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No one is immune: Outpatient surgery will feel impact of smallpox vaccine

You could face rescheduled surgeries, sick staff, and converted facility

The recently announced national smallpox vaccination plan will have a significant impact on your same-day surgery program, whether you work in a hospital, surgery center, or office setting. You may have vaccinated patients who reschedule surgery, vaccinated staff who need to avoid spreading the vaccination virus and may be out of work due to side effects, and staff and managers who may be asked to serve on smallpox response teams. In fact, your facility might be converted into a smallpox vaccination site!

In terms of the specific impact that the smallpox vaccine will have on individual same-day surgery programs, many questions remain unanswered; it has been nearly 25 years since the smallpox vaccination was suspended in the United States, says **Donald E. Fry, MD, FACS**, professor and chairman of the Department of Surgery at the University of New Mexico School of Medicine in Albuquerque and chair of the Governors' Committee on Bloodborne Infection and Environmental Risk for the American College of Surgeons.

EXECUTIVE SUMMARY

The national smallpox vaccination plan is expected to have an impact on hospital-based surgery programs, surgery centers, and office-based surgery practices.

- People who have the vaccine should wait at least until the vaccination site has healed, up to three weeks after the vaccination, before having elective surgery, some sources say.
- Many same-day surgery providers will be vaccinated in Phase 2. Staff who have received the vaccine can continue working but should use gauze and a semipermeable dressing over the site and wear long sleeves with a cuff (such as a warm-up jacket), some sources say. Many staff members may suffer mild reactions that prevent them from working.
- Your facility may be converted to a vaccination site for the general public.

"Outpatient surgery was truly in its infancy at the time that smallpox vaccination was stopped," Fry says.

This much is known: Many same-day surgery providers will be offered the smallpox vaccine in Phase 2 of a national smallpox vaccination plan announced Dec. 13 by President Bush. At press time, the first phase of the voluntary plan had begun to inoculate about 1 million military personnel, people who work in hospital emergency departments, and those on special smallpox response teams.

The second phase is likely to include offering the vaccine to about 10 million people including same-day surgery staff in hospitals, same-day

surgery centers, and office-based settings, according to reports from the American Medical Association and other groups. The second phase will include police, firefighters, and other health professionals. While plans are not finalized, this phase is expected to immediately follow Phase 1 and be completed within 45 to 90 days.

Adults who want the vaccine can sign up for clinical trials now under way. By late spring or early summer 2003, the government will make the vaccine available to the general public on a voluntary basis.

People who have had the vaccine should wait until the vaccination site has healed before having elective surgery, says **Douglas R. Bacon**, MD, associate professor of anesthesiology and history of medicine at the Mayo Clinic in Rochester, MN. "I would suspect that the immune system will react better without the confounding stresses of surgery and anesthesia," Bacon says.

Another potential problem is that vaccinees may suffer side effects, says **Joan Blanchard**, RN, MS, MSS, CNOR, CIC, perioperative nursing specialist at the Association of periOperative Registered Nurses in Denver. Vaccinees can move the vaccine virus to another spot simply by touching, she says.

"If the vaccine virus is in more than one area, they would not be [having] surgery, because that would put them at risk and other people at risk," Blanchard says.

According to the Centers for Disease Control and Prevention (CDC), it takes 2½ to three weeks for the scab to detach and a well-formed scar to remain.

Others are more conservative in their estimates of how long patients should wait to have outpatient surgery. The vaccine for smallpox is infection with the virus vaccinia, Fry says.

"In surgery, it would generally not be advisable to perform an operation when a patient has a concurrent infection," he says.

For example, if a patient had a urinary tract infection or a paronychia of the finger, infection rates at the surgical site would be greater than would ordinarily be expected, he says. "Thus, my recommendation would be that elective outpatient operations should be postponed for four to six weeks following smallpox vaccination."

Some hospital-based same-day surgery staff already are being asked to serve on special smallpox response teams that will be inoculated in the first phase. Managers, surgeons, and anesthesiologists are most likely to be asked. Regardless of when it happens, same-day surgery staff who

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For resources on smallpox, go to these web sites:

- **Centers for Disease Control and Prevention.** Web: www.cdc.gov/smallpox. This site offers resources for clinicians such as an adverse events training module.
- **Department of Health and Human Services.** Web: www.smallpox.gov. This site answers questions about smallpox and the president's vaccination plan. This site may be helpful for those receiving the vaccination or debating getting the inoculation.

received the vaccine can continue working but must take extra steps to ensure that they don't spread the vaccine virus.

"The important part is to use gauze and a semipermeable dressing over that vaccination site, and long sleeves with a cuff," Blanchard says. A warm-up jacket, for example, is ideal, she says.

Other tips for your staff from the Department of Health and Human Services: Don't touch the vaccination site or materials that have touched it. If you do touch the site or materials that have touched it by accident, clean your hands right away. Also, don't let others touch the vaccination site or materials that touched it.

There's no reason staff who have been vaccinated shouldn't continue working, provided they don't suffer side effects, sources say.

"I would have no concerns about staff transmitting the virus to immunocompromised patients assuming that the vaccination site was covered," Bacon says.

Others are a little less certain. "If you've been vaccinated, can you treat a patient who is immunosuppressed or a transplant patient? We don't know the answer to that yet," says **J. Wayne Meredith**, MD, FACS, chairman of the Department of Surgery at Wake Forest University School of Medicine in Winston-Salem, NC, and chairman

of the Committee on Trauma for the American College of Surgeons. Liability issues also haven't been resolved, he points out.

When your staff are receiving vaccinations, keep in mind that between 25% and 50% of vaccinees have mild reactions. "It's not a vaccine that is simple to get and you're on your way, like the flu vaccine," Blanchard says.

According to the CDC, normal typical mild reactions include lymphadenopathy (local, 25% to 50%); myalgia, headache, chills, nausea, and fatigue (0.3% to 37%), and fever (2% to 16%).

"If they have reactions — temperatures, signs and symptoms of a reaction — they may not feel like working or be able to work," Blanchard says. In fact, the CDC says that one out of three vaccinees may feel bad enough to miss work.

For that reason, managers will want to ensure that vaccinations are staggered so that the programs can be staffed sufficiently, sources suggest.

You also may be affected if your facility is selected as a spot to vaccinate the general public, Blanchard warns.

"When you look at the numbers of people that they're thinking of vaccinating, they have to have space to do it, and they have to have trained people approved to give the vaccine," she warns. ■

Effective staffing requires more than counting heads

Evaluate productivity, hire the right people

(Editor's note: This is the first of a two-part series on effective staffing for same-day surgery programs. This month, we look at how to determine how many people and what skills are needed for a successful program. Next month, we'll look at accreditation standards on staffing effectiveness standards and how the standards will affect same-day surgery managers.)

