

Surgical Care Improvement Project

Past, present, and future



Dale W. Bratzler, DO, MPH
President and CEO
Oklahoma Foundation for Medical Quality

This material was prepared by Oklahoma Foundation for Medical Quality, the Medicare Quality Improvement Organization for Oklahoma, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy.

**Where we started.....the
measurement**

SCIP Inf 1	Antibiotic within 60 minutes before incision*
SCIP Inf 2	Antibiotic consistent with guidelines*
SCIP Inf 3	Antibiotic stopped within 24 hours of surgery end
SCIP Inf 4	Glucose control for cardiac surgery
SCIP Inf 6	Appropriate hair removal
SCIP Inf 9	Urinary catheter removal within 2 days after surgery
SCIP Inf 10	Normothermia or active warming in OR
SCIP Card 2	Perioperative beta-blocker in patients on beta-blockers as a home medication
SCIP VTE 1	Recommended VTE prophylaxis ordered
SCIP VTE 2	Recommended VTE prophylaxis implemented within 24 hours before or after surgery

*Also collected and reported for select outpatient operations.

SCIP Steering Committee

- American College of Surgeons
- American Hospital Association
- American Society of Anesthesiologists
- Association of Peri-Operative Registered Nurses
- Agency for Healthcare Research and Quality
- Centers for Medicare & Medicaid Services
- Centers for Disease Control and Prevention
- Department of Veteran's Affairs
- Institute for Healthcare Improvement
- Joint Commission on Accreditation of Healthcare Organizations

Committee that met between 2003 to 2009 to guide development and implementation of the national project.

Initial Quality Indicators

National Surgical Infection Prevention Project

- Proportion of patients with antibiotic initiated within 1 hour before surgical incision
- Proportion of patients who receive prophylactic antibiotics consistent with current recommendations
- Proportion of patients whose prophylactic antibiotics were discontinued within 24 hours of surgery end time

Measures implemented nationally in 2002 were based on literature review and consensus of national experts on surgical infection prevention, and authors of multiple guidelines on surgical antimicrobial prophylaxis.

Based on Principles of Surgical Antimicrobial Prophylaxis

- Delivery of an antibiotic just before incision results in the lowest rate of SSI
 - Infection rates go up if given too early or if given after incision
- Narrow spectrum antibiotic that targets the organisms likely to be encountered for the operation
- Maintain adequate antibiotic levels in the tissue the entire time the wound is open in the OR
- For most operations, the standard of care is to give an IV antibiotic just prior to incision
 - IM antibiotics are not reliably absorbed
 - Oral fluoroquinolones only for urologic surgery

Principles of Surgical Antimicrobial Prophylaxis

- Multiple studies have evaluated single dose or short-course antibiotic prophylaxis compared to multi-day courses in a wide variety of operations
 - No difference in rates of infection
 - When infection occurs, more likely to be with a resistant organism
 - Increases risk of *C. difficile* enterocolitis



American College of Surgeons

FOUNDED BY SURGEONS OF THE UNITED STATES AND CANADA, 1912

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Thomas R. Russell, MD, FACS
Executive Director

May 7, 2004

Dale Bratzler, DO, MPH
Oklahoma Foundation for Medical Quality
14000 Quail Springs Parkway
Suite 400
Oklahoma City, OK 73134-2627

RE: "Antimicrobial Prophylaxis for Surgery: An Advisory Statement from the National Surgical Infection Prevention Project"

Dear Dr. Bratzler:

The American College of Surgeons appreciated the opportunity to participate in the development of the National Surgical Infection Prevention Project's "Antimicrobial Prophylaxis for Surgery: An Advisory Statement from the National Surgical Infection Prevention Project". The draft statement was forwarded to the College's Division of Research and Optimal Patient Care, the Committee on Perioperative Care and others for review.

The response was very positive, and the College is pleased to add its endorsement of this important document. Thank you.

Sincerely,

Thomas R. Russell, MD, FACS
Executive Director
American College of Surgeons

"...the College is pleased to add its endorsement of this important document."

**Thomas R. Russell, MD, FACS
Executive Director
American College of Surgeons**



Excerpta Medica

The American
Journal of Surgery

The American Journal of Surgery 189 (2005) 395-404
Scientific paper

Antimicrobial prophylaxis for surgery: an advisory statement from the National Surgical Infection Prevention Project

Dale W. Bratzler, D.O., M.P.H.*, Peter M. Houck, M.D., for the Surgical Infection Prevention Guideline Writers Workgroup

Oklahoma Foundation for Medical Quality, Inc., 14000 Quail Springs Pkwy., Suite 400, Oklahoma City, OK 73134-2627, USA

Abstract

In January 2003, leadership of the Medicare National Surgical Infection Prevention Project hosted the Surgical Infection Prevention Guideline Writers Workgroup meeting. The objectives were to review areas of agreement among the published guidelines for surgical antimicrobial prophylaxis, to address inconsistencies, and to discuss issues not currently addressed. The participants included authors from most of the published North American guidelines for antimicrobial prophylaxis and several specialty colleges. The workgroup reviewed currently published guidelines for antimicrobial prophylaxis. Nominal group process was used to draft a consensus paper that was widely circulated for comment. The consensus positions of the workgroup include that infusion of the first antimicrobial dose should begin within 60 minutes before surgical incision and that prophylactic antimicrobial agents should be discontinued within 24 hours of the end of surgery. This advisory statement provides an overview of other issues related to antimicrobial prophylaxis including specific suggestions regarding antimicrobial selection.

The American College of Surgeons has been involved since the outset!



Excerpta Medica

The American Journal of Surgery 189 (2005) 395–404
Scientific paper

The American
Journal of Surgery*

Antimicrobial prophylaxis for surgery: an advisory statement from the National Surgical Infection Prevention Project

Dale W. Bratzler, D.O., M.P.H.*, Peter M. Houck, M.D., for the Surgical Infection
Prevention Guideline Writers Workgroup

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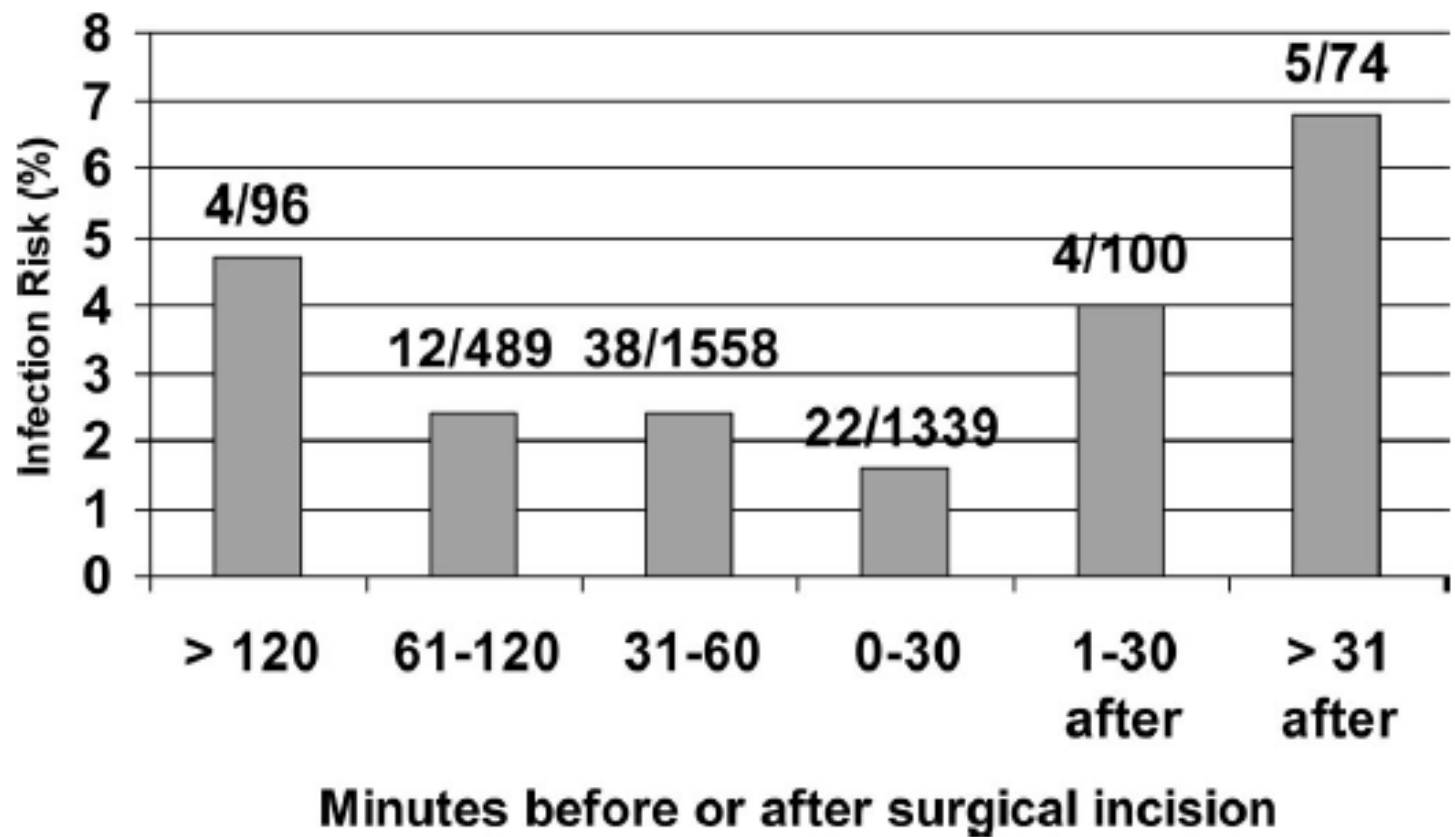
**Broad national
consensus!**

Acknowledgment:

The following organizations have endorsed this Advisory Statement American Academy of Orthopaedic Surgeons; American Association of Critical Care Nurses; American Association of Nurse Anesthetists; American College of Surgeons; American College of Osteopathic Surgeons; American Geriatrics Society; American Society of Anesthesiologists; American Society of Colon and Rectal Surgeons; American Society of Health-System Pharmacists; American Society of PeriAnesthesia Nurses; Ascension Health; Association of periOperative Registered Nurses; Association for Professionals in Infection Control and Epidemiology; Infectious Diseases Society of America; The Medical Letter; Premier, Inc.; Society for Healthcare Epidemiology of America; Society of Thoracic Surgeons; and the Surgical Infection Society. *The following organizations have had the opportunity to review and provide comment on this Advisory Statement:* American College of Obstetricians and Gynecologists; American Hospital Association; Centers for Disease Control and Prevention; Joint Commission on Accreditation of Healthcare; and VHA, Inc.

Key point – the national performance measures are not made up by CMS or The Joint Commission.... the measures are based on published guidelines with explicit input from surgical specialty societies and practicing physicians.

The measures are standardized nationally and publicly vetted through open public comment by the National Quality Forum. Reporting of the measures is the same for every hospital in the nation.



Steinberg JP, et al. *Ann Surg* 2009;250: 10–16.

Issues Related to SCIP Infection 1

- How close to incision can the antibiotic be started? Does the infusion need to be completed?
 - Very little data upon which to base recommendation
 - Good pharmacokinetic studies show that peak tissue levels of drugs such as cefazolin are achieved within 20-40 minutes of infusion
 - Do you need peak levels at incision?
 - When is the greatest risk of surgical infection – at the start or end of the operation?

Issues Related to SCIP Infection 1

- We do know...
 - Multiple studies demonstrate that starting the antibiotic close to the time of incision reduces the infection rate – newer studies suggest within 30 minutes (vancomycin within 15-60 minutes)
 - Studies with tissue biopsy show antibiotic levels that exceed the MIC of common skin organisms at the time of incision when antibiotics given shortly before incision
 - The closer to incision the antibiotic is given, the greater the likelihood of persistent tissue levels at the end of the operation

Antibiotic Recommendations

Surgery Type	Antimicrobial recommendations
Hip or knee arthroplasty	Preferred: Cefazolin or cefuroxime If patient high risk for MRSA: Vancomycin* Beta-lactam allergy: <ul style="list-style-type: none">• Vancomycin or clindamycin
Cardiac or vascular	Preferred: Cefazolin or cefuroxime If patient high risk for MRSA: Vancomycin* Beta-lactam allergy: <ul style="list-style-type: none">• Vancomycin or clindamycin

* For the purposes of national performance measurement a case will pass the antibiotic selection performance measure if vancomycin is used for prophylaxis (in the absence of a documented beta-lactam allergy) if there is physician documentation of the rationale for vancomycin use.

