

# 營造手術安全文化

## 手術安全現況與趨勢

### 如何預防手術錯誤提升安全

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# 背景

- 世界衛生組織 ( World Health Organization , 簡稱WHO ) 的估計 , 全球各地每年約有2.34億人口在施行大型手術。
- 研究顯示 , 在工業化國家 , 住院病人中較嚴重的手術併發症發生率為3-22% , 死亡率為0.4-0.8% , 有將近一半的不良事件 , 確定為可預防的
- 世界病人安全聯盟2007-2008年發起「安全手術 , 拯救生命」的活動

# 外科不良結果

-  醫院內的醫療不良結果中，1/2 - 2/3與外科照護相關。
-  大部分的外科錯誤發生在手術室且與技術錯誤相關。
-  造成外科不良結果的因素：
  - 外科醫師專業性不足
  - 病人量少的醫院
  - 溝通崩解
  - 工作負荷過重
  - 疲勞
  - 外科住院醫師及受訓者
  - 其他：設備異常

# 溝通崩解 (communication breakdowns)

📖 大部分的溝通崩解為口頭溝通不良(92%)。主治醫師是最常見的團隊相關成員。

📖 溝通崩解發生於：

☑ 43%發生在交班時

☑ 39%發生在病人轉換單位時

📖 最常見的溝通崩解發生原因：

☑ 住院醫師沒有通知主治醫師重要訊息

☑ 主治醫師與主治醫師之間的交班失誤



# 手術病人安全的範圍



- 手術前評估：心、肺、腎功能、糖尿病、新陳代謝異常...等。
- 手術全期項目：心臟缺血及保護、貧血、疼痛控制...等。
- 感染：手術部位感染、醫療照護相關感染。
- 血栓及凝血：深部靜脈栓塞、抗凝血劑。
- 手術後項目：出血、手術後噁心及嘔吐。
- 手術室相關項目：手術室設施、手術技術錯誤、正確手術部位、異物存留...等。

## Summary Data of Sentinel Events Reviewed by The Joint Commission

Type of Sentinel Event	Total 2004 -2011	2009	2010	2011
Anesthesia-Related Event	87 (1.4%)	15 (1.6%)	6 (0.8%)	16 (1.3%)
Op/Post-op Complication	636 (10.4%)	94 (9.7%)	86 (10.7%)	133 (10.7%)
Unintended Retention of a Foreign Body* (2005-2011)	658 (10.8%)	119 (12.3%)	133 (16.6%)	188 (15.1%)
Wrong-patient, wrong-site, wrong-procedure	819 (13.4%)	149 (15.4%)	93 (11.6%)	152 (12.2%)

# 台灣病人安全通報系統2011年年報

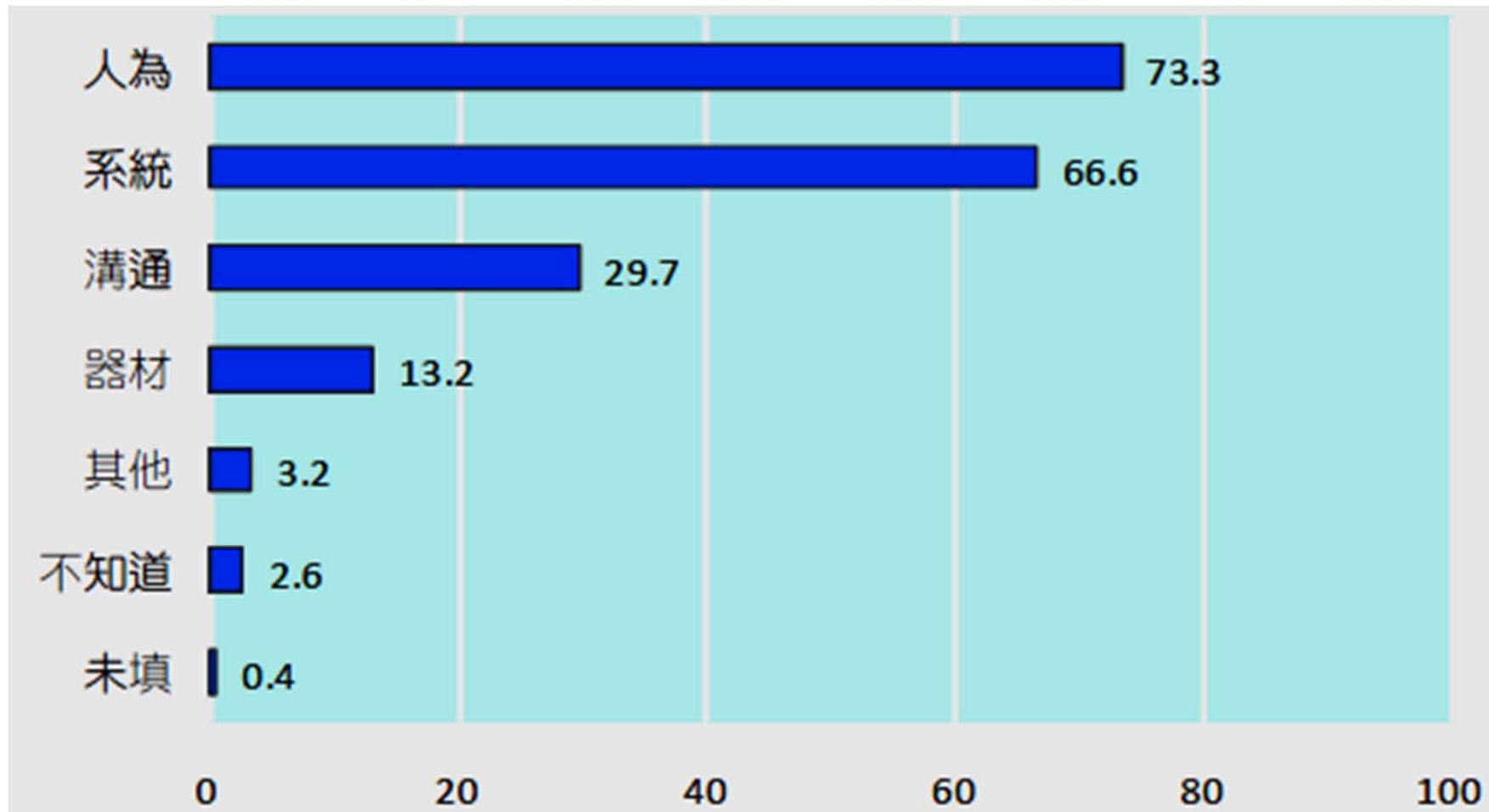
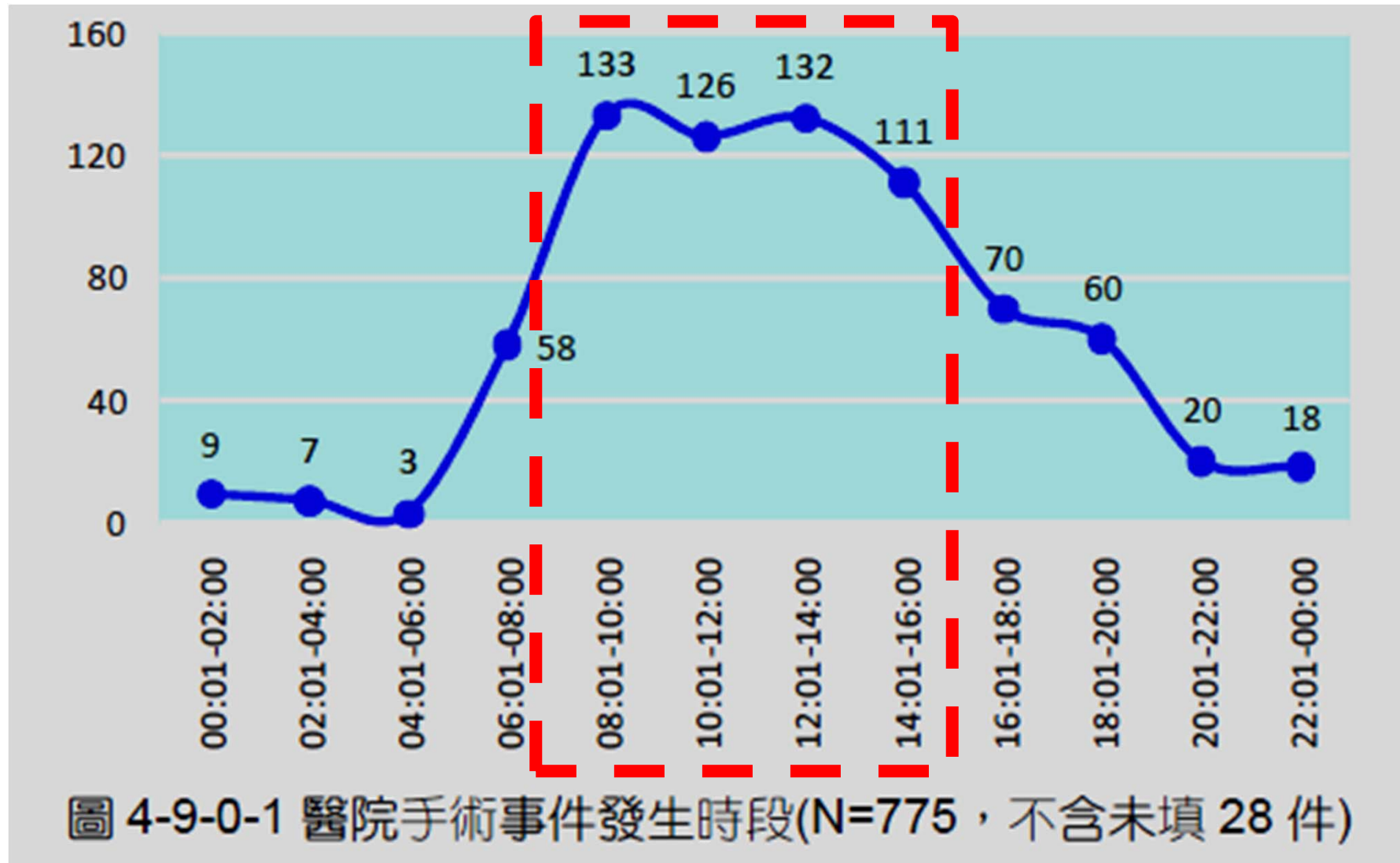