You've read the headlines. You've attended the seminars. You know that there is a nursing shortage and that it's hard to find people to staff your same-day surgery program.

All of the attention to the shortage doesn't change the fact that you still need to staff your program and you need to justify the numbers of staff members you need to your bosses. Add to these the Joint Commission on Accreditation of Healthcare Organizations' staffing effectiveness

EXECUTIVE SUMMARY

Staffing requires a balance of the right number of people and the right mix of skills. While there are standards for number of staff, also look at how effective and productive your employees are.

- Schedule at least two caregivers per OR.
- Cross-train employees to cover busy times, sick leave, and vacation time.
- Promote employees based on ability to handle clinical and management responsibilities, not seniority.

standards implemented July 2002 for hospitals, and you have quite a task to accomplish.

Staffing effectiveness standards for same-day surgery programs that are accredited under ambulatory care standards are being tested and probably will be implemented in 2004, says **Wilma Delaney**, staffing effectiveness team leader for the Joint Commission. The new standard requires accredited organizations to look at the cause and effect of human resource indicators such as sick time, overtime, or staff vacancy rate on clinical outcomes such as medication errors, patient complaints, and delayed or postponed procedures, she says.

"These studies will give management a useful tool that identifies human resource factors that affect clinical outcome," Delaney adds.

In addition to knowing how issues such as overtime and sick leave affect outcome, you need to make sure you have the right number of staff. As for how many employees you need to staff one operating room, the minimum number is two, says **Judy Swanson**, RN, director of perioperative services at Texas Children's Hospital in Houston. If you rely on two per operating room, however, you leave yourself no room for sick time or vacations, she points out.

"For four operating rooms running an eight-hour day in a same-day surgery program, I plan on 2½ people per operating room, or 10 people," she says. Within each operating room, there is a scrub nurse and a circulator, she says. The extra person floats between two rooms, she adds.

Just as important as making sure you have enough people is to make sure you have enough RNs, Swanson says. "To make sure you have a minimum of one RN per operating room, as recommended by the Association of periOperative Registered Nurses [AORN],¹ my perioperative staff are no less than 60% registered nurses," she

says. Swanson makes sure that any staff members who float from room to room are registered nurses to ensure that minimum of one RN is always met.

Of course, intraoperative time is not the only staff time you need to consider when staffing a same-day surgery program, Swanson explains. You need to account for staff time to process instruments, schedule and admit the patients, and perform any preadmission tests, she says. In fact, the extra staff time and the minimum of two caregivers in the operating room means that one hour of surgery time requires six to seven work hours of staff time, she says.

Be sure you have the data in hand when you approach your administrative team with a request for additional staff, says **Jill Speedy**, a health care consultant with Seay Management Consulting in Orlando, FL.

"Use numbers and facts to justify the size of your staff," she says. Also, don't use negative statements such as, "I need more people, or we can't get the job done," to request additional staff, Speedy says.

"Point out that if you add one more part-time or full-time person, you can increase turnover and schedule more procedures, or you can discharge patients more quickly, which will increase patient satisfaction," she suggests.

Evaluate staff productivity

Even before you ask for extra staff, be sure that your employees are as productive as they can be, Speedy says.

"Perform an internal assessment to make sure that you are operating efficiently and identify any improvements you can make," she says. If you can accompany your request for staff with a description of how you make sure you are as productive as possible with existing staff, your request has more credibility, she adds.

One important way to increase productivity is to hold staff meetings at which employees can brainstorm ideas to improve efficiency, Speedy suggests. Often, it is the employee who does the job every day who sees ways to improve, she adds. Team meetings also improve communications between all staff members by giving everyone an outlet for concerns or suggestions, she says.

Hiring the right people also is important.

"A same-day surgery program needs multifunctional, flexible, dependable staff who include people willing to cross-train to other areas," adds Swanson. "All of my nurses are trained to work in

the post-anesthesia care unit [PACU] in addition to their primary areas of responsibility.”

This cross-training gives Swanson an opportunity to move employees to PACU as the day goes on; and fewer patients are in the operating room, and more are in recovery, she points out. It also helps Swanson plan vacation leave or cover areas when a nurse calls in sick.

In addition to hiring the right employees, be sure you promote the right employees as well, Speedy says. “Don’t base promotions on seniority alone,” she says. “Not everyone is cut out to be a supervisor, so you need to make sure the person you’re promoting has the right skills to supervise.”

These skills include not only clinical skills, but also management skills such as record keeping and reporting, and communication skills with employees and patients, Speedy explains.

If you do promote someone who needs to work on certain skills, promote that person with a skill upgrade plan that spells out what skills you want developed or enhanced, and identify ways to accomplish the plan, she advises.

“Depending on the skills needed, the plan can call for further clinical education through seminars or vendor training, or management training through outside sources,” Speedy says. “Set a timeline for achievement of the plan objectives, and make it a condition of the promotion.”

Reference

1. Association of periOperative Registered Nurses. *Standards, Recommended Practices & Guidelines*. Denver; 2002. ■

SOURCES

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HIPAA

Q & A

[Editor’s note: This is the first in a series of periodic columns that will address specific questions related to implementation of the Health Insurance Portability and Accountability Act (HIPAA). Future columns will address business associate agreements, organized health care arrangements, peer review activities, and staff training. If you have questions regarding these areas or others, please send them to Sheryl Jackson, Same-Day Surgery, American Health Consultants, P.O. Box 740056, Atlanta, GA 30374. Fax: (404) 262-5447. E-mail: sherylsmjackson@cs.com.]

Question: What are the deadlines for compliance with the HIPAA rules?

Answer: There are three sections of HIPAA, each with its own deadline, says **Michael R. Callahan**, partner and head of the HIPAA section for Katten, Muchin, Zavis, and Rosenman, a Chicago-based law firm.

“April 14, 2003, is the deadline for complying with the privacy rule, and Oct. 15, 2003, is the date to be in full compliance with the transaction code sets,” he says. The security rules still are up in the air, and at press time, they had not received final approval. Once approved, same-day surgery programs have two years to comply with the security rules, he adds.

“The difficulty with the unapproved security rules is that many of the security requirements overlap with privacy requirements, such as development of passwords to protect electronic patient information,” Callahan points out. This overlap means that an organization must implement some security measures along with privacy measures, he explains.

Many organizations are basing their policies and implementing new activities based upon the proposed security rules and hoping they don’t change significantly, he adds.

Question: Who must comply with HIPAA?

Answer: “Any health care provider, billing clearinghouse, or other vendor that submits claims electronically must comply with HIPAA,” Callahan says.

Even if you don’t handle everything electronically, if any part of your process is electronic, such as verifying coverage, you must implement measures to meet HIPAA requirements, he adds.