Antibiotic Recommendations (continued)

Surgery Type	Antimicrobial recommendations
Hysterectomy	<ul style="list-style-type: none"> • Cefotetan, cefazolin, cefoxitin, cefuroxime, or ampicillin-sulbactam <p>Beta-lactam allergy:</p> <ul style="list-style-type: none"> • Clindamycin + gentamicin or fluoroquinolone* or aztreonam • Metronidazole + gentamicin or fluoroquinolone* • Clindamycin monotherapy • metronidazole monotherapy <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: 150px;"> <p style="color: red; font-size: small;">Clindamycin and metronidazole monoprophyllaxis are no longer recommended in new ACOG guidelines</p> </div>
Colorectal †	<ul style="list-style-type: none"> • Cefotetan, cefoxitin, cefazolin + metronidazole, ampicillin-sulbactam, or ertapenem (single-dose) <p>Beta-lactam allergy:</p> <ul style="list-style-type: none"> • Clindamycin + gentamicin or fluoroquinolone* or aztreonam • Metronidazole + gentamicin or fluoroquinolone*

* Ciprofloxacin, levofloxacin, gatifloxacin, or moxifloxacin.

Should vancomycin be used routinely?

- Controversial
 - Some authors highlight that use of a couple of doses for prophylaxis may reduce the need for weeks of therapy for an infection
 - However, a lot of patients who would never get a SSI will be exposed to use of vancomycin
 - MICs to vancomycin are increasing in many centers
- CDC and others proposing additional studies*

Why can't I use the antibiotics recommended for patients with beta-lactam allergy (in the absence of a documented allergy)

- Drugs such as fluoroquinolones should not be routinely used for surgical prophylaxis
 - Very high rates of gram negative resistance
 - Not great against common SSI organisms (such as *S. aureus*)
 - Associated with *C. difficile* infection and in some centers tied to increasing MRSA rates

Preoperative Screening

- If preoperative MRSA colonization screening is done in advance of surgery there may be utility to
 - Nasal mupirocin twice daily for 5 days
 - CHG bathing at home
 - Vancomycin for surgical prophylaxis

You do not “treat” colonization. You may provide additional care before surgery (CHG baths, etc), and you may use or add vancomycin as a preoperative antibiotic. But, you do not continue vancomycin after surgery because you do not treat colonization.

What about the pre-surgical prep?

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Chlorhexidine–Alcohol versus Povidone–Iodine for Surgical-Site Antisepsis

Rabih O. Darouiche, M.D., Matthew J. Wall, Jr., M.D., Kamal M.F. Itani, M.D., Mary F. Otterson, M.D., Alexandra L. Webb, M.D., Matthew M. Carrick, M.D., Harold J. Miller, M.D., Samir S. Awad, M.D., Cynthia T. Crosby, B.S., Michael C. Mosier, Ph.D., Atef AlSharif, M.D., and David H. Berger, M.D.

Preoperative cleansing of the patient's skin with chlorhexidine–alcohol is superior to cleansing with povidone iodine for preventing surgical-site infection after clean contaminated surgery.

CHG-alcohol vs iodine alone

My key point from these studies – use an alcohol-based prep!

Infect Control Hosp Epidemiol. 2009 Oct;30(10):964-71.

Effects of preoperative skin preparation on postoperative wound infection rates: a prospective study of 3 skin preparation protocols.

Swenson BR, Hedrick TL, Metzger R, Bonatti H, Pruett TL, Sawyer RG.

Departments of Surgery, University of Virginia Health System, Charlottesville, 22908-0300, USA. brs3j@virginia.edu

CONCLUSIONS: Skin preparation solution is an important factor in the prevention of surgical-site infections. Iodophor-based compounds may be superior to chlorhexidine for this purpose in general surgery patients.

CHG-alcohol vs iodine-alcohol

Studies Comparing Single versus Multiple Antibiotic Doses in Colorectal Surgery

1236 F. SONG and A.-M. GLENNY

Reference	Year	Antibiotic	Odds ratio (95% c.i.)	Proportion with surgical wound infection
Carr <i>et al.</i> ⁶⁸	1984	Metronidazole(1) <i>versus</i> (2-4)	1.5 (0.8, 2.8)	7 of 22 <i>versus</i> 11 of 68
Aberg and Thore ⁶⁹	1991	Cefuroxime + metronidazole(1) <i>versus</i> (3)	1.8 (0.8, 4.0)	2 of 19 <i>versus</i> 1 of 29
Corman <i>et al.</i> ²⁷	1993	Cefoxitin(1) <i>versus</i> (4)	2.5 (1.0, 6.0)	2 of 31 <i>versus</i> 0 of 27
Kow <i>et al.</i> ⁷⁰	1995	Cefoxitin(1) <i>versus</i> (3)	1.2 (0.6, 2.2)	10 of 73 <i>versus</i> 8 of 81
Jensen <i>et al.</i> ²⁵	1990	Ampicillin + metronidazole(1) <i>versus</i> (3)	1.0 (0.5, 2.0)	14 of 100 <i>versus</i> 12 of 104
Juul <i>et al.</i> ⁷¹	1987	Ampicillin + metronidazole(1) <i>versus</i> (4)	1.0 (0.5, 2.0)	9 of 149 <i>versus</i> 8 of 145
Hall <i>et al.</i> ³¹	1989	Latamoxef(1) <i>versus</i> (8)	1.1 (0.6, 2.0)	12 of 119 <i>versus</i> 10 of 126
Bates <i>et al.</i> ⁷²	1992	Co-amoxiclav(1) <i>versus</i> (3)	1.0 (0.5, 2.0)	23 of 113 <i>versus</i> 17 of 111
Grundmann <i>et al.</i> ⁷³	1987	Mezlocillin + metronidazole(1) <i>versus</i> (3)	1.0 (0.5, 2.0)	4 of 77 <i>versus</i> 4 of 77
Mendel <i>et al.</i> ⁷⁴	1987	Mezlocillin + metronidazole(1) <i>versus</i> (9)	1.5 (0.7, 3.0)	2 of 54 <i>versus</i> 1 of 46
Bittner <i>et al.</i> ⁷⁵	1989	Mezlocillin + metronidazole(1) <i>versus</i> (7)	1.2 (0.6, 2.2)	6 of 46 <i>versus</i> 3 of 44
Cuthbertson <i>et al.</i> ⁷⁶	1991	Ticarcillin/clavulanic acid(1) <i>versus</i> (2)	0.8 (0.4, 1.5)	16 of 146 <i>versus</i> 17 of 132
Kow <i>et al.</i> ⁷⁰	1995	Cefotaxime + metronidazole(1) <i>versus</i> (3)	0.8 (0.4, 1.5)	7 of 84 <i>versus</i> 9 of 81
Goransson <i>et al.</i> ⁷⁷	1984	Doxycycline(1) <i>versus</i> (4)	0.5 (0.2, 1.0)	1 of 53 <i>versus</i> 2 of 49
Wenzel <i>et al.</i> ⁷⁸	1985	Gentamicin + metronidazole(1) <i>versus</i> (3)	0.8 (0.4, 1.5)	6 of 30 <i>versus</i> 10 of 30
Lohr <i>et al.</i> ⁷⁹	1984	Cefotaxime(1) <i>versus</i> (3)	1.0 (0.5, 2.0)	4 of 30 <i>versus</i> 3 of 30
Tuchmann <i>et al.</i> ⁸⁰	1988	Piperacillin + metronidazole(1) <i>versus</i> (3)	1.0 (0.5, 2.0)	4 of 61 <i>versus</i> 5 of 63

Surgical infection rates were no different in those patients that got one versus multiple doses of antibiotics!

Favours single dose

Favours multiple doses

Fig. 5 Effect of single *versus* multiple doses of antibiotic in preventing surgical wound infection in colorectal surgery. Values in parentheses are number of doses. c.i., Confidence interval

SCIP Infection 4

- Proportion of cardiac surgery patients whose post-operative day 1 and 2 AM blood sugar is 200 mg/dL or less.

Glucose Control

- May be important for all operations
 - However, incidence of hyperglycemia may be less for non-cardiac surgery patients
 - Cardiac surgery patients have high rates of hyperglycemia (~30% diabetic coming in the door), use of inotropes that may elevate blood sugar, and unrecognized diabetes

AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN DIABETES ASSOCIATION CONSENSUS STATEMENT ON INPATIENT GLYCEMIC CONTROL

*Etie S. Moghissi, MD, FACP, FACE¹; Mary T. Korytkowski, MD²;
Monica DiNardo, MSN, CRNP, CDE³; Daniel Einhorn, MD, FACP, FACE⁴;
Richard Hellman, MD, FACP, FACE⁵; Irl B. Hirsch, MD⁶; Silvio E. Inzucchi, MD⁷;
Faramarz Ismail-Beigi, MD, PhD⁸; M. Sue Kirkman, MD⁹;
Guillermo E. Umperierrez, MD, FACP, FACE¹⁰*

SUMMARY OF RECOMMENDATIONS

I. Critically Ill Patients

- Insulin therapy should be initiated for treatment of persistent hyperglycemia, starting at a threshold of no greater than 180 mg/dL (10.0 mmol/L).
- Once insulin therapy has been started, a glucose range of 140 to 180 mg/dL (7.8 to 10.0 mmol/L) is recommended for the majority of critically ill patients.
- Intravenous insulin infusions are the preferred method for achieving and maintaining glycemic control in critically ill patients.
- Validated insulin infusion protocols with demonstrated safety and efficacy, and with low rates of occurrence

- Clinical judgment and ongoing assessment of clinical status must be incorporated into day-to-day decisions regarding treatment of hyperglycemia.

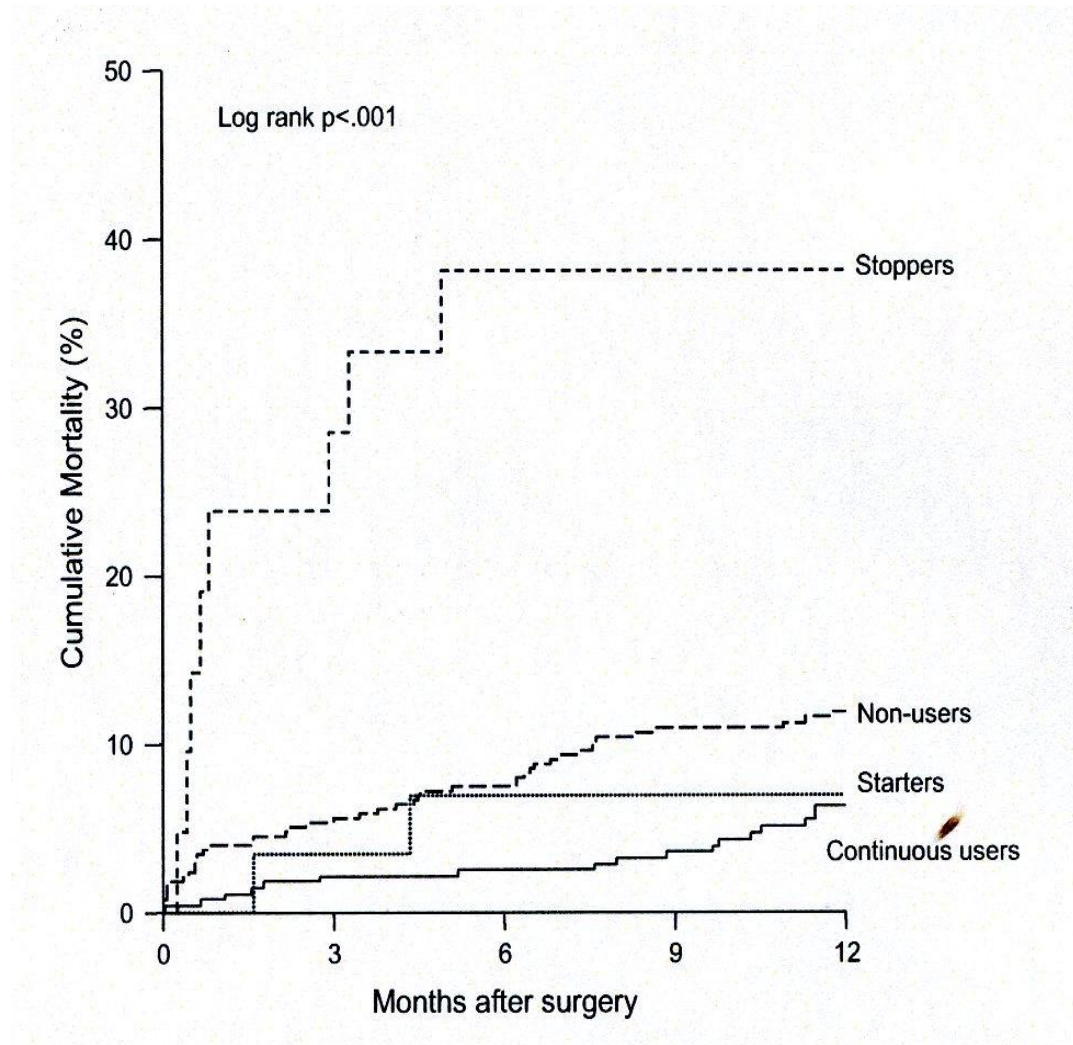
III. Safety Issues

- Overtreatment and undertreatment of hyperglycemia represent major safety concerns.
- Education of hospital personnel is essential in engaging the support of those involved in the care of inpatients with hyperglycemia.
- Caution is required in interpreting results of POC glucose meters in patients with anemia, polycythemia

SCIP Cardiac 2

- The proportion of patients undergoing surgery who take a beta-blocker as a home medication who have it continued peri-operatively
 - To pass measure, patient may take the medication at home (within 24 hours before incision), take it with a sip of water before surgery, or be given a beta-blocker intra-operatively or in the immediate postop period
 - Or, an explicit reason to not continue the beta-blocker must be documented by the physician in the chart
 - **MUST** be documented in the chart.

