

# Physician Assistants Make Their Mark in Surgery

BY ALICIA AULT

Associate Editor, Practice Trends

Among other changes engendered by the 80-hour workweek restrictions, more hospitals appear to be allowing physician assistants, nurse-midwives, and other midlevel staff to take over some duties from residents in the operating room.

"I absolutely think it's a trend," said Dr. Richard L. Prager, head of the division of

adult cardiac surgery at the University of Michigan in Ann Arbor. But he sees it as a slow-simmering trend that has been given a boost by the declining number of residents in rotation in the surgical suite.

In July 2003, the Accreditation Council for Graduate Medical Education said residents' work hours should be limited to 80 per week and continuous duty limited to 24 hours, with a 6-hour extension if needed for continuity of care or for educational reasons. In addition, residents should be

on call in-house only once every 3 nights, according to the ACGME guidelines.

Physician assistants (PAs) and nurse-practitioners are also expanding their roles in the critical care unit, said Dr. Prager. He views this as a positive development for residents. They should be on the floor or in the operating room "for educational aspects, and not simply to do chore work," he said.

"It is reasonable to guess that when the 80-hour workweek restrictions went in, a

lot of programs looked into ways of supplementing the service component of what residents do," said Dr. Roger P. Smith, chair of the Council on Resident Education in Obstetrics and Gynecology Committee for the American College of Obstetricians and Gynecologists.

Dr. Smith said some of the surgical services provided by residents may be of questionable educational value. As a result, some hospitals have decided to shift the workload to people with the skills to perform the job who aren't under a restriction on hours, he added.

There is, however, no hard evidence that a big shift has occurred, said Dr. Smith, who is also director of the residency program in the department of obstetrics and gynecology at the University of Missouri-Kansas City.

A systematic review of approaches taken by hospitals to reduce residents' work

## BOTOX® COSMETIC (Botulinum Toxin Type A) Purified Neurotoxin Complex

### INDICATIONS AND USAGE

**BOTOX® COSMETIC** is indicated for the temporary improvement in the appearance of moderate to severe glabellar lines associated with corrugator and/or procerus muscle activity in adult patients ≤ 65 years of age.

### CONTRAINDICATIONS

**BOTOX® COSMETIC** is contraindicated in the presence of infection at the proposed injection site(s) and in individuals with known hypersensitivity to any ingredient in the formulation.

### WARNINGS

**BOTOX®** and **BOTOX® COSMETIC** contain the same active ingredient in the same formulation. Therefore, adverse events observed with the use of **BOTOX®** also have the potential to be associated with the use of **BOTOX® COSMETIC**.

Do not exceed the recommended dosage and frequency of administration of **BOTOX® COSMETIC**. Risks resulting from administration at higher dosages are not known.

### Hypersensitivity Reactions

Serious and/or immediate hypersensitivity reactions have been rarely reported. These reactions include anaphylaxis, urticaria, soft tissue edema, and dyspnea. One fatal case of anaphylaxis has been reported in which lidocaine was used as the diluent, and consequently the causal agent cannot be reliably determined. If such a reaction occurs further injection of **BOTOX® COSMETIC** should be discontinued and appropriate medical therapy immediately instituted.

### Pre-Existing Neuromuscular Disorders

Caution should be exercised when administering **BOTOX® COSMETIC** to individuals with peripheral motor neuropathic diseases (e.g., amyotrophic lateral sclerosis, or motor neuropathy) or neuromuscular junctional disorders (e.g., myasthenia gravis or Lambert-Eaton syndrome). Patients with neuromuscular disorders may be at increased risk of clinically significant systemic effects including severe dysphagia and respiratory compromise from typical doses of **BOTOX® COSMETIC**. Published medical literature has reported rare cases of administration of a botulinum toxin to patients with known or unrecognized neuromuscular disorders where the patients have shown extreme sensitivity to the systemic effects of typical clinical doses. In some of these cases, dysphagia has lasted several months and required placement of a gastric feeding tube.