SOURCE/RESOURCES

For more information about compliance, contact:

- **Michael R. Callahan**, Partner, Head of HIPAA Section, Katten, Muchin, Zavis, Rosenman, 525 W. Monroe St., Suite 1600, Chicago, IL 60661-3693. Telephone: (312) 902-5634. Fax: (312) 902-1061. E-mail: Michael.Callahan@kmzr.com.

For resources on compliance, contact:

- **The Department of Health and Human Services' Office of Civil Rights** has released a new guidance document to address frequently asked questions about the medical privacy rule. Web: www.hhs.gov/ocr/hipaa/privacy.html.
- **Workgroup for Electronic Data Interchange**, 12020 Sunrise Valley Drive, Suite 100, Reston, VA 20191. Telephone: (703) 391-2716. Fax: (703) 391-2759. Web: www.wedi.org.

For example, if your same-day surgery program submits claims information on paper to a billing company that subsequently files claims electronically, your same-day surgery program must comply with the standards. ■

Same-Day Surgery Manager



Productivity tips: Is 100% efficiency desirable?

By **Stephen W. Earnhart, MS**
President and CEO
Earnhart & Associates
Dallas

(Editor's note: This is the first of a two-part series on productivity. This month, we tell you what productivity really means and discuss why 100% productivity may not be a good idea. Next month, we offer you realistic goals and suggest some ways to achieve them.)

How much productivity is enough, and when is it too much or too little? This column is written to address respondents to the *Same-Day Surgery* Reader Survey who said that work loads and caseloads are two of their top challenges.

What really is productivity? Depending upon whom you ask, there are differences of opinions. I called 10 nurses in ambulatory surgery center (ASC) environments, and 10 nurses in not-for-profit hospital settings. The difference between the two groups was interesting. The ASC group thought that productivity meant to "do whatever it took to get the job done," provided that patient safety and quality of care were not compromised. This "whatever it took" included flip-flopping of rooms, starting cases early, sending staff home when the workday was complete, cross-training staff, weekly staff meetings, "keeping the docs happy," exceeding expectations, and constantly seeking new ways to stay increasingly profitable.

Most in the hospital sector commented that productivity requirements were passed down from the top, and as managers, they had to comply with them. This was true even when the requirements were unreasonable and counterproductive, such as 100% productivity. The top comments about productivity from the hospital sector managers were: staying within the budget, achieving 100% productivity (by the measurement of the "organization"), providing superior patient care, having a quality work environment ("provide a great place to work"), and receiving positive patient feedback.

All of these measures are noble and worthy, but one difference between the groups is the understanding that productivity is the ability to get the job done. The error of most hospital systems (I have been there) is to expect too much in the way of measuring productivity. The goal of being 100% productive can be devastating on the surgical department. The way most hospital management measures success is to take the available minutes the surgical department is open and look at the difference in the surgical minutes.

For example, if you have 100,000 minutes of available operating rooms available, but you only use 75,000 of them in surgical minutes, then you are only operating at 75% efficiency. If you crank up the volume, you can get to 100%. In fact, we have clients who have exceeded 125%. The fact is that once you go past 75%, problems and complaints start to occur. The cases drag out, and elective cases go into the evening as the ability to "flip-flop" rooms goes away. You now are a slave to your own environment.

So what is productivity? The ability to get the job done in a quality environment that meets the needs of the organization mission statement and that makes you proud to be associated with it. That's the goal we should all want to achieve.

As baby boomers age, vision disorders increase

Need for surgery and laser treatments to rise

The number of blind or visually impaired people in the United States is expected to double in 30 years, to 6.8 million, as the baby boomer generation ages, according to *Vision Problems in the U.S.*, a report issued by the National Eye Institute in Bethesda, MD. Visual impairment is defined as having 20/40 vision or worse in the better eye, even with glasses.

Outpatient surgery managers can use the report to plan for the future and evaluate whether they need to add or expand ophthalmology services. "The report also takes a look at the various vision disorders that contribute to loss of vision and the treatments available to slow or stop vision loss," says **Frederick L. Ferris, MD**, clinical director of the National Eye Institute.

The significance of this report is not only that it confirms what many in the epidemiology field suspected, but uses data from a review of major epidemiological studies using standard case definitions for the eye conditions in this report, Ferris points out. "This is important for planning purposes because it gives you the best numbers to evaluate the extent of each condition," he adds.

The importance of the study to same-day surgery managers who have ophthalmic programs is that it identifies prevalence of conditions — including those that are typically treated by surgery — by state, gender, and race. "These numbers can help managers put together a proposal to justify a new program because they do give you an accurate picture of the population in your state," he adds.

Refractive errors are the most significant vision problem in the United States, with myopia, or nearsightedness, affecting more than 30.5 million Americans, Ferris says. While eyeglasses or contact lenses can correct myopia, hyperopia or farsightedness, astigmatism, or uneven focus, the field of refractive surgery is growing, he says.

"We are seeing twice the number of LASIK [laser-assisted in situ keratomileusis] patients that we saw during the same time last year," points out **Kris Kilgore, RN, BSN**, administrative director of Surgical Care Center of Michigan in Grand Rapids.

"Now that we can offer the procedure to people with a wider range of refractive error, including

EXECUTIVE SUMMARY

Vision Problems in the U.S., a report produced by the National Eye Institute in Bethesda, MD, predicts that the number of blind or visually impaired people will double over the next 30 years. The primary reason will be the aging of baby boomers. This information will help you evaluate the need to add or expand ophthalmology services.

- There are 3.4 million Americans who are blind or visually impaired, which is defined as having 20/40 vision or worse in the better eye, even with glasses.
- Myopia affects more than 30.5 million, and hyperopia affects almost 12 million people.
- Cataract affects 20.5 million Americans.
- Diabetic retinopathy affects 5.4 million people.

astigmatism, we are seeing a continued increase in the number of people in their 40s and 50s scheduling the surgery." And that's not the only procedure that's seen an increase. "We've noticed an increase in all of our surgeries, but especially in cataract," Kilgore says.

Cataract, a clouding of the eye's naturally clear lens, affects almost 20.5 million Americans who are older than 40, Ferris says. By age 80, more than half of Americans will have cataracts, he adds. An aging population that experiences more cataracts, however, can't completely explain this increase, Ferris points out.

"October is usually our busy month for cataract surgery, but we've experienced milder than normal winters in Michigan during the past couple of years, so the snowbirds have not been traveling south," Kilgore says.

This has meant that the surgeons are doing much more cataract surgery during January, February, and March than normal since the patients are staying in town, she adds.

Other eye disorders included in the report are:

- **Diabetic retinopathy.** Just fewer than 5.4 million Americans are diagnosed with diabetic retinopathy, but any one of the 10.3 million Americans with diabetes are at risk for the disease. Laser photocoagulation has been shown to reduce the risk of sight loss in retinopathy, Ferris says.