Beta-Blocker Withdrawal





European Heart Journal
doi:10.1093/eurheartj/ehp337


ESC GUIDELINES

CME † **Guidelines for pre-operative cardiac risk assessment and perioperative cardiac management in non-cardiac surgery**

The Task Force for Preoperative Cardiac Risk Assessment and Perioperative Cardiac Management in Non-cardiac Surgery of the European Society of Cardiology (ESC) and endorsed by the European Society of Anaesthesiology (ESA)

Authors/Task Force Members: Don Poldermans; (Chairperson) (The Netherlands)*; Jeroen J. Bax (The Netherlands); Eric Boersma (The Netherlands); Stefan De Hert

Recommendations on β -blockers^a



Recommendations	Class ^b	Level ^c
β -Blockers are recommended in patients who have known IHD or myocardial ischaemia according to pre-operative stress testing ^a	I	B
β -Blockers are recommended in patients scheduled for high-risk surgery ^a	I	B
Continuation of β -blockers is recommended in patients previously treated with β -blockers because of IHD, arrhythmias, or hypertension	I	C
β -Blockers should be considered for patients scheduled for intermediate-risk surgery ^a	IIa	B
Continuation in patients previously treated with β -blockers because of chronic heart failure with systolic dysfunction should be considered	IIa	C
β -Blockers may be considered in patients scheduled for low-risk surgery with risk factor(s)	IIb	B
Perioperative high-dose β -blockers without titration are not recommended	III	A
β -Blockers are not recommended in patients scheduled for low-risk surgery without risk factors	III	B

^aTreatment should be initiated optimally between 30 days and at least 1 week before surgery. Target: heart rate 60–70 beats/min, systolic blood pressure > 100 mmHg.

^bClass of recommendation.

^cLevel of evidence.

IHD = ischaemic heart disease.

PRACTICE GUIDELINE: FOCUSED UPDATE

2009 ACCF/AHA Focused Update on Perioperative Beta Blockade

A Report of the American College of Cardiology Foundation/American Heart Association
Task Force on Practice Guidelines

*Developed in Collaboration With the American Society of Echocardiography, American Society of Nuclear
Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular
Angiography and Interventions, Society for Vascular Medicine, and Society for Vascular Surgery*

**2009 Writing Group to Review New Evidence and Update
the 2007 Guidelines on Perioperative Cardiovascular Evaluation
and Care for Noncardiac Surgery**

Kirsten E. Fleischmann, MD, MPH, FACC, *Chair*

Joshua A. Beckman, MD, FACC*

Christopher E. Buller, MD, FACC†

Hugh Calkins, MD, FACC, FAHA‡

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Judy R. Kersten, MD, FACC¶

John F. Robb, MD, FACC, FAHA#

R. James Valentine, MD**

*SVM Representative; †ACCF/AHA Task Force on Practice Guidelines Liaison;
‡HRS Representative; §ACCF/AHA Representative; ||ASE Representative; ¶SCA
Representative; #SCAI Representative; **SVS Representative

Table 2. Updates to Section 7.2.1. Recommendations for Perioperative Beta-Blocker Therapy

2007 Perioperative Guideline Recommendations	2009 Perioperative Focused Update Recommendations	Comments
Class I		
<p>1. Beta blockers should be continued in patients undergoing surgery who are receiving beta blockers to treat angina, symptomatic arrhythmias, hypertension, or other ACC/AHA Class I guideline indications. <i>(Level of Evidence: C)</i></p> <p>2. Beta blockers should be given to patients undergoing vascular surgery who are at high cardiac risk owing to the finding of ischemia on preoperative testing. <i>(Level of Evidence: B)</i></p>	<p>1. Beta blockers should be continued in patients undergoing surgery who are receiving beta blockers for treatment of conditions with ACCF/AHA Class I guideline indications for the drugs. <i>(Level of Evidence: C)</i></p>	<p>2007 recommendation remains current in 2009 update with revised wording.</p> <p>Deleted/combined recommendation (class of recommendation changed from I to IIa for patients with cardiac ischemia on preoperative testing).</p>
Class IIa		
<p>1. Beta blockers are probably recommended for patients undergoing vascular surgery in whom preoperative assessment identifies coronary heart disease. <i>(Level of Evidence: B)</i></p>	<p>1. Beta blockers titrated to heart rate and blood pressure are probably recommended for patients undergoing vascular surgery who are at high cardiac risk owing to coronary artery disease or the finding of cardiac ischemia on preoperative testing (4,5). <i>(Level of Evidence: B)</i></p>	<p>Modified/combined recommendation (wording revised and class of recommendation changed from I to IIa for patients with cardiac ischemia on preoperative testing).</p>

SCIP VTE Measures

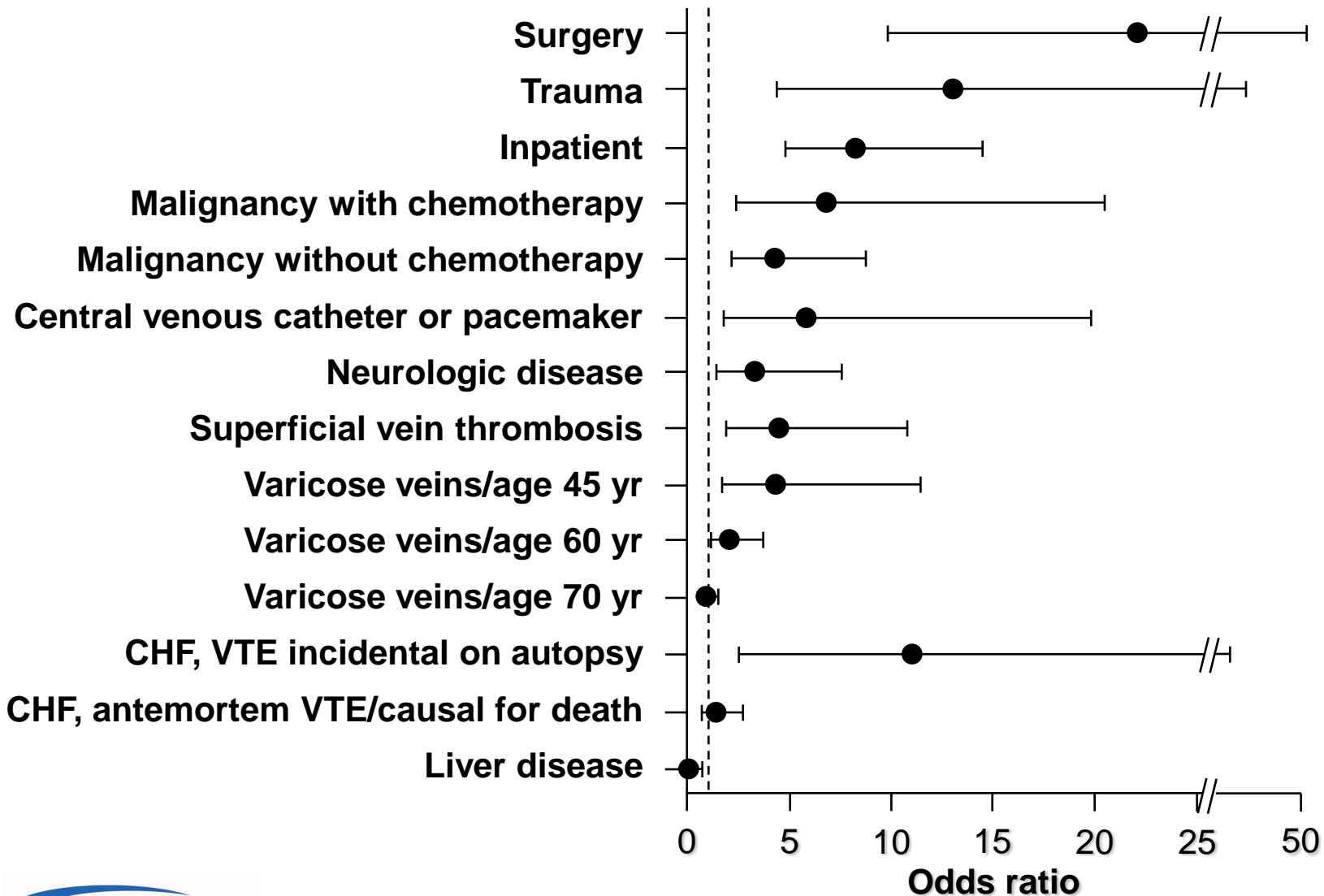
- VTE-1 Proportion of surgical patients who have recommended forms of VTE prophylaxis ordered
- VTE-2 Proportion of surgical patients who receive recommended forms of VTE within 24 hours before or after surgery

Pitfalls for VTE prophylaxis

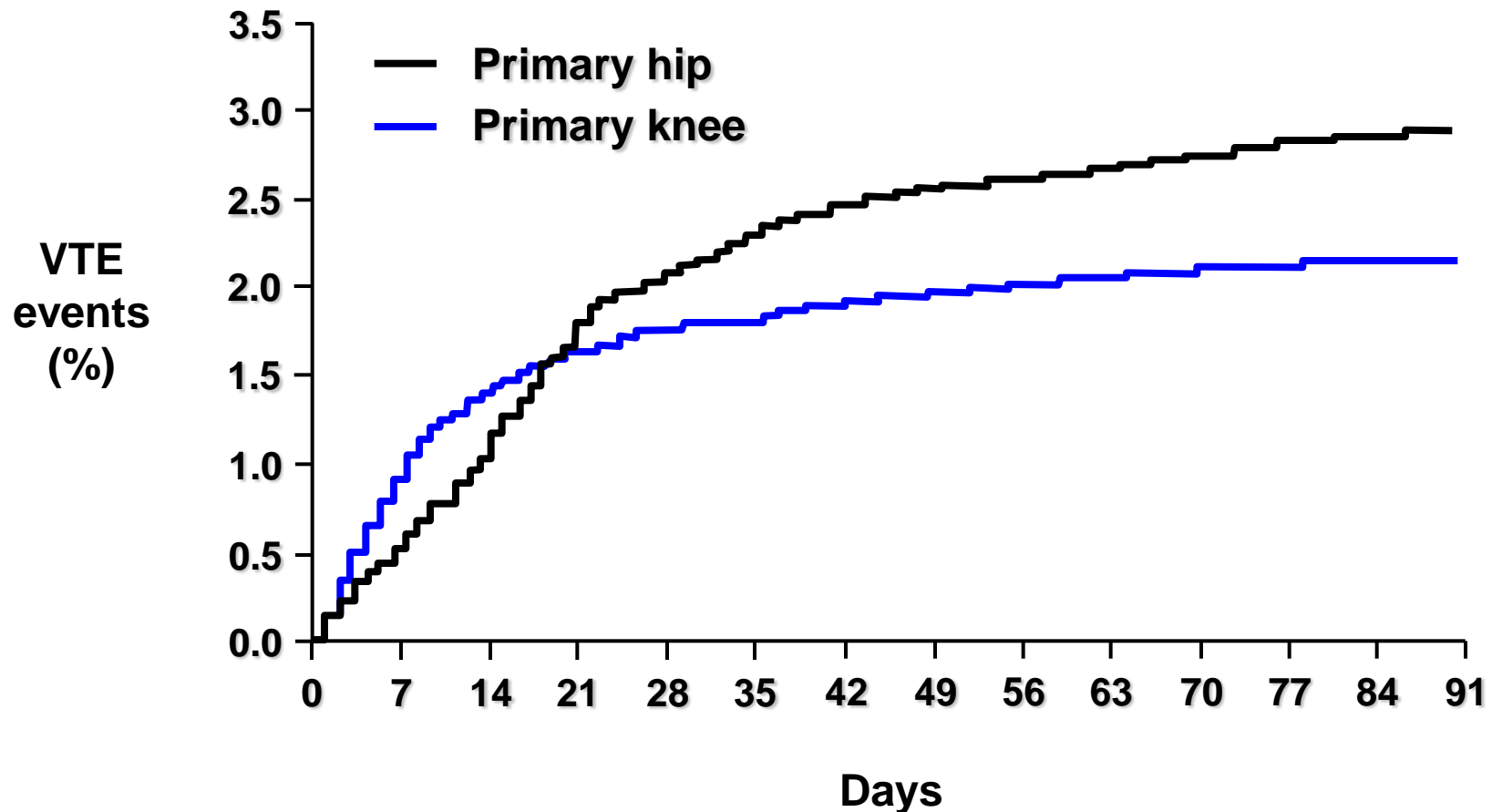
- Ambulation alone is not sufficient – early ambulation is the norm but VTE has not gone away
 - Prophylaxis should continue until discharge for most patients
- Mechanical devices don't work when they are on the floor or next to the bed
 - Well documented high rates of non-compliance in multiple studies

