

# BRANCHES



**Hygiene and Isolation**  
We know it works:  
contain 'em and kill 'em



**Infection Casualties**  
How we know if  
we're winning



**Zero Is Possible**  
Healthcare heroes at the  
barricades to infection

## GETTING TO ZERO WINNING THE WAR ON INFECTION

This issue of *Branches* is an ode to striving for perfection. It is intended to justify our belief that perfect precision in basic safety practices in every patient encounter and treatment will eliminate unnecessary death and injury. This requires removing every source of harm, every defect in care, immediately upon discovery, a commitment essential to “getting to zero.”

Wonders have occurred in eradication of infectious disease—deadly fevers in women after childbirth, yellow fever, small pox—prior to the discovery of a miracle cure. A primitive, first line of defense involves relentless hand hygiene and/or isolation of those who are infected. Minus a magic pill, contagion can be controlled dramatically, if these primary defense barriers are erected seamlessly and maintained vigilantly.

Who holds health care accountable for applying what we know to eliminate infection? In spite of numerous regulatory bodies that monitor healthcare delivery, evidence indicates that current diligence is unacceptable. Consider these data and take one telling example: MRSA. Pronounced “mur-sah,” the acronym describes a common staph infection that is resistant to a powerful antibiotic, methicillin.

The United States has a high rate of MRSA at more than 50 percent of our staph infections. People carry MRSA unknowingly. But if those people are healthcare workers in contact with

patients, MRSA works like an invading army, attacking a patient's surgical or wound site—anywhere that skin is broken.

But MRSA's spread can be virtually eliminated in hospitals. Several European countries have zeroed out MRSA with proven barriers: testing all patients for MRSA at admission, isolating carriers of MRSA, and practicing consistent hand hygiene. Such vigilance can get our healthcare systems to zero, and the public has a right to expect zero.

The challenge is to enlist healthcare workers to “man the barriers” 100 percent of the time. The Pittsburgh Regional Healthcare Initiative (PRHI) is getting us there, working with healthcare organizations to achieve 100 percent application of proven isolation and hand-hygiene protocols and 100 percent tracking and reporting of hospital-acquired infection. Working with the Commonwealth's new databases, healthcare workers can identify where barriers are strong, where they are weak, and what to do to reinforce them.

This issue of *Branches* hopes to inspire individuals and organizations to realize that we have the power to apply relatively low-cost, low-tech, proven best practices relentlessly, preventing tens of thousands of infections each year, saving millions of dollars, and removing immeasurable suffering and heartache.

*“I find it unfortunate that we have to spend so much time and effort trying to combat diseases that man is responsible for spreading...but the problem is so important that, as a citizen, I can't walk way from it.”*

### Donald A. Henderson, MD, MPH

Senior Advisor, Center for Biosecurity, University of Pittsburgh Medical Center. He led the World Health Organization's small pox eradication team that met success in 1979.

## INFECTIONS IN HOSPITALS: MANY CASUALTIES

- More than two million Americans per year acquire infections while they are hospitalized. At least 100,000 are infected with MRSA, a virulent form of staph.
- 90,000 Americans die each year from these preventable hospital-acquired infections (HAIs).
- It costs at least \$4.5 billion to treat HAIs in the United States each year; \$38,000 per patient with MRSA.
- The direct financial cost of caring for these preventable infections in Southwestern Pennsylvania exceeds \$110 million per year.

*Hospital-acquired infections (HAIs) are infections that were not present or incubating in a patient at the time of hospital admission. MRSA stands for methicillin-resistant Staphylococcus aureus.*

Source: Centers for Disease Control and Prevention

## A PALINDROME

PAULA TATARUNIS, MD

Ignaz Semmelwies,  
who cut the maternal death rate in the  
*Allgemeines Krankenhaus*  
obstetrical ward  
from 18 to 1.2 percent  
by insisting that the doctors  
wash their hands  
before and after  
each exam and delivery,  
so outraged his colleagues  
by his findings  
that they hounded him  
back to Budapest  
where he wrote  
*Die Aetiologie der Begriff  
und die Prophylaxis des  
Kindbedfiebers*  
and, in 1865, died of sepsis  
in an insane asylum,  
a brokenman.  
In Brockelman's Market,  
a woman, pregnant,  
her blouse a color  
between faded yellow  
and yellowed white,  
between spit-up milk  
and rebleached diapers,  
a tired woman, who, soon,  
for the sixth time, won't  
die of childbed fever,  
is buying warm  
whiterolls.