### Dysphagia

Dysphagia is a commonly reported adverse event following treatment of cervical dystonia patients with all botulinum toxins. In these patients, there are reports of rare cases of dysphagia severe enough to warrant the insertion of a gastric feeding tube. There is also a case report where a patient developed aspiration pneumonia and died subsequent to the finding of dysphagia.

### Cardiovascular System

There have also been rare reports following administration of **BOTOX®** of adverse events involving the cardiovascular system, including arrhythmia and myocardial infarction, some with fatal outcomes. Some of these patients had risk factors including pre-existing cardiovascular disease.

### Human Albumin

This product contains albumin, a derivative of human blood. Based on effective donor screening and product manufacturing processes, it carries an extremely remote risk for transmission of viral diseases. A theoretical risk for transmission of Creutzfeldt-Jakob disease (CJD) also is considered extremely remote. No cases of transmission of viral diseases or CJD have ever been identified for albumin.

### PRECAUTIONS

#### General:

The safe and effective use of **BOTOX® COSMETIC** depends upon proper storage of the product, selection of the correct dose, and proper reconstitution and administration techniques. Physicians administering **BOTOX® COSMETIC** must understand the relevant neuromuscular and/or orbital anatomy of the area involved, as well as any alterations to the anatomy due to prior surgical procedures and avoid injection into vulnerable anatomic areas. Caution should be used when **BOTOX® COSMETIC** treatment is used in the presence of inflammation at the proposed injection site(s) or when excessive weakness or atrophy is present in the target muscle(s).

Reduced blinking from **BOTOX® COSMETIC** injection of the orbicularis muscle can lead to corneal exposure, persistent epithelial defect and corneal ulceration, especially in patients with VII nerve disorders. In the use of **BOTOX®** for the treatment of blepharospasm, one case of corneal perforation in an aphakic eye requiring corneal grafting has occurred because of this effect. Careful testing of corneal sensation in eyes previously operated upon, avoidance of injection into the lower lid area to avoid ectropion, and vigorous treatment of any epithelial defect should be employed. This may require protective drops, ointment, therapeutic soft contact lenses, or closure of the eye by patching or other means.

Inducing paralysis in one or more extraocular muscles may produce spatial disorientation, double vision or past pointing. Covering the affected eye may alleviate these symptoms.

Caution should be used when **BOTOX® COSMETIC** treatment is used in patients who have an inflammatory skin problem at the injection site, marked facial asymmetry, ptosis, excessive dermatomal scarring, deep dermal scarring, thick sebaceous skin or the inability to substantially lessen glabellar lines by physically spreading them apart as these patients were excluded from the Phase 3 safety and efficacy trials.

Needle-related pain and/or anxiety may result in vasovagal responses, (including e.g., syncope, hypotension) which may require appropriate medical therapy.

Injection intervals of **BOTOX® COSMETIC** should be no more frequent than every three months and should be performed using the lowest effective dose (See Adverse Reactions, Immunogenicity).

#### Information for Patients

Patients or caregivers should be advised to seek immediate medical attention if swallowing, speech or respiratory disorders arise.

#### Drug Interactions

Co-administration of **BOTOX® COSMETIC** and aminoglycosides<sup>1</sup> or other agents interfering with neuromuscular transmission (e.g., curare-like nondepolarizing blockers, lincosamides, polymyxins, quinidine, magnesium sulfate, anticholinesterases, succinylcholine chloride) should only be performed with caution as the effect of the toxin may be potentiated.

The effect of administering different botulinum neurotoxin serotypes at the same time or within several months of each other is unknown. Excessive neuromuscular weakness may be exacerbated by administration of another botulinum toxin prior to the resolution of the effects of a previously administered botulinum toxin.

#### Pregnancy: Pregnancy Category C

Administration of **BOTOX® COSMETIC** is not recommended during pregnancy. There are no adequate and well-controlled studies of **BOTOX® COSMETIC** in pregnant women. When pregnant mice and rats were injected intramuscularly during the period of organogenesis, the developmental NOEL (No Observed Effect Level) of **BOTOX® COSMETIC** was 4 U/kg. Higher doses (8 or 16 U/kg) were associated with reductions in fetal body weights and/or delayed ossification.