Risk Factors for DVT or PE

Nested Case-Control Study (n=625 case-control pairs)



Cumulative Incidence of VTE After Primary Hip or Knee Replacement



**Diseases of the
Colon & Rectum**

**Practice
Parameters**

Practice Parameters for the Prevention of Venous Thrombosis

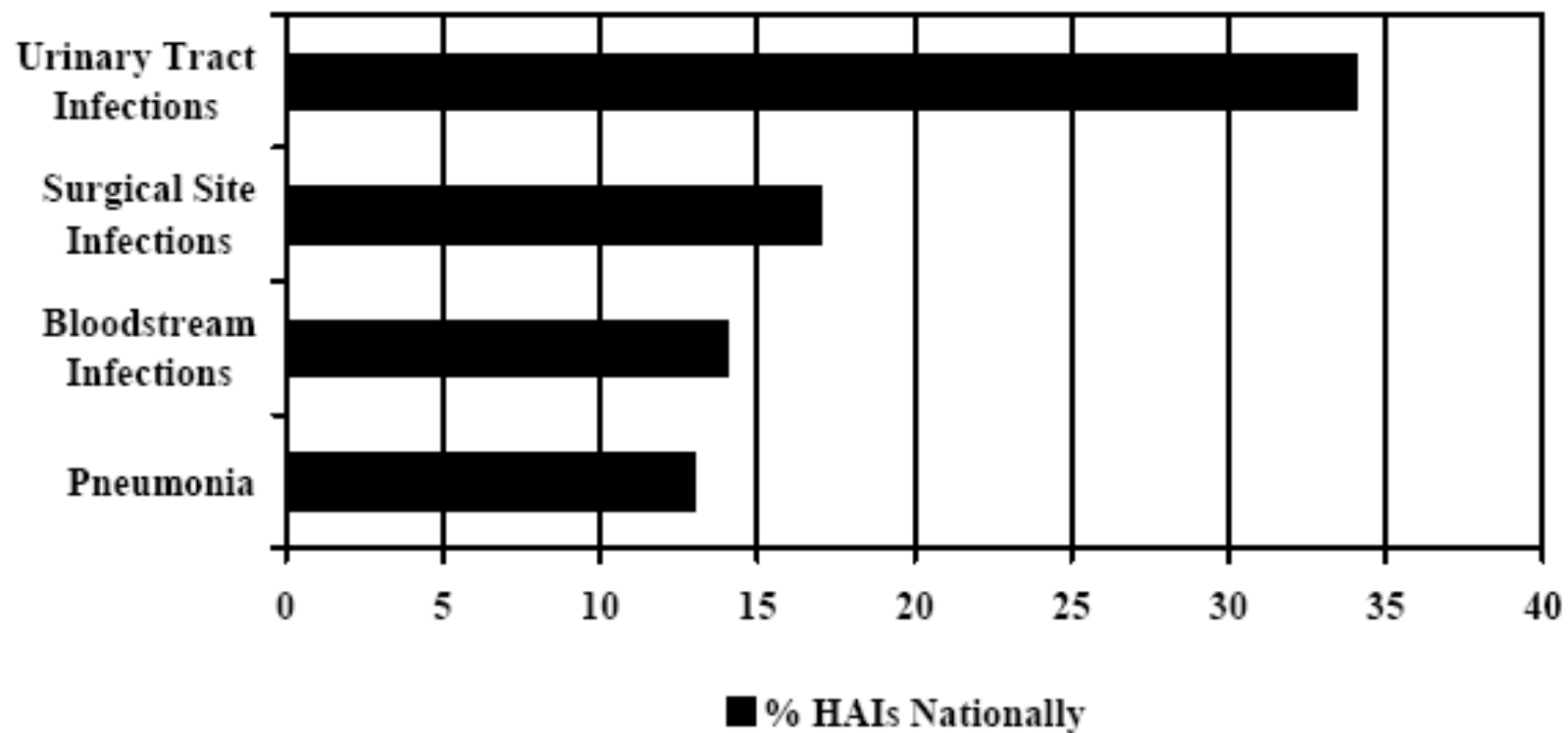
Thomas J. Stahl, M.D., Sharon G. Gregorcyk, M.D., Neil H. Hyman, M.D.,
W. Donald Buie, M.D., and the Standards Practice Task Force of The American
Society of Colon and Rectal Surgeons

The American Society of Colon and Rectal Surgeons is dedicated to ensuring high quality patient care by advancing the science, prevention, and management of disorders and diseases of the colon, rectum, and anus. The Standards Committee is composed of Society members who are chosen

specific procedure must be made by the physician in light of all of the circumstances presented by the individual patient. The evidence-based guidelines are used to categorize each recommendation by Level of Evidence and Grade of Recommendation.

New Measures for SCIP

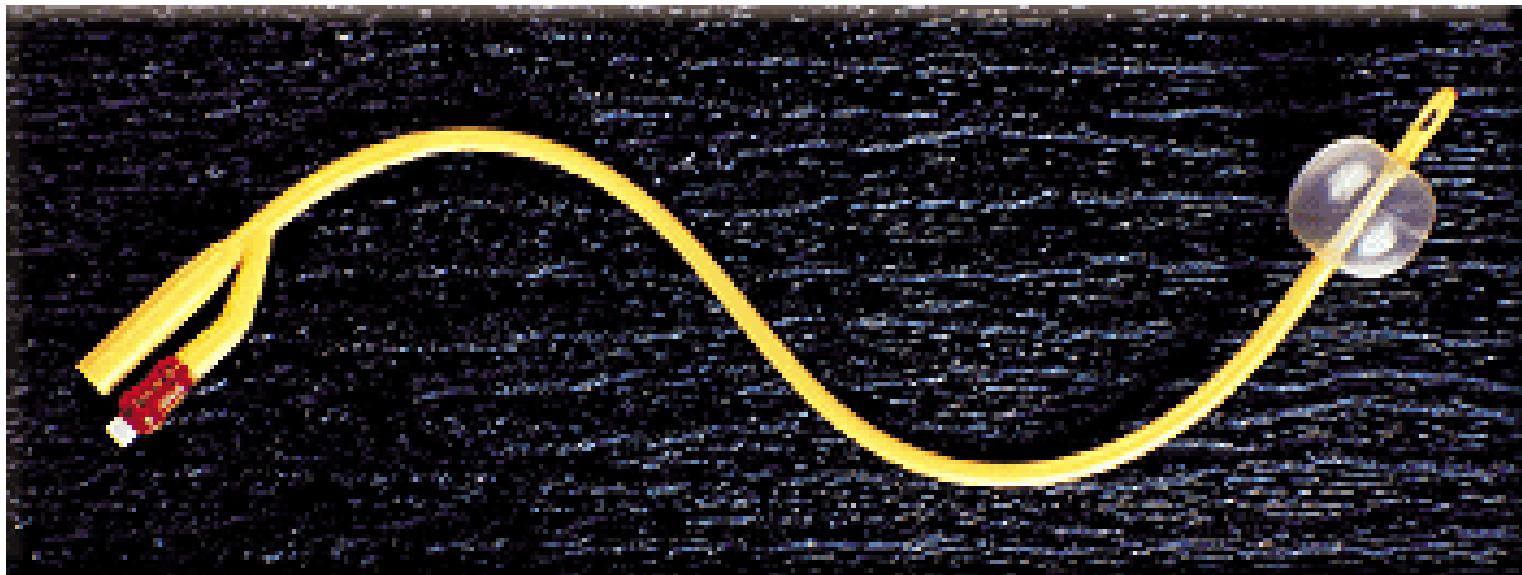
Leading Types of Healthcare-Associated Infections



Catheter-associated Urinary Tract Infections

- Most common HAI (40%)
- More common in older adults
 - 44% of HAIs vs. 28% in younger adults
- 500,000+ cases annually
- 5% complicated by bacteremia
- \$676/case, \$424-\$452 million/year

The indwelling urinary (Foley) catheter



Associated with **84%** of nosocomial UTIs
DURATION = biggest UTI risk factor

Urinary catheter use in hospitals

- **Widespread**
 - 40% of Medicare inpatients (MPSMS)
 - 86% of Medicare patients w/selected major surgeries (SIP)
 - 25% of Emergency Department patients
 - 75% are in patients > 65 years

Urinary catheter use in hospitals

- **Often inappropriate**
 - 30-50% of catheter-days on medical services
 - 50% of ED use
- **Often overlooked or forgotten**
 - Physicians don't know who has a catheter
- **Often unmonitored**
 - 23% of hospitals monitor who has catheters
 - 14% monitor catheter duration or discontinuation

Indwelling Urinary Catheter Use in the Postoperative Period

Analysis of the National Surgical Infection Prevention Project Data

Heidi L. Wald, MD, MSPH; Allen Ma, PhD; Dale W. Bratzler, DO, MPH; Andrew M. Kramer, MD

Based on Medicare inpatients (N=35904)
undergoing major surgery in 2001:

- *Eighty-six percent of patients undergoing major operations had perioperative indwelling urinary catheters. Of these, 50% had catheters for longer than 2 days postoperatively. These patients were twice as likely to develop urinary tract infections than patients with catheterization of 2 days or less.*

SCIP Infection 9

- Urinary catheter removed on postoperative day 1 (POD 1) or postoperative day 2 (POD 2) with day of surgery being day zero.
 - Excluded: Patients who had a urological, gynecological or perineal operation performed, (also ICU patients on diuretics)
 - Excluded: Explicit physician documentation of a reason to not remove

Final IPPS rule required hospitals to start publicly reporting this measure for January 2010 discharges to receive full Medicare Annual Payment Update

