

# Patient Education Management™

For Nurse Managers, Education Directors, Case Managers, Discharge Planners

July 2000 • Volume 7, Number 7 • Pages 73-84

## IN THIS ISSUE

### Individual approach best for education surrounding end of life

Death affects each person differently, and health care facilities must be ready to provide individualized education. Some patients need help in coming to terms with their impending death. Family members often must learn how to cope with the situation. Issues regarding withdrawal from life support, however, require a different educational approach . . . . . Cover

### Spirituality leaps to forefront at end of life

A spiritual identity gives patients and family members hope for the future. At the end of life, those who have built no spiritual foundation usually go back to their religious roots. It is important to help patients come to terms with their death, and pastoral care provides the guidance many need . . . . . 75

### Instructions remove mystery from dying wishes

Family members' decisions pertaining to a loved ones' care at the end of life are often filled with anguish, especially if families never talked about the dying patient's wishes before hand. It is especially difficult to decide to withdraw life support. That's why it is important for people to prepare explicit advance directives so there is no confusion regarding the dying patient's wishes . . . 76

### Descriptive language key in pain management

For health care providers to conduct a good pain assessment, they must have details about the location and type of pain the patient has. Thus, it is important for the patient to learn how to describe his or her pain. Once a pain management program is created, patients must understand their medications and how to help physicians fine-tune the program for best results . . . . . 77

*In This Issue continued on next page*

## Individual approach is best for educational issues surrounding end of life

*Education and support must be tailored to each individual's unique needs at a difficult time*

**D**eath is inevitable. We are reminded of our mortality every day in many ways. It often crosses our mind when we drive past a funeral home or a hospital. We think about death when we hear the traffic report and there has been a fatal accident.

Yet, in reality, most of the time people live with a perception of personal immortality, says **Shirley Otis-Green, ACSW, LCSW**, clinical social worker in supportive care and palliative medicine at City of Hope National Medical Center in Duarte, CA.

In visiting the bedsides of dying patients, Otis-Green has noticed that the biggest difference in the degree of suffering is in the amount of regret the person has experienced in life. For example, one terminally ill patient had lived her life for her children and husband. She knew their favorite colors and foods, but not her own. She had never developed, expressed, or shared her talents and was therefore experiencing enormous regrets. "If we live life where we minimize our regret, then we are better able to live a life that might be lengthened," Otis-Green says.

It is helpful for people to keep short journal accounts of feelings toward death and develop coping skills that will serve them well during times of crisis, she says. People can benefit from examining

**NOW AVAILABLE ON-LINE!**  
[www.ahcpub.com/online.html](http://www.ahcpub.com/online.html)

American Health Consultants® is A Medical Economics Company

**Keep caregivers in loop for terminal patients**

Caregivers often administer a pain medication regimen for terminally ill patients. Therefore, it's important that they understand how pain medications work and when and how they should be given. Caregivers also should understand the concepts of addiction, dependence, and tolerance. . . . . 78

**Caregivers' burden grows with impending death**

Family members who take on the role of caregiver for a terminally ill patient must learn all about a patient's sense of loss to understand their behavior. They also must learn how to garner the appropriate support to sustain them through this trying time. When death is imminent, there are many signs and symptoms to remember, as well as care techniques to keep the patient comfortable . . . . . 79

**Misconceptions hamper organ donations**

Most people think all they need to do to ensure that their organs will be used for transplants following their death is fill out a donor card. Not so; family members must be told of their wishes, for without the consent of next of kin, the patients' organs usually cannot be taken at the time of brain death. This is just one misunderstanding that prevents those waiting for a transplant from receiving the organs they need. . . . . 80

**Vision problems surfacing around computer work**

Eye and vision problems are the most common complaints of computer users. The symptoms — eyestrain, headaches, eye fatigue, blurred vision, dry, irritated eyes, and back and neck ache — all fall under the umbrella of computer vision syndrome. An optometrist can determine if the cause is a visual condition or environmental. Whatever the cause, there are ways to correct the problem . . . . . 82

**Take the test for environmental problems**

There are simple tests that computer users can perform to determine if vision, eye, and other problems such as headaches are being caused by environmental factors such as glare. Correcting environmental problems can take a lot of the distress out of computer work. . . . . 84

***Focus on Pediatrics Insert***

**The proof is in the numbers!**

Many store managers place cigarette ads or products near candy or at three feet or below in height. Because these locations are easily visible to children, they grow to accept cigarette smoking as acceptable behavior. Operation Storefront surveys the placement of ads to promote merchant and public awareness. . . . . Insert

**COMING IN FUTURE ISSUES**

- Pros and cons of having designated patient educators
- Improving medication compliance in pediatric patients
- Education for caregivers of disabled family members
- Outreach strategies to curb domestic violence
- Lessons on preventing eating disorders

their feelings about death before they are confronted with it. Therefore, education and support around end-of-life issues should not be limited to the times when a terminal illness is diagnosed or when a patient experiences sudden death, she advises.

**Elaine Glass, RN, MS, AOCN**, clinical nurse specialist at James Cancer Hospital in Columbus, OH, agrees. The time to educate people about advance directives is not in the hospital before a procedure, but in the physician's office while they are healthy. At that time, people should receive literature that explains such intensive care treatments as cardiopulmonary resuscitation (CPR), ventilators, and artificial nutrition and hydration. "A lot of the legal and ethical issues have been around younger people who didn't think they would get sick or hit by the truck and they did," says Glass. **(For innovative ideas on writing advance directives, see story on p. 76.)**

The truth is, much of the education and support around end-of-life issues comes after the fact because most Americans skirt the topic. The process is complicated, too, for there is no one-size-fits-all approach, explains Otis-Green. Instead, each person must be addressed in terms of his or her attitude toward death: denial, anger, spiritual crisis, or accepting. There are many ways to do this.

At City of Hope, a new program is being developed to help patients and their family members move through the dying process. The program is called *Transitions: Supporting You Through the Journey of Change*. "We are trying to develop a compassionate, caring, comprehensive model that looks at how we can help the person understand by giving them education, support, and the tools they need," explains Otis-Green.

For example, information about what to expect will be available so caregivers will know that at some point, a dying person is likely to become withdrawn from news and events and become disoriented to time, date, and place. People who know what to expect are more likely to remain calm.