*Congratulations to Paula Tatarunis, MD, of  
Newton, Massachusetts, winner of the 1998  
Annals Poetry Prize.*

*Dr. Tatarunis's poem, originally titled "Two  
Germans" and since renamed "A Palindrome,"  
was published in the May 1, 1998, issue of  
Annals (vol. 128, no.9) and is reprinted here.*

# MAKING HAND HYGIENE SECOND NATURE

Thinking outside the box doesn't always reap immediate praise, but it can have lasting effects. Consider Ignaz Philipp Semmelweis, MD, a scientist who lived from 1818 to 1865 and made a groundbreaking contribution in the fight against healthcare-associated infections. He developed and implemented the first antiseptic-based hand-hygiene protocol in the First Clinic at the General Hospital of Vienna in 1847.

As a result, the death rate among pregnant women in the First Clinic dropped dramatically, proof that antiseptic cleansing between patient contacts reduces the risk of transmitting healthcare-associated infections more effectively than soap and water cleansing. Despite his results, Dr. Semmelweis suffered years of opposition from the medical community, told once that it was "time to stop the nonsense about the chlorine hand wash."

But today, his doctrine is both respected and emulated. Dr. Julie Gerberding, director of the Centers for Disease Control and Prevention (CDC), confirms that "Clean hands are the single most important factor in preventing the spread of dangerous germs and antibiotic resistance in healthcare settings."

The Pittsburgh Regional Healthcare Initiative (PRHI) is living the hand-hygiene doctrine through its learning module, *Your Role in Preventing Hospital-Acquired Infections*. Peter Perreiah, trainer for the PRHI's Perfecting Patient Care Learning Line on nosocomial infection at the VA Pittsburgh Medical Center, and Dr. Jon Lloyd, medical director of Southwestern Pennsylvania for Health Dialog, designed this module for healthcare practitioners, filling a curriculum gap of many highly regarded medical schools.

There is not a conscious, concerted effort to educate medical students in hand-hygiene protocol. This is both frightening and troubling, so the PRHI is helping to institutionalize formal training regionally. For example, all chief surgical residents at the VA Hospital must complete the module, and then pass on that training to their residents, interns, and students. In addition, the University of Pittsburgh Medical School is incorporating the module into its core curriculum.

More information, including the content of *Your Role in Preventing Hospital-Acquired Infections*, is available at [www.prhi.org/lmod.cfm](http://www.prhi.org/lmod.cfm).



# HAND HYGIENE: ONE SURGEON'S FIRST-HAND ACCOUNT

The CDC and the Society for Healthcare Epidemiology of America (SHEA) published guidelines for hand hygiene that emphasize its importance in curtailing HAIs, but most healthcare professionals in American hospitals don't exercise hand hygiene between patient contacts. Atul Gawande, MD, MPH, describes his perspective on this in his candid article, "Notes of A Surgeon: On Washing Hands," which was published March 25, 2004, in *The New England Journal of Medicine*.

But, he knows that he and his staff are crucial to stopping the spread of HAIs by: knowing their patients' conditions; isolating carriers; performing hand hygiene on entry, between procedures, and on exit; gowning, gloving, and masking appropriately; disinfecting equipment and the environment; and supporting a culture of prevention.

### What If We Didn't Tolerate Dirty Hands?

Precisely following CDC hand-hygiene guidelines at every patient encounter could eliminate at least 25 to 30 percent of HAIs. One hospital system in Southwestern Pennsylvania has set this goal. We, like Holland and Scandinavia, can eliminate unnecessary infections, saving 300 lives in our region every year with ten easy steps.

*"Having shaken hands with a sniffing patient, pulled a sticky dressing off someone's wound, pressed a stethoscope against a sweating breast, most of us do little more than wipe our hands on our white coats and move on."*

**Atul Gawande, MD, MPH**

*Brigham and Women's Hospital, Department of Surgery*

Dr. Gawande says, "I have tried lately to be more scrupulous about washing my hands. I do pretty well...but then I blow it. It happens almost every day." At times, he's preoccupied, often thinking about what he has to tell his patients, and simply forgets about hand hygiene. Or, he decides there's not enough time to "wash up" between the many patients he has to treat in a limited amount of time thinking, "I'm late, I have to get a move on, and what difference does it really make this one time?"

