Paula does a lot of research on her own, so “I don’t look to my doctors to be the total source of information.”

---

\*Patient testimonials were collected separately from the Harris Interactive Survey and are not affiliated with Harris International.

# PAULA

(myeloma patient, diagnosed 1999)

*There's a difference between male and female patients. Sometimes men have trouble verbalizing – they're taught to suck it up and not complain about pain – but they might be more inclined to talk more openly with a female doctor. In any case, patients with myeloma need to be forthcoming about how they're feeling, even the minor problems, if they're going to get the kind of treatment they need.*

BECOME VERY INVOLVED IN YOUR CARE. SPEAK UP AND ENCOURAGE A DIALOGUE WITH YOUR ENTIRE HEALTHCARE TEAM, INCLUDING NURSES. REPORT ANY SYMPTOMS TO YOUR DOCTOR IMMEDIATELY TO GET EARLY DIAGNOSES AND TREATMENT. SEEK OUT PATIENT ADVOCACY GROUPS FOR INFORMATION AND SUPPORT.

## ROLE OF EFFECTIVE COMMUNICATION

As with any medical issue, the quality, accuracy and timeliness of communications between physicians and patients are critical to successful outcomes. Nurses also play a significant role in effective communications, as they spend a great amount of time counseling the patient about treatments, side effects and overall health issues.

## INFORMATION IS AVAILABLE

Knowledge is power. This is especially true for patients with cancer. So, as the ultimate consumers of healthcare, patients can make the best decisions about their treatment by becoming educated. Enormous amounts of information are available to help patients understand their diagnosis and treatment options.

While most patients with myeloma (63 percent) report being satisfied with the amount of information they received about bone health, the same amount (63 percent) report they would have liked to have learned more about bone health earlier in their treatment.<sup>5</sup>

Only about half (49 percent) of the myeloma respondents have sought additional information about bone-related complications, predominantly from their physicians (83 percent), the Internet (83 percent) and support groups (52 percent).<sup>5</sup>

## THE SUPPORT OF FAMILY AND FRIENDS – A NETWORK OF SUPPORT

Having the support and help of friends and loved ones is also very important. Bringing someone along to medical appointments, for example, not only provides emotional support but also gives the patient a critical back-up – someone who can listen carefully to directions, think of questions to ask, and remember details the patient may forget.<sup>14</sup>

## KEEP RECORDS

To improve and maintain effective communications, patients should prepare a list of specific questions beforehand and write down responses from their healthcare providers, to prevent important concerns from being forgotten during medical appointments.<sup>14</sup> Taking notes also helps the patient review the information later when there is more time to concentrate or do research. It may even make sense for patients to tape-record their visits, with the doctor's consent.<sup>14</sup> (Many of today's "smartphones" have a recording function.) Patients who record their visits can listen to specific information again or share it with family members or friends.

Another way for patients to record information about their specific diagnosis and keep track of details is to keep a notebook or journal. It is a good way to track not just appointments, blood tests, medications and side effects, but everything that is happening, including the patient's feelings.

## SPEAK UP

In any conversation with a doctor, patients should feel free to be assertive. If they don't know what a word means or don't understand the doctor's directions, they have a right to ask. Patients can also request a phone appointment or follow-up visit if more time is needed for discussion.<sup>14</sup>

## RECOMMENDATIONS FOR EFFECTIVE COMMUNICATION BETWEEN CLINICIANS AND PATIENTS

Myeloma is a complicated disease. It takes diligence and persistence to treat it effectively. Therefore, communication between patients and their healthcare providers is critical to make sure the right treatment is being carried out appropriately.

### MANAGING COMMUNICATIONS

Some medical centers start things off by arranging a patient meeting with the oncologist and radiation oncologist before treatment begins. As a result, a proposed course of treatment can be discussed so everyone understands, thus avoiding confusion along the way.

Providers can continue to collaborate on a course of treatment by having regular multi-disciplinary conferences that could include oncologists, radiologists and surgeons as well as various supportive specialties. When all doctors are under the same roof (or on the same call) periodically, communication is easier and better, resulting in clearer information for the patient.

Most doctors encourage their patients to equip themselves with facts, providing educational materials and referring them to both local and national support groups. While some patients are reluctant to get involved, participating in support groups can be an important part of recovery.

## VICKI

(myeloma patient, diagnosed 2004)

*I already subscribe to the Google service, [so] that every time myeloma is mentioned in the news anywhere, I get a Google news alert... then I can look and see what's being written about it. That kind of thing, that just makes me aware of what's out there, and then I can make the decision whether to go read it or not.*



TEAR-OUT FOR YOUR NEXT VISIT

# ASK KEY QUESTIONS

---

**Here are some questions patients might ask their doctors or nurses about their treatment and follow-up:<sup>14</sup>**

WHAT ARE MY TREATMENT OPTIONS?