Another part of the program will be to help people access their own resources. While a daughter may not have lost her mother to breast cancer before, she has dealt with other losses, challenges, and crises and can take what she has learned from these past experiences and apply it to the current situation. Keeping a journal, writing poetry, and taking long walks may have helped this person adjust to her divorce, and she can use those coping techniques in her current situation.

# Spirituality leaps to forefront at end of life

*Make connection early to build spiritual foundation*

“When patients approach the end of life, especially those who know it, the future is no longer a point of concern other than the fear of the process of dying or fear of the pain,” says **Karen Kent-Metteer**, MDiv, lead chaplain at City of Hope National Medical Center in Duarte, CA. What becomes important is the patient’s past, current relationships, and spirituality. The past is the person’s identity; relationships are what is important at the present time; and spirituality provides hope for the future. A person’s particular faith is what gives purpose and meaning to his or her life in this situation, she explains.

Yet spirituality is an aspect of the experience of death and dying that often is overlooked at medical facilities. A chaplain may be called to a patient’s bedside at death, but that relationship should begin with a spiritual assessment at the time of the diagnosis of the terminal illness.

“I always ask, ‘what is your faith background?’ It is a very generic statement and it doesn’t give any indication of religion. People always know what I am talking about,” says Kent-Metteer. It’s important to find out where people get their spiritual support, she explains.

Supportive counseling for patients and family members from the social work department is provided at Deborah Heart & Lung Center in Browns Mills, NJ. “A lot of time is spent on support, just getting them to verbalize their fears and concerns and ask questions,” says **Michelle Goffney**, BSW, MSW, LCSW, director of social services at the medical facility.

At James Cancer Hospital, three mental health clinical specialists help patients cope with the issues facing them. One-on-one facilitation works best for the hospital’s Midwestern patient population, says Glass. Also, Glass sometimes gives patients and family members materials from Fort Wayne, IN-based Willowgreen Productions that help to bring meaning and purpose to the dying process.

One helpful book for family members is titled *One You Love is Dying: 12 Thoughts to Guide You*

At the end of life, if people are not practicing any spirituality at the time of their diagnosis, they usually go back to their roots. Even if they weren’t raised in a family that practiced any kind of religion or spiritual faith, they will often remember an uncle, grandmother, sister, neighbor, or friend who was spiritually influential. This influence can act as a source of comfort, bringing meaning and hope to the situation.

For support, terminally ill patients need people who represent their faith background to be there to reaffirm them, says Kent-Metteer. People often have doubts that God can accept them because they feel they have not been faithful or they are angry with God. “They need a trained chaplain to educate them on the facts of their own theology and to reassure them within the context of their own theology,” she says. Family members who are close to the patient experience the same sort of spiritual crisis and require the same type of counseling.

“It is important for patients to come to terms with their death and to figure out what their spiritual beliefs are. It makes a difference between a good death and a bad death,” says Kent-Metteer. Spiritual conflict and anger seem to affect physical reactions to pain levels, agitation, and anxiety, she explains. If the patient is at peace, the situation is better for the family as well as the patient. ■

*on Your Journey*. The book helps family members continue to enjoy a positive relationship with the dying patient in spite of their situation. **(For information on how to obtain this book, see Editor’s note at the end of this article.)**

Getting people to identify and express their needs is key. To aid in the process, City of Hope is implementing distress guidelines. At every clinic visit, patients will have an opportunity to fill out a self-rated scale that indicates their psychological level of distress, level of fatigue, and level of pain. “We want to help highlight what is important to talk about, and patients don’t always know they can talk to their doctors about these areas,” says Otis-Green.

The scale will be used to help people learn that these areas need to be addressed. If patients are experiencing despair, a counselor can work with them to address what is bothering them. Suffering

at the end of life is multidimensional. Most patients think health care workers are only interested in the physiological aspect of their suffering, not the spiritual, social, and psychological aspects.

Yet, good pain control should be the No. 1 goal for a terminally ill patient, because without it, social, psychological, and spiritual needs can't be met, says Glass.

For good pain control, patients need to learn to have better communication skills and higher expectations so that when their physician says, "How are you doing?" they don't automatically reply "fine," says Otis-Green. At City of Hope's pain service, patients are taught to provide details when describing their pain to their physician. Much of the education centers on giving the patient permission to "complain" because people have been taught to be stoic.

"We tell patients we are not really asking them to complain to their physician. We are asking them to give feedback," says Otis-Green. **(For more information on education surrounding pain medications, see article on p. 78.)**

The issues surrounding a terminally ill patient are quite different from those at the bedside of a patient on life support following an accident. When a patient is on life support, family members often are being asked to decide whether or not to terminate the support; this usually is a very difficult decision because most families have never talked about this topic with their loved one. To aid families in making this decision, James Cancer Hospital is in the process of creating a pamphlet with the current working title, "Letting a Loved One Go." The pamphlet is designed to help families make the decision about whether or not to withdraw life support.

Family members often don't understand the concept of withdrawing life support. Their image usually is one of pulling a plug, says Goffney. It's important to explain that decreasing ventilator support is a gradual process accompanied by measures to keep the patient comfortable with medications.

"Sudden death is the hardest because there is no restoration, no goodbyes," says **Karen Kent-Metteer**, MDiv, lead chaplain at City of Hope's National Medical Center Pastoral Care Services. There is no closure; no chance for any kind of forgiveness or reconciliation between family members; and no opportunity to come to terms with God and faith, she explains. **(For more information on how spirituality factors into end-of-life issues, see article on p. 75.)**

At the time of death, loved ones experience shock and disbelief, which is a natural set of reactions regardless of what culture a person is from, says Kent-Metteer. "The biggest spiritual issue at this time is their questioning of why God would allow such a thing to happen," she says.

Bereavement classes work well at these times because grief is something people hold inside. It is not resolved until it is effectively mourned. "Mourning takes place in a public context. Therefore, anyone who withdraws in their grief is at risk. In a bereavement group, they basically share, which is what mourning is all about," says Kent-Metteer.