## ERADICATING INFECTION

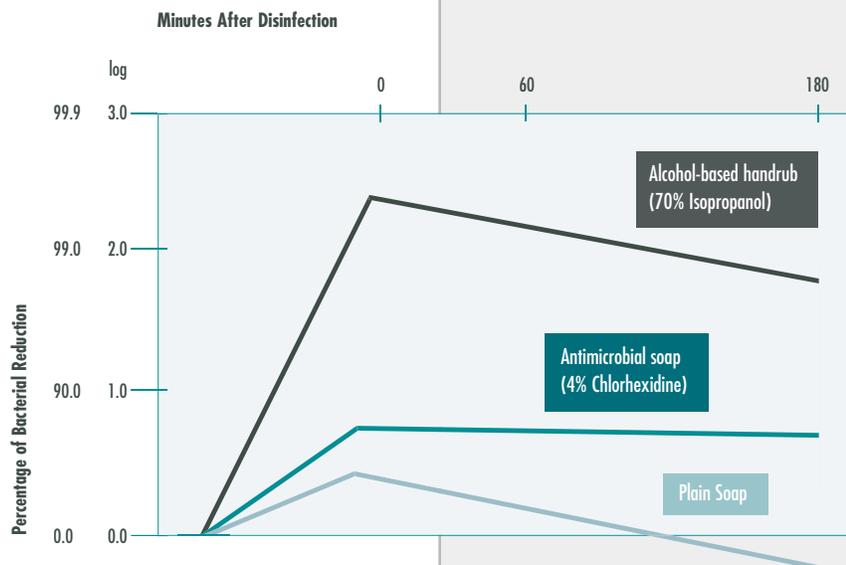
TEN STEPS TO WINNING THE WAR

**Every healthcare facility can immediately begin to eliminate infections, like MRSA. Here's how:**

1. Use hand-hygiene precautions for all patient contacts.
2. Make antimicrobial soap and alcohol sanitizer readily available where needed.
3. Use antimicrobial soap or alcohol sanitizer in intensive care units.
4. Identify colonized and infected patients through surveillance cultures.
5. Isolate colonized patients.
6. Use disposable gowns, gloves, and masks when caring for isolated patients.
7. Clean the patient care environment thoroughly.
8. Use disposable or dedicated equipment. Clean all shared equipment with 70% isopropyl alcohol swabs.
9. Flag colonized patients' medical records to ensure isolation if re-admitted.
10. Control antibiotic use.

*Sources: Centers for Disease Control and Prevention, Society for Healthcare Epidemiology of America, and Pittsburgh Regional Healthcare Initiative*

## HANDRUB KILLS MORE BACTERIA THAN SOAP AND ITS EFFECT LASTS LONGER



Adapted from: *Hosp Epidemiol Infect Control*, 2nd Edition, 1999

# PENNSYLVANIA REPORTS CASUALTIES:

## DATA DRIVE BETTER PERFORMANCE

As of this year, the Pennsylvania Health Care Cost Containment Council (PHC4) requires Pennsylvania hospitals to report the number of four types of hospital-acquired infections (HAIs): surgical site infections, central-line-associated bloodstream infections, ventilator-associated pneumonia, and catheter-associated urinary tract infections. Such reporting, as recommended by the CDC and based on the determination that an infection is hospital-acquired, makes infections visible. You can't attack and contain what you don't see; measurement provides the map for battle. The reporting requirement took effect January 1, 2004. PHC4 expects a full year of data by March 2005; ultimately, patients will benefit from this new policy only if hospitals use these data to drive infection control.

Concurrently, the Patient Safety Authority, an independent Pennsylvania agency established under Act 13 of the Medical Care Availability and Reduction of Error Act of 2002, is taking steps to reduce and eliminate medical errors — including infection. The Authority is testing PA-PSRS, the Pennsylvania Patient Safety Reporting System, among a group of 22 volunteering healthcare facilities. Ultimately, the PA-PSRS program will analyze data submitted by almost 400 facilities statewide to identify trends and suggest improvements to enhance patient safety. Individual facilities will receive detailed reports that can be used for internal quality improvement and patient safety activities. Reports also will share information on specific geographic regions and the state as a whole.

