Calciphylaxis: An Unusual Case with an Unusual Outcome

An intensive treatment plan and excellent nursing care help this patient beat the odds.

OVERVIEW: Calciphylaxis is most common in patients with end-stage renal disease, and hyperparathyroidism is often present as well. But several cases in patients with normal renal and parathyroid function have been reported; this article describes one such case. The etiology and pathophysiology of calciphylaxis aren't well understood. There are many risk factors, and the reported median survival time is 2.6 months after diagnosis. The condition is characterized by isolated or multiple lesions that progress to firm, nonulcerated plaques and then to ischemic skin necrosis and ulceration. In August 2010, a female patient arrived at the hospital with multiple deep, painful necrotic wounds. Given this patient's presentation on admission, the nurses kept expecting the physicians to initiate end-of-life discussions with her and were surprised when this did not happen. After five days, the patient was diagnosed with calciphylaxis in the unusual presentation of normal renal and parathyroid function, and the team realized that her chances for survival were greater than expected. The nursing staff was crucial in developing and implementing an intensive treatment plan. The patient survived and made a full recovery.

Keywords: calciphylactic wounds, calciphylaxis, necrotic wounds, wound care

Calciphylaxis has been described as a systemic hypersensitivity reaction in which tissues respond to certain events or exposures with sudden, localized calcification.[1] Calcium and phosphorus deposits form in the small arteries of the skin, resulting in vascular calcification with intimal arterial hypertrophy and superimposed small-vessel thrombosis.[2] Calciphylaxis is characterized by isolated or multiple lesions that first present with erythema, purplish discoloration, and bullae before progressing to "firm, nonulcerated plaques and finally to ischemic skin necrosis and ulceration."[3] It has a poor prognosis, with one study reporting a median survival time of 2.6 months after diagnosis.[4]

The etiology and pathophysiology of calciphylaxis aren't well understood. The condition is most often observed in patients with end-stage renal disease who are on long-term dialysis, although it is rare even in this population; hyperparathyroidism is often present as well.[5,6] There are many risk factors, including hyperparathyroidism, hyperphosphatemia, increased calcium-phosphate product, increased erythrocyte sedimentation rate, systemic use of corticosteroids, decreased albumin, liver disease, obesity, and female sex.[5,6] Potential precipitating agents may include steroids,

blood products, and immunosuppressant and immunotoxic drugs, although a definitive causative effect hasn't been established.[7]

Nontraditional cases. Although calciphylaxis occurring in patients with normal renal and parathyroid function is considered extremely unusual, several single case reports have recently been published.[5] It is possible that the condition is becoming more common in such patients.[5]

This is the story of one patient, L.W., and her journey from diagnosis to treatment and recovery. (This case is real and appears here with the patient's permission.) Ms. W. was two days shy of her fortieth birthday when she came to our unit. She had no medical diagnosis of calciphylaxis on admission, nor did she have a history of end-stage renal disease, diabetes, or (with the exception of female sex) any other known risk factor for calciphylaxis. Risk factors for the development of calciphylaxis in patients with normal renal and parathyroid function remain unclear. Kalajian and colleagues analyzed 14 nontraditional cases and identified notable patient characteristics among this group.[5] Ms. W. did have several such characteristics, including malnutrition, rapid weight loss, infection, previous use of corticosteroids, and an elevated calcium level. This article offers an overview of calciphylaxis and various treatment options and describes this patient's intriguing case.

FINDING A DIAGNOSIS

Ms. W., the mother of two teenage boys, came to our facility with her husband in August 2010, after a long flight from her home. Her vital signs on admission were as follows: temperature, 36.5°C; pulse, 126 beats per minute; respiratory rate, 20 breaths per minute; blood pressure, 100/72 mmHg; and oxygen saturation, 98% on room air. During the morning nursing report, the charge nurse explained that this patient had arrived on our surgical–medical progressive care unit with multiple large full-thickness wounds over her abdomen, upper thighs, and right breast. The wounds were extremely painful, foul smelling, deep, and necrotic. Her case reminded us of another—a few months earlier, we had discharged a similar patient with calciphylaxis to hospice care.