圖4-9-0-6 醫院手術事件發生可能原因相對次數百分比  
(N=1,464；N為事件數，本項複選)

資料來源：<http://www.tpr.org.tw/index03.php?getid=year>

# 台灣病人安全通報系統2011年年報



資料來源：<http://www.tpr.org.tw/index03.php?getid=year>



# 台灣病人安全通報系統2011年年報

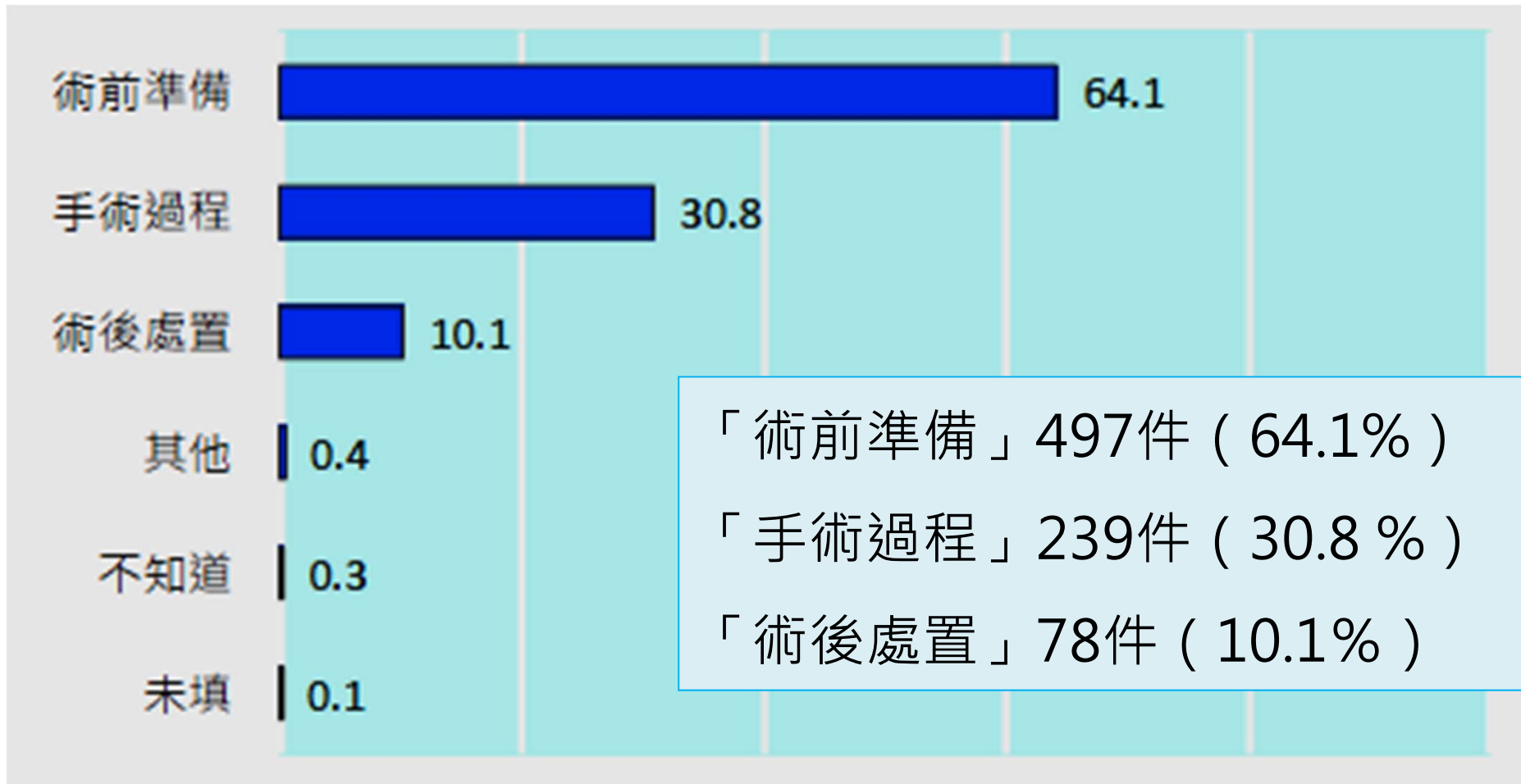
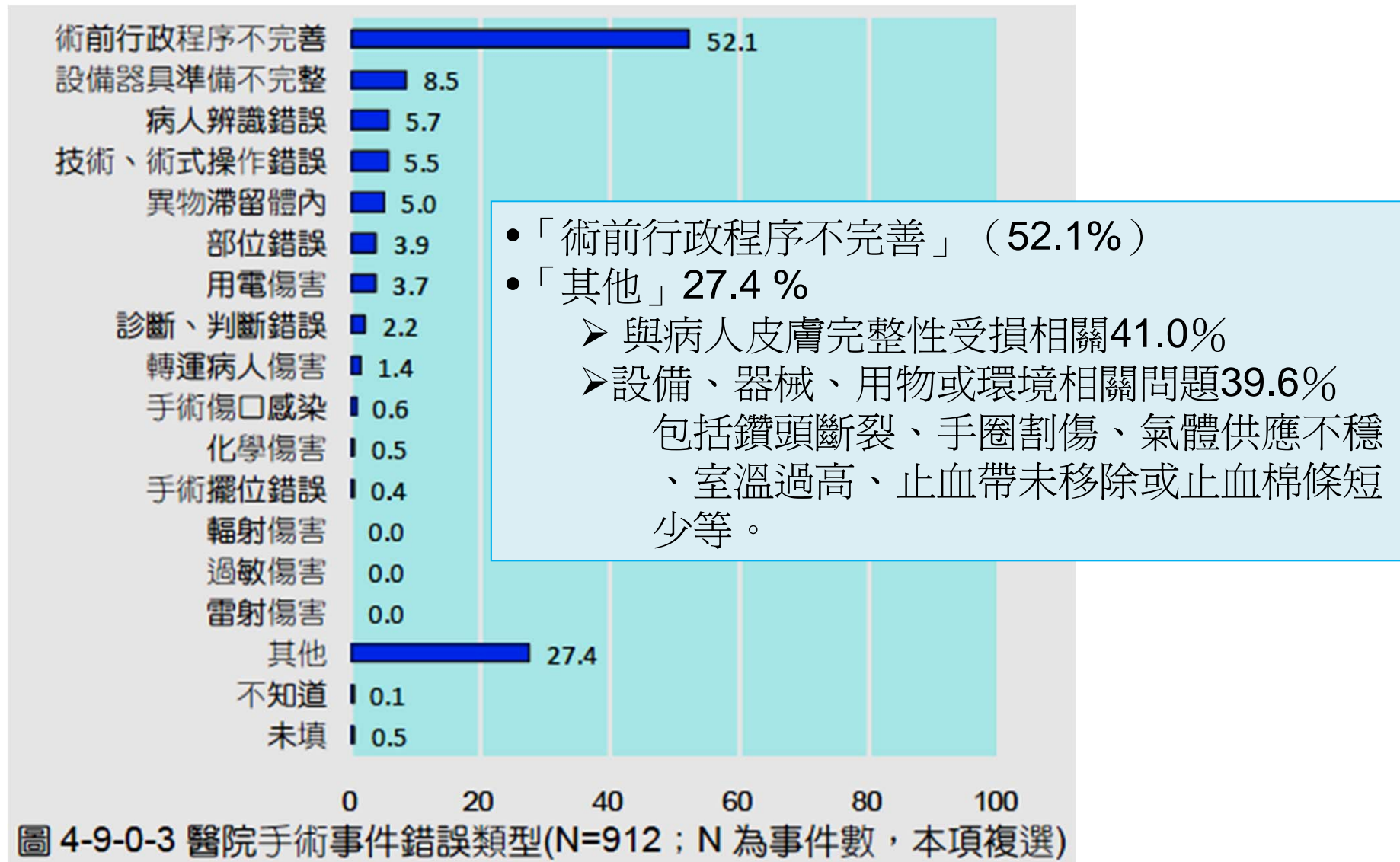


