



Wrong Site Surgery

The Evidence Base

Richard J. Croteau, M.D.

Executive Director for Patient Safety Initiatives



Is this really a problem?

- Wrong site surgery is rare—(1:100,000)
- Most wrong site surgery cases (64%) result in no permanent injury.
- There are many types of adverse events that are more frequent and more harmful.
- So why do we spend so much time and energy on it?

Wrong Site Surgery is a Symptom

- Wrong site surgery is the poster child of sentinel events
- It is a symptom of the systems and culture of health care
- Fix wrong site surgery and we'll fix a lot more

It's Not Just About Wrong Site Surgery

- ▶ **The work we do to eliminate wrong site surgery will teach us how to improve patient safety in all its manifestations.**
- ▶ **Wrong site surgery is an experimental model from which we can learn.**

Sentinel Event Experience to Date

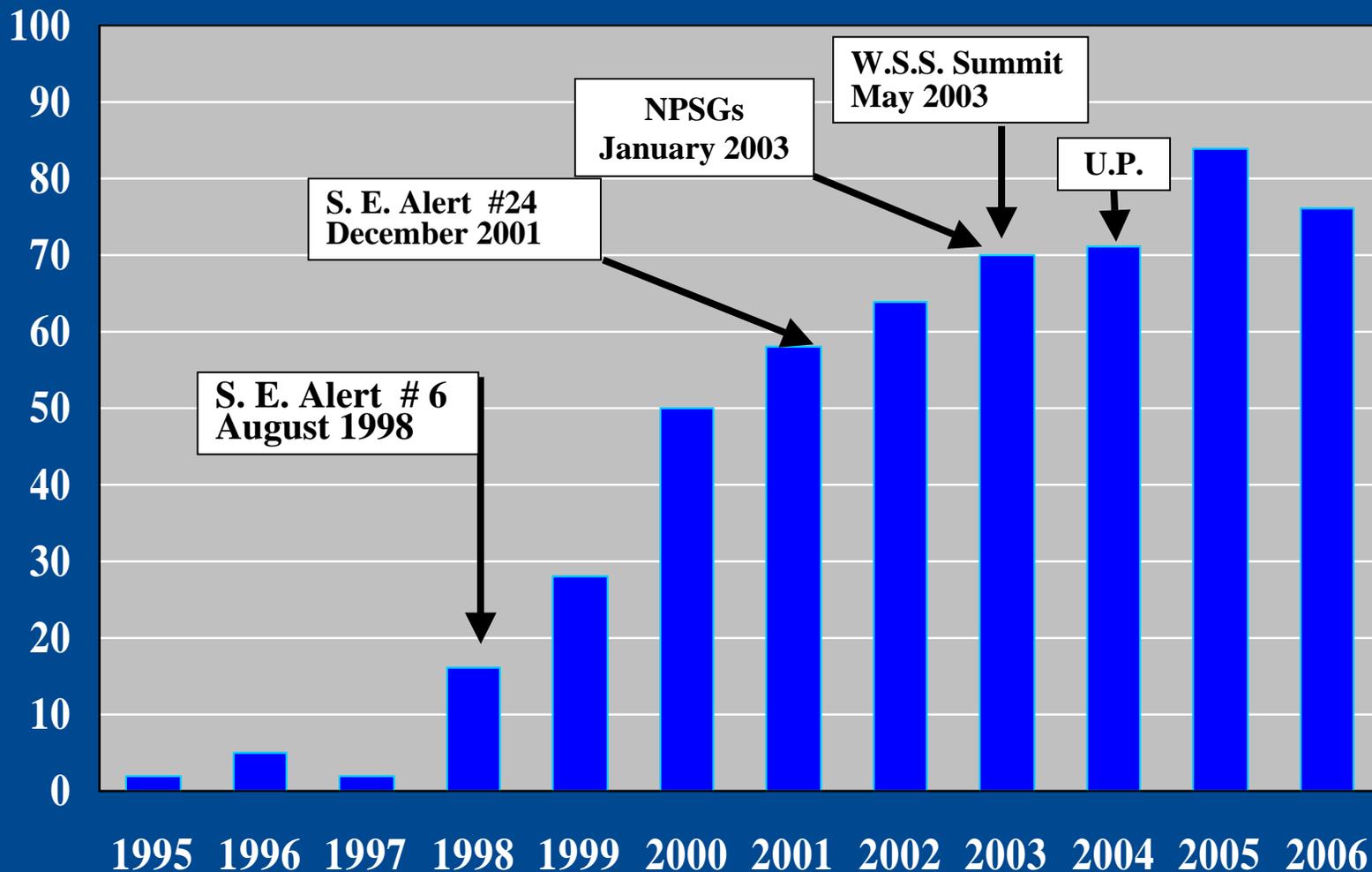
*Of 4074 sentinel events reviewed by the Joint Commission,
January 1995 through December 2006:*