- **Glaucoma.** "While we found the prevalence of most vision disorders consistent across diverse populations and genders, we discovered that glaucoma prevalence is related to age and race," Ferris says. "It affects [more than] 2.2 million Americans but is more common in African-Americans and

RESOURCE

To order a free copy of *Vision Problems in the U.S., Prevalence of Adult Vision Impairment and Age-Related Diseases in America*, contact:

- **National Eye Institute**, 2020 Vision Place, Bethesda, MD 20892-3655. Telephone: (301) 496-5248. Web: www.nei.nih.gov/order/pub_sorted_by_title.asp and choose Vision Problems in the U.S. to order on-line or download from the web site. A full copy of the report is also available at www.preventblindness.org. There is no charge, but there is a limit of one copy per order.

Hispanics," he says. While treatments such as laser peripheral iridotomy and argon laser trabeculoplasty are used to relieve the intraocular pressure and slow down the loss of vision, the number of surgeries to treat glaucoma is decreasing because there are many effective medications for the condition, Ferris points out.

- **Age-related macular degeneration.** Laser photocoagulation can destroy leaking blood vessels and slow the loss of vision in age-related macular degeneration (AMD), he says. More than 1.6 million people are diagnosed with AMD, Ferris adds.

In addition to the large group of baby boomers reaching their 60s, he points out that the fact we are living longer contributes to the study authors' prediction that the number of blind or visually impaired Americans will double in 30 years.

"Because all of these vision disorders are age-related and because people are living into their 80s, it is not surprising that we will continue to see increases in diagnoses of vision problems," he says. ■

Over, under, around: Know where patients can go

Facility addresses pediatric safety concerns

Evaluating your same-day surgery space as you sit or crawl around the floor doesn't sound practical or necessary, and it is definitely not dignified, but it is essential when you're designing space to be used for pediatric patients. In fact, while setting up one of the nation's first freestanding pediatric surgery centers, the staff at Children's Surgery Center in Columbus, OH, had

to consider several issues important for any program that has pediatric patients.

"Not only did we have to evaluate the level of countertops, safety of electrical outlets, position of televisions in the waiting room, and types of window coverings used, but we also had to make sure there are no sharp corners, and no water cooler in the hallway of which an NPO [nothing by mouth] child will make use," says **Annette R. Svagerko**, RN, CNOR, OR clinical coordinator for Children's Surgery Center. If your state requires water coolers in public hallways, be sure to place them in locations that can be seen by nurses, such as next to the nurses' station, sources suggest.

"We have to think like children when we evaluate a pediatric facility because we have to be able to identify everything that can be climbed on, crawled under, pushed over, tripped on, and put in a mouth," she adds.

Programs that serve large numbers of pediatric patients have to consider that these patients will chew on furniture, lamps, magazines, toys in the waiting room, or anything else that will fit into a mouth. Thus, managers have to think about how the items can be cleaned, Svagerko points out.

"We have to make sure that we can clean everything to remove germs before the next child chews it and make sure that the cleaning agent we use won't harm the child," she says.

Children's Surgery Center opened five years ago and now handles 350 to 450 cases each month in four operating rooms and one procedure room, Svagerko says. The center is a limited liability corporation owned jointly by Children's Hospital

EXECUTIVE SUMMARY

Pediatric patients have particular safety issues. Lessons can be gleaned from Children's Surgery Center in Columbus, OH, one of the nation's first freestanding pediatric surgery centers.

- Remove water coolers from hallways or monitor them. This keeps nothing by mouth (NPO) children from drinking.
- Install doors that have a 15-second delay before opening and an internal alarm to alert staff of a wandering child.
- Require pediatric advanced life support certification of all staff.
- Eliminate sharp corners that children might walk into, televisions that can be pushed over, and window coverings that children might hang on.
- Develop policies to verify the identity of adults with children.

SOURCE

For more about pediatric same-day surgery, contact:

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and a group of physicians. The center was built to meet the growing needs of surgeons who were looking for more operating room time as the numbers of outpatient pediatric procedures grew, she says. Physicians also wanted a facility that was not as intimidating to children and parents and did not require the red tape and myriad hallways that going into the hospital for surgery requires, she adds.

"We have an ocean theme that appeals to children throughout the center," Svagerko says. A front desk that looks like a boat greets the children, and all artwork and decorations carry the theme throughout the child's visit, she explains.

Beyond decorating for pediatric needs, staff also have to make sure their supply inventory contains the wide range of sizes needed for pediatric patients who range from infants to young adults, Svagerko explains.

Safety issues require more diligence in a facility that serves a large number of pediatrics, she says. "State requirements mandate that a pediatric advanced life support (PAL)-certified staff member be in the building whenever we have a patient," she says.

Rather than have four or five staff members with PAL certification juggle schedules to make sure one is always in the building, the center administrator and physician board members opted to require PAL certification for all staff members. The surgery center pays for the certification and gives employees the time off to attend the classes, Svagerko says. The certification helps keep patients safe, she emphasizes.

"We also have special doors throughout the building that have a 15-second delay," she adds. When the bar to open the door is pushed, an internal alarm beeps, and the door doesn't open for 15 seconds, which gives staff members a chance to stop a wandering child, she explains. There is an override button that staff members can push if there is an emergency requiring evacuation of the building, she adds.

Another issue to consider for pediatric patients is legal guardianship. "We have to make sure we

have the proper identification for parents or guardians," Svagerko says. The center's computer system does have pop-up screens to alert staff of missing or abducted children, she adds. "At this time, we are not tied into a national alert system, but we are working with the state of Ohio to bring this to fruition," she says.

There is one door in the center that serves as a marketing tool to alleviate parent concerns about safety, Svagerko says. "Even though we are independent of the hospital, we are located on the hospital's campus and our center connects by a door to the hospital," she says. "This enables the staff to reassure parents that if their children need more care than the same-day surgery center can provide, there is no need to transport by ambulance across town." ■

Follow-up study shows drop in colonoscopy times

Anesthesia administration, procedure prep studied

Sixty percent of participants in a second study on diagnostic colonoscopy, who also had participated in the first study, saw a significant decrease in some aspect of their procedure times.

The 2002 study conducted by the Institute for Quality Improvement (IQI), a subsidiary of the Wilmette, IL-based Accreditation Association for Ambulatory Health Care. It included data collected by 42 organizations on 952 cases performed between February and April of 2002.