WHAT IS THE RECOMMENDED TREATMENT?

HOW OFTEN WILL I RECEIVE TREATMENT?

WHAT ARE THE POSSIBLE SIDE EFFECTS?

WHAT ARE THE POSSIBLE BENEFITS AND RISKS OF THIS TREATMENT?

IF MY DOCTOR IS NOT AVAILABLE, WHO CAN I ASK? FOR EXAMPLE, IS A NURSE, SOCIAL WORKER, OR OTHER SPECIALIST AVAILABLE?

IS THERE ANY INFORMATION THAT I CAN READ ABOUT THIS TREATMENT OR PROCEDURE?

IS THERE ANYTHING ELSE I SHOULD KNOW?



**BONE HEALTH**  
IN FOCUS

## PATIENTS NEED TO BE THEIR OWN BEST ADVOCATES

Based on the research data and information collected in this report, it is clear that:

- SREs in multiple myeloma are a serious problem with a potentially devastating impact on patients.
- Patient knowledge about bone health is not as high as it should be, although most patients want more information. Even among patients who are satisfied with the amount of information available to them, many would have wanted more information about bone health earlier in the cancer treatment process.
- More and higher quality communication is needed between physicians and their patients, and it is up to physicians to provide that information, as well as recommend other information sources.

The data also show that physicians who treat patients with myeloma have high levels of awareness and concern about bone health and are generally satisfied with current treatments, but their satisfaction is not strong. This would suggest they may be interested in new, more efficacious treatment options.<sup>5</sup>

The entire healthcare community must take coordinated action to make cancer-related bone diseases more of a priority throughout the treatment continuum. Better bone health can't be achieved by either patients or their healthcare providers alone. The effort to understand the science and develop novel therapies to address the root cause of bone loss and bone destruction in patients with cancer is ongoing. In the meantime, patients, physicians, support groups and other advocates can do a great deal more to help alleviate pain and suffering and reduce the clinical and emotional effects of multiple myeloma-related bone disease by prioritizing discussions about this critical topic.

THE EFFECTIVE TREATMENT OF CANCER REQUIRES A CONSIDERABLE EFFORT BY THE PATIENT AND PHYSICIAN. FORMING A STRONG PARTNERSHIP, WHICH SHOULD ALSO INCLUDE FAMILY, FRIENDS, ONCOLOGY NURSES, SOCIAL WORKERS AND PATIENT SUPPORT GROUPS, IS NOT ONLY HELPFUL BUT CRUCIAL TO EFFECTIVE DISEASE MANAGEMENT AND TREATMENT.

Working closely together with this network, patients can and should:

- Achieve the highest standard of care and work with their physicians to develop a treatment plan that is tailored to their needs.
- Comply fully with an agreed-upon treatment plan. If side effects or other issues prevent this, communication is critical.
- Take enough time to exchange relevant information and maintain an ongoing dialogue with healthcare providers about their progress and treatment options.
- Make sure they get answers to questions they ask their healthcare providers.
- Obtain other professional opinions and use other support services that may benefit recovery.
- Seek out emotional, social and practical support that may help them during cancer treatment.

## SOME RESOURCES CAN BE A HELPFUL START:

International Myeloma Foundation ([www.myeloma.org](http://www.myeloma.org))

CURE ([www.curetoday.com](http://www.curetoday.com))

## SELF-REPORTED PATIENT SURVEY METHODOLOGY

The multiple myeloma patient survey was conducted online within the United States by the International Myeloma Foundation between March 31 and April 5, 2010. Respondents included 831 patients with multiple myeloma who were recruited from the International Myeloma Foundation's membership list. Data from the multiple myeloma patient survey was not weighted. All patient surveys averaged 10 minutes in length.

## SELF-REPORTED PHYSICIAN SURVEY METHODOLOGY

All physicians were interviewed online by Harris Interactive between February 19 and April 16, 2010 on behalf of Amgen and in partnership with the International Myeloma Foundation. Respondents included 150 hematology oncologists. All hematology oncologists were recruited by postal mail using the American Medical Association (AMA) master physician list as the sample frame. All physician surveys averaged 10 minutes in length. Physician data was weighted to be representative of the populations of the respective physician populations.