圖 4-9-0-2 醫院手術事件錯誤發生階段(N=820；N為事件數，本項複選)

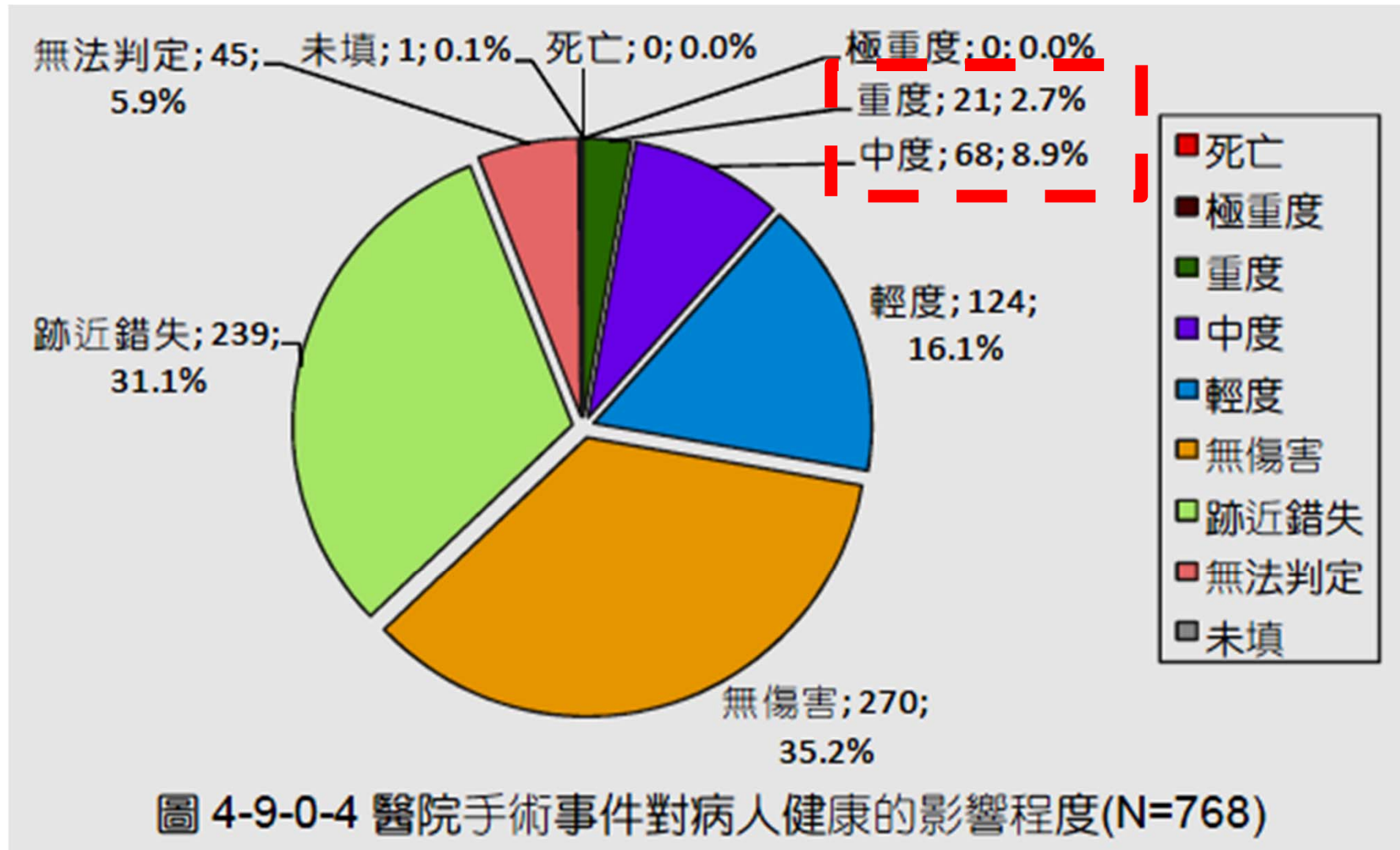
資料來源：<http://www.tpr.org.tw/index03.php?getid=year>

# 台灣病人安全通報系統2011年年報



- 「術前行政程序不完善」 (52.1%)
- 「其他」 27.4 %
  - 與病人皮膚完整性受損相關41.0%
  - 設備、器械、用物或環境相關問題39.6%  
包括鑽頭斷裂、手圈割傷、氣體供應不穩、室溫過高、止血帶未移除或止血棉條短少等。

# 台灣病人安全通報系統2011年年報



資料來源：<http://www.tpr.org.tw/index03.php?getid=year>

## 10 basic, essential objectives in any surgical case supported by the WHO safe surgery guidelines

1. operate on the correct patient at the correct site.
2. use methods known to prevent harm from administration of anaesthetics.
3. recognize and effectively prepare for life-threatening loss of airway or respiratory function.
4. recognize and effectively prepare for risk of high blood loss.
5. avoid inducing an allergic or adverse drug reaction for which the patient is known to be at significant risk.

## 10 basic, essential objectives in any surgical case supported by the WHO safe surgery guidelines

6. consistently use methods known to minimize the risk for surgical site infection.
7. prevent inadvertent retention of instruments and sponges in surgical wounds.
8. secure and accurately identify all surgical specimens.
9. effectively communicate and exchange critical information for the safe conduct of the operation.
10. Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.