*[Editor's note: The book One You Love is Dying: 12 Thoughts to Guide You on Your Journey by James E. Miller costs \$6.95 and can be ordered from Willowgreen Productions' Web site: [www.willowgreen.com](http://www.willowgreen.com). Miller, founder of Willowgreen Productions, designs resources and programs in the areas of life transition, illness, dying, loss and grief, caregiving, older age, and spirituality. For more information, contact: James E. Miller, Willowgreen Productions, 509 West Washington Blvd., Fort Wayne, IN 46802. Telephone: (219) 424-7916. Fax: (219) 466-3002.] ■*

## Instructions remove mystery from dying wishes

*Advance directives make choices clear*

Experts suggest that when people create an advance directive, they should provide more detailed information than is required by state law and expand on their wishes regarding how matters should be handled at the time of their death. That's why **Elaine Glass**, RN, MS, AOCN, clinical nurse specialist at James Cancer Hospital in Columbus, OH, wrote what she refers to as her "values history" form.

In this document, she states her beliefs on various medical procedures, her attitude about organ donation, her views on health, and thoughts about independence and control. "I comment about not wanting to be disabled and physically limited in my movement," she explains. It includes her overall attitude about life, her religious background, and her beliefs about God and heaven.

## SOURCES

For more information about education and support around end-of-life issues, contact:

- **Elaine Glass**, RN, MS, AOCN, Clinical Nurse Specialist, 004 James Cancer Hospital, 300 W. 10th Ave., Columbus, OH 43210-1240. Telephone: (614) 293-4553. Fax: (614) 293-6037.
- **Michelle Goffney**, BSW, MSW, LCSW, Director of Social Services, Deborah Heart & Lung Center, 200 Trenton Road, Browns Mills, NJ 08015. Telephone: (609) 893-1200, ext. 5301. Fax: (609) 893-5064. E-mail: GoffneyM@Deborah.org.
- **Karen Kent-Metteer**, MDiv, Lead Chaplain, City of Hope National Medical Center Pastoral Care Services, 1500 East Duarte Road, Duarte, CA 91010-3000. Telephone: (626) 359-8111, ext. 3317. Fax: (626) 930-5335. E-mail: kkent-metteer@coh.org.
- **Shirley Otis-Green**, ACSW, LCSW, Clinical Social Worker, Supportive Care and Palliative Medicine, City of Hope National Medical Center and Beckman Research Institute, 1500 East Duarte Road, Duarte, CA 91010-3000. Telephone: (626) 359-8111, ext. 2783. Fax: (626) 256-8798. E-mail: sotis-green@coh.org.

There are other ways to provide pertinent details within advance directives, says Glass. Several years ago, the *Journal of the American Society of Certified Life Underwriters* published guidelines for making end-of-life decisions in four situations:

- if I were in a coma or persistent vegetative state;
- if I were in a coma and might survive;
- if I had brain damage;
- if I had brain damage and a terminal illness vs. no terminal illness.

In each situation, several medical treatment options were offered, such as CPR, a ventilator, nutrition and hydration, surgery, chemotherapy, invasive tests, blood products, and pain medicine. Under each treatment option, people could mark one of the following four options:

- I would want.
- I want treatment tried; if no clear improvement, stop.
- I am undecided.
- I don't want.

Detailed instructions in writing remove any mysteries about the patient's dying wishes. "A lot of physicians are uncomfortable in trusting families to make decisions that aren't in writing, because they don't know if the family is just after their inheritance," says Glass. ■

## Descriptive language key in pain management

*Teach patients to convey symptoms to physician*

A good pain management program for any patient must be built on a sound assessment. Without the assessment, physicians might not be able to determine what kind of pain they are treating and which medication is best suited for relief of the pain. Therefore, patients need to be taught how to talk to their physician about pain.

"People need to be able to describe their pain, because pain that is caused from nerves may be described as a burning pain or a sharp shooting electric shock pain, whereas pain from a bone may be a dull, achy pain. Treatment for those two types of pain might be totally different," explains **Pamela Bennett**, BSN, RN, director of external affairs for the American Pain Foundation in Baltimore and an independent pain management consultant.

Other details that are important for determining the appropriate treatment include the location of the pain; if it is constant, or comes and goes; if it radiates or stays in one spot; when it started and if it has changed over time; if there are other symptoms associated with the pain, such as nausea; and what relieves the pain or makes the pain worse. Patients could keep diaries to track every detail about their pain to aid in discussions with their physicians.

Another important area of education is to teach patients how to advocate for themselves, says Bennett. "If the treatment is not working, patients need to be able to convey that to their provider. They need to know that they have a right to have their pain managed," she says.

In the third of a series of articles on medication education, *Patient Education Management* spoke to an expert at the American Pain Foundation in Baltimore to learn more about pain medications. We discuss what we learned about the importance of teaching patients how to describe pain to their physician for better treatment and how proper instruction about prescribed medications improves adherence for better pain management. Last month, we focused on Coumadin, a trademark for warfarin sodium, an anticoagulating drug. ■

# Keep caregivers in loop for terminal patients

*Understanding medications is vital to good care*

Many patients who are terminally ill suffer needlessly because of fears they have about taking pain medications. They often think that if they take a drug that relieves the pain they currently experience, they will build a tolerance and drugs won't be effective later when their pain becomes unbearable. They also have a fear of addiction.

Helping patients understand the difference between addiction, tolerance, and dependence is extremely helpful in this situation, says **Pamela Bennett**, BSN, RN, director of external affairs for the American Pain Foundation in Baltimore and an independent pain management consultant.

Dispelling patients' fears about pain medication is only one aspect of the education required during a terminal illness. Family members who are caring for the patient often play the role of

physician, pharmacist, and nurse because they provide 24-hour care for the patient if he or she is not hospitalized.

"They are placed in a situation where they must make choices and decisions they weren't trained to make," explains Bennett. For example, the patient may be very anxious and in pain, so the caregiver must decide whether to give the patient something for anxiety or something for pain. A health care system must provide education and support to family caregivers regarding pain medication necessary at the end of life, whether the patient has end-stage cardiac disease, renal disease, chronic obstructive pulmonary disease, cancer, or AIDS, says Bennett.

Caregivers often believe that their loved one will not be able to experience any meaningful time with family and friends when they are on pain medications. It's an area in which education is needed, says Bennett. "There are a variety of adjunctive types of medication, so even if patients are on high doses of opioids there are still other things we can do that gives them that quality of life," she explains. ■

This education would include teaching patients how to advocate for good pain management while in the hospital, even to the point of contacting the patient representative if the health care team isn't listening. The goal is to get good pain relief, not to get people in trouble, explains Bennett.

Terminally ill patients and their family members have special issues regarding pain medication education that must be addressed. **(For information on the special needs of terminally ill patients, see article above.)**

There are many barriers to good pain management, but one of the most common is misinformation about opioids. "Our society as a whole tends to be opioid-phobic. We have done a good job at teaching people how to 'just say no to drugs,' but not at teaching them when to say yes and why," says Bennett.