Consequences of Hypothermia

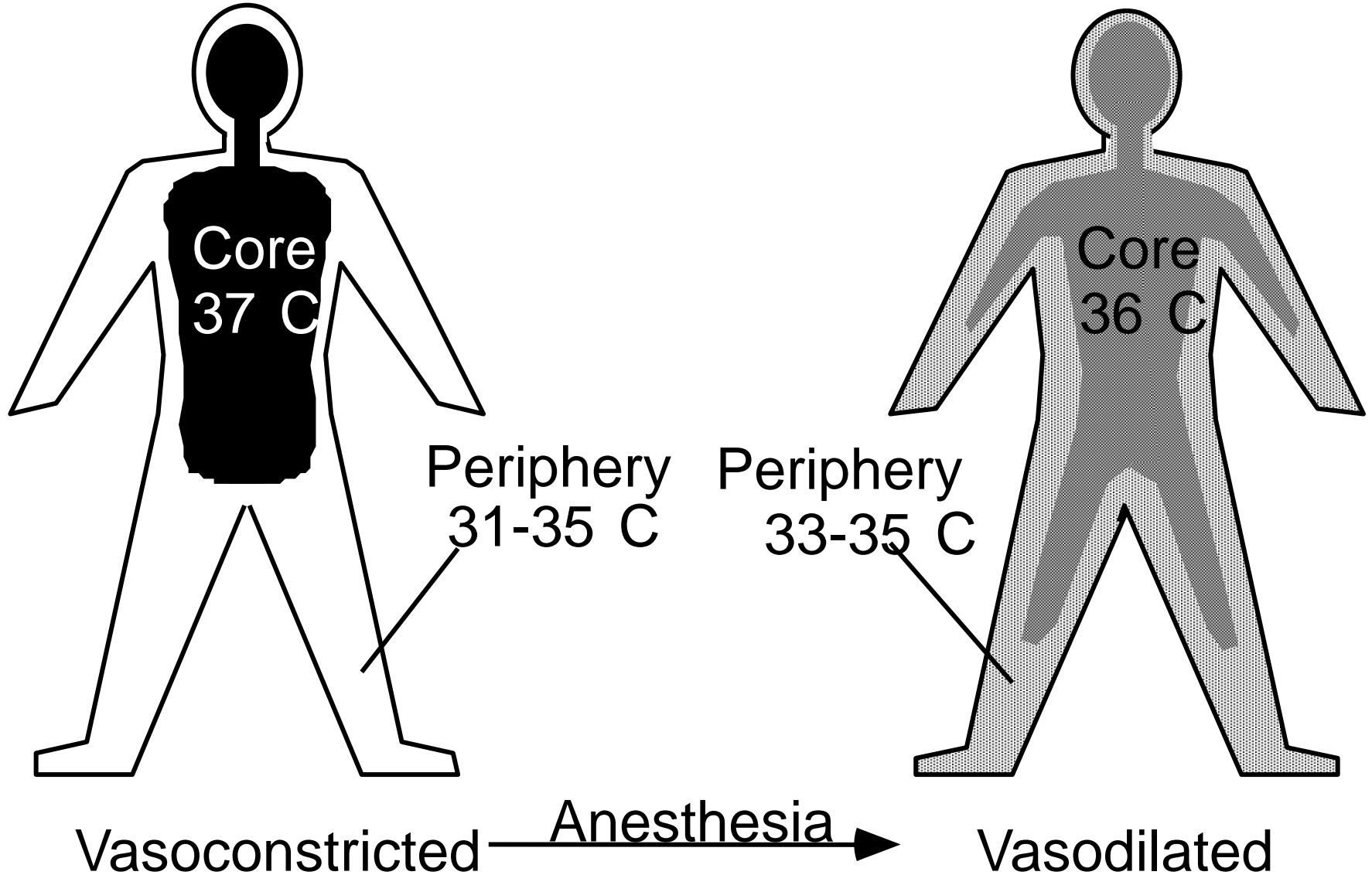
Perioperative Patients

- Adverse myocardial outcomes
 - 1.5° C core temperature decrease triples the risk of morbid myocardial events
- Coagulopathy
 - impairs platelet function and coagulation cascade
- Reduces drug metabolism
- Thermal discomfort (patient satisfaction)
- Surgical wound infection
 - thermoregulatory vasoconstriction

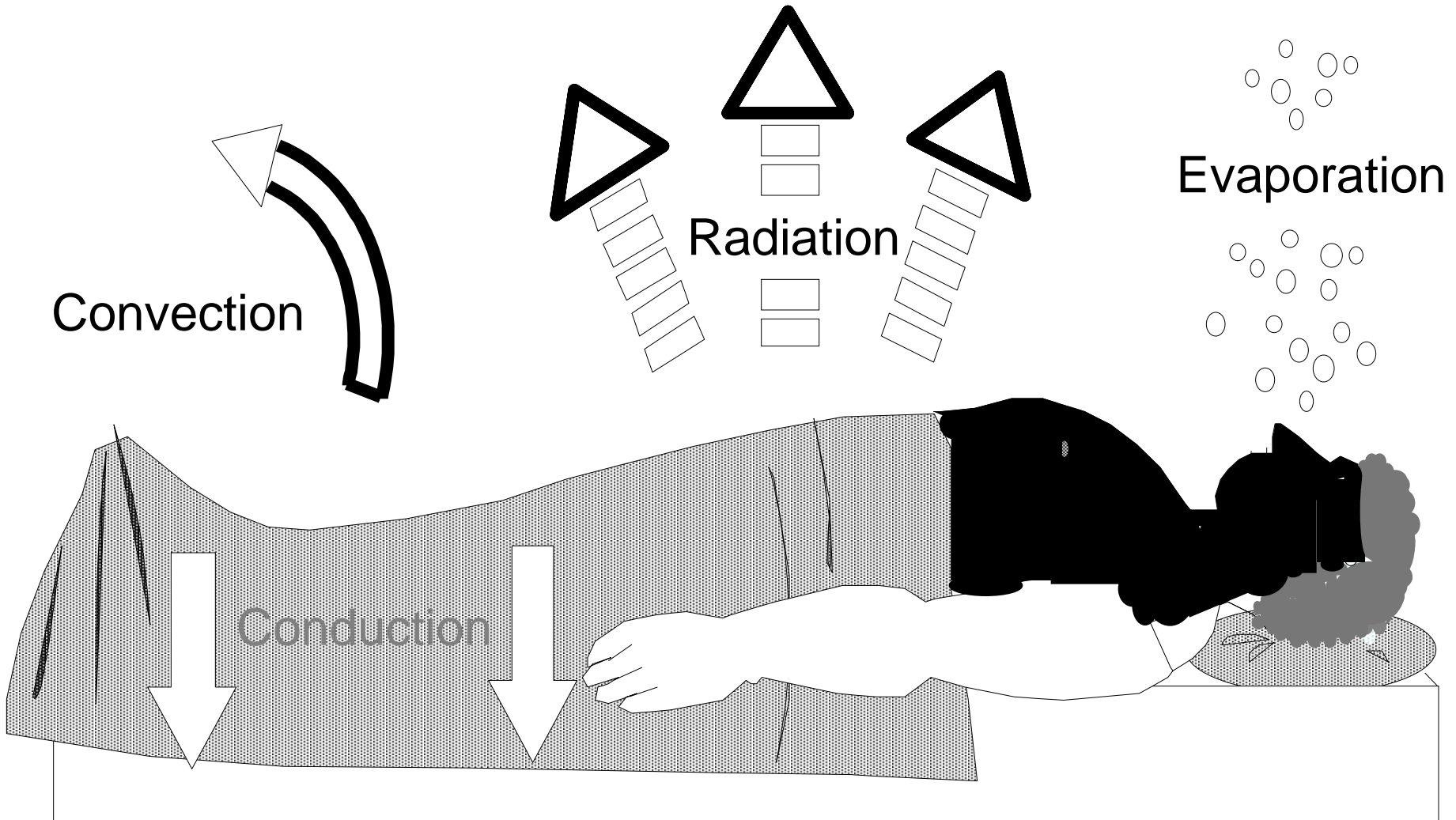
Temperature and Tissue O₂ tension

- Subcut temp increase 4° C
- Subcut O₂ tension increase 40 torr
- Linear correlation between temperature and O₂ tension
- Threefold increase in local perfusion

Redistribution Hypothermia



Intraoperative Heat Transfer



Myocardial Outcomes: n=300

	Normothermic		Hypothermic		<i>P</i>
Temperature	36.7	0.1	35.3	0.1	<0.001
Morbid Cardiac Events (%)	2		7		=0.04
Ventricular Tachycardia (%)	3		8		=0.03

Three-fold increase in norepinephrine during hypothermia
No correlation between ischemia and shivering

Temperature and SSI Following Colectomy

	<u>Normo (104)</u>	<u>Hypo (96)</u>	<u>P</u>
•Transfused pts	23	34	.054
•Units transfused	.4 <u>±</u> 1	.8 <u>±</u> 1.2	.01
•Vasoconstr-O.R.	6	77	<.001
•Vasoconst-PACU	21	81	<.001

Kurz. NEJM 1996;334:1209

Temperature and SSI Following Colectomy

	<u>Normo (104)</u>	<u>Hypo (96)</u>	<u>P</u>
SSI	6	18	.009
Collagen dep	328	254	.04
Time to eat	5.6d	6.5d	<.006

SCIP Infection 10


Surgical Normothermia

- Proportion of patients undergoing any operation (any age) who have anesthesia for more than one hour, who have active warming devices* used or achieve normothermia within 30 minutes before or 15 minutes after the end of anesthesia
 - Measure aligned with physician (PQRI) measure
 - Excludes patients with intentional hypothermia and all patients on cardiopulmonary bypass
 - NQF endorsed as of July 2008

Final IPPS rule required hospitals to start publicly reporting this measure for January 2010 discharges to receive full Medicare Annual Payment Update

*Active warming defined as: forced warm air, warm water garments, or conductive over-patient resistive heating blankets.

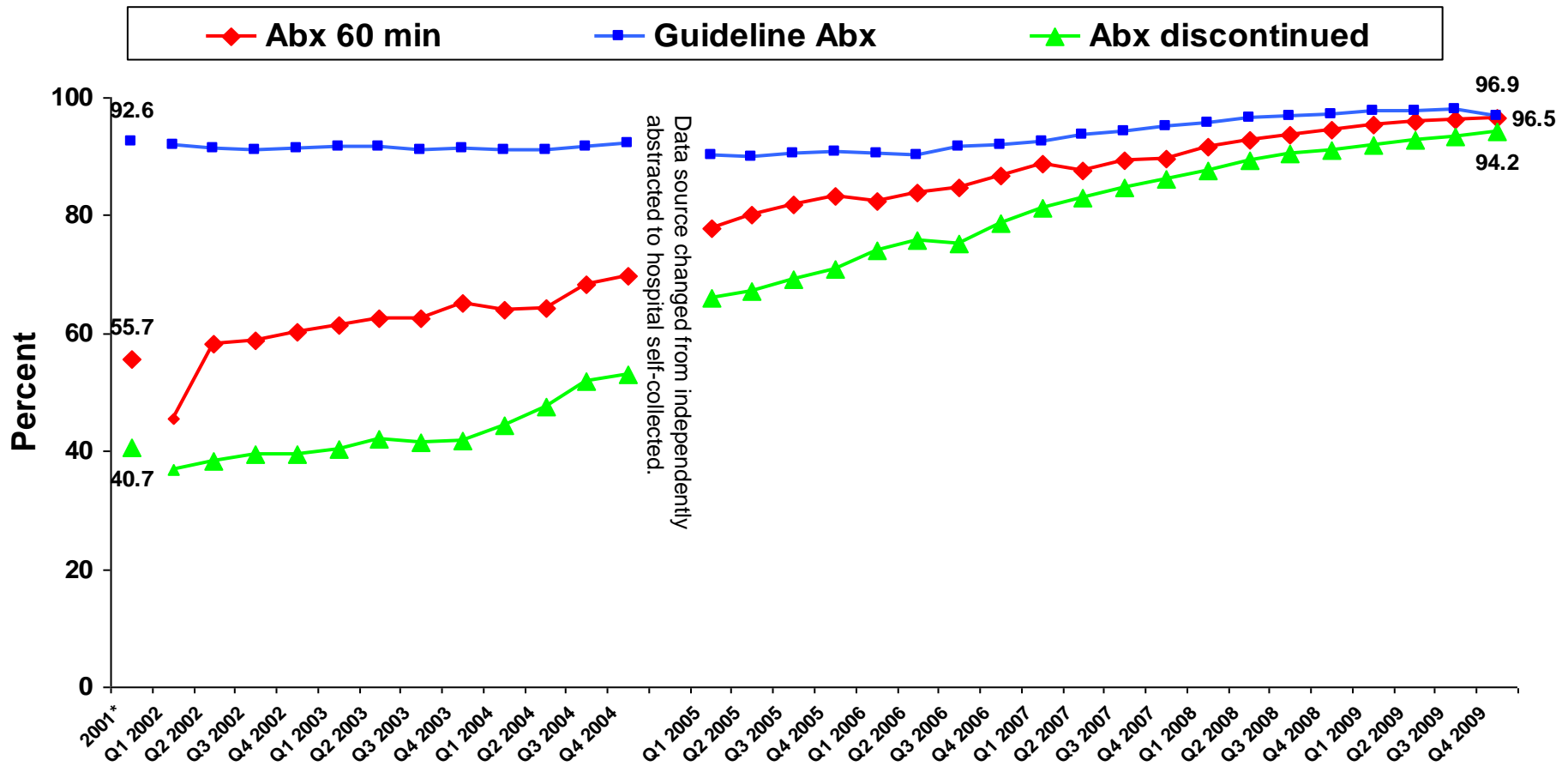
Pharmacologic Therapy for Heart Failure

	Improved symptoms	Decreased mortality	Prevention of CHF	Neurohumoral Control
DIURETICS	yes	?	?	NO
DIGOXIN	yes	=	minimal	yes
INOTROPES	yes	 mort.	?	no
Vasodil.(Nitrates)	yes	yes	?	no
ACEI	yes	YES	yes	YES
Other neurohormonal control drugs	yes	+ / -	?	YES

What are we at now?

