# Características generales de las infecciones del lugar quirúrgico

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## *Mangram AL et al. Guideline for prevention of surgical site infections, 1999. Infect Control Hosp Epidemiol 1999;20:247*

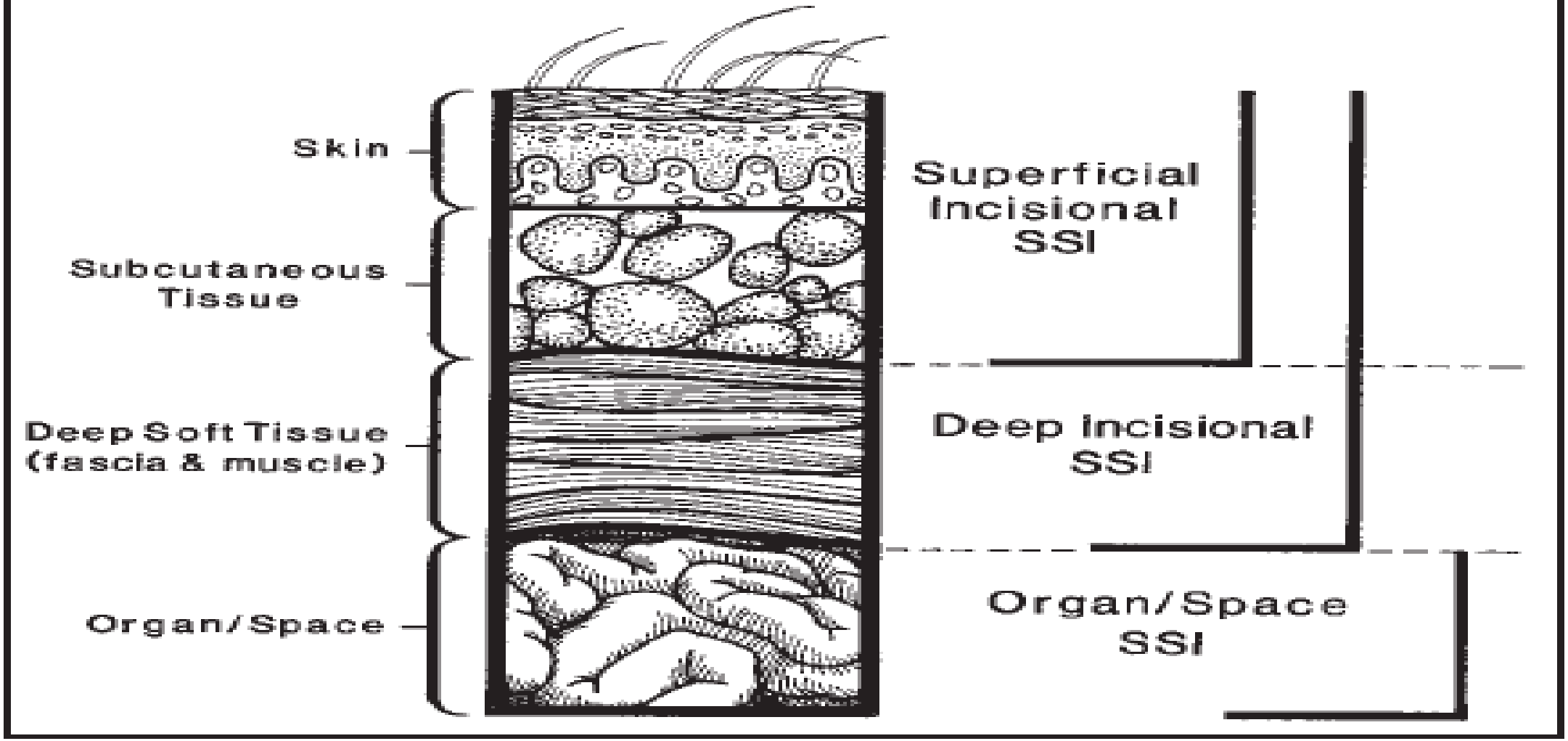
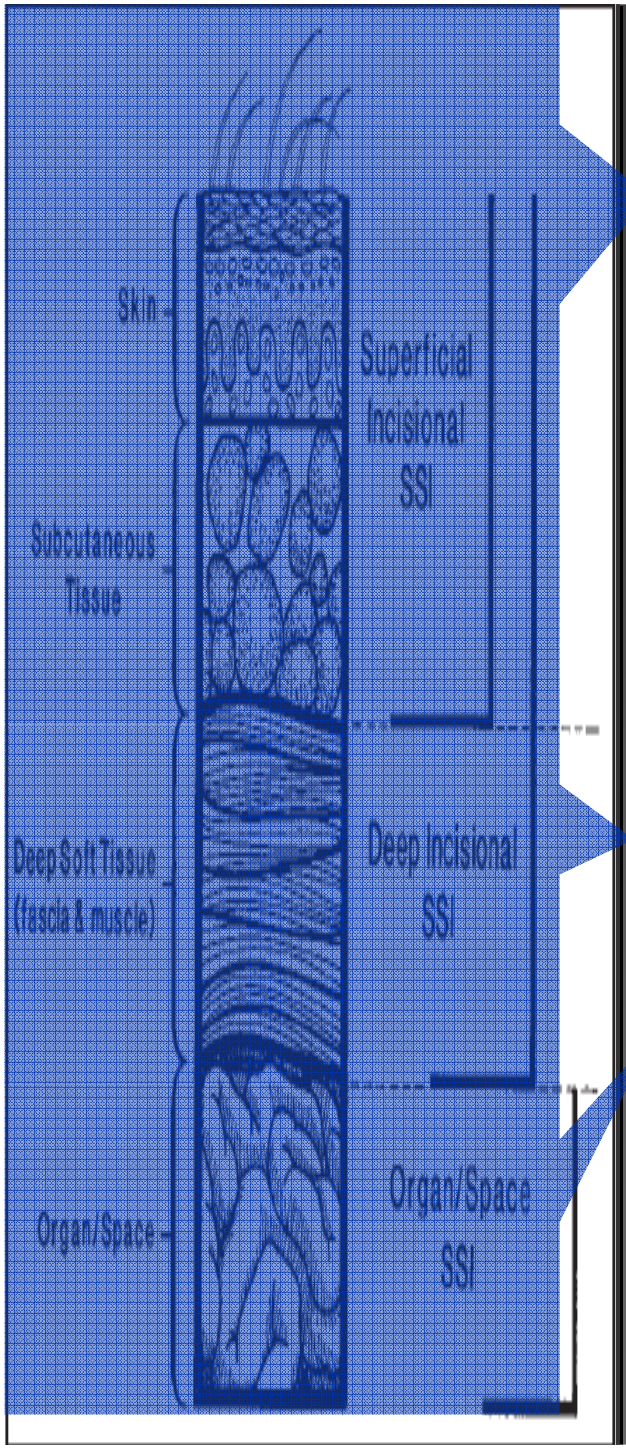



**FIGURE.** Cross-section of abdominal wall depicting CDC classifications of surgical site infection.[22]




- 30 d de la operación
- Afecta solo piel o tejido celular subcutáneo
- Y al menos uno de los siguientes: supuración, cultivo positivo (líquido o tejido), signos inflamatorios locales y apertura por el cirujano (salvo que el cultivo sea negativo), el cirujano o médico responsable la diagnostica como tal