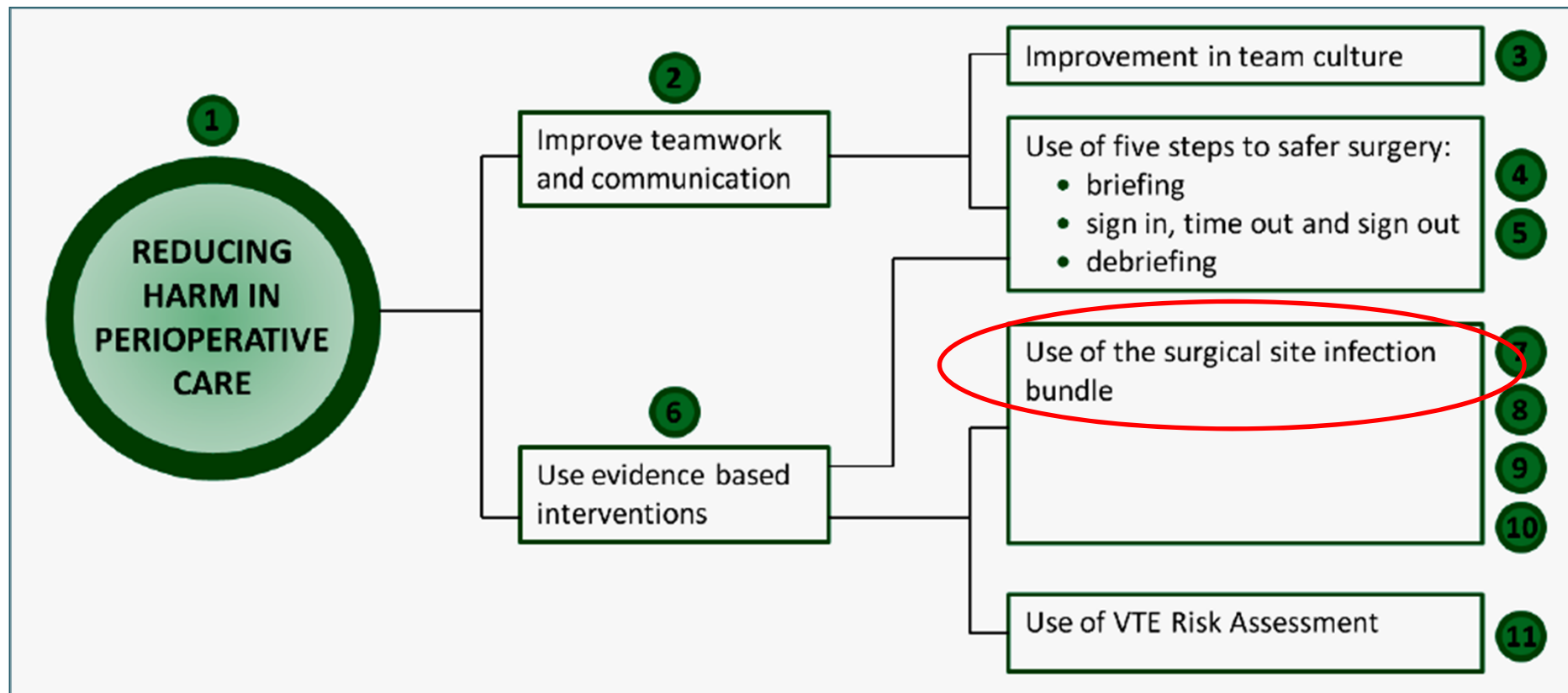
# WHO Guidelines for Safe Surgery 2009

***The nature of the challenge: Teamwork, safe anaesthesia and prevention of surgical site infection are fundamental to improving the safety of surgery and saving lives. Basic issues of infrastructure must be considered and of the ability to monitor and evaluate any instituted changes must be addressed.***

<b>Surgical Resources and Environment:</b> Trained personnel, clean water, consistent light source, consistent suction, supplemental oxygen, functioning surgical equipment and sterile instruments		
<u>Prevention of Surgical Site Infection</u> Hand washing Appropriate and judicious use of antibiotics Antiseptic skin preparation Atraumatic wound care Instrument decontamination and sterility	<u>Safe Anaesthesia</u> Presence of a trained anaesthetist Anaesthesia machine and medication safety check Pulse oximetry Heart rate monitoring Blood pressure monitoring Temperature monitoring	<u>Safe Surgical Teams</u> Improved communication Correct patient, site, and procedure Informed consent Availability of all team members Adequate team preparation and planning for the procedure Confirmation of patient allergies
<b>Measurement of Surgical Services:</b> quality assurance, peer review and monitoring of outcomes		

# 'How to Guide' Five Steps to Safer Surgery

December 2010



# 醫療品質及病人安全

101-102 年度工作目標

HOSPITAL



## 1 提升用藥安全

- 提升病人及照護者安全用藥的能力
- 加強慢性疾病病人用藥安全
- 落實用藥過敏及不良反應史的傳遞
- 運用資訊提升用藥安全
- 加強高警訊藥品的使用安全

## 2 落實感染管制

- 落實手部衛生遵從性及正確性
- 落實抗生素使用管理機制
- 落實組合式照護 (bundle care) 的概念，降低醫療照護相關感染

## 3 提升手術安全

- 落實手術辨識流程及安全查核作業
- 避免手術過程中造成的傷害
- 提升麻醉照護品質
- 建立適當機制，檢討不必要之手術



### 101-102年度診所醫療品質及病人安全工作目標 行政院衛生署2012年3月22日公告版

目  
提

目標	* 執行策略
目標一、用藥安全	* 檢視從處方到給藥之流程是否存有安全疑慮 * 落實病人用藥過敏史及不良反應史的記錄及運用 * 加強藥物諮詢功能，提升民眾安全用藥能力
目標二、跌倒預防	* 落實執行跌倒防範之教育宣導 * 改善醫療照護環境，以降低跌倒風險及傷害程度
目標三、提升手術安全	* 落實手術安全流程 * 提升麻醉照護品質



## Burden of SSIs as complications in acute care facilities

- Surgical site infection (SSI) develops following 3% to 20% of certain procedures, and that the incidence is even higher in certain high-risk patients in the United States.

Barie PS. Surgical site infections: epidemiology and prevention. *Surg Infect (Larchmt)* 2002;3(Suppl 1):S9–21.

- There were over 290,000 infections in hospitalized patients in 2002, and SSI was estimated to be directly responsible for 8205 deaths of surgical patients that year.

Klevens RM, Edwards JR, Richards CL Jr, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. *Public Health Rep* 2007;122:160–6.

## Outcomes associated with SSI

- Each SSI is associated with approximately 7-10 additional postoperative hospital days.
- Patients with an SSI have a 2-11 times higher risk of death, compared with operative patients without an SSI.
  - Seventy-seven percent of deaths among patients with SSI are directly attributable to SSI.
- Attributable costs of SSI vary, depending on the type of operative procedure and the type of infecting pathogen; published estimates range from \$3,000 to \$29,000.
  - SSIs are believed to account for up to \$10 billion annually in healthcare expenditures.

Anderson DJ et al. *Infect Control Hosp Epidemiol* 2008; 29:S51–S61

# 手術部位感染群組

## (Surgical site infection bundle)

- 適當的使用抗生素(Appropriate use of prophylactic antibiotics)
- 維持正常體溫(Maintenance of normothermia)
- 控制糖尿病人的血糖濃度(Maintenance of glycaemic control for known diabetic patients)
- 適當的去除毛髮(Use of recommended hair removal methods)

# Improving Americas Hospitals - The Joint Commissions Annual Report on Quality and Safety 2011

## Surgical Care Improvement Project (SCIP)

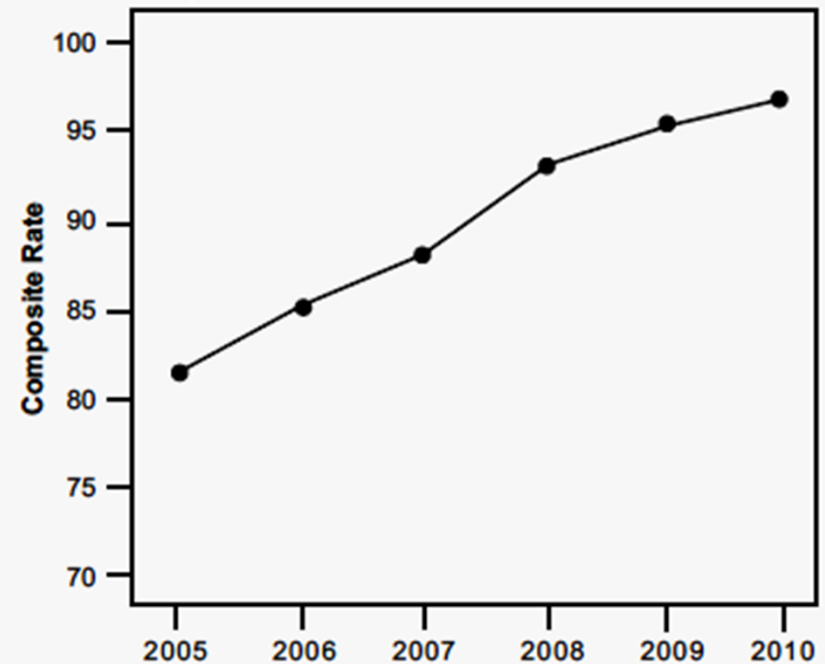


- The 2010 surgical care result is 96.4 percent, up from 82.1 percent in 2005 – an improvement of 14.3 percentage points.