The backstory. About six months earlier, Ms. W. had experienced flu-like symptoms that included excessive fatigue and elevated temperatures, rhinitis, cough, and congestion, and she began treatment with antibiotics. Eight days later, she felt worse and went to her local ED, where she was diagnosed as being in renal failure. A biopsy revealed thrombosis within the kidney vasculature. Hemodialysis was started and she continued on it for about eight weeks until her kidney function returned. During this time, she was given heparin, but after developing mild erythema and skin discoloration on her thighs and abdomen, she was diagnosed with thrombotic thrombocytopenic purpura and the heparin was discontinued. She also experienced a superficial burning sensation on her thighs and legs that progressed to skin breakdown consisting of multiple large erythematous bullae. (Later we found a similar case in the medical literature, with the patient having a history of good health and subsequently developing acute respiratory and renal failure due to hypercalcemia of unknown etiology.[8])

Figure 1. Left lateral thigh and abdomen on admission.

Over the next two to three months, as these wounds became more necrotic, Ms. W. was hospitalized at a tertiary care site. Consultations were sought from specialists in hematology, oncology, and rheumatology in an attempt to find a diagnosis that would explain their cause, but no diagnosis was made. Corticosteroids were started in an attempt to relieve the skin inflammation. After multiple debridements, skin grafts were also performed to aid in healing the open wounds. These measures proved unsuccessful, and Ms. W. was eventually discharged back to her local hospital. There the decision was made to send her to our large academic medical center for possible diagnosis, treatment, and cure.

On arrival. By the time Ms. W. arrived at our facility for her scheduled clinic appointment, her pain level had increased considerably, so her husband bypassed the appointment and brought her directly to the ED. She presented with full-thickness necrosis in multiple anteromedial areas of both thighs, as well as of the abdomen, pelvic region, and right breast.

Figure 2. Right lateral thigh, buttock, and abdomen on admission.

She was also quite depressed and withdrawn. On admission she was taken first to the operating room for skin and soft tissue biopsy specimens and initial wound debridement (see Figures 1 and 2). The initial workup included laboratory analyses and a computed tomographic (CT) scan to visualize and determine the extent of calcification. The CT scan showed extensive superficial soft tissue damage in the areas of her left groin and both upper thighs. On arrival she was using the topical antimicrobial bacitracin applied to all wound beds; and was taking the systemic antibiotics cefepime, 4 g daily; metronidazole, 1,000 mg daily; and vancomycin, 1,600 mg daily. Except for vancomycin, these were all continued.

During the next few days, consultations were sought from the departments of rheumatology, dermatology, hyperbaric oxygen therapy, infectious diseases, and psychiatry. The differential diagnoses from dermatology included calciphylaxis, heparin-associated necrosis, warfarin-associated necrosis, vasculitis, hyperthrombotic disease, and infection. The tissue biopsy specimens were sent for histologic evaluation and tissue culture, including bacterial, fungal, mycobacterial, and nocardial cultures. The consultation with rheumatology led to the conclusion that the physical findings were inconsistent with rheumatologic disease. The rheumatologist suggested consideration of pyoderma gangrenosum, small-vessel vasculitis, and Wegener granulomatosis. Calciphylaxis seemed unlikely because the patient did not have end-stage renal disease, but her wounds appeared to be consistent with this diagnosis.

Given this patient's presentation on admission, the nurses had begun a plan of care for managing what we believed to be a terminal illness. We kept expecting the surgical team to initiate end-of-life discussions with Ms. W. and her husband, and were surprised when this did not happen. As the days passed, we also began to question the treatment plan, which did not include end-of-life care. Soon the clinical nurse specialist (one of us, TW) contacted the hospital's primary care service for clarification.

Five days after admission, skin biopsy results showed an elevated level of calcium (6.03 mg/dL); the patient also had an elevated serum calcium level (10.2 mg/dL) and increased alkaline phosphatase (763 U/L). These findings confirmed a diagnosis of calciphylaxis. The primary care service resident met with the team to discuss the diagnosis and its unusual presentation of normal renal and parathyroid function, and explained that we could achieve improved outcomes with a therapeutic treatment regimen and collaborative care.