Patients who are at an adequate comfort level can have good function and heal faster, yet often they are not taught that. They also are not taught the difference between addiction, dependence, and tolerance, and their fears hamper their adherence to a medication regimen.

Patients also need adequate information about the drug they are taking so they can understand

how long it might take before the medication begins to work and will not assume it is ineffective. If they are given a medication that is usually used for another condition such as seizures, they need to know why they are being given an adjunctive medication so they won't be surprised by the knowledge and quit taking the drug.

Education on pain management must include information on complementary therapies such as hypnosis, because what works for one person won't necessarily work for another. This is especially important when people suffer from chronic pain. "It's important to tell people that there is a lot of needless suffering going on and there are things that can be helpful; it's not necessarily just a single pill," says Bennett. **(For information on complementary therapies, see Editor's note at the end of this article.)**

It's important to put tools in patients' hands so they have the best information when they talk to their health care provider. This would include information on how to discuss pain, factors that contribute to pain such as psychosocial and spiritual issues, and how to obtain financial aid to pay for expensive pain medications. **(For more information on resources, see article on p. 79.)**

[Editor's note: Patient Education Management frequently runs articles on complementary therapies, many of which help with pain management. Past articles have addressed therapeutic touch (April 1999), massage therapy (May 1999), music therapy (June 1999), acupuncture (July 1999), acupressure (October 1999), imagery and visualization (February 2000), and reflexology (May 2000).] ■

## Tools for patient pain management

### *Good information strengthens discussions*

A good program on pain management should include tools that empower the patient, says **Pamela Bennett**, BSN, RN, director of external affairs for the American Pain Foundation in Baltimore and an independent pain management consultant. There are many resources available, including Web sites, pamphlets, and books.

For instance, Roxane Laboratories in Columbus, OH, has a packet of palliative care educational resources. The packet includes information printed by the company as well as materials from other sources. Company resources include a pain assessment ruler, a symptom diary, and a booklet on how to maintain quality of life through palliative care. Roxane Laboratories can be contacted at P.O. Box 16532, Columbus, OH 43216. Telephone: (614) 272-4787.

Booklets from other sources include the *Patient Guide to Managing Cancer Pain*, published by the Agency for Healthcare Research and Quality (AHRQ) in Rockville, MD, and *Principles of Analgesic Use in the Treatment of Acute Pain and Cancer Pain*, published by the American Pain Society in Glenview, IL.

The book *Pain: Clinical Manual*, written by Margo McCaffery and published by Mosby-Year Book in St. Louis, is for health care providers, but it has patient information that can be copied, says Bennett. It is available from Amazon.com (www.amazon.com) for \$39.95.

The American Pain Foundation Web site (www.painfoundation.org) contains a wealth of information. It addresses disease-specific pain, such as that caused by cancer, arthritis, or back problems; pain management issues; and pain medications. It also provides financial information on how low-income people can get pain medications at no cost or low

## SOURCES

For more information on educating patients about pain medication, contact:

- **Pamela Bennett**, BSN, RN, Director of External Affairs, American Pain Foundation, 111 S. Calvert St., Suite 2700, Baltimore, MD 21202. Telephone: (410) 385-5276. Fax: (410) 385-1832. Web site: www.painfoundation.org.

cost. A pain diary provides a way for patients to track pain so they will be armed with vital facts the next time they discuss pain management with their physician.

To help patients advocate for better pain management, health educators can obtain information on cancer pain and acute pain management by logging onto the AHRQ Web site (www.ahrq.gov). ■

## Caregivers' burden grows with impending death

### *Education must address psychosocial aspects*

Many terminally ill patients die at home with family members in attendance. As a result, family caregivers must learn about the physical, psychological, and spiritual aspects of the dying process at the same time they are struggling to come to terms with the situation themselves. At these times, education and support must be ongoing, with health care workers tailoring information to fit each family's needs.

Time must be spent determining how much the family members know. They often have a lot of misinformation that must be corrected, says **Susan Prather**, RN, MA, nurse consultant for United Hospice Inc. in Lilburn, GA. For example, the caregiver may be reluctant to give the patient the pain

Last month, *Patient Education Management* launched a series on educating family caregivers with an article on caregivers of patients with Alzheimer's disease. This month, we focus on caring for a terminally ill patient. There are many physical and psychosocial aspects of the job that must be addressed in the education process.

medication he or she needs for fear that there won't be anything to control the pain if it gets worse later. "A lot of effort must be put into re-education, because people pick up misinformation from neighbors and friends," she explains.

There are many psychosocial issues for the family to address. For example, patients are not only losing their lives; as they become sicker, they often lose their ability to do the things they love, such as a favorite hobby. They may have already had to give up their job, and they can no longer drive. "We try to find things that are purposeful they can do and feel a sense of accomplishment, such as organizing photos in a collection," says **Jim Nash**, RN, a hospice nurse and Webmaster at Hospice of North Central Florida in Gainesville.

Because patients lose control of so many aspects of their lives, they may become very demanding about the small details over which they still have some control. For example, the caregiver may set a glass on the table, and the patient will insist it should be placed someplace else. It is helpful for the caregiver to understand the motivation behind such demands.

Being a caregiver for a terminal patient is very challenging. This means respite time is critical for the family. Volunteers or other family members should be asked to give the caregivers a break by watching the patient for them. "It is easy for a caregiver's world to shrink to the point where he or she is just caring for the person who is dying and there is no time or energy for anything else," says Nash.

As death becomes more imminent, the caregiver may not want to leave the patient's bedside. At these times, volunteers can get groceries or take care of other daily tasks.

Volunteers also can help with the isolation the patient sometimes feels if friends no longer stop by because they feel uncomfortable around a person with a terminal illness, says Prather.