This composite includes:

- Antibiotics within one hour before the first surgical cut
- Appropriate prophylactic antibiotics
- Stopping antibiotics within 24 hours
- Cardiac patient with 6 a.m. postoperative blood glucose
- Patients with appropriate hair removal
- Beta-blocker patients who received beta-blocker perioperatively
- Prescribing VTE medicine/treatment
- Receiving VTE medicine/treatment

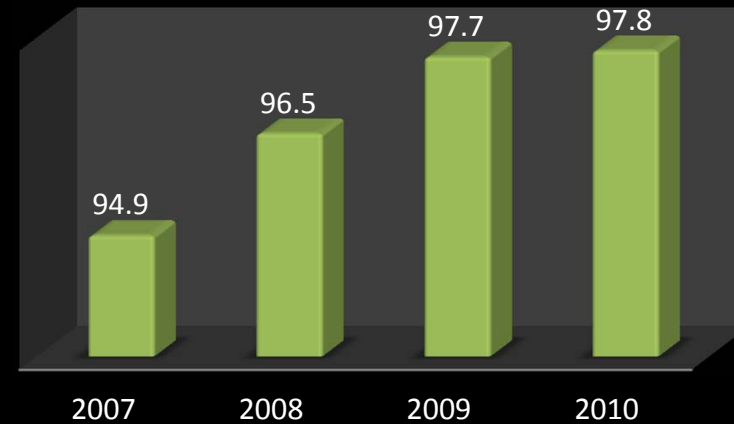
Graph 3: Surgical care accountability composite



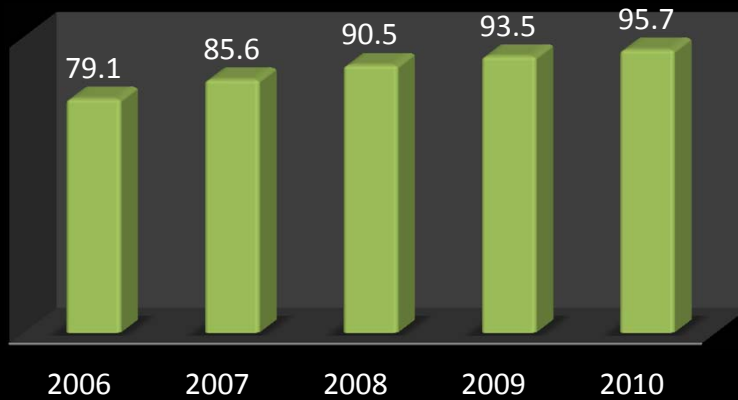
### antibiotics within one hour before the first surgical cut



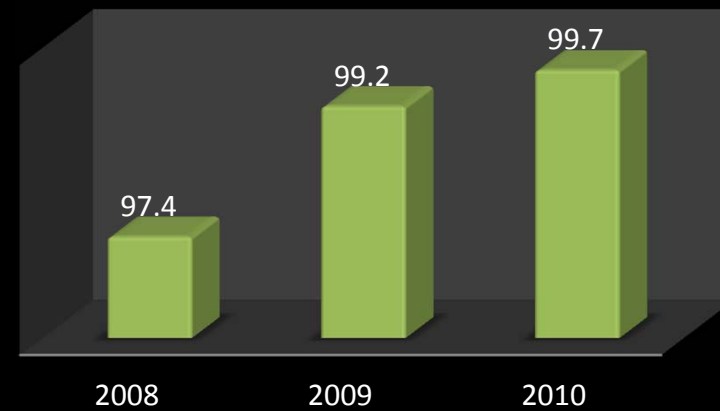
### appropriate prophylactic antibiotics



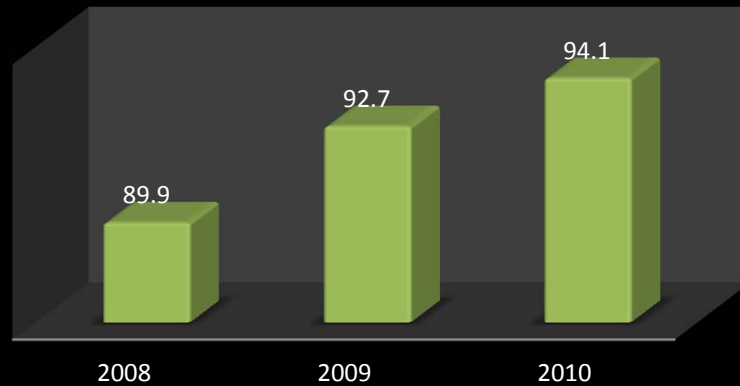
### stopping antibiotics within 24 hours



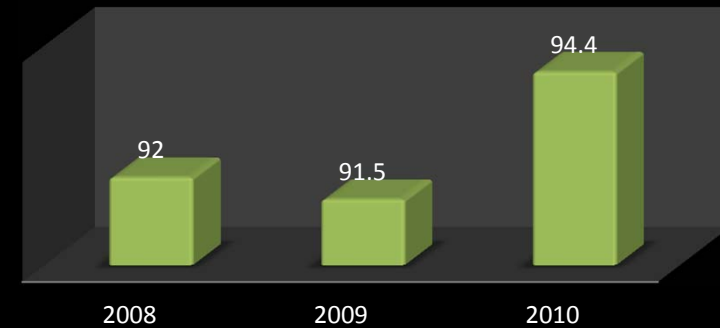
### patients with appropriate hair removal



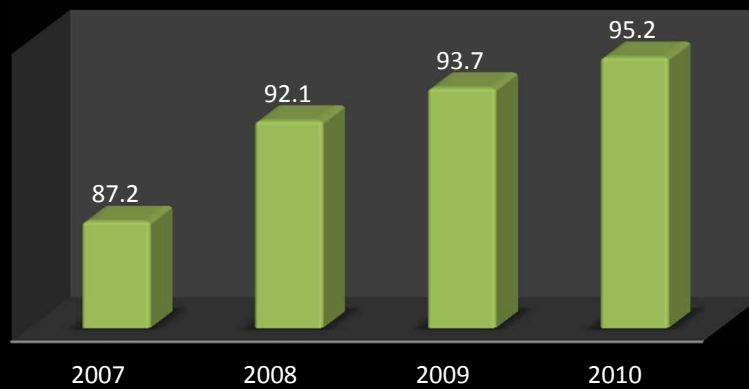
### Cardiac patients with 9 a.m. postoperative blood glucose



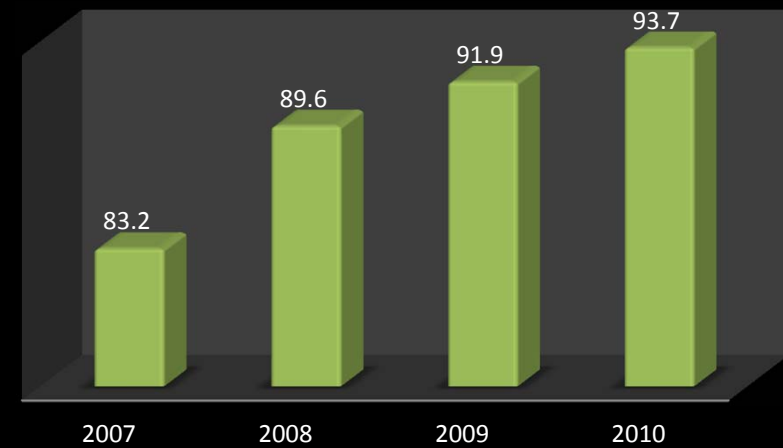
### Beta-blocker patients who received beta-blocker perioperatively