The Commonwealth's efforts represent a sea change in Pennsylvania's commitment to healthcare safety and quality. They require transparent reporting to standardize infection control and error reduction. The demand for such reporting resonates with the public; this is partly attributable to our local media, who showcase the dangers of hospital-acquired infections and other medical errors. For example, the *Pittsburgh Tribune-Review* published several articles on the magnitude of hospital-acquired infections in October 2003, calling much-needed attention to the need for a solution. The *Pittsburgh Post-Gazette* shared hospital battles with the spread of a lethal bacterial infection beginning in October 2002 and a MRSA outbreak in May 2004. Media coverage of these issues puts the need for vigorous remedial actions on the front-burner.

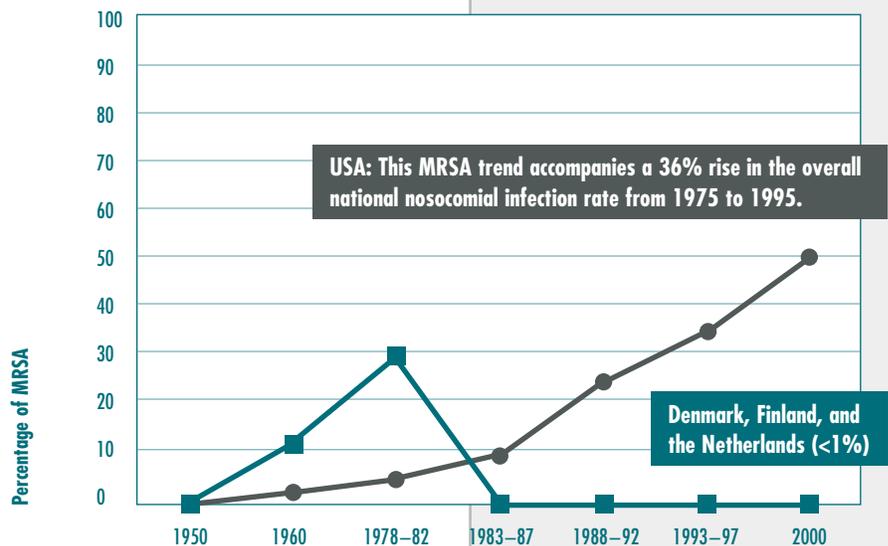
**Pennsylvania now requires hospitals to report four types of hospital-acquired infections.**

*"This puts Pennsylvania at the forefront of providing consumers with information about hospital infection rates. This could be a model for the nation."*

**Lisa McGiffert**

*Senior Policy Analyst for the Consumers Union, on the new PHC4 requirement*

PERCENTAGE OF MRSA IS RISING IN THE USA... BUT HAS BEEN CONTROLLED IN DENMARK, FINLAND, AND THE NETHERLANDS (SOURCE: CDC NNIS DATA)



USA: This MRSA trend accompanies a 36% rise in the overall national nosocomial infection rate from 1975 to 1995.

Denmark, Finland, and the Netherlands (<1%)

# BULL'S EYE!

## SOME UNITS GET TO ZERO

**A**ccording to the CDC, 90,000 Americans die each year from hospital-acquired infections. In a pilot project funded by the CDC and the Agency for Healthcare Research and Quality (AHRQ), the Pittsburgh Regional Healthcare Initiative (PRHI) and Oakland's VA Pittsburgh Medical Center 4-West post-surgical, 36-bed unit, are getting to zero MRSA infections, largely through effective hand hygiene. When the study began in 2000, VA physicians used appropriate hand hygiene only 29 percent of the time for patients in isolation; the rate for nurses was 70 percent.