531 events of wrong site surgery

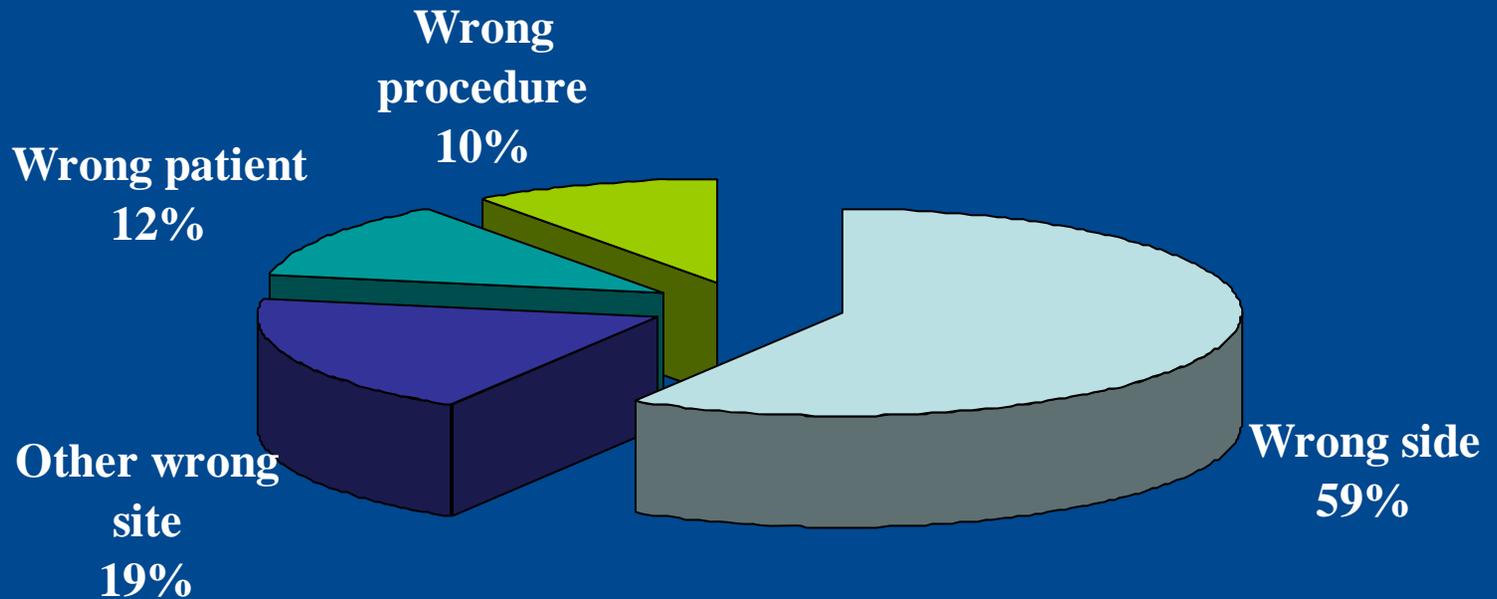
- 520 inpatient suicides
- 488 operative/post op complications
- 385 events relating to medication errors
- 302 deaths related to delay in treatment
- 224 patient falls
- 153 deaths of patients in restraints
- 138 assault/rape/homicide
- 125 perinatal death/injury
- 94 transfusion-related events
- 85 infection-related events
- 72 deaths following elopement
- 66 fires
- 67 anesthesia-related events
- 51 retained foreign objects
- 773 “other”