"Our pre-procedure time dropped by 50%

EXECUTIVE SUMMARY

In a diagnostic colonoscopy study conducted by the Institute for Quality Improvement, participants reported decreased discharge and pre-procedure times compared to the results of the 2001 study. Study findings included:

- Average pre-procedure mean decreased from 37 minutes to 33 minutes.
- Average discharge time decreased from 46.2 to 39.2 minutes.
- Average procedure times increased slightly, but more polyps were found and removed per procedure.
- Endoscopists and RNs administered anesthesia in more than 70% of the cases.

from the first study," says **Linda Ray**, administrator of the Shreveport (LA) Endoscopy Center. Ray attributes her facility's pre-procedure time of 15 minutes to a variety of changes they've made.

"We collect all of our information at the time we schedule the colonoscopy, so when the patients arrive, we've already pre-certified them, verified insurance information, and prepared the forms they need to sign," Ray says.

Although patients are instructed to arrive 30 minutes prior to their procedure, they often just sign their consent forms and are taken directly to a procedure room, she adds.

Another big change that affects pre-procedure time is that the physicians are scheduled for the entire morning, afternoon, or day in the center, Ray says. "When they are here, they don't cover call, schedule procedures in another location, or see patients in the office," she points out. This system keeps cases on schedule, Ray adds.

The median pre-procedure time for all participants was almost 33 minutes, down from 37 minutes in the 2001 study, but that time can be affected by how early or late patients arrive, says **Naomi Kuznets**, PhD, director of the IQI. "Overall, the decrease in different aspects of procedure times is encouraging," she says.

Although average procedure times increased slightly, there were proportionately more polyps found per procedure (90% for 2002 and 84% for 2001), and of these, proportionately more were removed (93% for 2002 and 85% for 2001), Kuznets says. The average discharge time decreased from 46.2 to 39.2 minutes, she adds.

Sometimes the short procedure time and rapid operating room turnover can cause problems in the discharge area, says **Tracey E. Carrigan**, RN, BSN, CNOR, administrative director of Texas Midwest Surgery Center in Abilene.

"Our turnover time between cases is so rapid that our physicians weren't able to get to recovery in a timely manner to discharge patients," she explains. This contributed to the discharge time of almost 70 minutes, she says. "We already knew this was a problem before the IQI study was complete because we were seeing complaints on our patient satisfaction surveys about how long they had to

RESOURCE

Copies of the study are \$50 each. To order a copy of the *2002 Colonoscopy Study*, contact:

- **Institute for Quality Improvement**, 3201 Old Glenview Road, Suite 300, Wilmette, IL 60091-2992. Telephone: (847) 853-6060. Web: www.aaahciqi.org.

stay following a colonoscopy," Carrigan says.

To address the problem, Carrigan's staff now walk the patients from Level 1 recovery area to a Level 2 area where the patient's family is allowed to join the patient.

"The physician then calls the Level 2 area and talks by conference call to the patient and family members, while a nurse listens as well," she says. "This process means that the physician doesn't have to leave the operating room area but can still explain everything," she adds.

If patients don't feel comfortable talking to the physician by phone, the physician comes to meet with them in the Level 2 area, she explains. This change has created a dramatic decrease in the amount of time patients wait to see the endoscopist, she says.

"I'm embarrassed to admit that some patients would wait up to two hours," she says. "Now our patients typically wait no more than 30 minutes before the physician talks with them."

Carrigan's multispecialty same-day surgery program handles about 580 cases per month, with only 60 colonoscopies per month. Because there is no team dedicated to colonoscopy and nurses don't see enough to develop an expertise in the procedure, Carrigan utilizes a certified registered nurse anesthetist (CRNA) to administer anesthesia.

"I can't expect my nurses to give and monitor drugs with which they're not familiar, and I also don't want to have a double standard in my operating rooms, where some patients get CRNAs and others are monitored by nurses," she says. "I realize that a CRNA is a luxury and the cost is not always reimbursed, but this is our process."

Endoscopists, RNs, and combinations of the two comprised 70% of the anesthesia administrators in

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the study. CRNAs represented 9% of the anesthesia administrators, anesthesiologists were used in 8% of the cases, and certified gastroenterology registered nurses (CGRN) or a combination of RNs/CGRNs were used in 3% of the cases. (Editor's note: Regulations governing the administration of anesthesia differ from state to state. Not all states allow RNs to administer anesthesia in hospitals and surgery centers.)

Carrigan's facility was one of only five programs that used a CRNA as the designated anesthesia monitor, and the five programs represented 7% of all the cases included in the study. Of the 952 cases, 66% had an RN as the designated monitor, and 9% had an anesthesiologist as the monitor.

IQI's studies change slightly each year, with questions added as concerns of participants and review committee members are addressed, says Kuznets. "We added a question about discomfort with bowel prep because some people thought the discomfort of the prep would affect a patient's willingness to repeat the procedure," she says.

While only 11% of patients reported severe discomfort and 30% described the prep procedure as

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not comfortable, there was no correlation between these numbers and the number of patients saying they would not repeat the procedure, she adds. As IQI staff members plan the next colonoscopy study, a question related to removals and biopsies may be added, Kuznets says.

“There are no guidelines as to when the endoscopist removes or biopsies a lesion,” she says. “Some endoscopists remove and biopsy as the scope goes into the colon, and some [remove and biopsy] as the scope comes out,” she says. Because there are no guidelines, Kuznets contends that gathering this information will add some additional valuable clinical data to the study. ■

CE/CME questions

Please save your monthly issues with the CE/CME questions to take the semester tests in June and December. A Scantron form will be inserted in those issues, but the questions will not be repeated.

5. How can the smallpox vaccine viral material be transferred, according to Joan Blanchard, RN, MS, MSS, CNOR, CIC, perioperative nursing specialist?
 - A. By touching
 - B. By infected insects
 - C. Through inhalation
 - D. None of the above
6. What vision treatment(s) is/are being seen in increasing numbers, according to Kris Kilgore, administrative director of Surgical Care Center of Michigan?
 - A. Macular degeneration
 - B. Cataract
 - C. Refractive disorders
 - D. A and C
 - E. B and C
7. According to Annette R. Svagerko, clinical coordinator for Children’s Surgery Center, what issues require the most diligence when planning or operating a pediatric same-day surgery program?
 - A. Medical records
 - B. Billing
 - C. Equipment
 - D. Safety
8. What was one way that Tracey E. Carrigan, administrative director of Texas Midwest Surgery Center, reduced discharge times for colonoscopy patients?
 - A. Changed the medication used in prep
 - B. Scheduled patients further apart
 - C. Combined recovery areas
 - D. Set up conference telephone line for physicians to talk with patients

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CE objectives

- Identify how the smallpox vaccine can be moved to another spot. (See “No one is immune: Outpatient surgery will feel impact of smallpox vaccine,” in this issue.)
- Know the prevalence of vision disorders such as cataract, glaucoma, diabetic retinopathy, and refractive error. (See “As baby boomers age, vision disorders increase.”)
- Identify the most important issues when developing a pediatric same-day surgery program. (See “Over, under, around: Know where patients can go.”)
- Identify methods used to address issues highlighted in a diagnostic colonoscopy study. (See “Follow-up study shows drop in colonoscopy times.”)