Ms. W. was also diagnosed with multifactorial hypoactive delirium and adjustment disorder, with mixed emotional features of depression and anxiety. According to Maldonado, hypoactive delirium is a delirium subtype that can mimic depression; symptoms can include unawareness of one's surroundings, lethargy, apathy, decreased alertness, psychomotor retardation, decreased speech, and episodes of staring or nonresponsiveness.[9] Moreover, it's well known that a major life event such as a serious illness can have significant effects. Some patients might have unpredictable emotional reactions; in others, emotional distress might "ramp up" to the development of an adjustment disorder, which can impair coping and functional ability to cope.[10]

TREATMENT OPTIONS

Currently, treatment options for calciphylaxis are limited. As Shah and Williamson have stated, "a multidisciplinary approach focusing on careful wound care and correction of the underlying cause, where possible, is advocated."[11] Other treatment options include parathyroidectomy, surgical debridement, and hyperbaric oxygen therapy. Treating infected chronic wounds can be particularly challenging. According to Lipsky and Hoey, recent studies have shown that, in such wounds, "bacteria persist in adhesive, polymeric matrix biofilm communities, in which they induce chronic inflammation that delays healing."[12] These bacteria also appear to be more resistant to systemic antimicrobial therapy, so topical agents should be considered.

Antiseptic agents are one such possibility. As Lipsky and Hoey note, they "can be used on intact skin and on some open wounds to kill or inhibit microorganisms. They often have multiple microbial targets, a broad antimicrobial spectrum, and residual antiinfective activity."[12] Many topical antiseptics can be toxic to healthy tissue, so they're not recommended for routine wound care. But as Stojadinovic and colleagues point out, they can be useful for difficult-to-treat wounds involving "critical colonization"—situations when "the bacterial balance exceeds the ability of

host defenses to clear the bacterial biofilm," thereby impeding normal healing.[13]

Acetic acid is often used for wound irrigation and cleansing. It is available in 0.25%, 0.5%, and 1% formulations that, applied directly, will kill most gram-positive and gram-negative organisms.[12] Another antiseptic agent, potassium permanganate, is typically used to treat infected eczema, dirty ulcerations, and furunculosis. It's available in several forms. As a solution or in tablet form, potassium permanganate can be used at various dilution ratios in a bath to help decrease bacterial load and provide astringent effects.[14]

Dressings. Current evidence favors the use of wet-to-moist rather than wet-to-dry dressings for wound healing. As Junker and colleagues have noted, a moist environment facilitates the healing process "by preventing dehydration and enhancing angiogenesis and collagen synthesis together with increased breakdown of dead tissue and fibrin."[15] This also aids in decreasing pain, and doesn't increase the risk of infection.[15]

Hyperbaric oxygen therapy involves administering 100% oxygen at increased atmospheric pressure, and takes place within an airtight chamber. The therapy increases the capacity of the blood to carry and deliver oxygen to tissues, thus enhancing oxygenation of compromised tissues; it may also restore perfusion to compromised areas. Hyperbaric chambers may be either monoplace (which are small and accommodate one patient lying on a padded bed) or multiplace (which are large enough to accommodate several patients, who may be seated or supine). Protocols vary depending on the specific disease process, but patients generally receive treatment five to seven times a week. A typical session in the chamber lasts for 90 minutes at 2 to 2.5 atmospheres absolute (ATA), and the patient generally receives 40 to 60 treatments.[16]

Figure 3. Right thigh 10 days before discharge.

caregiver should be present and in contact with them at all times.[16]

Ultrasonic therapy. Noncontact ultrasound therapy, a relatively new modality, is also sometimes used to aid in wound debridement. In this therapy, an ultrasonic device delivers low-frequency (25 to 40 kHz) sound waves to the wound bed through a sterile saline mist, thus avoiding the need for direct contact.[17] This can promote wound healing and aid in debridement by helping to remove debris and exudates. There is some evidence favoring the use of noncontact ultrasound therapy for healing chronic wounds that fail to progress through conventional treatment.[18]

BEGINNING TREATMENT

Once the diagnosis of calciphylaxis was confirmed, the treatment plan was developed. The primary care service resident stressed that prevention of infection was crucial, as it represented the greatest risk of mortality.[5] Ms. W.'s wounds also had a great deal of necrotic and infected tissue that needed to be debrided. The plan of care included dressing changes, whirlpool baths, physical therapy, and later, hyperbaric oxygen therapy.