- 30 d de la operación o 1 año si implante de biomaterial
- Afecta órgano/espacio, estructura anatónica distinta de la incisión que haya sido abierto o manipulado
- Y al menos uno de los siguientes: a por el cirujano obtención de pus a través de un drenaje, microbio aislado de fluido o tejido obtenidos asépticamente del órgano o cavidad, documentación de absceso, el cirujano o médico responsable la diagnostica como tal

# Owens CD et al. Surgical site infection: epidemiology, microbiology and prevention. J Hosp Infect 2008;70:3-10

Table 2
Pathogens commonly associated with different surgical procedures (adapted from Mangram *et al.* [2])

| Type of surgery | Common pathogens [a] |
|---|---|
| Placement of graft, prosthesis or implant | *Staphylococcus aureus*; CoNS |
| Cardiac | *S. aureus*; CoNS |
| Neurosurgery | *S. aureus*; CoNS |
| Breast | *S. aureus*; CoNS |
| Ophthalmic | *S. aureus*; CoNS; streptococci; Gram-negative bacilli |
| Orthopaedic | *S. aureus*; CoNS; Gram-negative bacilli |
| Non-cardiothoracic | *S. aureus*; CoNS; *Streptococcus pneumoniae*; Gram-negative bacilli |
| Vascular | *S. aureus*; CoNS |
| Appendectomy | Gram-negative bacilli; anaerobes |
| Biliary tract | Gram-negative bacilli; anaerobes |
| Colorectal | Gram-negative bacilli; anaerobes |
| Gastroduodenal | Gram-negative bacilli; streptococci; oropharyngeal anaerobes (e.g. peptostreptococci) |
| Head and neck | *S. aureus*; streptococci; oropharyngeal anaerobes (e.g. peptostreptococci) |
| Obstetric and gynaecological | Gram-negative bacilli; enterococci; Group B streptococci; anaerobes |
| Urological | Gram-negative bacilli |

## *Shankar VG et al. Prophylactic antibiotics in open mesh repair of inguinal hernia –A randomized controlled trial. Int J Surg 2010;8:444*

**Table 7**
Microorganisms in culture positive wound infections.

| Micro organism | Number (percentage) |
|---|---|
| *Staphylococcus aureus* | 12 (70.5%) |
| *Streptococci* | 2 (11.7%) |
| *Klebsiella pneumoniae* | 2 (11.7%) |
| *E. coli* | 1 (5.8%) |
| *Enterobacteria* | 1 (5.8%) |
| Multiple organisms | 2 (11.7%) |

***334 procedimientos. Tasa infección: 8,7% (infección superficial :8,1%; infección de la malla: 0,6%)***

*Kirkland KB et al. The impact of surgical-site infections in the 1990s: attributale mortality, excess length of hospitalization, and extra cost. Infect Control Hosp Epidemiol 1999;20:725.*

| Desenlace | Infectados | No infectados | RR o diferencia |
|---|---|---|---|
| • Mortalidad | 7,8% | 3,5% | 2,2 (1,1-4,5) |
| • Necesidad UCI | 29% | 18% | 1,6 (1,3-2) |
| • Días hospital | 11 | 6 | 6,5 (5-8) |
| • Rehospitalización | 41% | 7,4% | 5,5 (4-7,7) |
| • Costo en $ | 3842 | 7486$ | 3089 (2148-4136) |

*Estudio caso-control de 255 casos con infección y 225 sin infección emparejados por tipo de cirugía, índice de riesgo NNIS, edad y fecha de cirugía*

**Sephard J et al. Financial impact of surgical siteinfections on hospitals. The hospital management perspective. JAMA Surg 2013;148:907**

Table 2. Metrics for Patients With or Without an SSI: 2007-2010[a]

| Metric | Mean (95% CI) | | *P* Value |
|---|---|---|---|
| | Patients With SSI | Control Patients | |
| LOS, d | 10.56 (9.50-11.62) | 5.64 (5.34-5.95) | <.001 |
| ICU LOS, d | 2.84 (2.28-3.41) | 1.27 (1.21-1.33) | <.001 |
| Non-ICU LOS, d | 7.72 (7.01-8.43) | 4.38 (4.32-4.44) | <.001 |
| Total charges, $ | 58 822 (43 352-74 292) | 35 827 (36 348-35 305) | <.001 |
| 30-d Inpatient readmission rate per 100 procedures | 51.94 (47.92-55.94) | 8.19 (7.83-8.56) | <.001 |

# Factores “clásicos” de riesgo de infección quirúrgica

- **Relacionados con factores del huésped:**
  - Edad, obesidad, enfermedad subyacente, puntuación ASA
  - Estado de portador nasal de *S. aureus*
  - Infección remota
  - Duración de la estancia preoperatoria
  - Malnutrición o hipoalbuminemia, diabetes
- **Relacionados con el procedimiento:**
  - Afeitado preoperatorio
  - Tipo de cirugía, grado de contaminación de la herida
  - Profilaxis antibiótica
  - Duración de la cirugía
  - Múltiples procedimientos, trauma excesivo
  - Colocación de material protésico
  - Transfusión sanguínea

# Indicadores de riesgo quirúrgico utilizados con propósitos de vigilancia: índice del National Nosocomial Infection Surveillance System (NNIS, 1993)

**Table V** *NNIS Categories of variables as predictors of SSI risk*[58, 97]

| Category | Variable | NNIS risk index criteria for presence of a risk factor* |
|---|---|---|
| Intrinsic degree of microbial contamination of the surgical site | Wound class, i.e., clean, clean-contaminated, contaminated or dirty[96] | Contaminated or dirty<br>If present, scores one point |
| Duration of an operation | Time, in hours, of the duration of the surgical procedure from skin incision to skin closure[58] | Length of operation > T hours where T is the approximate 75th percentile of the duration of the surgical procedure<br>T is surgical procedure-specific<br>If present, scores one point |
| Makers for host susceptibility | American Society of Anesthesiologists (ASA) Physical Status Classification[94] | ASA score of 3, 4 or 5<br>If present, scores one point |

* Risk index is obtained by summing the scores of the individual variables. Ranges from 0 to 3.