One of the most difficult parts of the education is preparing the caregiver for the actual dying process. "It is important for caregivers to know the signs and symptoms of approaching death so they will know if something is an emergency or is to be expected," says Nash. Preparation takes some of the anxiety out of the situation. **(For more information on the signs and symptoms of approaching death, see Editor's note at the end of this article.)**

There also are comfort measures that patients can learn, says Nash. For example, people near death tend to sleep a lot and sometimes don't even respond to stimuli. Yet they usually can still hear, and family members can speak softly and

## SOURCES

For more information about education and support for family caregivers of terminally ill patients, contact:

- **Jim Nash**, RN, Webmaster, Hospice of North Central Florida, 4200 Northwest 90th Blvd., Gainesville, FL 32606. Telephone: (352) 378-2121. Fax: (352) 379-6291. E-mail: [healing@hospicecarees.com](mailto:healing@hospicecarees.com).
- **Susan Prather**, RN, MA, Nurse Consultant, United Hospice Incorporated, 3945 Lawrenceville Highway, Lilburn, GA 30047. Telephone: (770) 925-4788. Fax: (770) 925-0922. E-mail: [sprather@uhs-pruitt.com](mailto:sprather@uhs-pruitt.com).

naturally to them and reassure them. Also, patients may keep their eyes open to the point of drying out unless the caregiver administers artificial tears, or they may keep their mouths open constantly, requiring the caregiver to learn about and administer mouth care.

Repetition is important when teaching about the signs and symptoms of dying, for it is a difficult topic for the family members, says Prather. It's important to provide the information in several different ways. "We need to provide the information over and over, because people are at different stages of their acceptance of the illness," she explains.

More frequent visits from the visiting nurse near the time of death are important, because caregivers have a lot of questions and need more support, says Nash.

*(Editor's note: For a detailed description of the signs and symptoms of approaching death, visit the Hospice of North Central Florida's Web site at [www.hospice-cares.com](http://www.hospice-cares.com).)* ■

## Misconceptions hamper organ donations

*Education can dispel potential donors' myths*

Every day, an average of 16 people die waiting for an organ transplant, according to the United Network for Organ Sharing (UNOS) in Richmond, VA. Yet, education could whittle down the waiting list of 70,000 and help save lives.

Unfortunately, misconceptions abound regarding organ donation. Many people believe that the pool for organ donors is large, yet the waiting list is much larger compared to willing donors, says **Bob Spieldenner**, a spokesman for UNOS.

Each year, about 20,000 people are declared brain dead at medical facilities due to cerebral stroke, a blunt trauma to the head in an accident, or a gunshot wound. From that pool of potential donors, many have a negative medical history, such as being HIV-positive, and are not potential candidates. Of those candidates, only about 5,000 become donors.

The public holds many misconceptions that also help keep the number low. A well-targeted education program, however, could dispel some of the misunderstandings, which include:

- **Signing a donor card is all that is needed.**

In all states except Pennsylvania, next of kin must consent to the organ donation, regardless of whether or not the victim signed a donor card or stated his or her wishes on a driver's license. "Many think that just putting their willingness to be a donor on their driver's license is enough, but it is not. They must have a family discussion around it so there is no doubt," says Spieldenner.

People need to think about organ donation when they are healthy and active, because the ideal candidate is a young healthy individual who has sustained a life-threatening injury, says **June Hinkle**, RN, MSN, CNP, program manager for bereavement services at The Ohio State University Medical Center in Columbus. Family members are approached at a very difficult time; if there has been no discussion on the matter, the decision is very difficult.

- **Brain death isn't the same as legal death.**

The concept of brain death often is introduced to family members at the time they are approached about possible organ donation. "Often, they have never heard that a person can be declared brain dead, and they think they have to make the decision to stop the ventilator. They don't understand that it is a legal death," says Hinkle. People need to have an understanding of brain death well in advance of a tragedy.

Although the criteria are different in each state, in order for a person to be declared brain dead, he or she can have no reflexes such as blinking, coughing, and gagging; nor can the patient be able to breathe without a ventilator. Once the oxygen is removed, the heart will stop beating because the brain stem is not working, depriving the body of a neurological stimulus to breathe, explains Hinkle. Even with a ventilator, it doesn't take long after brain death for the heart to quit beating.

- **Potential donors will not receive the same life-saving measures as others.**

Many people fear that if they declare themselves a potential donor on their driver's license or a donor card, health care workers will not do everything possible to save their life. People need to understand that such an assumption is false, says Spieldenner. Emergency workers always do whatever they can to save someone, and it is only after someone is declared brain dead that organ donation is considered and the family is approached and permission is requested.

- **Celebrities and rich people receive preferential transplant status.**

The waiting list is totally blind to wealth, celebrity status, race, and religion. A transplant recipient is basically a number on a list, and the sickest people get the higher priority, says Spieldenner. The organ donor must have a compatible blood type with the recipient, and with kidney transplants, there must be a degree of genetic match.

Health fairs are a good venue for organ donation education, as are health classes within high schools, says Hinkle. High school health classes are an especially good place to begin discussing and why a person might want to become an organ donor, because victims in this age group are often good candidates for organ donation if they should happen to be declared brain dead.

Discussing the concept of brain death is always important. "Students can be taught how people are declared dead and learn that it is not just when the heart quits beating but when the brain quits working," says Hinkle. The organ procurement organization in the region where the medical center is located is a good resource for educational materials. **(For more information on where to find educational materials, see Editor's note at the end of this article.)**

Although tissue donation takes a back seat to organ donation because it is a life-enhancing procedure rather than a life-saving procedure, people should receive education surrounding it

## SOURCES

For more information on organ donation, contact:

- **June Hinkle**, RN, MSN, CNP, Program Manager for Bereavement Services, The Ohio State University Medical Center, 168 Doan Hall, 410 West 10th Ave., Columbus, OH 43210. Telephone: (614) 293-8505. Fax: (614) 293-6200. E-mail: hinkle-2@medctr.osu.edu.
- **Bob Spieldenner**, United Network for Organ Sharing, 1100 Boulders Parkway, Suite 500, Richmond, VA 23225. Telephone: (804) 327-1432.

as well, says Hinkle. Skin can be used for burn victims. Cancer patients often have diseased bones removed and a bone graft rather than a full amputation. "You can actually procure tissue up to 12 hours after someone dies, so you have a little more time to discuss tissue donation," says Hinkle.

*[Editor's note: The Coalition on Donation provides educational materials on organ donation, including a brochure titled "Donate Life for 13 Cents," which explains the need to discuss the decision to become an organ donor with family members. Posters dispelling many of the myths surrounding organ donation are also available for 50 cents each. For more information or to order, contact: Coalition on Donation, 1100 Boulders Parkway, Suite 700, Richmond, VA 23225. Telephone: (804) 327-1447. Fax: (804) 323-7343. Web site: [www.shareyourlife.org](http://www.shareyourlife.org).] ■*

## Vision problems surfacing around computer work

*Solutions are either optometric or environmental*

Computer vision syndrome is a health problem that surfaced in the 1990s as computer use became prevalent in the workplace and home. In the year 2000, it is becoming a common complaint.