Changes in National Performance

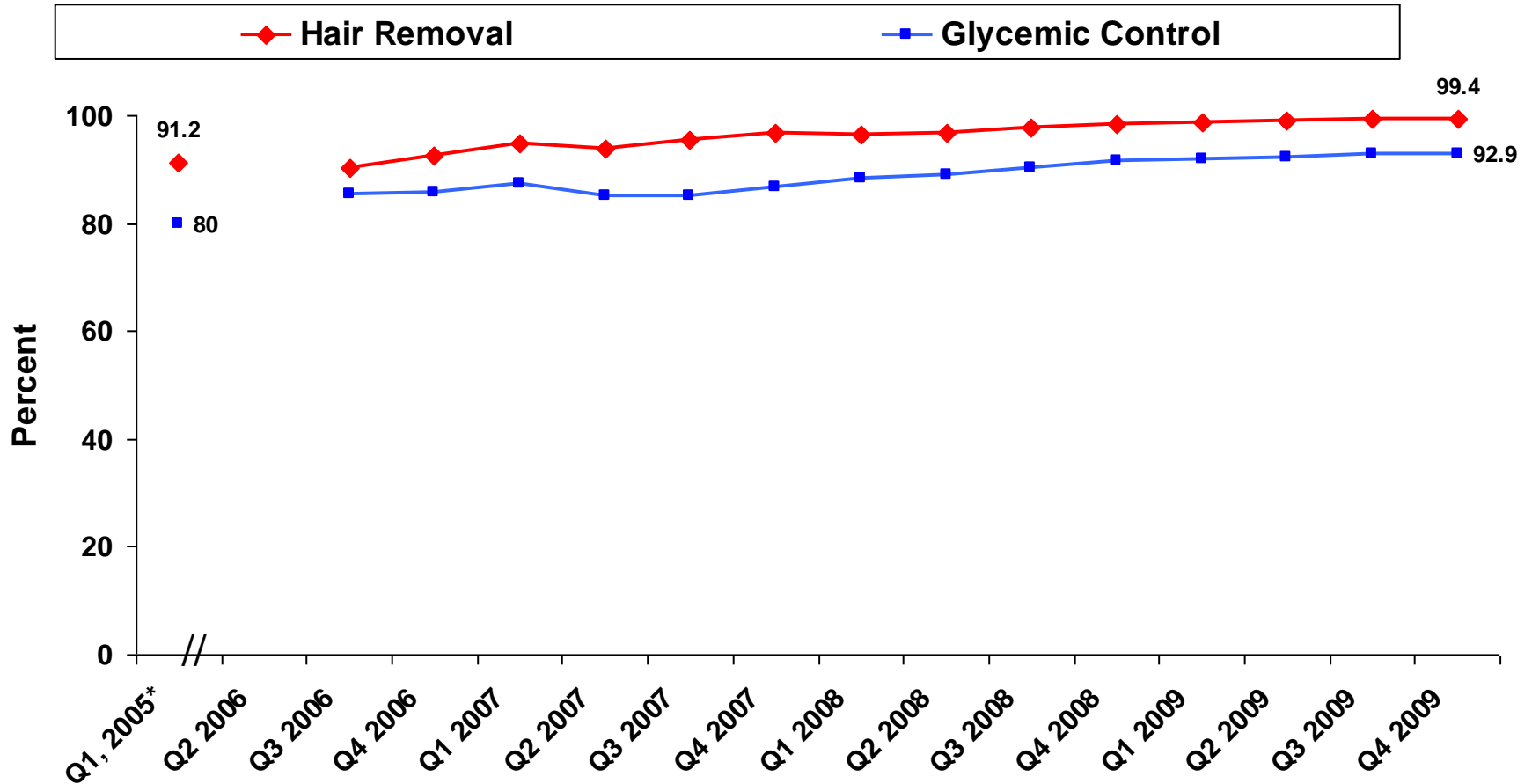
Baseline to Q4, 2009



*National sample of 39,000 Medicare patients undergoing surgery in US hospitals during 2001.
 Bratzler DW, Houck PM, et al. *Arch Surg.* 2005;140:174-182.

Changes in National Performance

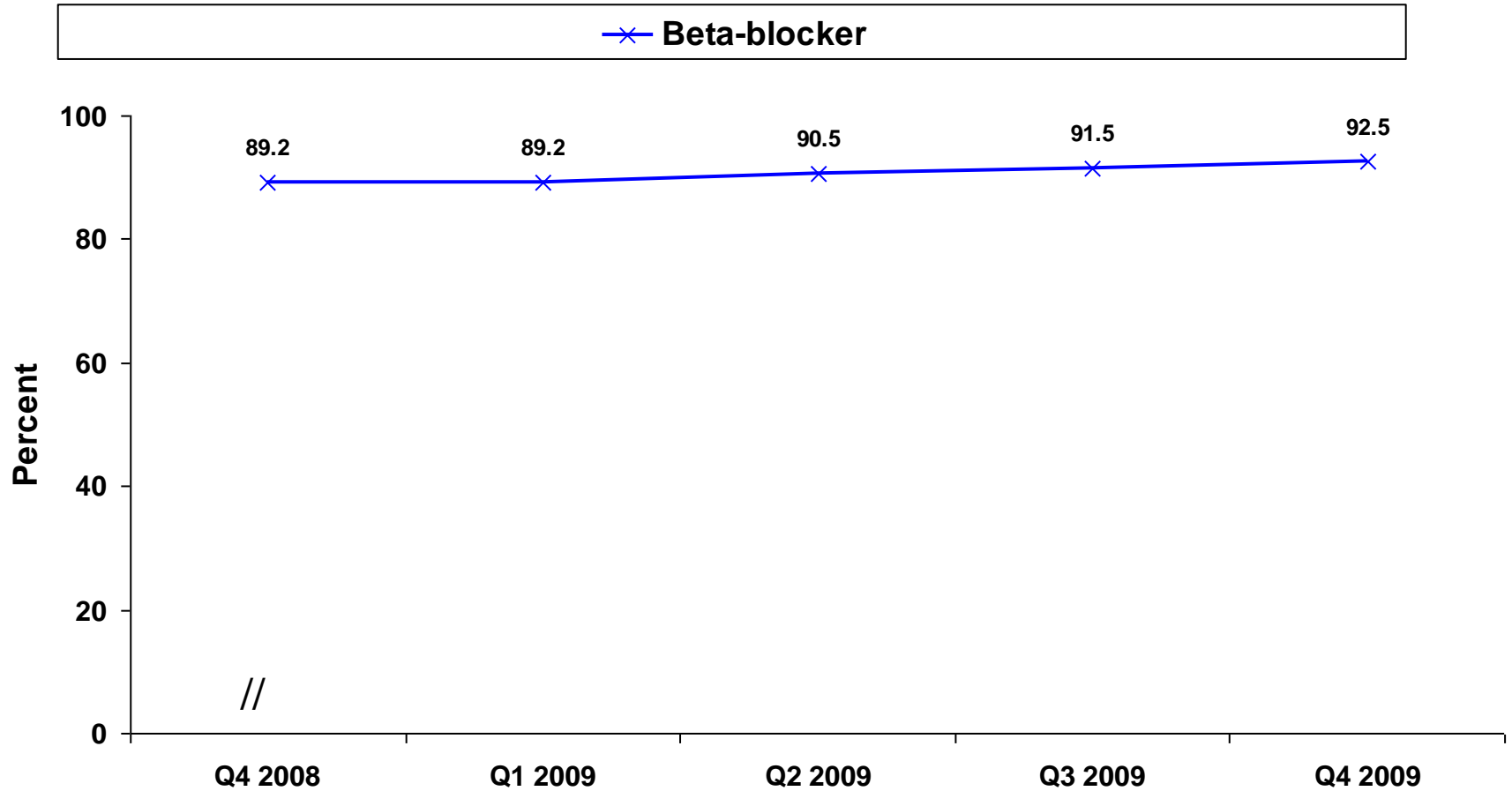
Baseline to Q4, 2009



*National sample of 19,497 Medicare patients undergoing surgery in US hospitals during the first quarter of 2005.