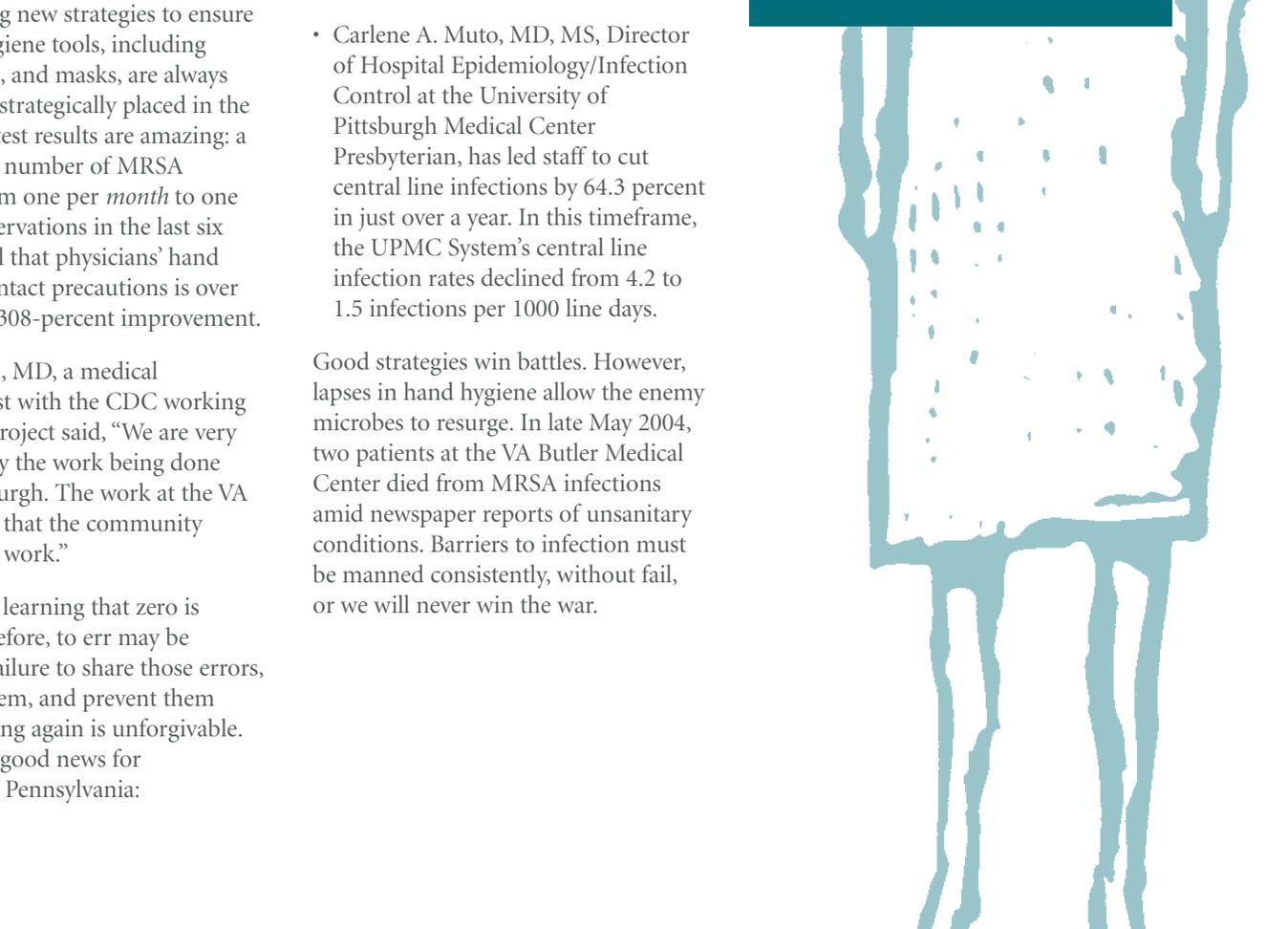
Staff are now learning and using standard precautions for encounters with all patients and contact precautions for patients in isolation. They're testing new strategies to ensure that hand-hygiene tools, including gowns, gloves, and masks, are always available and strategically placed in the unit. Their latest results are amazing: a decline in the number of MRSA infections from one per *month* to one per *year*. Observations in the last six months reveal that physicians' hand hygiene in contact precautions is over 95 percent, a 308-percent improvement.

John Jernigan, MD, a medical epidemiologist with the CDC working on the pilot project said, "We are very encouraged by the work being done here in Pittsburgh. The work at the VA is showing us that the community approach can work."

Our region is learning that zero is possible; therefore, to err may be human, but failure to share those errors, learn from them, and prevent them from happening again is unforgivable. There's more good news for Southwestern Pennsylvania:

- Donna Ramusivich, Senior Vice President of Professional Services and Quality at Monongahela Valley Hospital, has guided her staff to achieve *zero* central line infections in the ICU for 15 months, and in the Coronary Care Unit (CCU) for 12 months; achieve *zero* urinary tract infections in the ICU and the CCU for calendar year 2003; and achieve *zero* ventilator-associated pneumonias in the ICU and in the CCU during the last six months.
- Allegheny General Hospital (AGH) staff, under the exemplary leadership of Richard Shannon, MD, Chairman of Medicine, reduced the central line infections in AGH's Medical Intensive Care and Cardiac Care units to *zero* within 90 days.
- Carlene A. Muto, MD, MS, Director of Hospital Epidemiology/Infection Control at the University of Pittsburgh Medical Center Presbyterian, has led staff to cut central line infections by 64.3 percent in just over a year. In this timeframe, the UPMC System's central line infection rates declined from 4.2 to 1.5 infections per 1000 line days.