It's difficult to know exactly how many people suffer from computer vision syndrome, but a survey by an optical company found that 43% of the people who spend four or more hours a day working at a computer had symptoms. In another survey, 60 million people said they suffered from

From time to time, new opportunities for education arise in health care. They may be brought to the forefront by media attention or simply arise by patient demand. However, they aren't your usual health care topics that are routinely covered at medical centers. At such times, we will provide information on these "out-of-the-box" topics. In this article, we present information on computer vision syndrome, an eye and vision problem directly related to technology.

eyestrain, eye fatigue, or glare-related headaches while using their computer.

According to the St. Louis-based American Optometric Association, eye and vision problems are the health-related problem most frequently experienced by people who work at a video display terminal. "There are probably 100 million computers in use now, and eyes by far are the greatest source of problems for computer users," says **Kent M. Daum**, OD, PhD, associate professor of optometry in the School of Optometry at the University of Alabama at Birmingham.

The symptoms for computer vision syndrome are eyestrain, headaches, eye fatigue, blurred vision, dry, irritated eyes, and back and neck ache. "Most of these symptoms could be caused by an underlying vision condition that needs correction, or they could be caused by something wrong in the work environment. Very often, it is a combination of the two," says **James Sheedy**, OD, PhD, a clinical professor at the University of California, Berkeley School of Optometry. In the majority of the cases, proper intervention can relieve the symptoms, he says.

The good news is that the problem does not cause any permanent eye damage. "It's kind of like having a stone in your shoe; you can walk with it, but it is a nuisance," says **Robert Newcomb**, OD, director of clinic at The Ohio State University College of Optometry in Columbus. The bad news is that it can hamper work performance.

The No. 1 reason to prevent or reverse computer vision syndrome is that people feel better, says Sheedy. The second reason is that they will perform better. While permanent eye damage may not occur, an awkward posture at the computer due to vision problems could contribute to long-term back and neck problems, he says.

### *Optometric vs. environmental*

People experiencing any of the symptoms for computer vision syndrome should see an optometrist to determine if the symptoms are being caused by optometric problems or environmental problems. It could be that their eyes are out of focus and they need glasses to see clearly at a short distance, or they could have ocular alignment problems, in which the right eye doesn't point at exactly the same location as the left eye, explains Newcomb.

Dryness of the cornea often occurs when people become interested in their computer work

and their blink rate goes down or they do not blink completely.

If a person is not under good regular eye care, he or she should make an appointment with an optometrist. Otherwise, the environment would be the place to begin an investigation of the problem.

One of the most common environmental culprits is lighting, says Sheedy. Most work sites have bright overhead lights or bright open windows. Because people look at a computer screen horizontally as opposed to looking down at the desk, the glare is in their field of vision and causes discomfort. **(To learn how to test for environmental problems, see article on p. 84.)**

Other environmental factors that could result in computer vision syndrome symptoms are lack of air currents in high-rise office buildings and a computer monitor that is too high or is near a window so there is reflective light. "I ask if they experience the symptom at home as well as at the office when working at a computer screen. An ocular problem is going to occur at home as well as at the office," says Newcomb. **(To learn the recommended components of an eye examination for computer vision syndrome, see the Editor's note at the end of this article.)**

When computer users wear their reading glasses at a computer terminal, they often must get in an awkward position to see because reading glasses are designed for viewing material at a distance of about 16 inches and a viewing angle of 25 to 30 degrees. The computer screen is typically viewed at a distance of 24 inches and at an angle of 10 to 20 degrees. "People often get in an awkward position to see, which leads to neck or back problems," says Sheedy.

People will inch closer to the screen and tip their chin up to see what is going on, and that will cause back and shoulder problems, agrees Daum. "Special glasses for the computer are really ideal, because they allow you to get a natural distance of what the computer is designed for," he explains.

Glasses can be designed to help with more than just focusing or ocular alignment; they also can help with glare. A tint, anti-reflection coating, or ultraviolet radiation filter can be put on the lenses, says Newcomb.

Moving the computer away from the window or angling the screen also can eliminate glare, as can turning off some of the fluorescent lights in an office, says Daum. For minor problems with dry eyes, computer users can purchase artificial tears at a drugstore.

Prime candidates for computer vision syndrome are those who spend four to five hours on a computer each day, says Newcomb. However, it is not only related to the amount of time spent on a computer, because tolerance levels are different. Some people can only work at a visually intensive task on a computer for 10 to 15 minutes, while others can work 12 hours a day, says Sheedy. "Everyone has their point at which their visual system starts rebelling a little bit at the load they are putting on it," he explains.

*[Editor's note: The American Optometric Association offers a vision fax sheet titled "Recommended Components of an Eye/Vision Examination for Video Display Terminal Operators." To obtain a copy, call the association's VisionFax Information-on-Demand Service at (800) 365-2219, ext. 329. Request document 0004.]* ■

Patient Education Management™ (ISSN 1087-0296) is published monthly by American Health Consultants®, 3525 Piedmont Road, N.E., Building Six, Suite 400, Atlanta, GA 30305. Telephone: (404) 262-7436. Periodical postage paid at Atlanta, GA 30304. POSTMASTER: Send address changes to Patient Education Management™, P.O. Box 740059, Atlanta, GA 30374.

#### Subscriber Information

Customer Service: (800) 688-2421 or fax (800) 284-3291. Hours of operation: 8:30 a.m.-6:00 p.m. Monday-Thursday; 8:30 a.m.-4:30 p.m. Friday EST. E-mail: customerservice@ahcpub.com. World Wide Web: www.ahcpub.com.

Subscription rates: U.S.A., one year (12 issues), \$339. Approximately 18 nursing contact hours annually, \$389. Outside U.S., add \$30 per year, total prepaid in U.S. funds. One to nine additional copies, \$271 per year; 10 or more additional copies, \$203 per year. Call for more details. Missing issues will be fulfilled by customer service free of charge when contacted within 1 month of the missing issue date. Back issues, when available, are \$57 each. (GST registration number R128870672.)