In a range finding study in rabbits, daily injection of 0.125 U/kg/day (days 6 to 18 of gestation) and 2 U/kg (days 6 and 13 of gestation) produced severe maternal toxicity, abortions and/or fetal malformations. Higher doses resulted in death of the dams. The rabbit appears to be a very sensitive species to **BOTOX® COSMETIC**.

If the patient becomes pregnant after the administration of this drug, the patient should be apprised of the potential risks, including abortion or fetal malformations that have been observed in rabbits.

#### Carcinogenesis, Mutagenesis, Impairment of fertility

Long term studies in animals have not been performed to evaluate carcinogenic potential of **BOTOX® COSMETIC**.

The reproductive NOEL following intramuscular injection of 0, 4, 8, and 16 U/kg was 4 U/kg in male rats and 8 U/kg in female rats. Higher doses were associated with dose-dependent reductions in fertility in male rats (where limb weakness resulted in the inability to mate), and

testicular atrophy or an altered estrous cycle in female rats. There were no adverse effects on the viability of the embryos.

**Nursing mothers:** It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when **BOTOX® COSMETIC** is administered to a nursing woman.

**Pediatric use:** Use of **BOTOX® COSMETIC** is not recommended in children.

#### Geriatric use

The two clinical studies of **BOTOX® COSMETIC** did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. However, the responder rates appeared to be higher for patients younger than age 65 than for patients 65 years or older. (See: CLINICAL STUDIES)

There were too few patients (N=3) over the age of 75 to allow any meaningful comparisons.

#### ADVERSE REACTIONS

##### General:

**BOTOX®** and **BOTOX® COSMETIC** contain the same active ingredient in the same formulation. Therefore, adverse events observed with the use of **BOTOX®** also have the potential to be associated with the use of **BOTOX® COSMETIC**.

The most serious adverse events reported after treatment with botulinum toxin include rare spontaneous reports of death, sometimes associated with anaphylaxis, dysphagia, pneumonia, and/or other significant debility. There have also been rare reports of adverse events involving the cardiovascular system, including arrhythmia and myocardial infarction, some with fatal outcomes. Some of these patients had risk factors including pre-existing cardiovascular disease. (See: WARNINGS). New onset or recurrent seizures have also been reported, typically in patients who are predisposed to experiencing these events. The exact relationship of these events to the botulinum toxin injection has not been established. Additionally, a report of acute angle closure glaucoma one day after receiving an injection of botulinum toxin for blepharospasm was received, with recovery four months later after laser iridotomy and trabeculectomy. Focal facial paralysis, syncope and exacerbation of myasthenia gravis have also been reported after treatment of blepharospasm.

In general, adverse events occur within the first week following injection of **BOTOX® COSMETIC** and while generally transient may have a duration of several months or longer. Localized pain, infection, inflammation, tenderness, swelling, erythema and/or bleeding/bruising may be associated with the injection.

##### Glabellar Lines

In clinical trials of **BOTOX® COSMETIC** the most frequently reported adverse events following injection of **BOTOX® COSMETIC** were headache\*, respiratory infection\*, flu syndrome\*, blepharoptosis and nausea.

Less frequently occurring (<3%) adverse reactions included pain in the face, erythema at the injection site\*, paresthesia\* and muscle weakness. While local weakness of the injected muscle(s) is representative of the expected pharmacological action of botulinum toxin, weakness of adjacent muscles may occur as a result of the spread of toxin. These events are thought to be associated with the injection and occurred within the first week. The events were generally transient but may last several months or longer.

(\* incidence not different from Placebo)

The data described in Table 4 reflect exposure to **BOTOX® COSMETIC** in 405 subjects aged 18 to 75 who were evaluated in the randomized, placebo-controlled clinical studies to assess the use of **BOTOX® COSMETIC** in the improvement of the appearance of glabellar lines (See: CLINICAL STUDIES). Adverse events of any cause were reported for 44% of the **BOTOX® COSMETIC** treated subjects and 42% of the placebo treated subjects. The incidence of blepharoptosis was higher in the **BOTOX® COSMETIC** treated arm than in placebo (3% vs. 0%).