Smyth ETM et al. J Hosp Infect 2000;45:173

## *Rioux C et al. Impact of a six-year control programme on surgical site infections in France: results of the INCISO surveillance. J Hosp Infect 2007;66:217*

**Table III** Crude surgical site infection (SSI) incidence according to patients' characteristics and perioperative conditions (pooled data $N = 150\,440$)

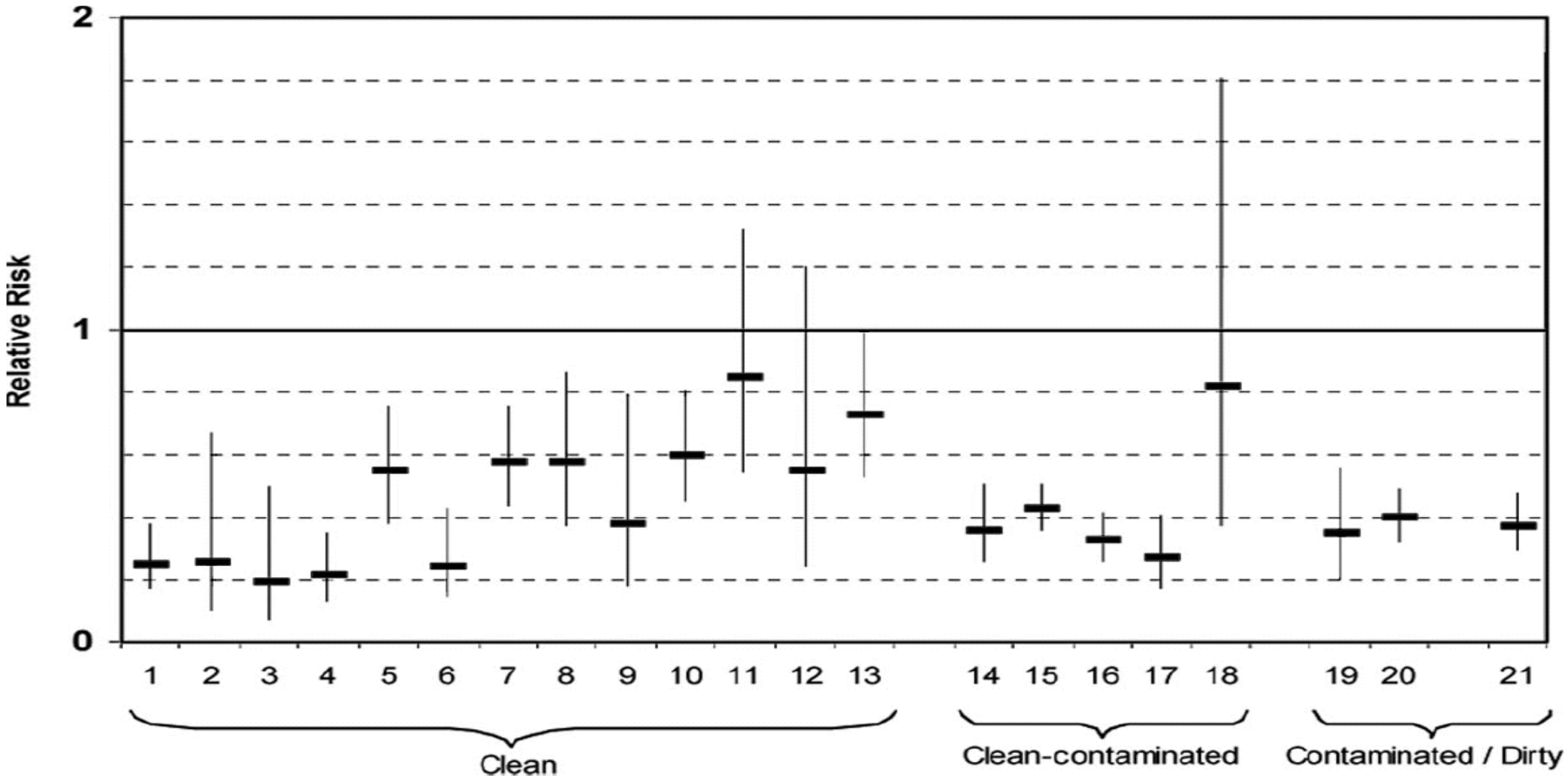
| | | *N* | % SSI[a] | *P*[b] |
|---|---|---|---|---|
| Age (years) | ≤65 | 110 368 | 2.06 | <0.0001 |
| MV = 34 | >65 | 40 038 | 3.45 | |
| Gender | Female | 82 359 | 2.26 | <0.0001 |
| MV = 16 | Male | 68 065 | 2.65 | |
| ASA score | ≤2 | 131 294 | 2.00 | <0.0001 |
| MV = 589 | >2 | 18 554 | 5.54 | |
| Altemeier wound class | ≤2 | 135 348 | 1.93 | <0.0001 |
| MV = 313 | >2 | 14 779 | 7.08 | |
| Operation duration | ≤75th percentile | 127 554 | 1.93 | <0.0001 |
| MV = 947 | >75th percentile[b] | 21 939 | 5.40 | |
| Preoperative hospital stay | <48 h | 130 601 | 2.05 | <0.0001 |
| MV = 230 | ≥48 h | 19 609 | 4.97 | |
| Ambulatory | No | 131 492 | 2.71 | <0.0001 |
| MV = 0 | Yes | 18 948 | 0.52 | |
| Emergency surgery | No | 128 412 | 2.20 | <0.0001 |
| MV = 363 | Yes | 21 665 | 3.84 | |
| Video surgery | No | 125 525 | 2.57 | <0.0001 |
| MV = 70 | Yes | 24 845 | 1.75 | |
| Length of follow-up (day) | <15 | 34 018 | 1.87 | <0.0001 |
| MV = 6 | ≥15 | 116 416 | 2.60 | |

# *Bowater RJ et al.* Is antibiotic prophylaxis in surgery a generally effective Intervention?. Testing a generic hypothesis over a set of meta-analysis. *Ann Surg 2009; 249:551-556*

TABLE 3. Meta-Analyses and Types of Surgery for Which a Relative Risk Could be Calculated