Photocopying: No part of this newsletter may be reproduced in any form or incorporated into any information retrieval system without the written permission of the copyright owner. For reprint permission, please contact American Health Consultants®, Address: P.O. Box 740056, Atlanta, GA 30374. Telephone: (800) 688-2421 or (404) 262-5491.

This continuing education offering is sponsored by American Health Consultants®, which is accredited as a provider of continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation. Provider approved by the California Board of Registered Nursing, provider number CEP 10864, for approximately 18 nursing contact hours.

Opinions expressed are not necessarily those of this publication. Mention of products or services does not constitute endorsement. Clinical, legal, tax, and other comments are offered for general guidance only; professional counsel should be sought for specific situations.

Editor: Susan Cort Johnson, (916) 362-0133.  
Group Publisher: Brenda Mooney, (404) 262-5403,  
(brenda.mooney@medec.com).  
Editorial Group Head: Leslie Coplin, (404) 262-  
5534, (leslie.coplin@medec.com).  
Managing Editor: Kevin New, (404) 262-5467,  
(kevin.new@medec.com).  
Senior Production Editor: Brent Winter,  
(404) 262-5401.

#### Editorial Questions

For questions or comments, call Susan Cort Johnson at (916) 362-0133.

Copyright © 2000 by American Health Consultants®. Patient Education Management™ is a trademark of American Health Consultants®. The trademark Patient Education Management™ is used herein under license. All rights reserved.

# Take the test for environmental problems

*Block glare, reflection to prevent vision problems*

Several easy tests can help people determine if glare or a reflection on the computer screen is contributing to a set of eye and vision problems known as computer vision syndrome, says **James Sheedy, OD, PhD**, a clinical professor at the University of California, Berkeley School of Optometry.

To determine if glare from a window or overhead lights is a problem, he recommends that people use their hand as a visor to block the source of the light. Most people notice an immediate sense of improvement if glare is a problem. To remedy discomfort from glare, draw the blinds, turn the light out, rotate the workstation, or wear a visor.

Reflections on the computer screen make it difficult to see the image, contributing to eyestrain. To test for reflections on the screen, use a file folder to block the source of light, whether from a window or an overhead light. If the image is clearer, there is a reflection problem. To get rid of reflection problems, purchase an anti-reflection filter for the computer screen, advises Sheedy.

For additional tests, visit Sheedy's ergonomics site on the Internet ([www.DoctorErgo.com](http://www.DoctorErgo.com)).

Sheedy's Web site has a series of tests users can take to find out the most likely source of their problem. ■

## SOURCES

For more information on computer vision syndrome, contact:

- **Kent M. Daum, OD, PhD**, Associate Professor of Optometry, School of Optometry, University of Alabama at Birmingham, Birmingham, AL 35294-0010. Telephone: (205) 934-6763. Fax: (205) 934-6758. E-mail: [Kdaum@icare.opt.uab.edu](mailto:Kdaum@icare.opt.uab.edu).
- **Robert Newcomb, OD**, Director of Clinic, The Ohio State University College of Optometry, 338 West 10th Ave, Columbus, OH 43210. Telephone: (614) 292-6019. Fax: (614) 688-5603. E-mail: [newcomb.2@osu.edu](mailto:newcomb.2@osu.edu).
- **James Sheedy, OD, PhD**, Clinical Professor, UC Berkeley School of Optometry, 136 Hillcroft Way, Walnut Creek, CA 94596. Telephone: (925) 256-1855. Fax: (925) 256-1857. E-mail: [JS@Dr.Sheedy.com](mailto:JS@Dr.Sheedy.com). World Wide Web: [www.DrSheedy.com](http://www.DrSheedy.com).

## EDITORIAL ADVISORY BOARD

Consulting Editor: **Sandra Cornett, RN, PhD**  
Program Manager for Consumer Health Education  
The Ohio State University Medical Center  
Columbus, OH

**Kay Ball, RN, CNOR, FAAN**  
Perioperative Consultant/  
Educator  
K&D Medical  
Lewis Center, OH

**Fran London, MS, RN**  
Health Education Specialist  
The Emily Center  
Phoenix Children's Hospital  
Phoenix

**Kate Lorig, RN, DrPH**  
Associate Professor/Director  
Stanford Patient Education  
Research Center  
Stanford University School of  
Medicine  
Palo Alto, CA

**Carol Maller, RN, MS, CHES**  
Patient Education  
Coordinator  
New Mexico VA  
Health Care System  
Albuquerque, NM

**Annette Mercurio,  
MPH, CHES**  
Director  
Health Education Services  
City of Hope National  
Medical Center  
Duarte, CA

**Magdalyn Patyk, MS, RN**  
Advanced Practice Nurse,  
Patient Education  
Nursing Development  
Northwestern Memorial  
Hospital  
Chicago

**Michele Knoll Puzas,  
RNC, MHPE**  
Pediatric Nurse Specialist  
Michael Reese Hospital &  
Medical Center  
Chicago

**Dorothy A. Ruzicki, PhD, RN**  
Director, Educational Services  
Sacred Heart Medical Center  
Spokane, WA

**Mary Szczepanik, BSN**  
Clinical Program Coordinator  
Grant-Riverside Methodist  
Hospital  
Columbus, OH

**Louise Villejo, MPH, CHES**  
Director, Patient Education  
Office  
University of Texas MD  
Anderson Cancer Center  
Houston

**Nancy Atmosphera-Walch,  
RN, MPH, CDE, CHES**  
Coordinator, Health  
Education and Wellness  
Queen's Medical Center  
Honolulu

## CE objectives

After reading *Patient Education Management*, health professionals will be able to:

- identify management, clinical, educational, and financial issues relevant to patient education;
- explain how those issues impact health care educators and patients;
- describe practical ways to solve problems that care providers commonly encounter in their daily activities;
- develop or adapt patient education programs based on existing programs from other facilities. ■



## Teens prove vulnerable to the 'virtues' of cigarettes

*The proof is in the numbers!*

The facts are alarming: According to the New York City-based American Lung Association, more than 4,800 U.S. teen-agers ages 11 to 17 experiment with cigarettes each day. About 2,000 of these first-time smokers form the habit of smoking, totaling about 720,000 new teen smokers annually. Currently, about 4.5 million adolescents smoke.

Research shows that most teens first light up with a friend who already smokes. Advertising provides incentive by emphasizing youthful vigor, sexual attraction, and themes of independence, all of which are important to teens. The American Lung Association also reports that the earlier someone begins smoking, the more likely he or she is to develop severe levels of nicotine addiction.