= 4074 RCAs

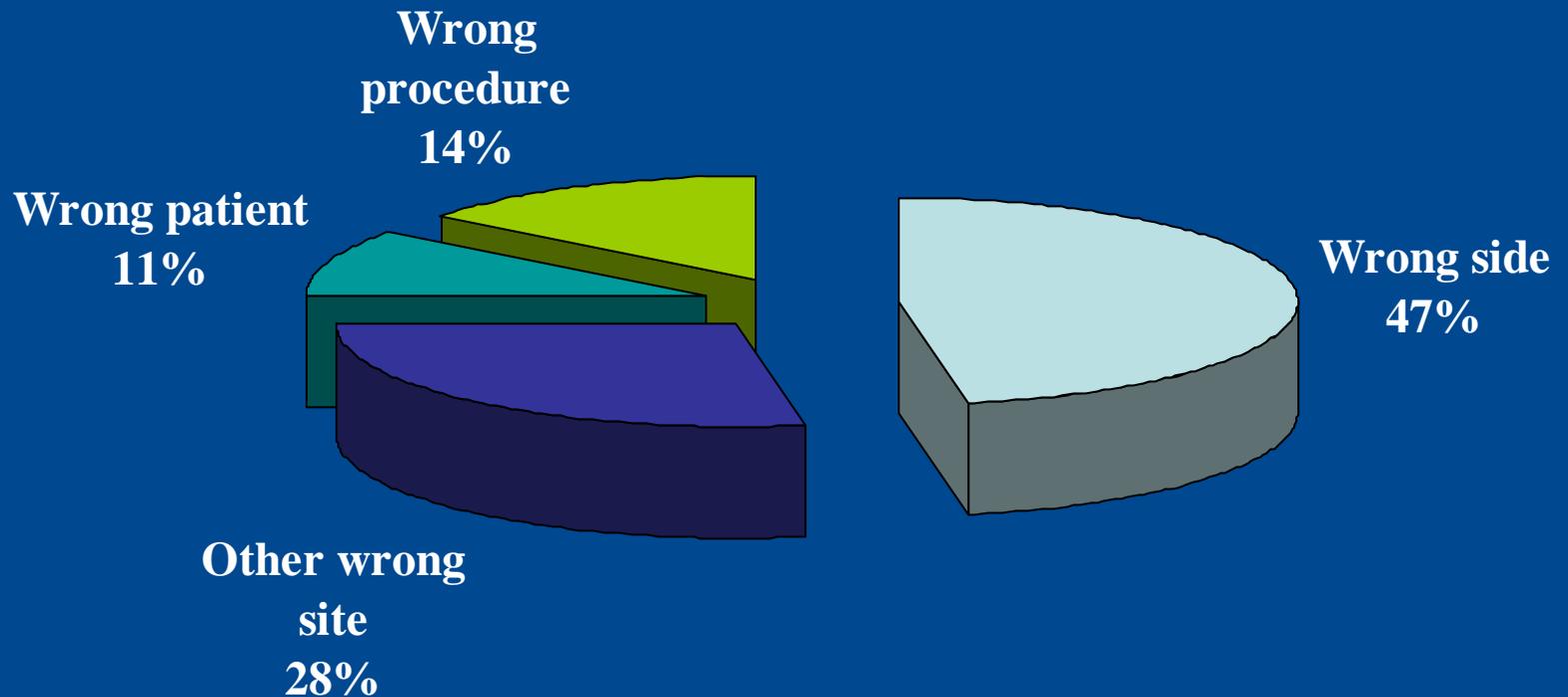
Sentinel Event Trends: Wrong-site Surgeries Reported by Year