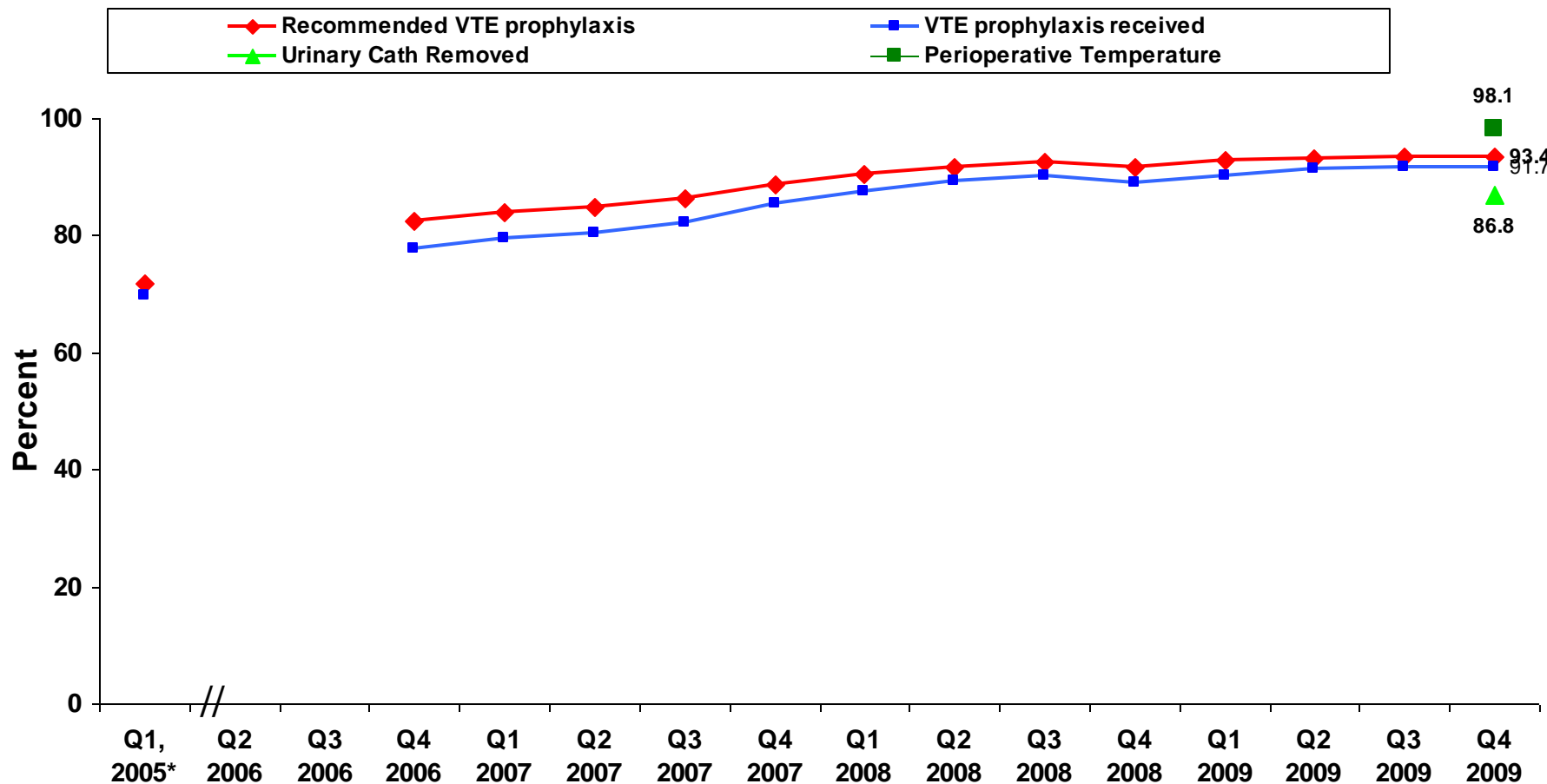
Changes in National Performance

Baseline to Q4, 2009



Changes in National Performance

Baseline to Q4, 2009



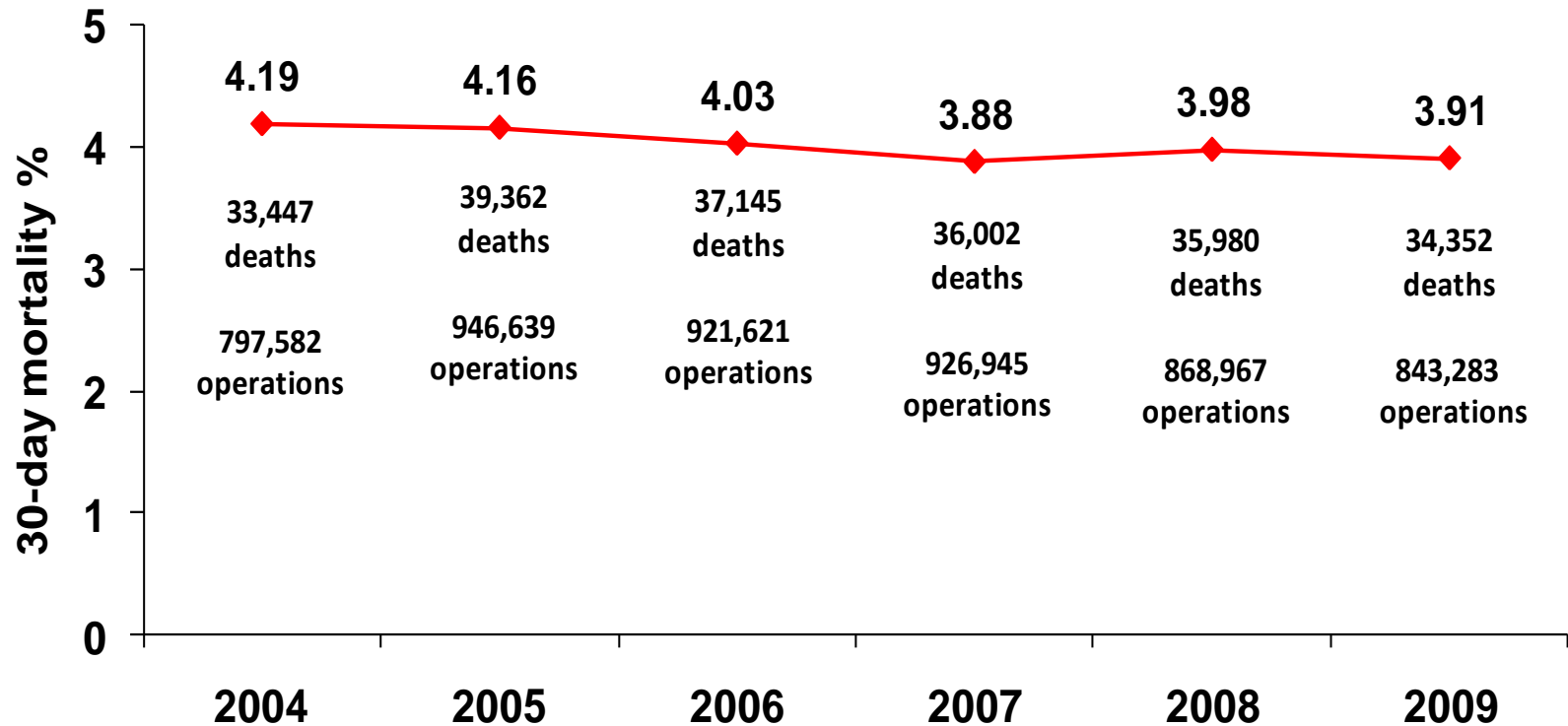
*National sample of 19,497 Medicare patients undergoing surgery in US hospitals during the first quarter of 2005.
(Bratzler, unpublished data)

State Performance and National Benchmarks

Measure	Kansas	National Benchmark
SCIP Inf 1 – Abx in 60 minutes	95.4	99.8
SCIP Inf 2 – Abx consistent with guideline	96.4	99.8
SCIP Inf 3 – Abx discontinued 24 hours	93.3	99.5
SCIP Inf 4 – Glucose control cardiac surgery	92.4	99.6
SCIP Inf 6 – Hair removal	99.5	100
SCIP Card 2 – Perioperative beta-blocker	90.0	99.8
SCIP VTE 1 – Recommended VTE prophylaxis	91.2	99.8
SCIP VTE 2 – Timely VTE prophylaxis	90.1	99.7
SCIP Inf 9 – Urinary catheter removal	87.9	99.2
SCIP Inf 10 – Perioperative normothermia	97.8	99.9
HF-3 – ACEI/ARB for LV systolic dysfunction	90.5	99.8

National Trends Surgical Mortality

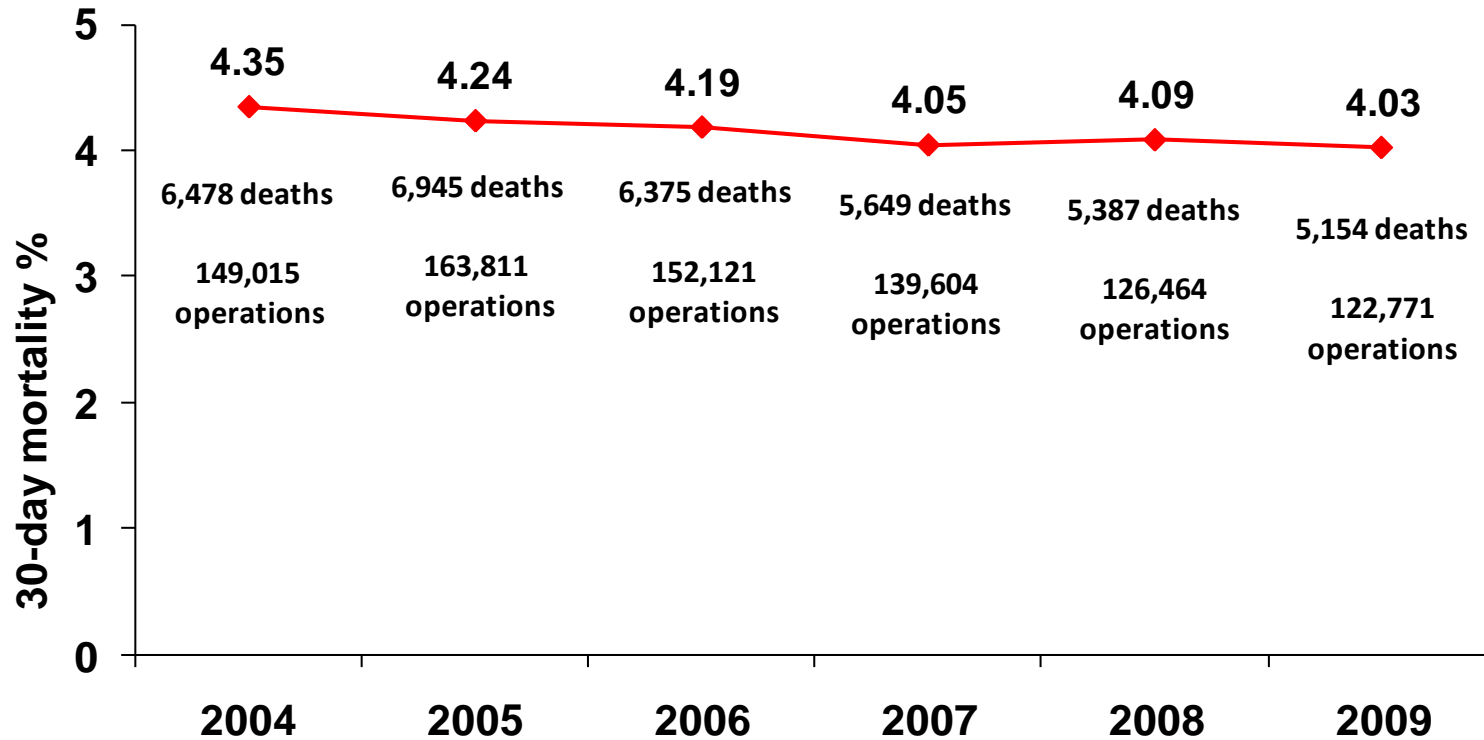
Non-cardiac surgery



Limited to all Medicare patients undergoing those operations included in SCIP.

National Trends Surgical Mortality

Cardiac surgery



Limited to all Medicare patients undergoing those operations included in SCIP.

**“Progress Toward Eliminating Healthcare-
Associated Infections”**

Expert Meeting and Workshop:

September 23-24, 2010

Key Bridge Marriott – Arlington, VA

Surgical Site Infections (SSI)

- Measurement System: CDC National Healthcare Safety Network (NHSN)
- **2013 Target: 25% reduction in admission and readmission SSI**
- Baseline Period: 2006-2008
- **Current (CY 2009): SIR = 0.95 = 3,930 / 4,144 SSIs**
 - **5% reduction from baseline**
 - 946 facilities reporting; 416,341 procedures reported

SCIP Procedure	No. of SSIs	Validated Parameters for Risk Model
Abdominal aortic aneurysm repair	30	duration of procedure, wound class
Coronary artery bypass graft	1,644	age, ASA, duration of procedure, gender, med school affiliation, age gender (interaction)
Cardiac surgery	229	age, duration of procedure, emergency (y/n)
Colon surgery	1,825	age, ASA, duration, endoscope, med school affiliation, hospital bed size, wound class
Hip prosthesis	1,183	total/partial/revision, age, anesthesia, ASA, duration of procedure, med school affiliation, hospital bed size, trauma (y/n)
Abdominal hysterectomy	389	age, ASA, duration of procedure, hospital bed size
Knee prosthesis	1,108	age, ASA, duration of procedure, gender, med school affiliation, hospital bed size, trauma (y/n)
Peripheral vascular bypass surgery	176	age, ASA, duration of procedure, med school affiliation
Rectal surgery	38	duration of procedure, gender, hospital bed size
Vaginal hysterectomy	122	age, duration of procedure

Data as of September 2010



Surgical Care Improvement Project (SCIP) Process Measures

- **2013 Target: 95% adherence to process measures to prevent SSI**
- Baseline Period: CY 2006-2008
- Current Data: FY 2009
- Data Source: CMS Hospital Compare
http://www.cms.gov/HospitalQualityInits/11_HospitalCompare.asp
- Based on 3,600-3,700 hospitals reporting each quarter since mid-2006

SCIP Performance and Relative Improvement Rates (RIR)

	Baseline			Current	RIR (%)
	CY06 Rate (%)	CY07 Rate (%)	CY08 Rate (%)	FY09 Rate (%)	
SCIP Inf 1: Antibiotic 1 hr prior to incision	84	88	92	96	9
SCIP Inf 2: Appropriate antibiotic	92	93	96	98	4
SCIP Inf 3: Antibiotic discontinued	75	82	88	92	12
SCIP Inf 4: Glucose control for cardiac surgery	n/a	n/a	89	92	3
SCIP Inf 6: Appropriate hair removal	n/a	n/a	97	99	2

Where are we going?

What's coming for SCIP

- Greater focus on healthcare-associated infections
 - Required public reporting of CLABSI (Jan 1, 2011), and SSI rates (Jan 1, 2012)
 - National Action Plan on HAIs
- Surgical outcomes (e.g., risk-standardized infection rates, reoperation, mortality, rehospitalization)
- New measures?

How do you sustain improvement?