| Review Number | Type of Surgery | Cleanliness | Type of Infection | Relative Risk (95% CI) | Odds Ratio | Baseline Risk of Infection | Absolute Risk Reduction | No. Trials (Patients) |
|---|---|---|---|---|---|---|---|---|
| 1 | Arterial reconstruction, Stewart et al[4] | Clean | Wound | 0.25 (0.17, 0.38) | 0.22* | 0.16 | 0.12† | 10 (1297) |
| 2 | Pacemaker insertion, Da Costa et al[5] | Clean | Any | 0.26‡ (0.10, 0.66) | 0.26 | 0.04 | 0.03† | 7 (2023) |
| 3 | Tube thoracostomy, Sanabria et al[6] | Clean | Wound | 0.19 (0.07, 0.50) | 0.18* | 0.08 | 0.06† | 5 (614) |
| 4 | Craniotomy, Barker[7] | Clean | Wound | 0.21§ (0.13, 0.35) | 0.20§ | 0.09 | 0.07† | 8 (2075) |
| 5 | Intracranial ventricular shunts, Ratilal et al[8] | Clean | Shunt and wound | 0.55‡ (0.38, 0.76) | 0.52 | 0.11 | 0.05† | 16 (1736) |
| 6 | Total hip replacement, Glenny and Song[9] | Clean | Wound | 0.24 (0.14, 0.43) | 0.23* | 0.04 | 0.03† | 5 (2582) |
| 7 | Closed long bone fractures, Gillespie and Walenkamp[10] | Clean | Wound | 0.58§ (0.44, 0.75) | 0.56§ | 0.08 | 0.03† | 7 (3500) |
| 8 | Hip fracture repair, Southwell-Keely et al[11] | Clean | Wound | 0.58‡ (0.38, 0.86) | 0.55 | 0.10 | 0.05 | 10 (2417) |
| 9 | Spinal surgery, Barker[12] | Clean | Wound | 0.38‡ (0.18, 0.79) | 0.37 | 0.06 | 0.03 | 6 (843) |
| 10 | Breast surgery, Tejirian et al[13] | Clean | Wound | 0.60 (0.45, 0.81) | 0.56* | 0.15 | 0.06† | 5 (1307) |
| 11 | Inguinal hernia repair (without mesh), Sanchez-Manuel and Seco-Gil[14] | Clean | Wound | 0.85‡ (0.54, 1.32) | 0.84 | 0.05 | 0.01† | 5 (1867) |
| 12 | Inguinal hernia repair (with mesh), Aufenacker et al[15] | Clean | Wound | 0.55‡ (0.25, 1.20) | 0.54 | 0.03 | 0.01† | 6 (2507) |
| 13 | Caesarean section (elective), Smaill and Hofmeyr[16] | Clean | Wound | 0.73 (0.53, 0.99) | 0.71* | 0.09 | 0.02† | 12 (2015) |
| 14 | Caesarean section (non-elective), Smaill and Hofmeyr[16] | Clean-contaminated§ | Wound | 0.36 (0.26, 0.51) | 0.34* | 0.08 | 0.05† | 20 (2780) |
| 15 | Abdominal hysterectomy, Mittendorf et al[17] | Clean-contaminated§ | Any | 0.43§ (0.36, 0.51) | 0.37§ | 0.21 | 0.12† | 25 (3604) |
| 16 | Biliary tract surgery, Meijer et al[18] | Clean-contaminated§ | Wound | 0.33‡ (0.26, 0.41) | 0.30 | 0.135 | 0.09 | 42 (4129) |
| 17 | Percutaneous endoscopic gastrostomy, Sharma and Howden[19] | Clean-contaminated§ | Wound | 0.27 (0.17, 0.41) | 0.22* | 0.24 | 0.18 | 7 (777) |
| 18 | Laparoscopic cholecystectomy (elective), Catarci et al[20] | Clean-contaminated§ | Wound | 0.82‡ (0.37, 1.81) | 0.82 | 0.03 | 0.01† | 6 (974) |
| 19 | Colorectal surgery, Song and Glenny[21] | Contaminated§ | Wound | 0.35‡ (0.20, 0.56) | 0.24 | 0.40 | 0.26† | 4 (293) |
| 20 | Simple appendicitis, Andersen et al[22] | Contaminated§ or clean-contaminated§ | Wound | 0.40‡ (0.32, 0.49) | 0.37 | 0.11 | 0.06† | 26 (5317) |
| 21 | Complicated appendicitis, Andersen et al[22] | Dirty | Wound | 0.37‡ (0.29, 0.48) | 0.28 | 0.35 | 0.22† | 24 (1152) |

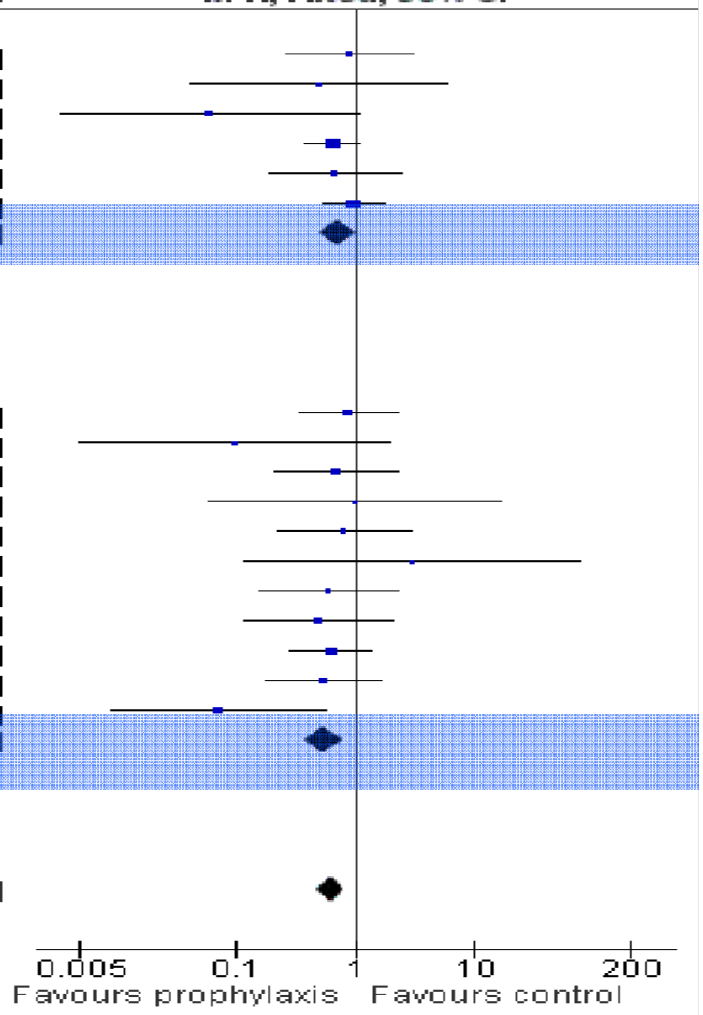
**_Bowater RJ et al._ Is antibiotic prophylaxis in surgery a generally effective intervention. Testing a generic hypothesis over a set of meta-analysis. _Ann Surg 2009; 249:551-556_**



## *Sanchez-Manuel FJ et al.* Antibiotic prophylaxis for hernia rapair (Review). *Cochrane Database Systematic Reviews 2012; 2:CD003769.*

**Figure 4. Forest plot of comparison: I Antibiotic prophylaxis vs Placebo, outcome: I.I Wound infec**

| Study or Subgroup | Prophylaxis Events | Prophylaxis Total | Control Events | Control Total | Weight | Odds Ratio M-H, Fixed, 95% CI |
|---|---|---|---|---|---|---|
| **1.1.1 Herniorraphies** | | | | | | |
| Andersen 1980 | 5 | 137 | 6 | 150 | 3.6% | 0.91 [0.27, 3.05] |
| Evans 1973 | 1 | 48 | 2 | 49 | 1.3% | 0.50 [0.04, 5.70] |
| Lazorthes 1992 | 0 | 155 | 7 | 153 | 5.0% | 0.06 [0.00, 1.11] |
| Pessaux 2006 | 68 | 2008 | 20 | 394 | 21.3% | 0.66 [0.39, 1.09] |
| Platt 1990 | 4 | 301 | 6 | 311 | 3.8% | 0.68 [0.19, 2.45] |
| Taylor 1997 | 25 | 283 | 25 | 280 | 15.1% | 0.99 [0.55, 1.77] |
| **Subtotal (95% CI)** | | **2932** | | **1337** | **50.2%** | **0.71 [0.51, 1.00]** |
| Total events | 103 | | 66 | | | |
| Heterogeneity: Chi² = 4.31, df = 5 (P = 0.51); I² = 0% | | | | | | |
| Test for overall effect: Z = 1.94 (P = 0.05) | | | | | | |
| **1.1.2 Hernioplasties** | | | | | | |
| Aufenacker 2004 | 8 | 475 | 9 | 472 | 5.9% | 0.88 [0.34, 2.30] |
| Celdran 2004 | 0 | 50 | 4 | 49 | 3.0% | 0.10 [0.01, 1.91] |
| Ergul 2011 | 5 | 100 | 7 | 100 | 4.4% | 0.70 [0.21, 2.28] |
| Jain 2008 | 1 | 60 | 1 | 60 | 0.6% | 1.00 [0.06, 16.37] |
| Morales 2000 | 4 | 237 | 6 | 287 | 3.5% | 0.80 [0.22, 2.88] |
| Oteiza 2004 | 1 | 124 | 0 | 123 | 0.3% | 3.00 [0.12, 74.36] |
| Othman 2011 | 4 | 50 | 6 | 48 | 3.7% | 0.61 [0.16, 2.31] |
| Perez 2005 | 3 | 174 | 6 | 176 | 3.9% | 0.50 [0.12, 2.02] |
| Shankar 2010 | 12 | 172 | 17 | 162 | 10.8% | 0.64 [0.30, 1.38] |
| Tzovaras 2007 | 5 | 193 | 9 | 193 | 5.8% | 0.54 [0.18, 1.65] |
| Yerdel 2001 | 1 | 136 | 12 | 133 | 8.0% | 0.07 [0.01, 0.58] |
| **Subtotal (95% CI)** | | **1771** | | **1803** | **49.8%** | **0.56 [0.38, 0.81]** |
| Total events | 44 | | 77 | | | |
| Heterogeneity: Chi² = 7.69, df = 10 (P = 0.66); I² = 0% | | | | | | |
| Test for overall effect: Z = 3.04 (P = 0.002) | | | | | | |
| **Total (95% CI)** | | **4703** | | **3140** | **100.0%** | **0.64 [0.50, 0.82]** |
| Total events | 147 | | 143 | | | |
| Heterogeneity: Chi² = 12.58, df = 16 (P = 0.70); I² = 0% | | | | | | |
| Test for overall effect: Z = 3.53 (P = 0.0004) | | | | | | |
| Test for subgroup differences: Chi² = 0.90, df = 1 (P = 0.34), I² = 0% | | | | | | |