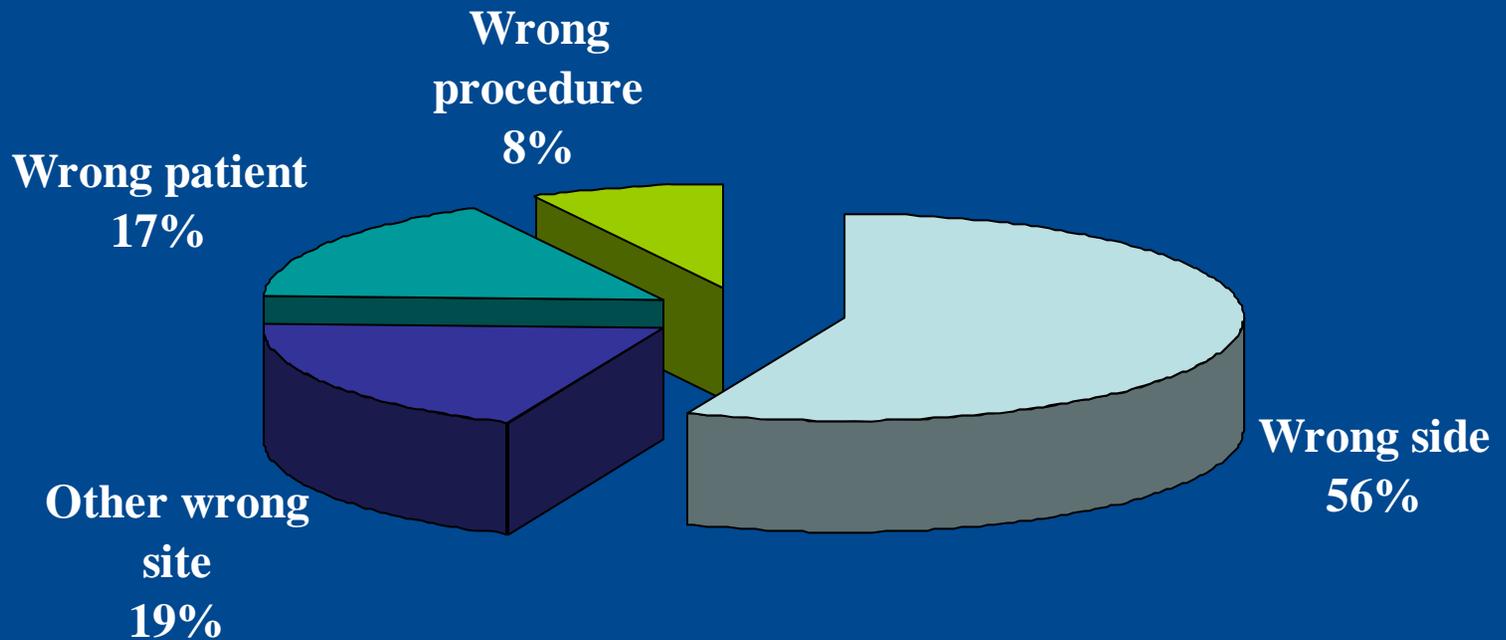
Types of “Wrong surgery” Cases (1995-2003)



Types of “Wrong surgery” Cases (2004-2005)



Types of “Wrong surgery” Cases (2006)



“WSS” Cases by Surgical Specialty

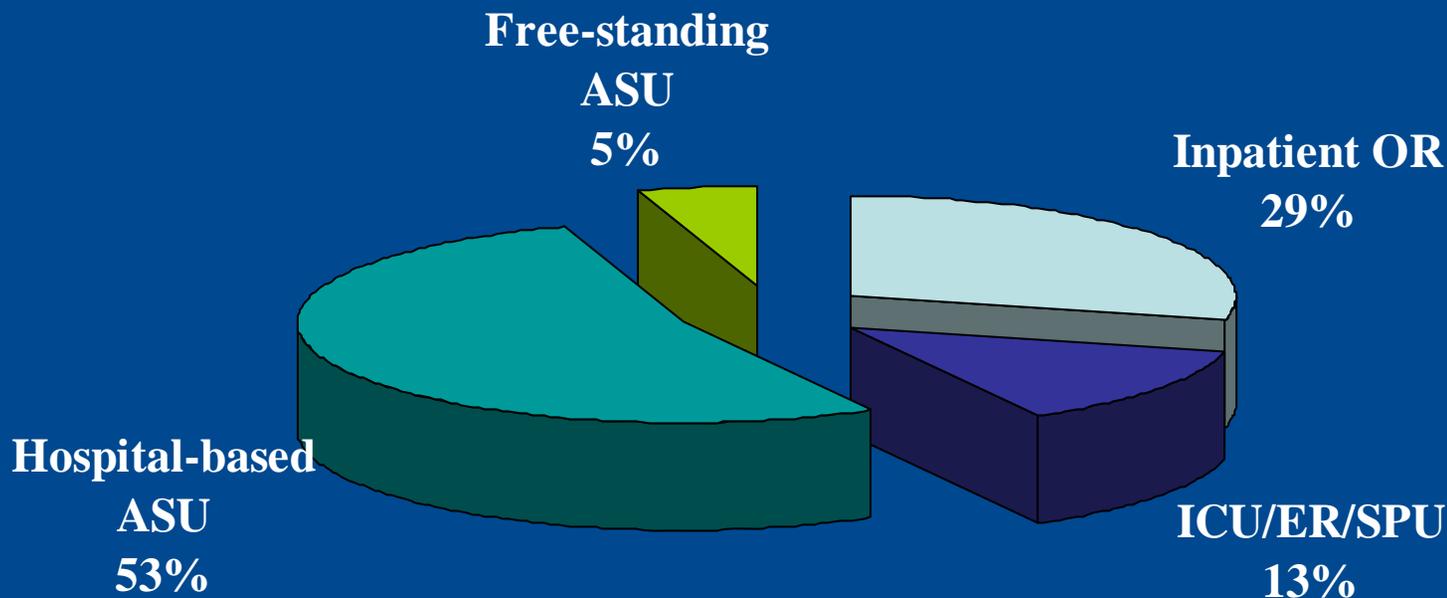
Specialty	% ('95-'03)	% ('04-'05)	% ('06)
Orthopedic surgery	35	29	20
General surgery	17	17	20
Neurosurgery	13	12	6
Urology	9	5	5
Podiatric surgery	6	2	1
Dental/OMF surgery	4	13	8
Obstetrics/gynecology	3	2	1
Cardiovascular-thoracic	4	6	10
Ophthalmology	2	6	5
Otolaryngology	1	2	3
Anesthesiology	2	2	16
Radiology	3	3	4