### prescribing VTE medicine/treatment



### receiving VTE medicine/treatment



# 2011年病人安全文化調查結果

## -手術室-

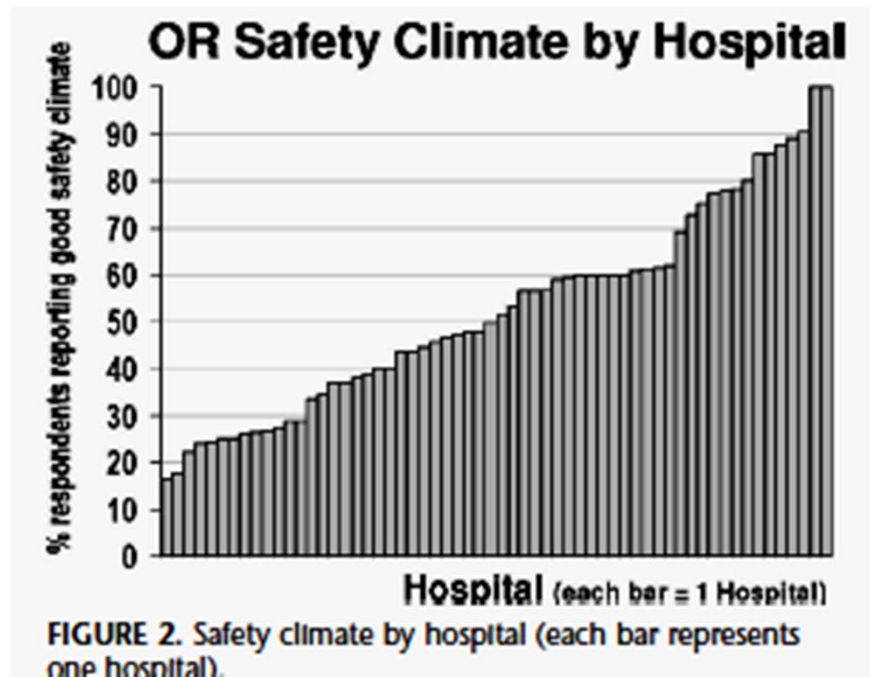
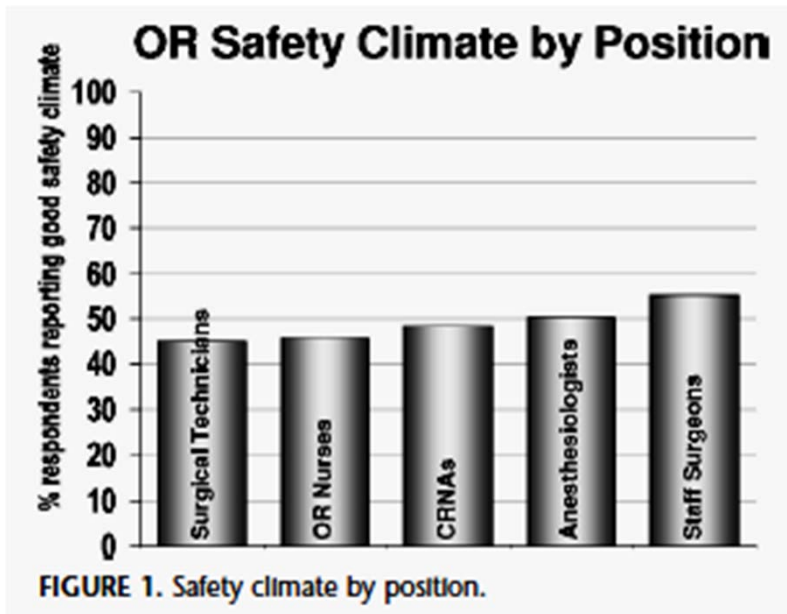
單位 \ 構面	團隊 合作	單位 安全 風氣	對工 作的 滿意	對壓 力的 認知	對管 理的 感受	工作 狀況	管理 支持 病安 活動	跨單 位團 隊合 作	交接 班
手術 室	40.1	38.8	38.6	59.4	34.7	39.9	32.7	22.7	15.1

單位：正向回答百分比(%)

醫院家數：38家，樣本數：31,651人

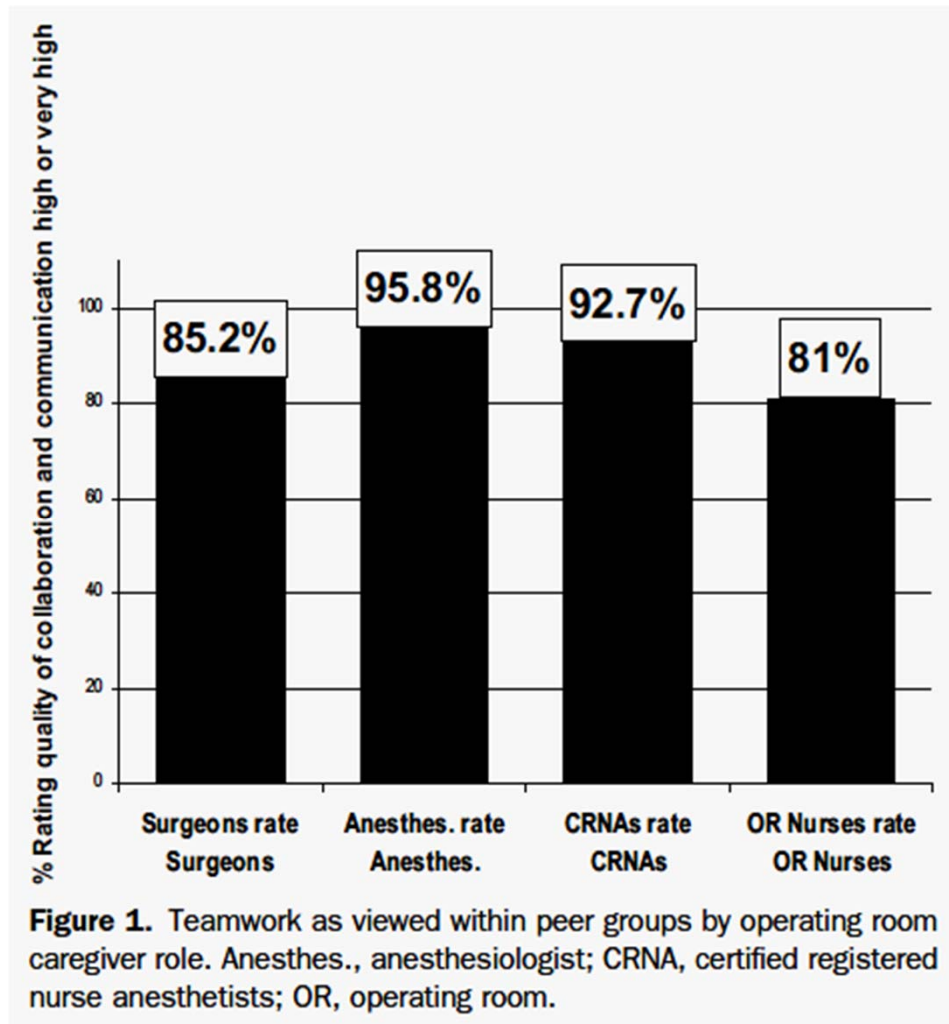
資料來源：醫策會病安文化調查系統

Makary MA, Sexton JB, Freischlag JA, et al: Patient safety in surgery. Ann Surg 2006;243 (5): 628-632.