***Hohman C et al. Adherence to guidelines for antibiotic prophylaxis in surgery patients in German hospitals: a multicentre evaluation involving pharmacy interns. Infection 2012; 40:131-7***

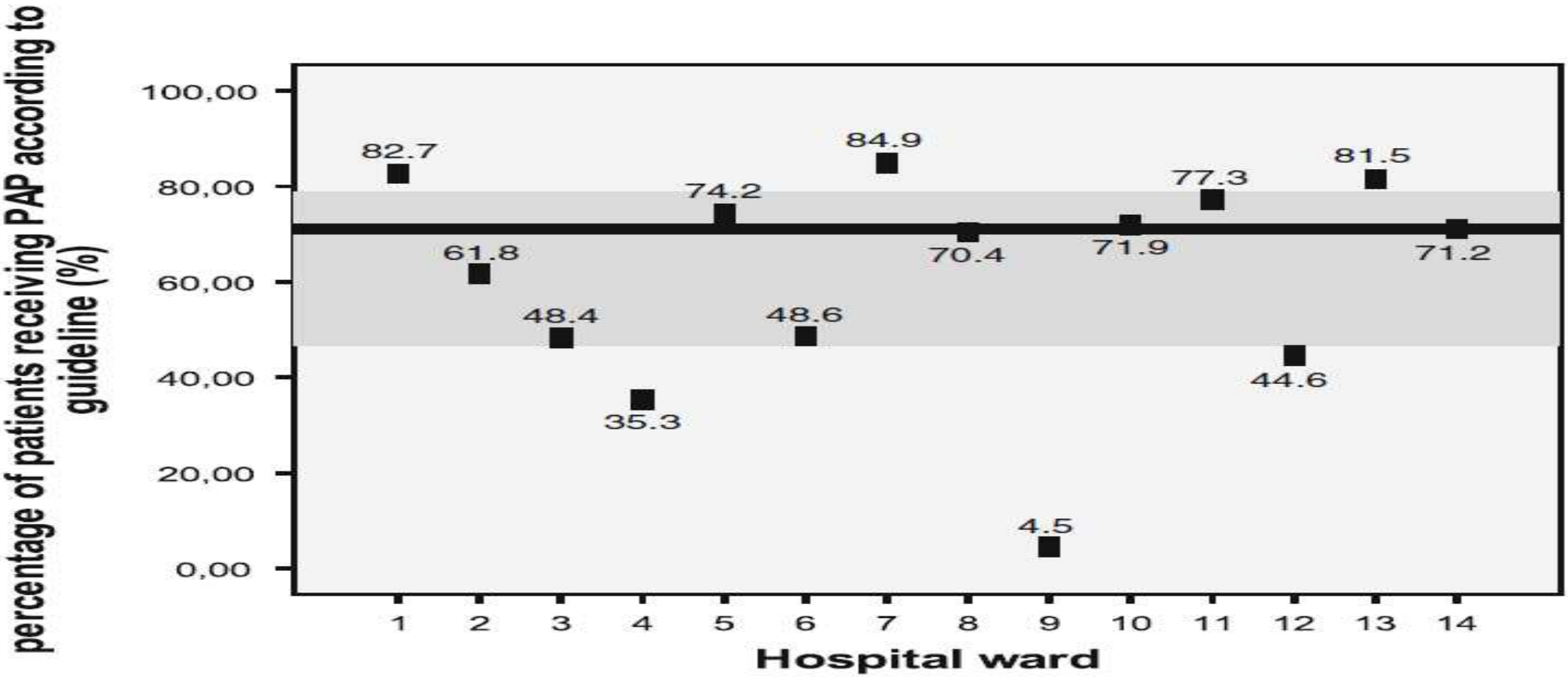



**Fig. 2** Adherence with guidelines for antibiotic prophylaxis for each hospital ward. *Black line* Median of all hospital wards, *grey area* interquartile range of all hospital wards, *Black/grey boxes* median of each hospital ward. Values are given as percentages

*Young B et al. Noncondordance with surgical site infection prevention guidelines and rates of surgical site infections for general surgical, neurological, and orthopedic procedures. Antimicrob Agents Chemother 2011; 55:4659-63*