About one-third of the teens who start smoking each year will die of smoking-related illnesses. Teens who smoke experience health problems such as cough and phlegm production, more respiratory illnesses, a poor lipid profile, and an increased potential for retardation in the rate of lung growth and the level of maximum lung function.

Tobacco is known as a gateway drug. According to a 1994 report by the office of the Surgeon General, teens who had smoked in the past 30 days were three times more likely to use alcohol, eight times more likely to smoke marijuana, and 22 times more likely to use cocaine within that time period than teens who did not smoke.

In this issue of *Focus on Pediatrics*, we profile two Ohio programs that are employing unusual methods to prevent teen-age tobacco use. One focuses on improving awareness of cigarette advertising that targets children; the second is using legislative means to prevent teen smoking. ■

## Cigarette ads focus of prevention program

*Effort made to raise awareness about ads' influence*

Just how persuasive are cigarette ads? Research has shown that cigarette ads are more likely than peer pressure to persuade kids to smoke, says **Julia Spears**, MPA, coordinator of the Southside Initiative in Columbus, OH. That's why this neighborhood organization, formed to reduce the use of alcohol, tobacco, and hard drugs among community teens, participates in Operation Storefront.

"In tobacco prevention, there is a lot we want to focus on," Spears notes. "One method is a personal development program to give young people the skills they need to be confident and resistant to tobacco use. In addition, we want to look at the community as a whole and see how it contributes or helps to insulate young people from tobacco messages."

Operation Storefront is a community research project in which stores in the Southside neighborhood are surveyed to determine the extent of their participation in cigarette promotions that influence young people. To determine the influence of those promotions, surveyors count the number and placement of tobacco advertisements in each store.

Every promotional item is assessed, from posters to clocks with a cigarette logo. One red flag for surveyors is when the product or ad is located next to candy; another is when the ad or product is located at a height of three feet or below. "Those two spots, next to candy or three feet or below, are really targeted at children," says Spears.

To complete the project, the Southside Initiative partnered with a class called Career Connection at the local high school. Thirty-two students were trained and sent to 50 stores that had been identified as selling tobacco products. Students asked permission to survey the store, explaining to merchants that they were conducting a research project on advertisements. When given permission,

### SOURCES

For more information about the teen smoking prevention programs at the Southside Initiative, contact:

- **Julie Spears**, MPA, Coordinator, Southside Initiative, 1086 Oakwood Ave., Columbus, OH 43206. Telephone: (614) 445-0618. Fax: (614) 449-6433. E-mail: [jspears@netexp.net](mailto:jspears@netexp.net).

the student stood in one location, carefully looking for tobacco ads and products and marking their locations on the survey.

Following each survey, a letter was sent to the store manager explaining the results. The letter gave merchants information on why they need to be sensitive to tobacco marketing practices that might influence children. In the process, the students who conducted the survey also became more aware of the amount of cigarette advertising in the community geared towards teens.

About 80% of the stores had either products or ads next to candy or at a height of three feet or below. The survey provided a baseline against which to measure progress each year, says Spears.

“Most people think it is peer pressure that gets kids to smoke, but in reality it is the subliminal messages they take for granted every time they go in and out of the corner store that influences a child on whether or not it is okay to smoke,” says Spears.

### ***High school role models give classes***

In addition to Operation Storefront, the Southside Initiative uses a couple of other tactics in their efforts to prevent teens from smoking. In conjunction with the Atlanta-based American Cancer Society and the Columbus Tobacco Free Collaborative, the Southside Initiative has implemented the STAMP program (Stay Tobacco Free Athletic Mentoring Program). This program trains high school athletes and other outstanding students who are viewed as role models to provide smoking prevention classes for sixth-graders.

The high school students conduct four 45-minute sessions that are skills-based, fun, and interactive. One session covers the reasons people smoke and the health risks associated with it; another focuses on peer pressure and how to resist cigarettes; a third session covers the fact that not everyone uses tobacco; and a fourth session teaches teens how to be media-savvy by assessing the message a cigarette ad conveys.

The Teen Institute, the Southside Initiative's third tobacco prevention project, is an after-school drug prevention program that is really a social club, although some tobacco prevention activities take place.

“We are trying to build a lot of different opportunities for students to take a leadership role in tobacco prevention. We also hire students to work in our office, and they are the student leaders in some of the programs,” says Spears. ■

## **Bill aims to change legal smoking age to 21**

*Proponents hope to keep teens smoke-free*

If a person reaches the age of 21 without smoking, the likelihood that he or she will start is remote. In fact, if someone does not begin addictive smoking by the age of 22, the odds are more than 10 to one that he or she won't start. Yet, not one state has moved the legal age for smoking to 21. Those supporting the Tobacco to 21 initiative hope Ohio will do so by the year 2001.

**Rob Crane**, MD, assistant professor of family medicine at The Ohio State University in Columbus, has been working hard to get the bill passed since its introduction in 1997. The 35 professional, registered lobbyists in Ohio representing the tobacco industry make it an uphill battle.

It seems like an obvious piece of the teen smoking prevention puzzle, Crane says. “By raising the age to 21, we rely on what we saw happen as a social experiment with alcohol,” he explains. After the voting age was lowered to 18, many states thought it appropriate to lower the drinking age as well. In a few years, all 18 states that had lowered the drinking age saw dramatic upswings in traffic crashes and fatalities caused by drinking drivers under the age of 21.

Tobacco to 21 would raise the legal smoking age to 21 and would require retailers to purchase tobacco licenses from their local health departments, who would use the license revenue to make compliance checks on stores.

While weekend or first-time smokers may ask friends who are over 21 to buy cigarettes for them, those who smoke more than 10 cigarettes a day usually buy their own at stores that are not compliant with the law. “Having someone buy you a pack of cigarettes a day is not that easy. That is why we think Tobacco to 21 will work better for cigarettes than alcohol because most alcohol purchases are made for intermittent use,” says Crane. ■

### **SOURCES**

For more information about Tobacco to 21, contact:

- **Rob Crane**, MD, Assistant Professor of Family Medicine, The Ohio State University Department of Family Medicine, 5600 Dublin Road, Columbus, OH 43017. Telephone: (614) 766-2211. Fax: (614) 766-6644. E-mail: [cran.17@osu.edu](mailto:cran.17@osu.edu).