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Relative contraindications to this therapy include seizure disorder, pregnancy, upper respiratory infection, emphysema, hyperthermia, spherocytosis, history of spontaneous pneumothorax, history of optic neuritis, and history of otosclerosis.[16] According to Broussard, the most common adverse effect of hyperbaric oxygen therapy is claustrophobia; patients who experience this should be reassured, and a

This plan of care would be intense and full of appointments scheduled back to back, with little

A Day in Ms. W.'s Schedule

5–6 AM	First dressing change
6 AM	Breakfast
6:45 AM	Transport to hyperbaric facility
7–11:30 AM	Hyperbaric therapy
Noon	Lunch
1–2 PM	Physical therapy
2–3 PM	Whirlpool therapy
3–4 PM	Second dressing change
4–6 PM	Rest time
6 PM	Dinner
7–8 PM	Third dressing change

downtime for the patient (see *A Day in Ms. W.'s Schedule*). Furthermore, Ms. W. was extremely anxious and fearful, as one might expect given her diagnosis and physical condition. We knew we needed to help Ms. W. gain trust and believe that she had a chance of survival. So that Ms. W. could get to know and trust her caregivers, a core group of nurses was formed to deliver her care. Our nursing plan focused on four areas: wound care, rehabilitation, psychosocial care, and discharge plans.

Dressing changes were ordered three times daily. The morning and midday dressings consisted of 0.5% acetic acid–soaked cloth pads secured with large dry cloth pads. The evening dressing consisted of topical bacitracin applied to all wound beds with gauze infused with petrolatum and 3% bismuth tribromophenate (Xeroform). Nitrofurantoin (Macrobid) 100 mg was given twice daily.

Because of exposure during dressing changes, Ms. W. would become extremely cold. To address this, the nurses warmed the acetic acid solution in the fluid warmer, increased the room temperature, and gave her warm blankets afterward.

Dressing changes were stressful, causing anxiety and extreme pain. Each session could last up to an hour, so when the time came the primary care nurse (SM) enlisted the help of another RN (KF). They proceeded slowly and checked frequently with Ms. W. regarding her pain level. They were careful to tell her what they were going to do before they did it. To further reduce Ms. W.'s anxiety during dressing changes, music that she found comforting was played.

Pain and anxiety management. Throughout Ms. W.'s hospitalization, in order to prevent a lapse in pain control, the nurses were diligent about administering her pain medication at the scheduled times and whenever breakthrough pain arose. This helped minimize both the patient's pain level and her anxiety about treatments. Her pain medication regimen included acetaminophen, 1,000 mg every 8 hours; fentanyl, 200 mcg lozenge PRN (taken with each dressing change and whirlpool therapy); hydromorphone, 0.4 mg IV every hour PRN; oxycodone 12-hour sustained-release, 20 mg three times daily; oxycodone, 15 mg every four hours PRN; and pregabalin, 24 mg at bedtime. For anxiety, she took alprazolam 1 mg three times daily PRN.

Ms. W. often had difficulty sharing her feelings about being overwhelmed and expressing the level of pain she was experiencing. We used several nonpharmacologic measures to help her, including relaxation techniques, regular chaplaincy visits, and music therapy. But we believe it was her husband's presence that had the most impact. He supported her in so many ways—staying by her side, reading scripture to her (faith is an important part of their lives), arranging telephone and Skype calls with their sons at home, and helping her find the strength to keep going. (They had not expected to stay at our facility as long as they did, and had brought limited clothing and necessities with them. Not once did Mr. W. complain about the situation. He was grateful to be with his wife and was positive that she was going to get better.)

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Whirlpool baths were implemented about two weeks after admission. Ms. W. was scheduled for five 30-minute sessions weekly; a ratio of 1:64,000 solution of 5% potassium permanganate was used, with a water temperature of 94°F to 96°F and moderate direct or indirect agitation. Salt was added to the water for normal salinity, which helped ease her pain. For Ms. W., the thought of submerging herself into a tub of this unknown solution with open wounds produced much

An Update from Ms. W.

Being at the Mayo Clinic's Saint Mary's Campus facility was very comforting from the moment I arrived. I had already spent several months in two other hospitals that just did not compare. The doctors, nurses, and surgeons at Saint Mary's were amazing—it seemed like they were there just for me. I am grateful to each and every one of those who cared for me, and to my husband and our two boys. I do not think I could have made it without their support.

I have not been able to return to work, as I now have neuropathy in my feet. I believe this might be from my not being able to walk for eight months or maybe from the surgeries that removed tissue down to the muscle on both thighs, front and back, as well as on both hips and stomach. Everything has grown back, although there are terrible scars.