**216 procedimientos (50 colorectales, 67 neuroquirúrgicos, 99 ortopédicos)**

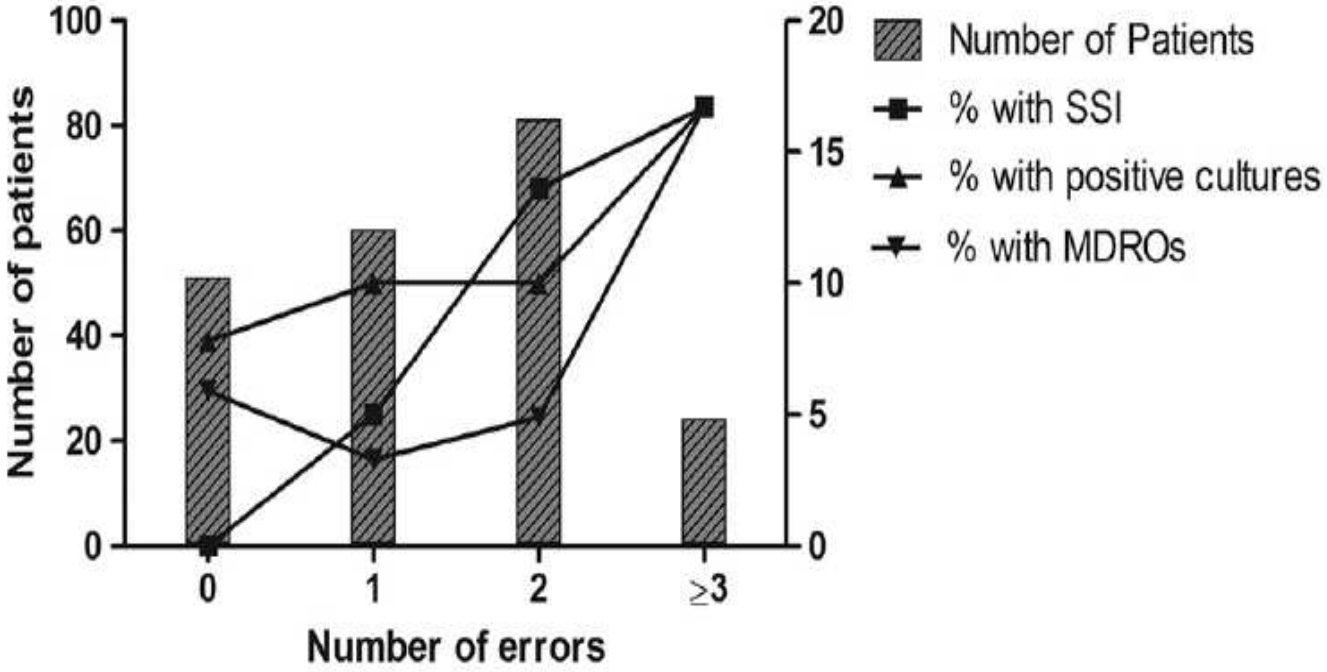



FIG. 2. Rates of surgical site infection (SSI) significantly correlated with antibiotic prophylaxis errors ($P = 0.001$, Mantel-Haenszel linear-by-linear association chi-square test) but not with positive cultures or acquisition of multidrug-resistant organisms (MDROs).

**Distribución de "errores":**

- Antibiótico: 36%
- Timing: 17%
- >24 h: 56%
- No suplemento: 66%

## *Van Rijen MML et al.* Intranasal mupirocin for reduction of *Staphylococcus aureus* infections in surgical patients with nasal carriage: a systematic review. *J Antimicrob Chemother 2008; 61:254-261*

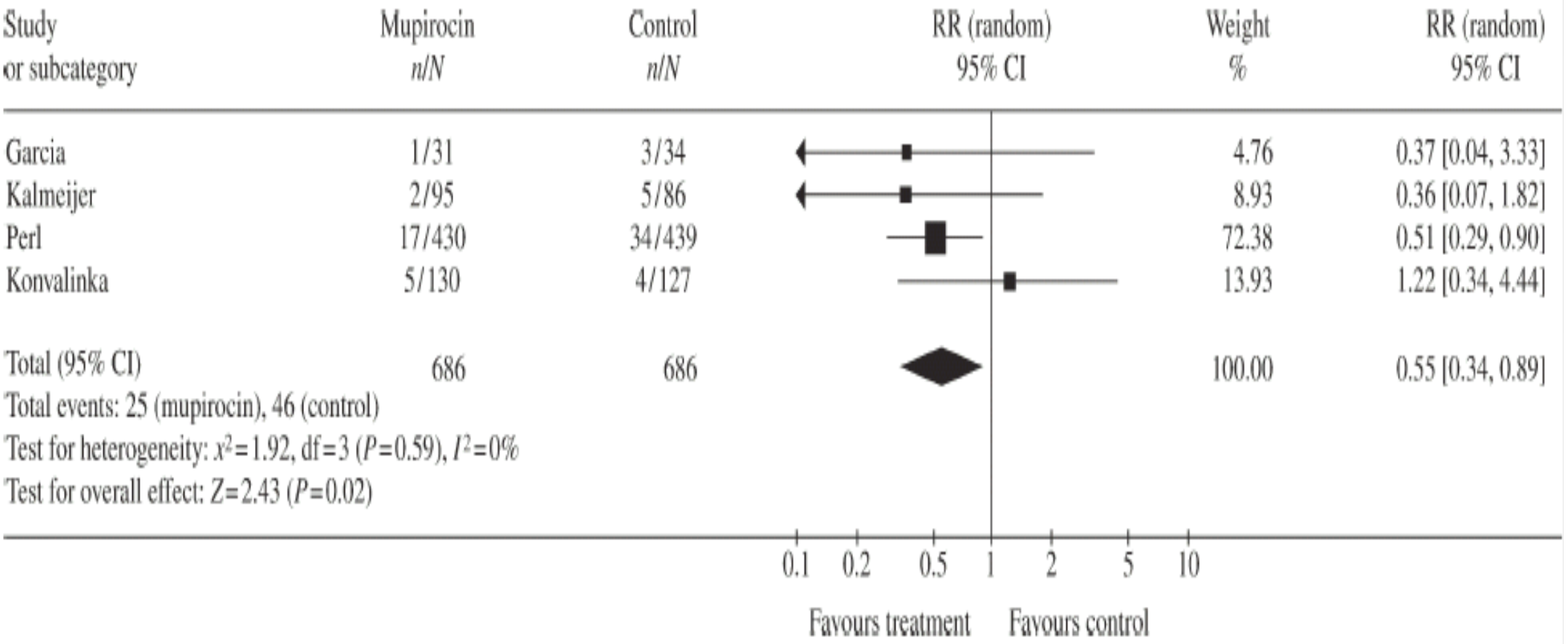



**Figure 2.** Nosocomial *S. aureus* infections among surgical patients with *S. aureus* nasal carriage.

## *Van Rijen MML et al.* Intranasal mupirocin for reduction of *Staphylococcus aureus* infections in surgical patients with nasal carriage: a systematic review. *J Antimicrob Chemother 2008; 61:254-261*