“WSS” Cases by Anatomical Site

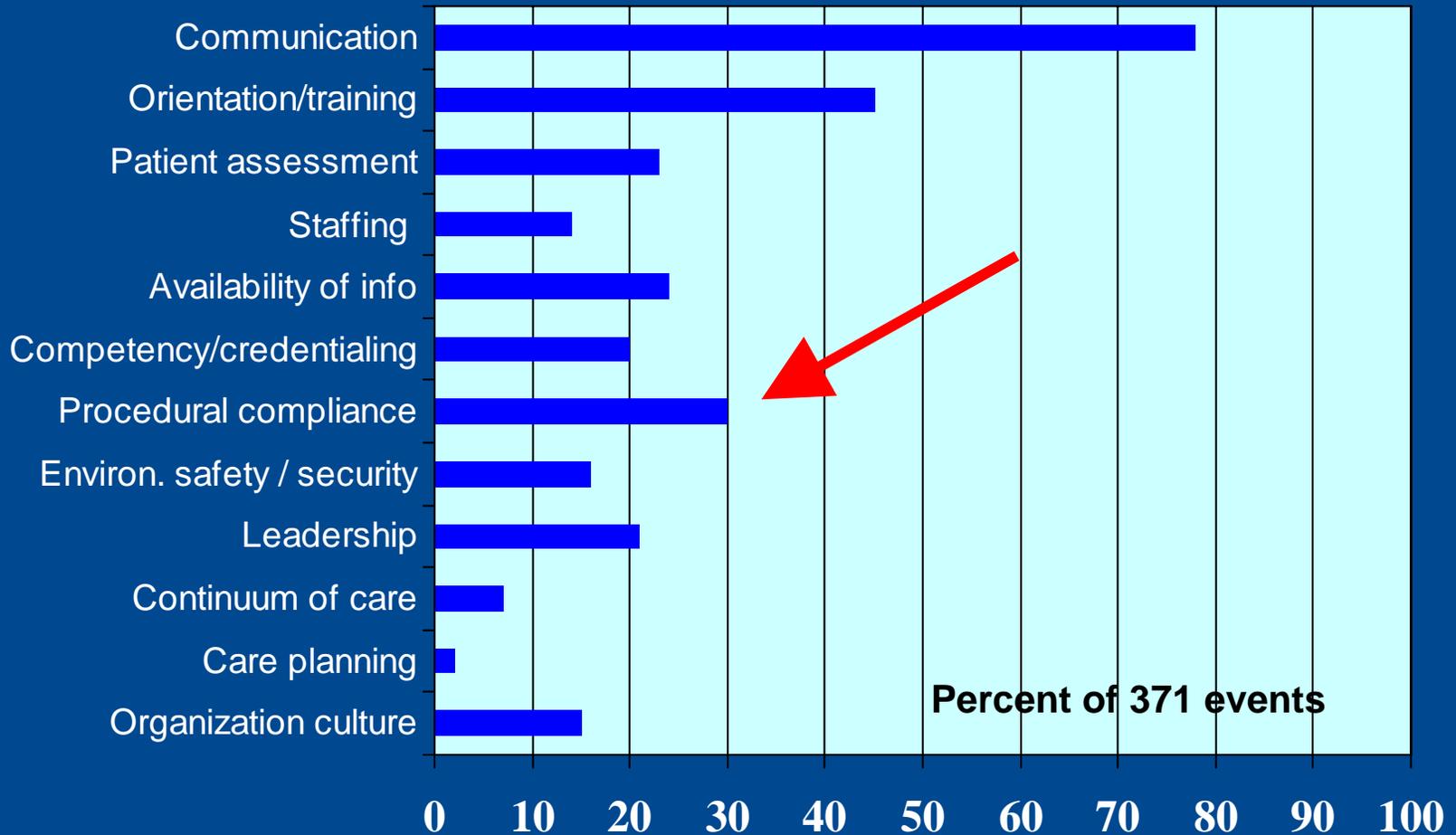
Anatomical Site	% ('95-03)	% ('04-'05)	% ('06)
Knee	17	13	3
Foot/ankle	10	4	5
Hand/wrist	9	6	5
Spine	8	5	10
Cranium	6	8	4
Hip	6	4	4
Hernia	5	5	3
Chest	5	6	10
Male genitalia/prostate	5	4	4
Mouth/pharynx/larynx	5	12	7
Uterus/ovaries/tubes	3	1	1
Peripheral vascular	3	6	5