# DEFINITIONS

---

**Skeletal-related events (SREs)** can occur when cancer has spread to the bone (metastasized) and weakened it. SREs include:

**Pathological fracture:** A fracture to bone for a patient with advanced cancer is significant and generally requires hospitalization. It can cause serious impairment and disability in addition to pain.<sup>15</sup>

**Spinal cord compression:** If the bone metastasis is in or around the vertebral column, expansion from the bone can compress the spinal cord. This can lead to serious complications such as paralysis, incontinence and numbness.<sup>16</sup>

**Surgery to bone:** If a bone is at risk of fracture or has already fractured, surgery to the bone is performed to manage or prevent further complications. With patients with advanced cancer, surgery to the bone is a major operation, and recovery can often be challenging and require hospitalization.<sup>15</sup>

**Radiation to the bone:** Radiation to the bone is performed to treat the bone metastasis and alleviate pain. However, the consequence of this is permanent damage to the bone, and radiation is generally only performed on small areas.<sup>17</sup>

**Smoldering multiple myeloma:** Smoldering multiple myeloma is a plasma-cell proliferative disorder that is associated with a high risk of progression to symptomatic multiple myeloma or amyloidosis. Prognostic factors for the progression and outcome of this disease are unclear.<sup>18</sup>

**Peripheral neuropathy:** The term, peripheral neuropathy, denotes damage to nerves of the peripheral nervous system that may be caused either by diseases of the nerve or from the side-effects of systemic illness or its cancer.<sup>19</sup>

**Osteoporosis:** A disease where bone loss occurs throughout the body resulting in lower bone density and an increased risk of fracture. The disease often develops unnoticed over many years, with no symptoms or discomfort until a fracture occurs.<sup>20</sup>

**Plasmacytoma:** A plasmacytoma is the particular name for uncontrolled division of the plasma cells. When plasma cell cancer is found in just one place in the body (usually bone), it is called solitary plasmacytoma. When it exists in multiple areas, it is called multiple myeloma.<sup>1</sup>

# REFERENCES

---

- 1 Durie BG. Concise review of disease and treatment options: multiple myeloma—cancer of the bone marrow. International Myeloma Foundation. 2008:1-40.
- 2 Kumar SK, Rajkumar SV, Dispenzieri A, et al. Improved survival in multiple myeloma and the impact of novel therapies. *Blood*. 2008;11:2516-2520.
- 3 Mundy GR. Myeloma bone disease. *Eur J Cancer*. 1998;34:246-251.
- 4 Berenson JR, Lichtenstein A, Porter L, et al. *J Clin Oncol*. 1998;16:593-602.
- 5 Harris Interactive Bone Health Survey. Data on file. Amgen Inc. July 27, 2010.
- 6 Mortimer JE, Shulman K, Kohles JD. Patterns of bisphosphonate use in the United States in the treatment of metastatic bone disease. *Clin Breast Cancer*. 2007;7:682-689.
- 7 Saad F, Lipton A, Cook R, et al. Pathologic fractures correlated with reduced survival in patients with malignant bone disease. *Cancer*. 2007;110:1860-1867.
- 8 Zometa® (zoledronic acid) prescribing information, Novartis.
- 9 Coleman RE. Skeletal complications of malignancy. *Cancer*. 1997;80(suppl):1588-1594.
- 10 The NCCN Clinical Practice Guidelines in Oncology. National Comprehensive Cancer Network website. [http://www.nccn.org/professionals/physician\\_gls/default.asp](http://www.nccn.org/professionals/physician_gls/default.asp). Accessed August 31, 2010.
- 11 Kyle RA, Yee GC, Somerfield MR, et al. ASCO 2007 clinical practice guideline update on the role of bisphosphonates in multiple myeloma. *J Clin Oncol*. 2007;25:2464-2472.
- 12 Aredia (pamidronate disodium) prescribing information, Novartis.
- 13 Hoering A, Crowley J, Shaughnessy JD, et al. Complete remission in multiple myeloma examined as time-dependent variable in terms of both onset and duration in total therapy protocols. *Blood*. 2009;114:1299-1305.
- 14 Doctor Can We Talk? Cancer Care website. [http://www.cancercare.org/pdf/fact\\_sheets/fs\\_doctor\\_talk\\_en.pdf](http://www.cancercare.org/pdf/fact_sheets/fs_doctor_talk_en.pdf). Accessed August 31, 2010.
- 15 Costa L, Badia X, Chow E, et al. Impact of skeletal complications on patients' quality of life, mobility, and functional independence. *Support Care Cancer*. 2008;16:879-889.
- 16 Dictionary of Cancer Terms—spinal cord compression. National Cancer Institute website. <http://www.cancer.gov/dictionary>. Accessed August 31, 2010.
- 17 Janjan NA. Radiation for bone metastases. *Cancer*. 2000;80:1628-1645.
- 18 Kyle RA, Remstein ED, Therneau TM, et al. Clinical course and prognosis of smoldering (asymptomatic) multiple myeloma. *N Engl J Med*. 2007;356:2582-2590.
- 19 Definition—peripheral neuropathy. Mayo Clinic website. <http://www.mayoclinic.com/health/DiseasesIndex/>. Accessed September 16, 2010.
- 20 Osteoporosis. American Academy of Orthopaedic Surgeons website. <http://orthoinfo.aaos.org/topic.cfm?topic=a00232>. Accessed August 31, 2010.







# BONE HEALTH IN FOCUS