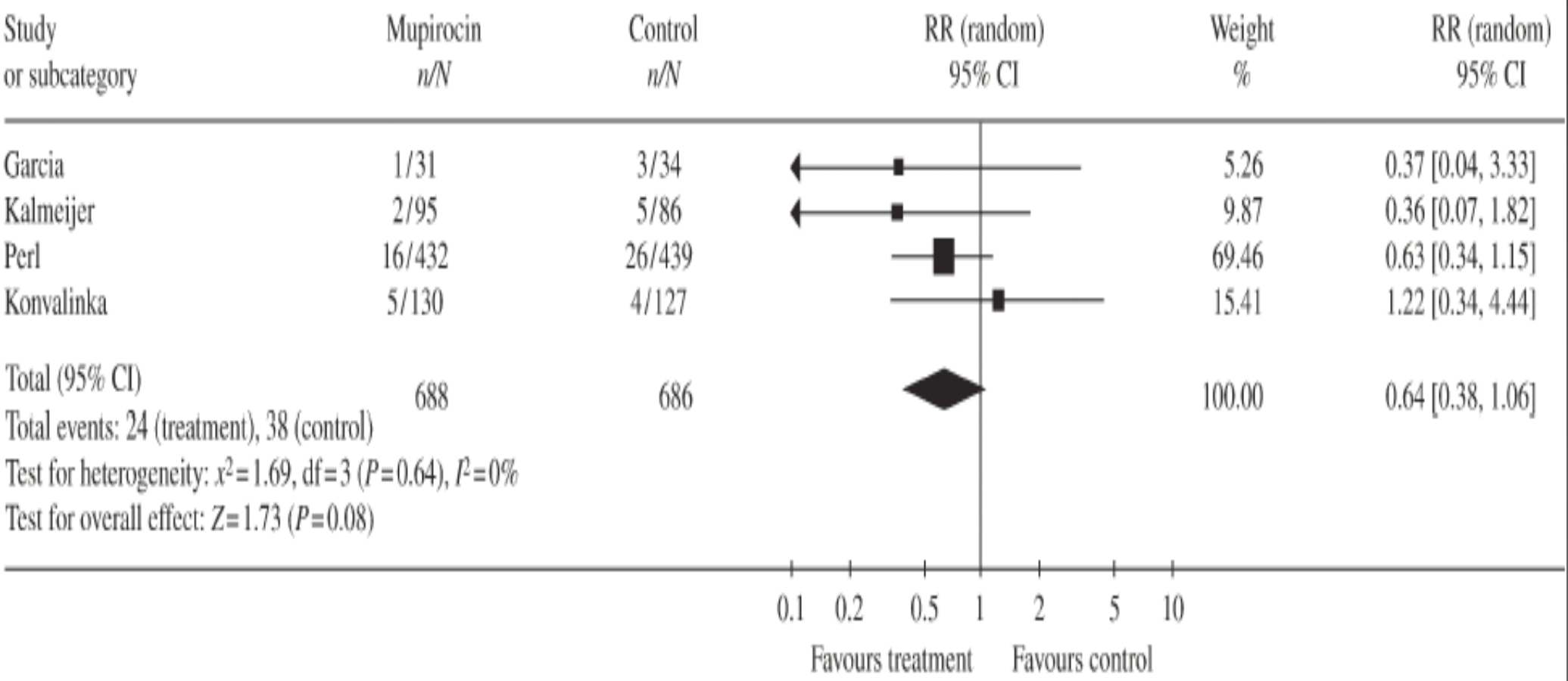



**Figure 3.** *S. aureus* SSIs among surgical patients with *S. aureus* nasal carriage.

## *Bode LGM et al.* Preventing surgical-site infections in nasal carriers of *Staphylococcus aureus*. *N Engl J Med 2010; 362:9-17*

**Table 2.** Relative Risk of Hospital-Acquired *Staphylococcus aureus* Infection and Characteristics of Infections (Intention-to-Treat Analysis).

| Variable | Mupirocin–Chlorhexidine (N = 504) | Placebo (N = 413) | Relative Risk (95% CI)* |
|---|---|---|---|
| | *no. (%)* | | |
| *S. aureus* infection | 17 (3.4) | 32 (7.7) | 0.42 (0.23–0.75) |
| Source of infection† | | | |
| Endogenous | 12 (2.4) | 25 (6.1) | 0.39 (0.20–0.77) |
| Exogenous | 4 (0.8) | 6 (1.5) | 0.55 (0.16–1.92) |
| Unknown | 1 (0.2) | 1 (0.2) | |
| Localization of infection | | | |
| Deep surgical site‡ | 4 (0.9) | 16 (4.4) | 0.21 (0.07–0.62) |
| Superficial surgical site‡ | 7 (1.6) | 13 (3.5) | 0.45 (0.18–1.11) |
| Lower respiratory tract | 2 (0.4) | 2 (0.5) | 0.82 (0.12–5.78) |
| Urinary tract | 1 (0.2) | 0 | |
| Bacteremia | 1 (0.2) | 1 (0.2) | |
| Soft tissue | 2 (0.4) | 0 | |

*Así quedó la piel de un amigo tras el afeitado preoperatorio en mi hospital, AD 2012*

# *Tanner J et al.* Preoperative hair removal to reduce surgical site infection. *The Cochrane Database of Systematic Reviews 2011;11:CD004122.*

**Analysis 4.3. Comparison 4 Shaving compared with clipping, Outcome 3 Surgical site infection - body hair and scalp hair.**

Review: Preoperative hair removal to reduce surgical site infection

Comparison: 4 Shaving compared with clipping

Outcome: 3 Surgical site infection - body hair and scalp hair

| Study or subgroup | Shaving n/N | Clipping n/N | Risk Ratio M-H,Fixed,95% CI | Weight | Risk Ratio M-H,Fixed,95% CI |
|---|---|---|---|---|---|
| Alexander 1983 | 31/537 | 14/476 | | 88.1 % | 1.96 [ 1.06, 3.64 ] |
| Balthazar 1983 | 2/100 | 1/100 | | 5.9 % | 2.00 [ 0.18, 21.71 ] |
| Abouzari 2009 | 3/65 | 1/65 | | 5.9 % | 3.00 [ 0.32, 28.09 ] |
| **Total (95% CI)** | **702** | **641** | | **100.0 %** | **2.03 [ 1.14, 3.61 ]** |

Total events: 36 (Shaving), 16 (Clipping)

Heterogeneity: $Chi^2 = 0.13$, $df = 2$ ($P = 0.94$); $I^2 = 0.0\%$

Test for overall effect: $Z = 2.40$ ($P = 0.017$)

Test for subgroup differences: Not applicable

# Factores “no tan clásicos” de riesgo de infección quirúrgica

- **Relacionados con el procedimiento:**
  - Limpieza mecánica del colon (cirugía colorectal)
  - Hipotermia perioperatoria
  - (No) Oxígeno suplementario perioperatorio (30-35% vs 80%)
  - (No) Reducción de fluidos intraoperatorios (cirugía de colon)
  - (No) Utilización de “protectores de la incisión” (cirugía abdominal)
  - Preparación cutánea con povidona yodada en vez de clorhexidina alcohólica

## *Matos GKF et al.* Mechanical bowel preparation for elective colorectal surgery. *Cochrane Database of Systematic Reviews 2011; 9:CD001544*

**Comparison 1. Mechanical bowel preparation versus no preparation**

| Outcome or subgroup title | No. of studies | No. of participants | Statistical method | Effect size |
|---|---|---|---|---|
| 1 Anastomosis leakage stratified for colonic or rectal surgery | 11 | | Peto Odds Ratio (Peto, Fixed, 95% CI) | Subtotals only |
| 1.1 Leakage after low anterior resection | 7 | 846 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 0.88 [0.55, 1.40] |
| 1.2 Leakage after colonic surgery | 8 | 3147 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 0.85 [0.58, 1.26] |
| 2 Overall anastomotic leakage for colorectal surgery | 13 | 4533 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 0.99 [0.74, 1.31] |
| 3 Mortality | 11 | 4166 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 0.93 [0.58, 1.47] |
| 4 Peritonitis | 10 | 3983 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 0.74 [0.50, 1.08] |
| 5 Reoperation | 11 | 4319 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 1.04 [0.81, 1.34] |
| 6 Wound infection | 13 | 4595 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 1.16 [0.95, 1.42] |
| 7 Infectious extra-abdominal complications | 6 | 3575 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 1.05 [0.85, 1.30] |
| 8 Non-infectious extra-abdominal complications | 6 | 2346 | Peto Odds Ratio (Peto, Fixed, 95% CI) | 0.98 [0.71, 1.36] |