In the open-label, repeat injection study, blepharoptosis was reported for 2% (8/373) of subjects in the first treatment cycle and 1% (4/343) of subjects in the second treatment cycle. Adverse events of any type were reported for 49% (183/373) of subjects overall. The most frequently reported of these adverse events in the open-label study included respiratory infection, headache, flu syndrome, blepharoptosis, pain and nausea.

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not be predictive of rates observed in practice.

TABLE 4.

Adverse Events by Body System	Percent of Patients Reporting Adverse Events	
	BOTOX® Cosmetic (N=405) %	Placebo (N=130) %
Overall	44	42
Body as a Whole		
Pain in Face	2	1
Skin and Appendages		
Skin Tightness	1	0
Digestive System		
Nausea	3	2
Dyspepsia	1	0
Tooth Disorder	1	0
Special Senses		
Blepharoptosis	3	0
Musculoskeletal System		
Muscle Weakness	2	0
Cardiovascular		
Hypertension	1	0

Adverse Events Reported at Higher Frequency (>1%) in the **BOTOX® COSMETIC** Group Compared to the Placebo Group

#### Immunogenicity

Treatment with **BOTOX® COSMETIC** may result in the formation of neutralizing antibodies that may reduce the effectiveness of subsequent treatments with **BOTOX® COSMETIC** by inactivating the biological activity of the toxin. The rate of formation of neutralizing antibodies in patients receiving **BOTOX® COSMETIC** has not been well studied.

The critical factors for neutralizing antibody formation have not been well characterized. The results from some studies suggest that botulinum toxin injections at more frequent intervals or at higher doses may lead to greater incidence of antibody formation. The potential for antibody formation may be minimized by injecting the lowest effective dose given at the longest feasible intervals between injections.

#### Rx Only

\*Marks owned by Allergan, Inc.

Based on package insert 71711US13S revised January 2005

Manufactured by: Allergan Pharmaceuticals Ireland  
a subsidiary of: Allergan, Inc., 2525 Dupont Dr., Irvine, CA 92612

#### Reference:

1. Wang YC, Burr DH, Korthals GJ, Sugiyama H. Acute toxicity of aminoglycoside antibiotics as an aid in detecting botulism. *Appl Environ Microbiol* 1984; 48:951-955.



The increased use of midlevel providers is a positive development for residents.

DR. PRAGER

hours found a mixed bag on how the increased use of PAs and nurses affected residents across specialties, including their presence in the operating room (JAMA 2005;294:1088-100).

According to the investigators, three programs increased residents' OR experience. Another program that added night float and weekend cross-coverage significantly boosted the number of cases for the chief residents. A program that added health technicians to the surgical service increased residents' average operating room time from 3.3 hours per week to 9.8 hours per week. Several studies found no change in residents' OR hours, and three found that the number of their operative cases decreased.

Meanwhile, the number of residency slots available in the United States has remained stable, according to the Association of American Medical Colleges. In 2005, of the available 24,012 residency positions in the United States, 22,221 of them were filled, the AAMC said. First-year residencies in general, orthopedic, and plastic surgery have generated a great deal of interest. From 2001 through 2005, the number of general surgery slots offered remained pretty steady at about 1,050, and orthopedic positions offered hovered around 600. The number of plastic surgery positions grew from 58 in 2001 to 81 in 2005.

The path taken by PAs generally follows that of medical students and physicians, said Nancy Hughes, vice president of communications and information services for the American Academy of Physician Assistants. According to AAPA's survey data, over the past 7 years there has been little change in the percentage of respondents who say they work in surgery or a surgical subspecialty, perform invasive pro-

Continued on following page



# Computerized Drug Orders Can Reduce Hospital Errors

BY JOYCE FRIEDEN

Associate Editor, Practice Trends

WASHINGTON — Aiming for computerization of physician order entry at health care institutions isn't the right course to take, Dr. Stephen T. Lawless said at a health care congress sponsored by the Wall Street Journal and CNBC.