Anatomical Site	% ('95-03)	% ('04-'05)	% ('06)
Abdominal cavity	2	6	4
Breast	2	2	0
Kidney	2	1	5
Skin/subcutaneous	2	2	3
Shoulder/arm/forearm	2	0	0
Eye	2	6	5
Urethra/bladder/ureter	2	1	1
Heart	1	0	0
Peripheral nerve	1	4	14
Ear/nose/sinus	1	2	3
Neck	1	0	4

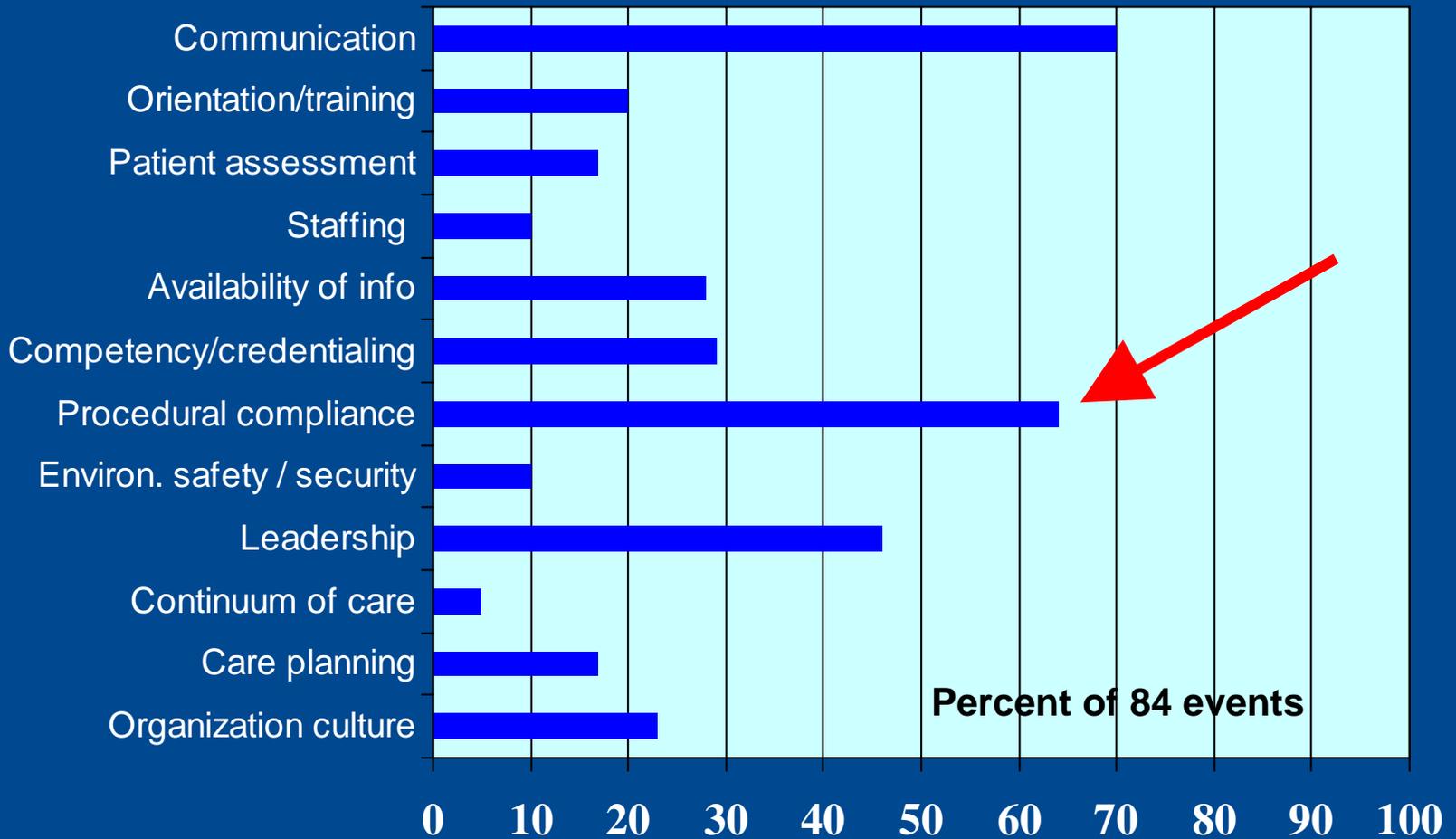
“Wrong Surgery” Cases by Setting



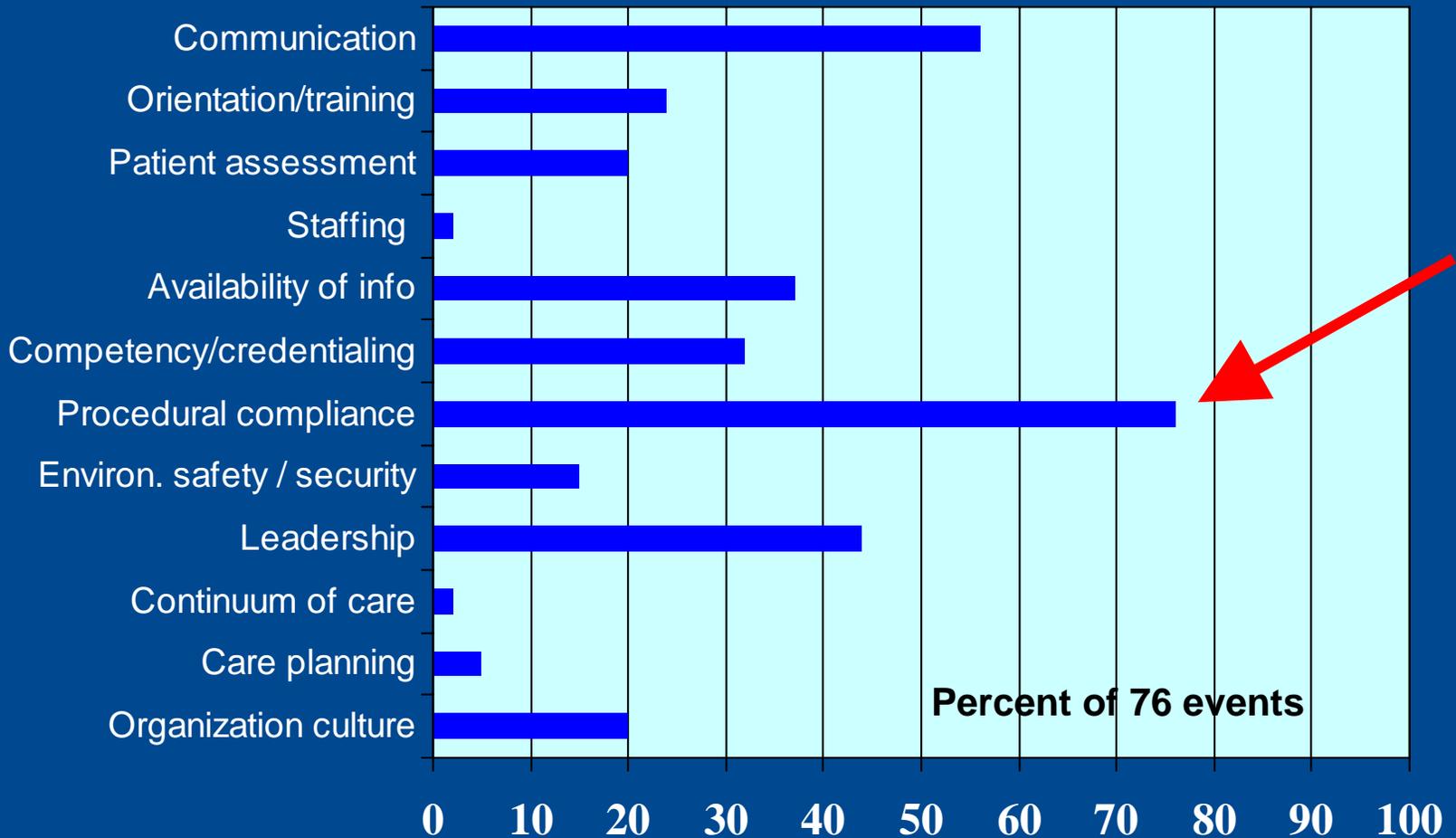
Root Causes of Wrong Site Surgery (1995-2004)