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Same-Day Surgery Reports

Supplement to *Same-Day Surgery*

February 2003, S03152

Introduction

Postoperative nausea and vomiting (PONV) has a significant impact on the patient and health care provider. The incidence varies between 20% and 30%, but has been reported to be as high as 60% or as low as 5%, depending on the mix of cases, treatment regimens, and definition of outcomes (nausea alone, retching, vomiting).¹⁻³ High patient expectation in same-day surgery makes PONV an important issue. PONV causes distress to the patient, delays returning to normal activities, increases resource utilization in the post-anesthesia care unit (PACU), and may delay discharge even to the point of requiring admission.

In one study, patients desiring to avoid PONV were willing to spend up to \$100 of their own money to avoid PONV.⁴ In another study, absence of PONV was almost twice as important to patients as absence of pain.⁵ While routine prophylaxis to prevent these complications may seem desirable, wide variations in efficacy and costs of treatment suggest that routine use is not warranted.

Physiology of PONV

Nausea is the feeling of impending vomiting that may or may not be associated with actual vomiting. Retching is a rhythmic activity of the respiratory muscles that typically precedes vomiting. Vomiting is the actual forceful expulsion of gastrointestinal contents.

Vomiting is a complex reflex that is coordinated by the vomiting center (VC) near the nucleus of the solitary tract, which receives input from the chemoreceptor trigger zone (CTZ) in the area postrema (AP). The VC also receives input from the

vestibular apparatus, cerebellum, and higher cortical centers. Vomiting can be triggered by multiple factors, including unpleasant sights, smells, or ideas; pregnancy; pain; drugs; increased intracranial pressure; coronary artery occlusion with vasovagal syncope; or intra-abdominal pathology.

Distension and contraction of the gut can activate mechanoreceptors there. Chemoreceptors in the gut are triggered by

intraluminal toxins. Release of 5-hydroxytryptamine (5-HT) from enterochromaffin cells activates visceral afferents. Absorbed toxins also may be sensed in the area postrema, a vascular area on the floor of the fourth ventricle where the blood-brain barrier is incomplete. CTZ activity is affected by chemicals through the modulation of dopaminergic,

histaminic, acetylcholinergic (muscarinic), and serotonergic receptors.

Pharmacology of PONV

The dopamine₂ receptor is the classic receptor involved in emesis. Dopamine agonists, such as apomorphine and bromocriptine, induce vomiting. Antagonists such as metoclopramide, droperidol, perphenazine, and perchloroperazine all have been used as antiemetics. However, side effects including extrapyramidal effects (akathisia and oculogyric crisis) or sedation, as well as cardiac effects may limit their utility. Droperidol is commonly used for PONV and is more effective against nausea than against vomiting. Metoclopramide is no more effective for PONV than placebo.⁶

Serotonin receptor antagonists (5-HT subtype 3 [5-HT₃]) have become popular in the treatment PONV. 5-HT₃ receptors

Current Concepts on Reducing Postoperative Nausea and Vomiting

Author: Alan P. Marco, MD, MMM, Associate Professor, Department of Anesthesiology, Medical College of Ohio, Toledo.

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are found in the AP, cerebral cortex, hippocampus, the gut mucosa, nerve endings, and primary afferent nerve fibers. Ondansetron, dolasetron, and granisetron have been found to be effective with minimal adverse effects. These three agents have equivalent safety and efficacy profiles. The serotonin antagonists are more effective against vomiting than nausea.⁷ Other serotonergic receptor antagonists such as those for the 5-HT_{1A} subtype also hold promise as future antiemetic agents.⁸

Muscarinic antagonists that penetrate the blood-brain barrier can modulate centrally initiated vomiting as well as the peripheral gastrointestinal motor correlates of vomiting through a combination of central blockade of vestibular initiated motion sickness, peripheral reduction of salivary and gastric secretions, and prevention of relaxation of sphincters.

Atropine and scopolamine have been used in anesthetic practice for their antiemetic effects; glycopyrrolate does not cross the blood-brain barrier and has no antiemetic effect. The

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usefulness of scopolamine has been limited by its side effects, including drowsiness and confusion, especially in the elderly. However, it has received renewed interest since its availability in a new transdermal delivery system, especially for prolonged relief of PONV extending past discharge. In one meta-analysis, transdermal scopolamine has been shown to be effective compared to placebo, but the additional PONV relief is balanced by the incidence of side effects.⁹

Antihistaminics have been used to treat PONV. Many centrally acting antihistamines have anticholinergic activity, and it is unclear if their antagonism of histaminic or cholinergic receptors is responsible for their antiemetic action. Promethazine has anticholinergic, anti-5-HT, and antidopaminergic activity. Cyclizine also is effective, but its anticholinergic properties may contribute to sedation and dry mouth.

Neurokinin (NK₁) receptors are widely distributed in the central and peripheral nervous systems. The first NK₁ agonist to be identified was Substance P. Central NK₁ receptors in the AP have a role in vomiting. Studies in an animal model as well as human studies suggest that NK₁ receptor antagonism may have a role in the treatment of PONV in the future.^{10,11}

Cannabinoids have been touted for the treatment of chemotherapy-induced nausea and vomiting. Their mechanism of action may be inhibition of the emetic pattern generator via descending pathways. They are similar in effectiveness to metoclopramide in PONV. Side effects such as dizziness, sedation, and dysphoria limit their usefulness.

Corticosteroids have been suggested for the prevention of PONV. Their mechanism of action in antiemesis is unknown. Reduction in inflammatory processes could lead to reduced stimuli from the operative site. While they have been used as monotherapy for chemotherapy and PONV, their efficacy is improved when used in combination with a 5-HT₃ antagonist.¹² Single doses of corticosteroids at the doses used for PONV (4 mg to 8 mg of dexamethasone in adults and 0.5 mg kg⁻¹ in children) have few side effects.

Droperidol and the 'Black Box' Warning

In December 2001, the Food and Drug Administration (FDA) issued a black box warning (the most serious warning for an FDA-approved drug set off in the text of the package insert by a black box as opposed to merely being listed in the Warning section) stating that droperidol, even at the low doses typically used for antiemesis, has been associated with prolongation of the QT interval or torsades de pointes, potentially resulting in death.¹³

However, the FDA failed to provide statistical information.¹⁴ The warning stated that a 12-lead ECG should be obtained to determine pre-existing QT prolongation prior to droperidol being used and that ECG monitoring should be continued for several hours after administration. Clearly, this additional monitoring would eliminate droperidol's cost-effectiveness and would be unwieldy in the fast-paced outpatient setting.