Principles include:

- Provide direct and visible leadership
- Deploy teams to make changes
- Test changes with the PDSA process
- Use the service delivery as a framework for change
- Coach for change
- Make the new way unavoidable
- Allocate actual resources
- Monitor what you want to sustain
- Create a culture of improvement

Make the New Way Unavoidable

Imbedded/institutionalized the process *and* the new way:

- Consumer delivery processes and forms
- Policies and procedures
- Staff education, training, orientation, and professional development
- Job description and performance evaluations
- New services/programs/departments and other infrastructures
- Provider incentives
- Existing and new committees and departments
- Orientations and staff development
- Strategic plans, including vision, mission, and strategic direction
- Measurements and reports

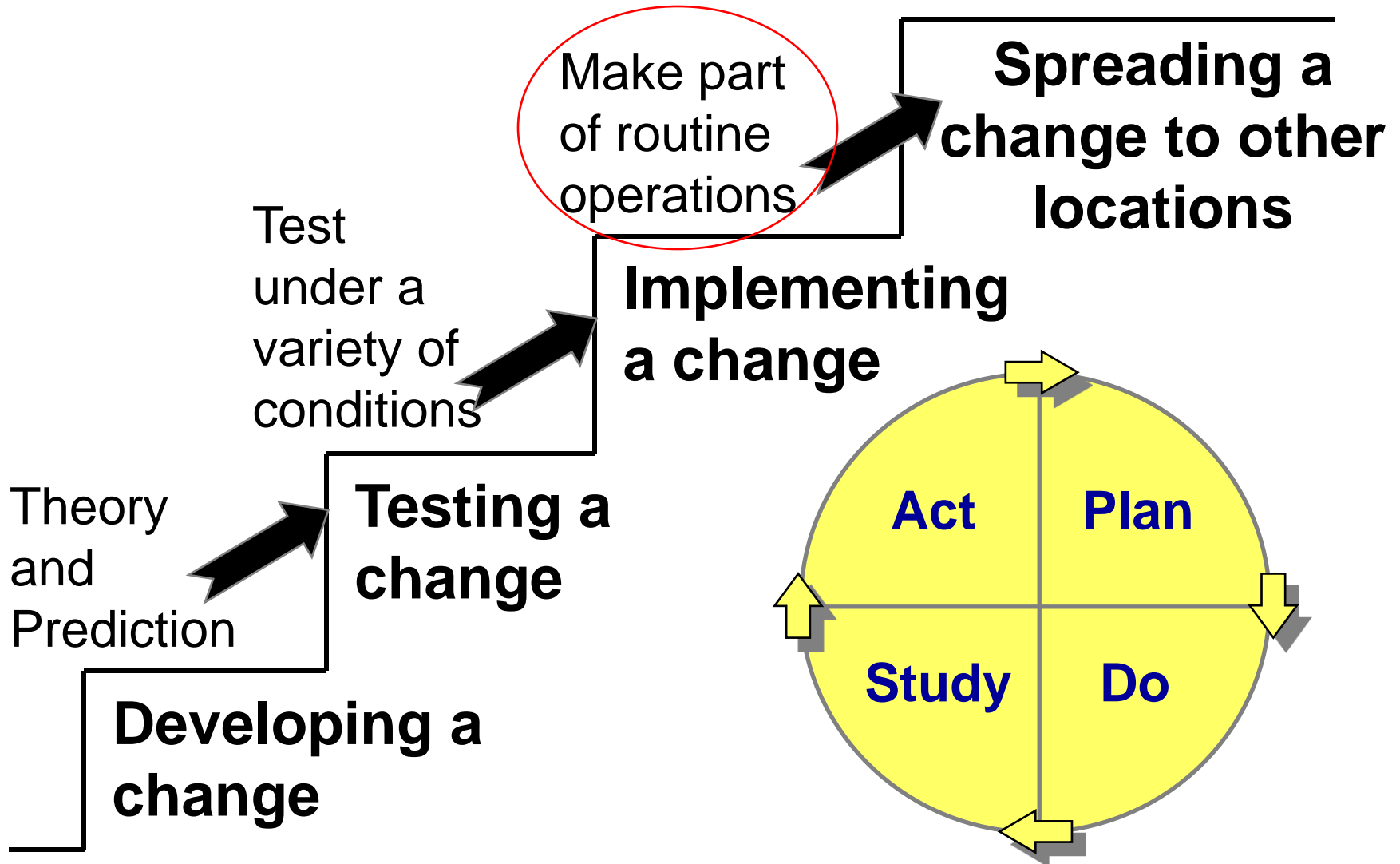
Do you make it hard to do the wrong thing?

Culture of Improvement

- Everyone in the organization is clear on major performance improvement activity and can explain their role in it.
- Staff view quality improvement work as part of their job.
- Managers write job descriptions to reflect improvement responsibilities.
- Managers create opportunities for all stakeholders in improvement to share ideas and express concerns.

Is there a gap in perception about the importance of quality between leadership and front-line healthcare workers?

The Sequence for Improvement and Spread

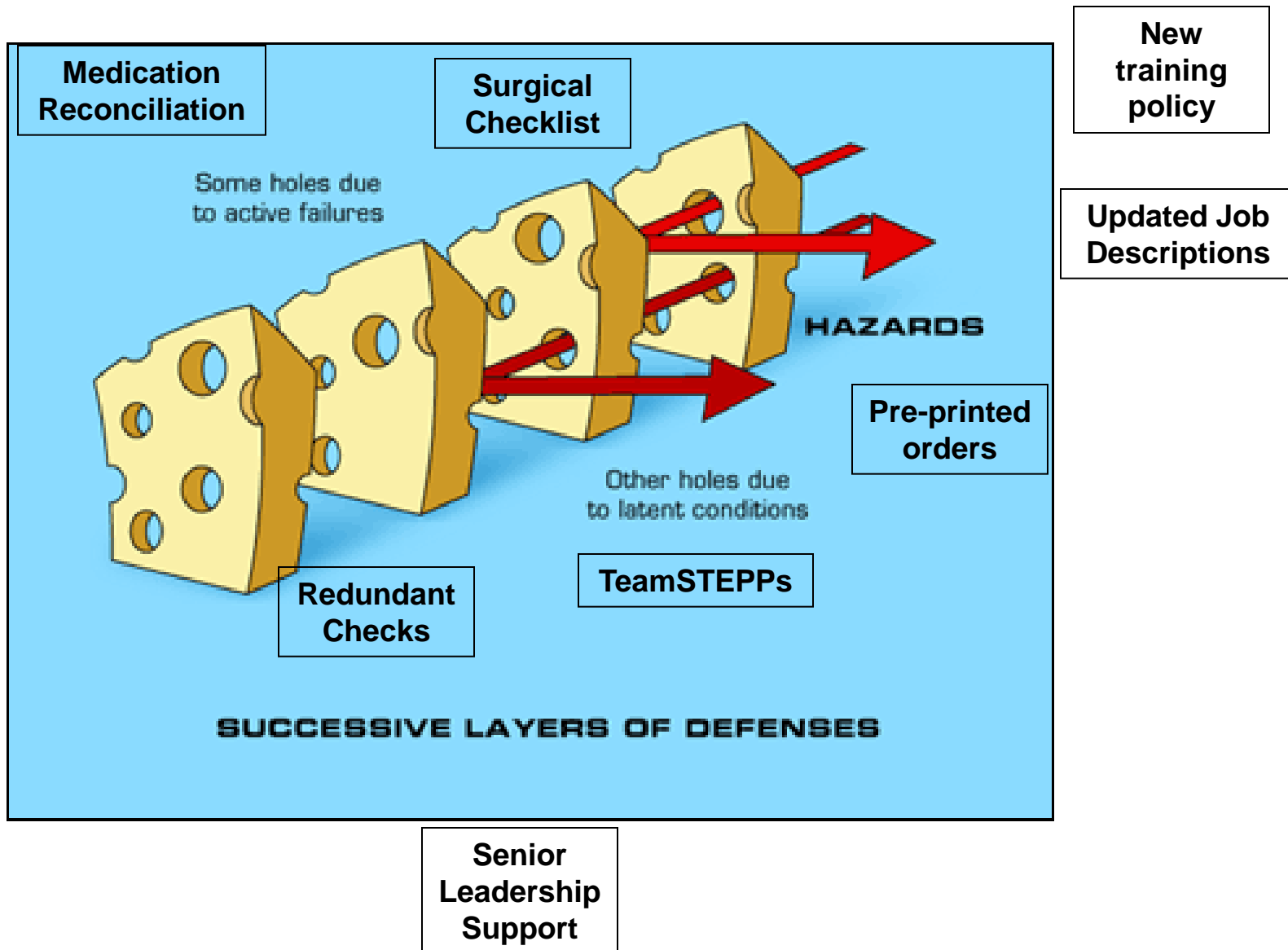


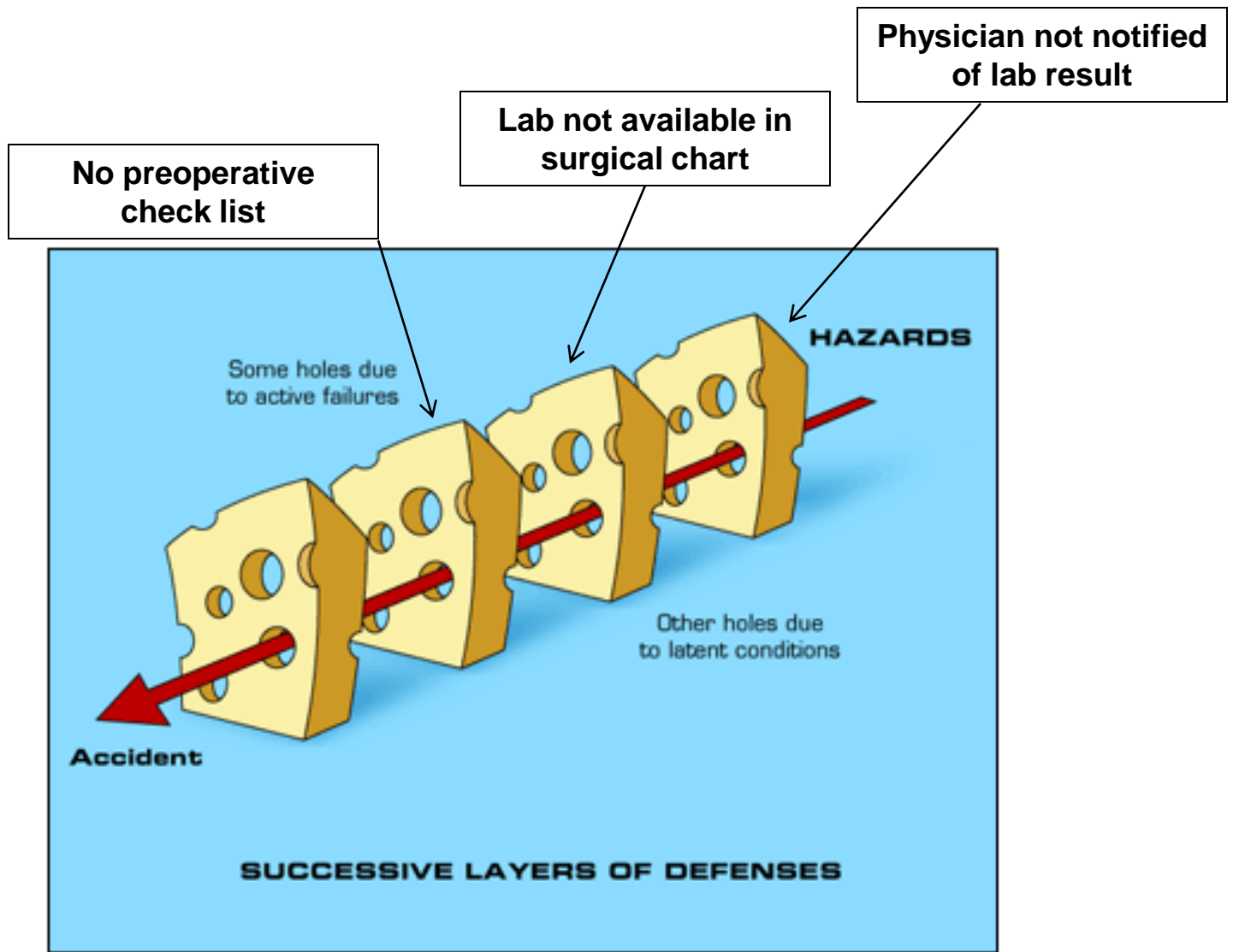
It is usually the system.... ..not the people

“Sam” came into the hospital outpatient department for a relatively minor laparoscopic operation...

..he had seen his primary care physician, surgeon, and anesthesiologist several days before surgery and everything was done correctly

We assume the system will protect us...





Unfortunately for Sam, all of the holes lined up



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