I feel extremely blessed to have this second chance to live. God gave me many miracles during this illness. My kidneys resumed functioning after a month of total kidney failure. Tissue and skin grew back after I'd been told this was unlikely. And I survived, although I had been told that I'd eventually die from infection in the wounds. I believe I was sent to this hospital by God, not only to survive, but so I could tell my story and help raise awareness about the need for more research.

anxiety. So, before leaving her room, we explained exactly what was going to happen in the whirlpool and how this treatment would help heal her wounds. Her biggest concern was pain control, so we assessed her current pain level, administered pain medications, and discussed how to control her pain during the whirlpool treatments. Both an RN (SM) and the clinical nurse specialist accompanied Ms. W. to the first session, and her husband was also present. We lowered her into the whirlpool gradually to allow her to adjust to submersion, and continually assessed her pain and anxiety levels. These measures comforted her greatly, and we adjusted the pain control plan for future sessions accordingly. This plan included administering pain medication beforehand, using adjunctive pain medications and playing music Ms. W. liked during whirlpool sessions, and honoring her requests for breaks when she needed them. From this point on, an RN from the core group went with her to each whirlpool session to ensure adequate pain control. On these days, based on our patient classification system and Ms. W.'s intensive regimen, she was eligible for a higher number of hours of nursing care. She found her RN's presence reassuring, and over time her anxiety decreased. Toward the end of her whirlpool treatments, Ms. W. said one day that she felt secure going without her nurse and with just her husband to accompany her. This showed all of us the power of building trust.

The goal was for Ms. W. to tolerate hyperbaric treatments so she would be a candidate for skin grafting.

Hyperbaric oxygen therapy. Three weeks after admission, Ms. W. was able to begin hyperbaric oxygen therapy. It was recommended that she have 40 sessions with 100% oxygen at a pressurization of 2 ATA, with each session lasting 90 minutes. The goal

was for her to tolerate these treatments with minimal pain and marked wound healing, so that later she would be a candidate for skin grafting. But her history had revealed possible seizure activity during a previous attempt at hyperbaric oxygen therapy, while she was under treatment at another facility. The primary care service resident talked with Ms. W.'s husband to learn more, since according to Ms. W.'s medical records she did not have a history of seizures. Her husband explained that Ms. W. is claustrophobic and that the previous attempt had taken place in a monoplace chamber. Coupled with her anxiety, her fear of small, enclosed spaces had resulted in an episode of uncontrolled physical shaking and tremors.

Physical therapy entailed daily range-of-motion exercises, which focused on upper and lower body strengthening.

For the treatment team, this was good news, as it meant Ms. W. was a candidate for hyperbaric oxygen therapy. For Ms. W., it was not such good news, as she was asked to try hyperbaric oxygen therapy again. Our medical center has a hyperbaric facility with a multiplace chamber, which, because it is roomier than a monoplace chamber, is less likely to trigger claustrophobic fears. The multiplace chamber allows several patients and staff members to be present during a treatment or "dive." We reassured Ms. W. that an RN would be with her for the duration of each treatment. It's also worth noting that since our hyperbaric facility is located a few blocks away, a local ambulance crew had to transport Ms. W. to and from each session. At first she was also anxious about the ride, given her pain and the fact that her husband couldn't ride with her in the ambulance. But we explained that since she needed hemodynamic monitoring, the RN would also accompany her during transport, and she found this comforting.

Physical therapy. Because of her lengthy illness and the extent of her wounds, Ms. W. had become deconditioned and weak. She had not been able to walk for several months, and needed an intensive rehabilitation program to help her regain her strength. Twice-daily physical therapy was recommended as ideal, but this proved difficult to coordinate given Ms. W.'s daily schedule and her low energy and strength levels. Physical therapy entailed daily range-of-motion exercises, which focused on upper and lower body strengthening through hand and ankle "pump" moves and isometrics. During her rest time, Ms. W. also used stretch bands tied to her bedside rails, to help her develop muscle strength.

Nutrition. Over the course of Ms. W.'s illness, she had lost weight rapidly and become cachectic because of her high pain levels from the wounds and her uncontrollable nausea. She also had low serum albumin on admission, and this may have been related to her diminished nutritional intake and systemic inflammation. (A strong association between low serum albumin and the development of calciphylaxis has been reported,[19] but whether there is a causal effect remains unclear.)