Even if the monitoring is performed, it isn't clear that it would detect patients at risk or prevent complications.¹⁵ Others

have expressed doubt that the evidence supports the avoidance of such a widely used and effective drug.^{16,17} There were 12 adverse cardiac events associated with droperidol doses of 2.5 mg or less (five at doses of less than 1 mg), but more than 25 million doses of generic droperidol were sold in 2000 alone. Clearly, the incidence of such adverse events, even if truly caused by droperidol, is extremely low. Even large-scale studies have failed to show safety or efficacy advantages of ondansetron over droperidol. The 5-HT₃ antagonists also may cause prolongation of the QT interval, and yet no “black box” warning has been issued for these drugs.

The main dilemma for clinicians is whether they should practice evidence-based medicine, which supports the use of droperidol as a cost-effective and safe therapy, or give in to the fear of lawsuits should an adverse event (related or not to droperidol) occur.

Risk Factors for PONV

Patient risk factors for PONV include age, gender (women are more prone to experiencing PONV than are men), phase of the menstrual cycle, obesity, anxiety, history of motion sickness, history of PONV, gastroparesis (e.g. diabetes or bowel obstruction), and full stomach. Genetics such as differences in metabolism that effect plasma concentrations of antiemetics also may be a factor.^{18,19}

Several surgical procedures have been found to correlate with increased PONV. These include laparoscopic (especially gynecologic), strabismus repair, middle ear procedures, orchiopexy, stomach, duodenal, and gallbladder surgeries. Increased duration of surgery also correlates with increased PONV risk, but this is confounded by the increased duration of anesthesia.

Postoperative risk factors include pain. The relief of pain may relieve nausea, but opioids used for analgesia may increase the risk of PONV. Dizziness and early ambulation have been associated with PONV, especially in patients who have received opioids (which may confound this observation). Hypotension can lead to nausea, and in some cases, vasopressors such as ephedrine may be effective. Lastly, forcing oral intake may provoke PONV and delay discharge, especially in children.²⁰

Anesthetic choices also can affect the incidence of PONV. The use of opioids frequently leads to increased PONV. However, opioids continue to be a mainstay of analgesia in medical care. The use of opioid-sparing techniques, such as the concomitant use of nonsteroidal anti-inflammatory drugs (NSAIDs), may help reduce the incidence of opioid-associated PONV. Propofol probably is most useful if given as a continuous infusion rather than a bolus at induction, especially for cases exceeding one hour.^{21,22}

When using propofol during total intravenous anesthesia (TIVA), the choice of opioid does not significantly affect the risk of PONV.²³ Some authors advocate the avoidance of opioids altogether and suggest local anesthesia combined with propofol for hypnosis and ketamine to cover the discomfort of the initial injection. In procedures where this technique can be

Table 1. Summary of Risk Factors for PONV

- Female Gender
- History of PONV
- History of Motion Sickness
- Nonsmoker
- Planned Postoperative Opioid Use
- Laparoscopy
- Laparotomy
- Cosmetic Surgery
- Major Breast Surgery
- Craniotomy
- Otolaryngologic Procedures
- Strabismus Surgery

Source: Adapted from Gan TJ. Postoperative nausea and vomiting — Can it be eliminated? *JAMA* 2002; 287:1,233-1,236.

used, such as cosmetic surgery, the incidence of PONV has been reduced drastically.²⁴ However, this technique did not improve PONV when used for outpatient laparoscopy cases.²⁵

Etomidate and ketamine are associated with PONV. Intubation and cricoid pressure also may cause vomiting by stimulating the gag reflex. The use of preoperative benzodiazepines to treat anxiety reduces the incidence of early PONV.²⁶ Antagonism of neuromuscular block with cholinesterase inhibitors may promote muscarinic effects on the gastrointestinal tract and increase PONV. The concomitant use of anticholinergics may help offset this effect.

Inhalational agents have been associated with PONV. In some studies, nitrous oxide (N₂O) has been associated with PONV, perhaps through gastric distention or vestibular stimulation from the diffusion of N₂O into these gas-containing spaces. PONV has been associated with the use of N₂O in gynecologic laparoscopy, so it may be prudent to avoid its use there. However, for short office-based surgical procedures, N₂O does not have a significant effect on the incidence of PONV.²⁷

Combinations of Antiemetics

Single agent therapy can reduce the incidence of PONV by 30%. Rather than give higher doses of the same agent, giving additional types of receptor antagonists may be more effective.²⁸ The most common pairings have been dopamine antagonists with a 5-HT₃ antagonist or dexamethasone. These combinations can yield a significant reduction in the incidence of PONV compared to either agent alone.²⁹

Recent investigations suggest that targeting multiple receptors may be even more effective. One study showed that a multidrug regimen of dexamethasone, ondansetron, droperidol, and metoclopramide decreased PONV for 24 hours compared to

Table 2. Postoperative Nausea and Vomiting Prophylaxis Strategies

Number of Factors Identified	1-2	3-4	>4
Risk Category	Mild to Moderate	Moderate to High	Very High
Incidence of PONV if no Treatment	20% to 40%	40% to 80%	>80%
Suggested Prophylaxis	Droperidol <i>Or</i> Dexamethasone <i>Or</i> Scopolamine <i>Or</i> 5HT ₃ antagonist	Droperidol and 5HT ₃ antagonist <i>Or</i> Dexamethasone and 5HT ₃ antagonist	Combination therapy and total intravenous anesthesia (TIVA) with propofol

Source: Adapted from Gan TJ. Postoperative nausea and vomiting — Can it be eliminated? *JAMA* 2002; 287:1,233-1,236.

both placebo and an propofol infusion that was continued four hours postoperatively.³⁰ The combination of propofol, droperidol, and ondansetron also may be more effective than droperidol and ondansetron combined with a traditional anesthetic of isoflurane and N₂O in oxygen.³¹

Nonpharmacologic Techniques

Traditionally, anesthesiologists turn to medications to treat PONV. However, drug therapy is not completely effective in eliminating PONV.

There is a growing trend toward complementary medicine in general, and several complementary techniques hold promise for the treatment of PONV.