Good strategies win battles. However, lapses in hand hygiene allow the enemy microbes to resurge. In late May 2004, two patients at the VA Butler Medical Center died from MRSA infections amid newspaper reports of unsanitary conditions. Barriers to infection must be manned consistently, without fail, or we will never win the war.



90,000 AMERICANS  
DIE EACH YEAR FROM  
HOSPITAL-ACQUIRED  
INFECTIONS

# INVEST IN SAFETY AND QUALITY

Southwestern Pennsylvania can bear the world's standard for safe health care. The Jewish Healthcare Foundation is making patient safety and the highest quality care the norm in our region. The following list is a sample of funded initiatives that other foundations can replicate in their communities.

## Improve Education in Medical Safety.

This summer the JHF/Coro Health Sciences Fellowship will test a medical safety curriculum among 20 graduate students. During the eight-week course, teams of students will observe a major challenge in healthcare settings and develop safety solutions. Lessons learned from this demonstration will shape a larger medical safety curriculum developed by the Foundation.

## Support Simulation Centers: Learning on Robots, Not Humans.

The University of Pittsburgh Peter M. Winter Institute for Simulation Education and Research (WISER) can now teach its Crisis Resource Management course to a broader range of emergency medicine students at multiple sites. Students learn to organize as a team and cooperate and deliver emergency medicine more effectively, reducing errors in care.

## Advance Research on Delivery System Improvements.

The University of Pittsburgh School of Medicine's Department of Medicine is improving the quality of clinical care by providing faculty with infrastructure and funding for continuous process improvement (CPI) projects, a competitive grants process for individual CPI projects, and new CPI teaching programs for students, residents, fellows, and faculty.

## Perfect Medication Management.

The University of Pittsburgh School of Pharmacy, through a research and demonstration project run in 1999, determined that direct involvement of a pharmacist in patient discharge planning and education can improve patient outcomes.

## Remove Environmental Hazards.

In 1997, the Pittsburgh community developed and implemented a housing repair and safety program in Squirrel Hill. They assured that senior housing was safe, and that seniors could remain independent in their community. The United Jewish Federation, Habitat for Humanity, and Mitzvah Corps led the initiative.

## Prevent the Preventable.

In 1994, the Pittsburgh region developed a comprehensive package of services to reduce the incidence of falls and fall-related injuries among seniors living in the community. The three-part program included T'ai Chi, geriatric assessments, and home "audits" at community sites, coordinated by the Riverview Center for Jewish Seniors, the Jewish Community Center, and Council Care and in partnership with the Pittsburgh Mercy Foundation.



## RESOURCES

**Key federal, state, and regional players addressing the MRSA problem include the following:**

Centers for Disease Control and Prevention (CDC)  
[www.cdc.gov](http://www.cdc.gov)

Patient Safety Authority  
[www.psa.state.pa.us](http://www.psa.state.pa.us)

Pittsburgh Regional Healthcare Initiative (PRHI)  
[www.prhi.org](http://www.prhi.org)

Pennsylvania Health Care Cost Containment Council (PHC4)  
[www.phc4.org](http://www.phc4.org)

Agency for Healthcare Research and Quality (AHRQ)  
[www.ahrq.gov](http://www.ahrq.gov)

Society for Healthcare Epidemiology of America (SHEA)  
[www.shea-online.org](http://www.shea-online.org)

## SUGGESTED READING

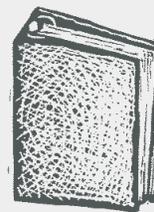
*The Demon in the Freezer*, by Richard Preston, 2002

*Internal Bleeding, The Truth Behind America's Terrifying Epidemic of Medical Mistakes*, by Robert M. Wachter, MD, and Kaveh G. Shojania, MD, 2004

*Complications*, by Atul Gawande, MD, MP, 2002

"Notes of a Surgeon: On Washing Hands," by Atul Gawande, MD, MPH, *The New England Journal of Medicine*, March 25, 2004

"To Fix Health Care, Hospitals Take Tips From Factory Floor," by Bernard Wysocki Jr., *The Wall Street Journal*, April 9, 2004



**Branches® is a publication of the Jewish Healthcare Foundation**  
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