Our registered dietician was consulted soon after Ms. W.'s admission and began working with her to encourage greater oral intake. Calorie counts were initiated, along with different oral supplements (for example, supplementary nutritional drinks [Boost], fruit smoothies, and high-calorie beverages), in an attempt to foster weight gain and improve her nutritional status. Antiemetics were prescribed to help control nausea. She was also given cholecalciferol (vitamin D) 1,000 units daily, because vitamin D participates in calcium and phosphate metabolism. To address hypercalcemia, Ms. W. was started on 50 g IV sodium thiosulfate daily. Other nutritional support included ferrous sulfate, 160 mg daily; folic acid, 1 mg daily; potassium chloride, 20 mEq packet twice daily; and sodium bicarbonate, 650 mg two tablets three times daily.

Since adequate nutrition is vital to wound healing, it was extremely important for Ms. W.'s oral intake to be monitored closely. Despite the interventions designed to increase her caloric intake, Ms. W. still struggled to achieve adequate nutritional intake, partly because her packed schedule didn't give her much time to eat. The dietician suggested the use of a nasojejunal feeding tube; the primary care service resident agreed, and this was done and tube feeds were initiated two weeks after admission. The tube feeds were administered at a continuous rate during the night, so as not to interfere with Ms. W.'s daytime schedule and to allow her to eat during the day. This approach ensured that she would obtain adequate calories and nutrition even on days when her nausea worsened and her oral intake was poor.

PREPARING FOR DISCHARGE

As soon as patients are admitted, the process of discharge planning begins, and Ms. W.'s case was no exception. The primary care service resident indicated that several interventions should continue after discharge, including assistance with activities of daily living, use of a specialized bed, hyperbaric oxygen therapy, whirlpool treatments, frequent dressing changes, physical therapy, nasogastric feedings, and continual intravenous infusion of sodium thiosulfate. Two weeks after Ms. W.'s admission, our social worker began to look for facilities closer to

Ms. W.'s home where all these services could continue.

The hyperbaric facility closest to Ms. W.'s home presented a challenge, as it only had a monoplace chamber. Ms. W.'s claustrophobia and her earlier experience in a monoplace chamber made it difficult for her to consider undergoing such treatment again. By now, both the unit's nursing staff and the hyperbaric oxygen therapy staff had gained Ms. W.'s trust. The clinical nurse specialist arranged for another meeting with Ms. W. and the nurses at our hyperbaric facility. Our hyperbaric facility also has a monoplace chamber, and we asked if she'd be willing to try using it for one session. The clinical nurse specialist and the hyperbaric nurse had viewed this chamber together to consider Ms. W.'s questions and concerns, and developed a plan. We were able to reassure her that, while in the chamber, she would still be able to see and speak with her caregiver and could ask for the treatment to be stopped at any time. Reassured, Ms. W. agreed to try it, and did so successfully at her next session. This alleviated her fears somewhat, and she felt that she would be able to continue hyperbaric oxygen therapy at the new facility.

After nearly one month with us, Ms. W. was discharged to a long-term care facility near her home and was transported by air ambulance. The combination of autolytic debridement using moist dressings with acetic acid solution (along with surgical debridement performed on admission), whirlpool baths, and hyperbaric oxygen treatments had proved effective in eliminating large amounts of necrotic tissue. Her wounds were healing (see Figure 3), and her pain was under control. She was able to sit upright in a chair for more than two hours, demonstrating to us that her strength was returning. Best of all, she was smiling again. Six months postdischarge, after 90 hyperbaric oxygen therapy sessions and endless hours of rehabilitation, Ms. W.'s wounds had healed completely. She continued to participate in weekly physical therapy sessions, working to regain her strength. (See *An Update from Ms. W.*)

With early diagnosis, supportive care, and focused treatment for patients diagnosed with this unusual type of calciphylaxis, improved outcomes are clearly possible. The nurses on our unit continue to be challenged with the care of complicated medical and surgical patient cases. We learned a great deal about multidisciplinary teamwork and the value of communication while providing care for Ms. W. As strong patient advocates and nurses who seek to meet each patient's physical and emotional needs, we no longer wait for these conversations to occur—we initiate them. Caring for this extraordinary patient reinforced two essential lessons: the importance of patient-centered care and the importance of the multidisciplinary team approach to that care. ▼

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