Therapeutic suggestions given during anesthesia have been shown to decrease PONV.³² Supplemental oxygen (80%) has been shown to reduce the incidence of PONV in bowel surgery, possibly by reducing subclinical bowel ischemia.³³ Increasing intravenous fluids during the procedure also can reduce the incidence of PONV, perhaps by increasing perfusion of the gut and reducing intestinal ischemia.^{34,35} Acupressure at the Pericardium 6 (P.6, Nei-Guan) point has been shown to be effective in adults, but not in children.^{36,37,38} Transcutaneous electrical stimulation at the P.6 point decreases nausea, but not vomiting after laparoscopic cholecystectomy.³⁹

A postulated mechanism for the action of acupuncture is the release of beta endorphin that potentiates the endogenous antiemetic actions at the mu-opioid receptor.⁴⁰ Also, there may be activation of serotonergic and norepinephrinergic fibers, thus changing serotonin transmission.⁴¹ Acupuncture and related techniques were comparable in efficacy to antiemetics (metoclopramide, cyclizine, droperidol, prochlorperazine) in adults for the prevention of early and late PONV.⁴²

In a study of transcutaneous electrical stimulation vs. ondansetron in combination with droperidol, transcutaneous

electrical stimulation improved the efficacy of the combination therapy in this outpatient setting.⁴³

Avoiding provoking PONV can be accomplished by slow transport of patients to the PACU (especially when turning corners) and transporting them feet first. A nontraditional (but not truly nonpharmacologic) treatment for transportation-related PONV is the inhalation of isopropyl alcohol vapors.⁴⁴ This technique was shown to be effective in adults, but only transiently in children.^{45,46}

Cost-effectiveness of Antiemetic Treatment

To optimize care, clinicians must be able to consider the risk factors and overall situation to decide who should be treated. While it is appealing to simply treat all patients, economic considerations as well as good medical care suggest that a more rational approach should be used. Some authors have attempted to develop risk scores for prediction of PONV.²

These can be assessed manually or by automated information systems.⁴⁷ Patient risk factors can be put into a mathematical formula to develop a prediction score. A simple version of this is available on the Internet, although this tool has not been validated.⁴⁸

Other authors have developed algorithms based on the identification of risk factors.⁴⁹ (See **Tables 1 and 2, p. 3 and above.**)

Because physicians cannot predict with certainty which patients will suffer from PONV or which ones will benefit from treatment, some patients will receive unnecessary treatment and others will receive treatment that is ineffective. Both of these will result in cost to society in the form of increased medical expenditures. However, the practitioner cannot confine the examination of cost solely to drug acquisition costs.

There are other costs that are direct (such as nursing labor costs and supplies) and indirect (such as decreased patient

satisfaction and delayed return to normal functioning).⁵⁰

One of the problems with assessing the efficacy is that many researchers use surrogate outcomes (number of PONV episodes) rather than true outcomes (length of stay in the recovery room, unplanned hospital admissions, and decreased patient satisfaction).⁵¹ When the efficacy of antiemetic prophylaxis on surrogate outcomes or on true outcomes is considered, routine prophylactic administration of antiemetic medications results in little difference.⁵²

Hospital-based operating rooms may have different concerns than ambulatory surgery centers or office-based practices. In the office-based setting, an extended stay in the PACU may be more directly linked to nursing labor costs than in the inpatient setting. When the full spectrum of costs is considered, prophylactic treatment of high-risk patients with antiemetics is more cost effective than placebo.⁵³

The addition of metoclopramide, dolasetron, or ondansetron to a baseline therapy of droperidol and dexamethasone in an office-based setting did not improve outcomes, but they did significantly increase the direct cost of care.⁵⁴ Thus, selective administration of antiemetics is needed to reduce overall costs, even though acquisition costs may be increased.

Some anesthetic regimens may be more effective than others at reducing the incidence of PONV and its associated costs. In one study, the use of total intravenous anesthesia with propofol-alfentanil was more cost effective than low flow desflurane with tropisetron in moderate risk patients.⁵⁵ The choice of treatment drug also is important.

While ondansetron may be more effective than metoclopramide or droperidol at treating PONV, droperidol is more cost-effective even when costs of treatment failure (but not side effects of droperidol) are considered.⁵⁶

For continued treatment of PONV in the postoperative period, prochlorperazine is more cost effective than ondansetron for inpatients after total hip or knee replacement procedures.⁵⁷ Continued PONV after discharge from the ambulatory facility remains a problem.

Over-the-counter treatments are not consistently effective and unlike inpatients, outpatients cannot readily ask health care providers for treatment. Therapies to consider include the use of an ondansetron orally disintegrating tablet, transcutaneous acupoint electrical stimulation, or a transdermal scopolamine patch.⁵⁸

Conclusion

PONV is still a frequent occurrence despite recent advances in therapy.

Cost-effective practice mandates the consideration of direct, indirect, and intangible costs of therapy. Focusing prophylaxis on those patients identified as being high risk should be routine in current practice. A multimodal approach of identifying preoperative risk factors, targeting different receptors, avoiding PONV triggers, and incorporating nonpharmacologic techniques should be used to minimize the impact of PONV on patients.

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CE/CME Objectives

This program is intended for surgeons, anesthesiologists, physician assistants, nurses, and other staff. This material is authorized for CME and CE credits beginning February 2003 and expiring February 2004.

Physicians and nurses participate in this continuing medical education/continuing education program by reading the article, using the provided references for further research, and studying the questions at the end of the article. Participants should select what they believe to be the correct answers, then refer to the list of correct answers to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing this activity, please complete the evaluation form provided and return in the reply envelope also provided. A certificate will be mailed to you.

After participating in this CE/CME activity, the learner will be able to:

- identify the portion of the brain that processes triggers of postoperative nausea and vomiting (PONV);
- list where antiemetic drugs such as ondansetron, dolasetron, and granisetron act primarily;
- identify which patients have the highest risk of PONV;
- list the combination therapy most likely to be effective for treating high-risk patients.

CE/CME Questions

1. Triggers of PONV come from many sources and these inputs are processed in the portion of the brain known as the:
 - A. peri-aqueductal grey (PG).
 - B. the chemoreceptor trigger zone (CTZ).
 - C. vomiting center (VC).
 - D. area postrema (AP).
 - E. choroid plexus (CP).
2. Antiemetic drugs such as ondansetron, dolasetron, and granisetron act primarily at:
 - A. dopaminergic receptors.
 - B. histaminergic receptors.
 - C. serotonergic receptors.
 - D. adrenergic receptors.
 - E. muscarinic receptors.
3. Which of the following patients has the highest risk of PONV?
 - A. 42-year-old anxious male smoker for carpal tunnel release
 - B. 79-year-old female smoker with hypertension for cataract extraction
 - C. 22-year-old male nonsmoker for knee arthroscopy under general anesthesia
 - D. 28-year-old female nonsmoker with a history of motion sickness for gynecologic laparoscopy
 - E. 23-year-old female smoker roller coaster aficionado for tubal ligation
4. Combination therapy has been proposed for treating high-risk patients. Which of these combinations is most likely to be effective?
 - A. Droperidol, ondansetron, metoclopramide
 - B. Ondansetron, tropisetron, granisetron
 - C. Metoclopramide, atropine, droperidol
 - D. Propofol, isoflurane, metoclopramide
 - E. Propofol, droperidol, ondansetron, dexamethasone

Answers: 1. C; 2. C; 3. D; 4. E