Root Causes of Wrong Site Surgery (2005)



Root Causes of Wrong Site Surgery (2006)



What are the details?

- **Incorrect or ambiguous consent form (8%)**
- **Test specimen or results switched, mislabeled, or incorrectly displayed (12%)**
- **Biopsy or other diagnostic test misinterpreted (8%)**
- **Technical error (“incidental nephrectomy”) (5%)**
- **One or more U.P. steps not done (67%)**
 - **Required site mark not done (27%)**
 - **Time out not done or incomplete (40%)**
- **Site mark done but not looked for (5%)**
- **“Automatic” time-out (???)**

Who Marks the Site?

- 94% have a policy for site marking
- 42% of wrong side / level / digit cases had no mark
- About half specify surgeon marks the site
- Of those, more than half do not follow the policy
- Variability in site marking policies:
 - 50% specify surgeon
 - 40% specify pre-op nurse
 - 10% specify patient or parent
 - None required site marking for anesthesia procedures

Risk Factors for Wrong Site Surgery

Risk Factors	%
Emergency case	19%
Multiple surgeons	13%
Multiple procedures	10%
Morbid obesity/physical deformity	16%
Unusual time pressure	13%
Unusual equipment or set-up	13%
Room change	12%

Provisions of the Universal Protocol

- **Preoperative verification process**
 - Relevant pre-op tasks completed and information is available and correct
- **Surgical site marking**
 - Unambiguous mark, visible after prep & drape
 - Right/left, multiple structures or levels
- **“Time out” immediately before starting**
 - Involves entire team; active communication
 - Fail-safe model: “No go” unless all agree
- **Applicable to invasive procedures in all settings**



Types of “Wrong site” Cases That Will Not Be Prevented by the U.P.

- Wrong patient or wrong site due to mislabeled biopsy or other specimen
- Wrong procedure due to technical error
 - Example: Lung biopsy intended; liver biopsy done
- Wrong implant due to incorrect pre-op measurement
- Wrong procedure due to incorrect consent form
 - Example: “Add-on” procedure requested by patient, subsequently changed mind but consent form not revised

NPSG Compliance Data for 2003—2006

(General Hospital Full Surveys: Percent Non-compliance)

NPSG requirement	2003	2004	2005	2006
1A: Two identifiers	3.8%	4.1%	3.9%	8.1%
1B: Time out before surgery	8.9%	8.0%	17.1%	25.8%
2A: Read-back verbal orders	7.4%	8.2%	11.6%	15.7%
2B: Standardize abbreviations	23.5%	24.8%	39.5%	36.9%
2C: Improve timeliness of reporting	---	---	7.6%	26.9%
2E: Hand-off communications	---	---	---	6.1%
3A: Concentrated electrolytes	3.0%	1.9%	1.3%	---
3B: Limit concentrations	0.6%	0.9%	1.5%	1.7%
3C: Manage look-alike/sound-alike drugs	---	---	1.9%	7.4%
3D: Label medications & solutions	---	---	---	8.9%
4A: Preoperative verification	1.5%	5.4%	5.5%	2.9%
4B: Surgical site marking	6.2%	4.6%	3.8%	6.6%
7A: CDC hand hygiene guidelines	---	1.2%	3.6%	8.8%
7B: HC-associated infection & RCA	---	0.1%	0.0%	0.1%
8A: Medication reconciliation – list & reconcile	---	---	0.0%	33.9%
8B: Medication reconciliation – communicate	---	---	0.3%	27.5%
9A: Fall risk assessment	---	---	3.0%	---
9B: Fall prevention program	---	---	---	6.5%