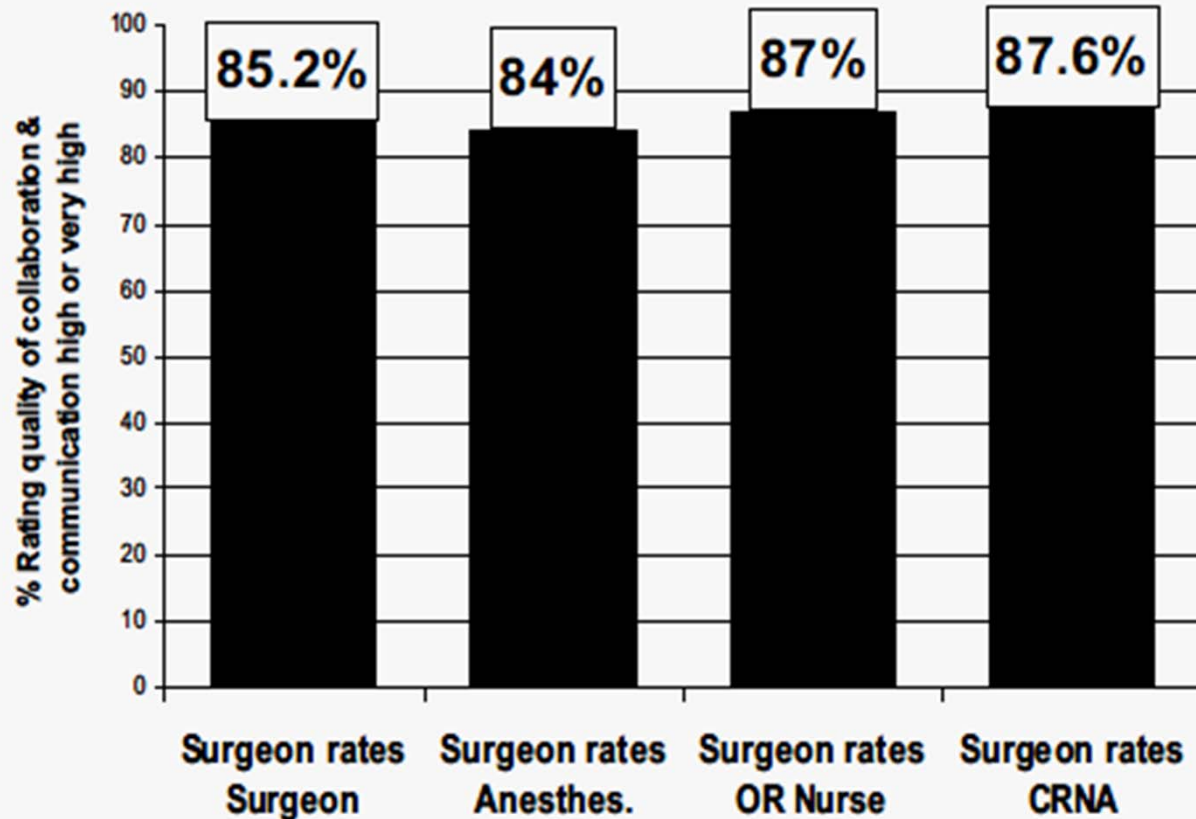




Makary MA, Sexton JB, Freischlag JA, et al. Operating room teamwork among physicians and nurses: teamwork in the eye of the beholder. J Am Coll Surg 2006;202(5):746-752.



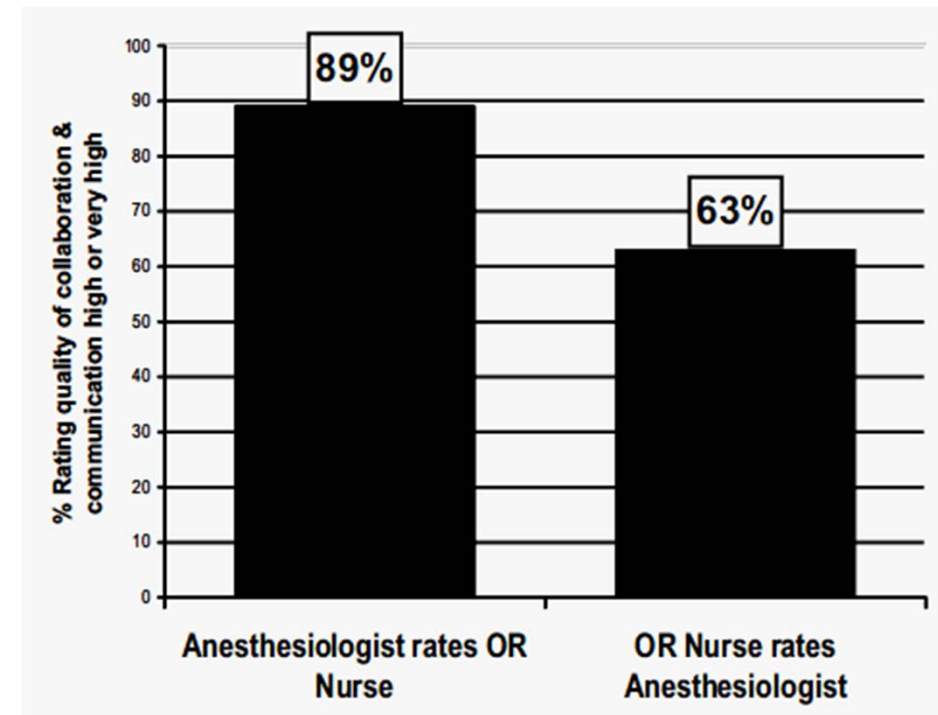
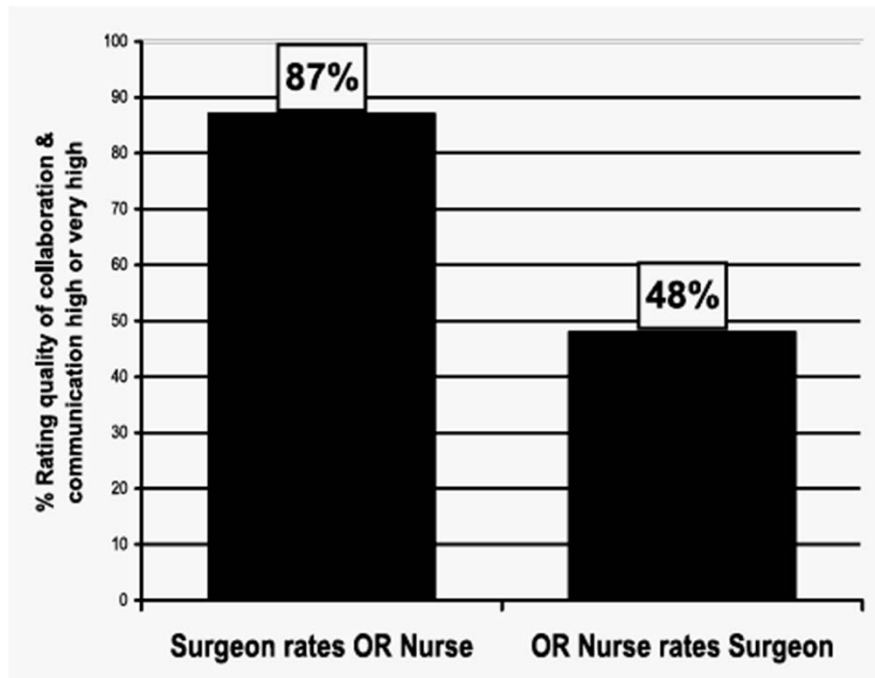
Makary MA, Sexton JB, Freischlag JA, et al. Operating room teamwork among physicians and nurses: teamwork in the eye of the beholder. J Am Coll Surg 2006;202(5):746-752.



**Figure 2.** The surgeon's view of operating room (OR) teamwork by OR caregiver role. Anesthes., anesthesiologist; CRNA, certified registered nurse anesthetists.

Makary MA, Sexton JB, Freischlag JA, et al. Operating room teamwork among physicians and nurses: teamwork in the eye of the beholder.

J Am Coll Surg 2006;202(5):746-752.