"That's the wrong goal," said Dr. Lawless, chief knowledge and quality officer at Nemours, a Wilmington, Del., pe-

diatric subspecialty practice with about 1 million patient encounters per year. "The right goal is NPOE—no physician order entry. Just tell us what you want and we'll have the best person [enter] it for you."

With this caveat, computerized order entry still remains an important tool in reducing medication errors, said Dr. Lawless, also professor of pediatrics at Jefferson Medical College, Philadelphia.

He said that the hospital where he practices—the Alfred I. DuPont Hospital for

Children, Wilmington—partnered with a large pharmacy chain and asked the pharmacy to find the errors in the hospital's handwritten prescriptions.

Of handwritten prescriptions, 35%-40% had errors, he said. "Of those, 53% had legibility problems, 36% had issues with completeness, and 11% had content errors."

The hospital's use of electronic prescribing has eliminated legibility errors, but that still leaves the other half of the errors to be resolved, he said. That's where the

"decision support" piece comes in, which has encountered some resistance from providers. "We're forcing people by saying, 'You've picked this drug at this time, at this dose, at this range. Thank you very much.' It's very hard to make people do that."

Dr. Lawless said measures such as checklists are resisted by the medical community because "we all think it's about health care professionals being industrialized. I'm saying it's [about] health care craftsmen fighting being professionalized." ■

Continued from previous page

cedures, or assist with surgery. But the growing number of practicing PAs has meant an overall increase in their presence during this same period.

In 1999, 3% of the 15,000 or so respondents said they practiced in general surgery and 17% in surgical subspecialties. A total of 44% said they performed invasive procedures, and 25% said they assisted with surgery. In the 2004 survey, 3% of the 20,500 respondents said they practiced in general surgery and 21% in surgical subspecialties; 42% performed invasive procedures, and 26.5% assisted with surgery.

Judith Zaczek, a certified physician assistant (PA-C) in the ob.gyn. department at Oakwood Hospital and Medical Center in Dearborn, Mich., believes there has been a trend toward more PAs replacing residents in the OR.

At her facility there are 16 residents total per year, with 4 on the ob.gyn. service. But there are three PAs and two midwives to help with the 6,000 deliveries per year. The attending physicians are happy to have the help, Ms. Zaczek said. "I think they've seen what continuity of care is, and they appreciate that."

Dr. Prager agrees that advanced practice PAs and nurse-practitioners are invaluable to a surgical team because they know the routines and are committed and efficient. At the University of Michigan Hospital, four PAs provide first and second assistance for cardiothoracic surgery. They are more skilled in harvesting arteries endoscopically than the junior-level residents, he said.

An advanced practice team of 10 PAs and nurse-practitioners manages the floor, generally covering 30-32 patients and freeing residents from rounds. Dr. Prager sees this as a boon to both the hospital, which gets more efficient patient care, and the residents, who spend more time on education.

A similar evolution has taken place at St. Joseph Mercy Hospital in Ann Arbor. Before workweek restrictions were in place, the cardiothoracic service had seven PAs. With the reduction in residents' hours, the hospital had to double that number to cover critical care 24 hours a day, 7 days a week, and to assist both during and after operations, said LaWaun Hance, a PA-C and education coordinator for the cardiothoracic PA residency program at St. Joseph.

The PAs provide first and second assists, including endoscopic vein harvest, and if necessary they open or close the chest, said Ms. Hance. ■

**SARNA® Anti-Itch Lotion breaks the Itch-Scratch cycle.**

- Steroid-free; soothes with camphor and cools with menthol
- Fast onset of action with prolonged itch relief
- Excellent adjunctive therapy; may be used with other treatments

**STIEFEL**  
Research in Dermatology™

Stiefel Laboratories, Inc. Coral Gables, FL 33134  
1-888-STIEFEL (784-3335) www.stiefel.com

SARNA is a registered trademark of Stiefel Laboratories, Inc.  
Research in Dermatology is a trademark of Stiefel Laboratories, Inc.  
© Copyright 2005 Stiefel Laboratories, Inc. All rights reserved. SRN-03-2005-USA