# 溝通

- 醫療團隊之間溝通失效是無意中造成病人傷害的主要原因，也是病安通報的前哨事件之中，排名第一的促成因素。
- 分析2,455件通報至醫院評審聯合委員會的哨兵事件顯示，造成70%以上的事件之主要的根本原因是溝通失效，而這些病人中約有75%死亡（Leonard et al. 2004）。
- 人為因素的研究指出，因為每個人記憶的固有限制、多重工作的有限能力以及壓力和疲勞的影響，即使是最熟練且經驗豐富的護士和醫師也會犯錯誤（Leonard et al. 2004）。

# Surgical Safety Checklist

## Before induction of anaesthesia

(with at least nurse and anaesthetist)

**Has the patient confirmed his/her identity, site, procedure, and consent?**

- Yes

**Is the site marked?**

- Yes  
 Not applicable

**Is the anaesthesia machine and medication check complete?**

- Yes

**Is the pulse oximeter on the patient and functioning?**

- Yes

**Does the patient have a:**

Known allergy?

- No  
 Yes

Difficult airway or aspiration risk?

- No  
 Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

- No  
 Yes, and two IVs/central access and fluids planned

## Before skin incision

(with nurse, anaesthetist and surgeon)

Confirm all team members have introduced themselves by name and role.

Confirm the patient's name, procedure, and where the incision will be made.

**Has antibiotic prophylaxis been given within the last 60 minutes?**

- Yes  
 Not applicable

**Anticipated Critical Events**

To Surgeon:

- What are the critical or non-routine steps?  
 How long will the case take?  
 What is the anticipated blood loss?

To Anaesthetist:

- Are there any patient-specific concerns?

To Nursing Team:

- Has sterility (including indicator results) been confirmed?  
 Are there equipment issues or any concerns?

**Is essential imaging displayed?**

- Yes  
 Not applicable

## Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

**Nurse Verbally Confirms:**

- The name of the procedure  
 Completion of instrument, sponge and needle counts  
 Specimen labelling (read specimen labels aloud, including patient name)  
 Whether there are any equipment problems to be addressed

**To Surgeon, Anaesthetist and Nurse:**

- What are the key concerns for recovery and management of this patient?

## Root Cause Information for Op/Post-op Complication Events Reviewed by The Joint Commission

(Resulting in death or permanent loss of function)

<b>2004 through 2011 (N=630)</b> <i>The majority of events have multiple root causes</i>	
Human Factors	390
Communication	352
Assessment	318
Leadership	265
Information Management	129
Operative Care	100
Care Planning	74
Physical Environment	74
Medication Use	63
Continuum of Care	54

## Root Cause Information for Unintended Retention of Foreign Object Events Reviewed by The Joint Commission

2004 through 2011 (N=657) <i>The majority of events have multiple root causes</i>	
Leadership	526
Communication	422
Human Factors	408
Operative Care	381
Assessment	163
Physical Environment	153
Information Management	102
Continuum of Care	19
Performance Improvement	9
Care Planning	7

# Root Cause Information for Wrong-patient, Wrong-site, Wrong-procedure Events Reviewed by The Joint Commission

(Regardless of the magnitude of the procedure)

2004 through 2011 (N=817) <i>The majority of events have multiple root causes</i>	
Leadership	681
Communication	567
Human Factors	528
Information Management	293
Operative Care	288
Assessment	275
Physical Environment	79
Patient Rights	52
Anesthesia Care	42
Continuum of Care	28



# 溝通失效的原因

- 實際環境的限制：例如：噪音、語言上的困難、陳述問題或意見時被打斷。
- 不同的溝通方式：例如：階層或權威性差別、挑戰假設問題失敗
- 使用專業術語話或不同的溝通模式，特別是在跨學科的團隊，可能會導致誤解。
- 個人會因自己的觀點或偏見而對相同的溝通有非常不同的解釋，或因為聚焦於過度負荷的任務而可能不會收到的信息。
- 文化因素也是有效溝通的一個組成部分。

# Outcomes before and after Checklist Implementation, According to Site

Site No.	No. of Patients Enrolled		Surgical Site Infection		Unplanned Return to the Operating Room		Pneumonia		Death		Any Complication	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
1	524	598	4.0	2.0	4.6	1.8	0.8	1.2	1.0	0.0	11.6	7.0
2	357	351	2.0	1.7	0.6	1.1	3.6	3.7	1.1	0.3	7.8	6.3
3	497	486	5.8	4.3	4.6	2.7	1.6	1.7	0.8	1.4	13.5	9.7
4	520	545	3.1	2.6	2.5	2.2	0.6	0.9	1.0	0.6	7.5	5.5
5	370	330	20.5	3.6	1.4	1.8	0.3	0.0	1.4	0.0	21.4	5.5
6	496	476	4.0	4.0	3.0	3.2	2.0	1.9	3.6	1.7	10.1	9.7
7	525	585	9.5	5.8	1.3	0.2	1.0	1.7	2.1	1.7	12.4	8.0
8	444	584	4.1	2.4	0.5	1.2	0.0	0.0	1.4	0.3	6.1	3.6
<b>Total</b>	<b>3733</b>	<b>3955</b>	<b>6.2</b>	<b>3.4</b>	<b>2.4</b>	<b>1.8</b>	<b>1.1</b>	<b>1.3</b>	<b>1.5</b>	<b>0.8</b>	<b>11.0</b>	<b>7.0</b>
<b>P value</b>			<b>&lt;0.001</b>		<b>0.047</b>		<b>0.46</b>		<b>0.003</b>		<b>&lt;0.001</b>	

Source: Haynes AB, Weiser TG, Berry WR, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med 2009 ;360(5):491-9.

# The Joint Commission's Annual Report on Quality and Safety 2009



## NATIONAL PERFORMANCE SUMMARY, 2005-2008

Performance measure*	2005	2006	2007	2008	Improvement since inception (percentage points)
<i>Surgical care</i>					
Antibiotics within one hour before the first surgical cut <sup>††</sup>	81.8%	86.6%	89.5%	93.5%	11.7
Appropriate prophylactic antibiotics <sup>††</sup>	N/A	N/A	94.9%	96.8%	1.9
Stopping antibiotics within 24 hours <sup>††</sup>	73.5%	79.1%	85.6%	90.5%	17.0
Cardiac patients with controlled 6 a.m. postoperative blood glucose	N/A	N/A	N/A	89.9%	N/A
Patients with appropriate hair removal	N/A	N/A	N/A	97.4%	N/A
Beta blocker patients who received beta blocker perioperatively	N/A	N/A	N/A	92.0%	N/A
Prescribing VTE medicine/treatment	N/A	N/A	87.2%	92.1%	4.9
Receiving VTE medicine/treatment	N/A	N/A	83.2%	89.6%	6.4

# 手術檢體之收集及處理原則

- 檢體取下之後最好立即置入已貼上正確標籤的檢體容器內。如果沒有立即放入檢體容器內而暫時置放於手術器械桌上時，應標示清楚，以免造成錯誤。
- 檢體由醫師取下交給刷手護士時，兩人應確認檢體之來源及數目。
- 無論何時將取下的檢體置入檢體容器內，刷手護士必須與流動護士或醫師確認檢體之來源、檢體數目及標籤之標示是正確的。
- 手術完成後，應由手術醫師與護理人員確認檢體來源、檢體數目及標籤標示正確。當病人意識清醒時，可與病人共同確認檢體來源、檢體數目及標籤標示。
- 均應將檢體視為具有「生物危險 ( biohazardous) 」。必要時，應將檢體容器置於可以密封之塑膠袋或其他容器內。
- 取下的檢體如果含有放射性物質時，應依院內放射性物質管理準則處理，並在檢體容器上標示含有放射性物質。
- 檢體如果不能在短時間內轉送至病理檢查單位時，應妥善保管。

# 防止手術物品存留於手術部位

- 美國的聯合委員會 ( The Joint Commission ) 主張，醫療照護機構必須採取措施以減低手術物品存留於手術部位的可能性，這些措施可以包括下列幾種：
  - 審核手術記錄，以確認需要計數的項目都已完成計數並且有記錄。
  - 檢討所制定的政策與程序是否符合目前的作業情況，並且確認現行的作業符合醫院的政策與程序。
  - 進行隨機之實際觀察，以監測人員之作業是否符合安全要求。
  - 確認有定期評估人員之職業能力。
  - 考慮把科技之使用融入流程，如：無線射頻辨識系統。
  - 利用跡近錯失 ( near miss ) 的案例做為學習教材。

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