## *Kurz A et al.* Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. *N Engl J Med 1996; 334: 1209-15*

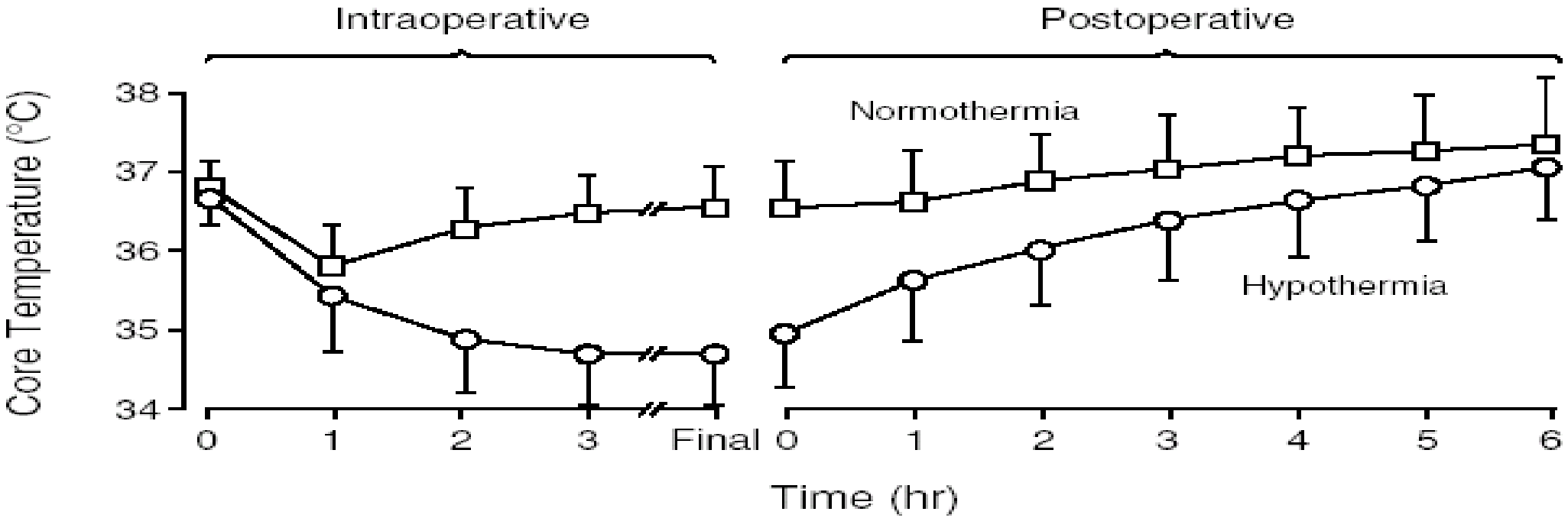



Figure 1. Core Temperatures during and after Colorectal Surgery in the Study Patients.

The mean (±SD) final intraoperative core temperature was 34.7±0.6°C in the 96 patients assigned to hypothermia, who received routine thermal care, and 36.6±0.5°C in the 104 patients assigned to normothermia, who were given extra warming. The core temperatures in the two groups differed significantly at each measurement, except before the induction of anesthesia (first measurement) and after six hours of recovery.

## *Sajid MS A et al.* The role of perioperative warming in surgery: a systematic review. *Sao Paulo Med J 2009; 127:231-7*

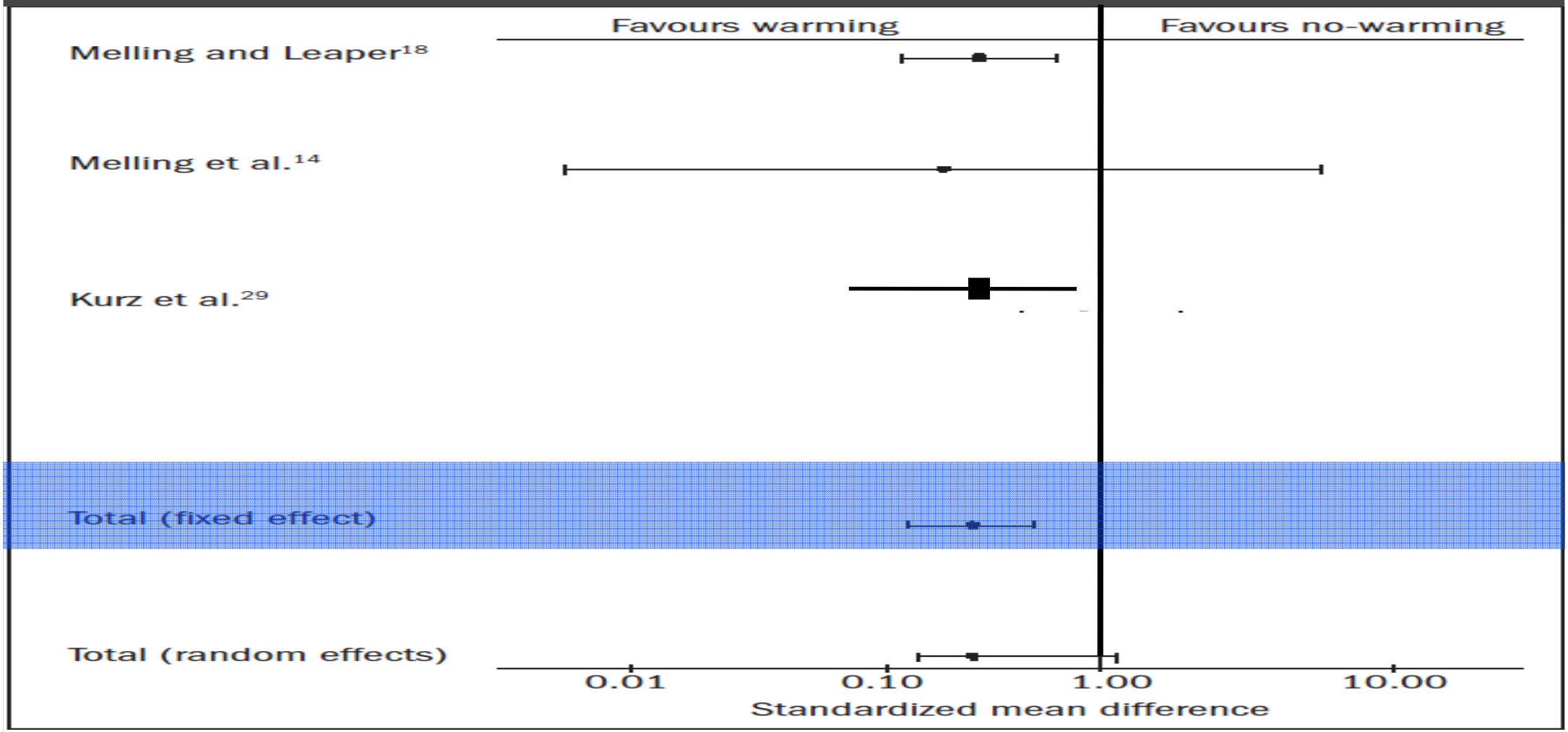



**Figure 4.** Wound infection: combined analysis of the randomized controlled trials in this review.

**Qadan M et al. Perioperative supplmental oxygen therapy and surgical site infection. A meta-analysis of randomized controlled trials. *Arch Surg 2009; 144:359-66***

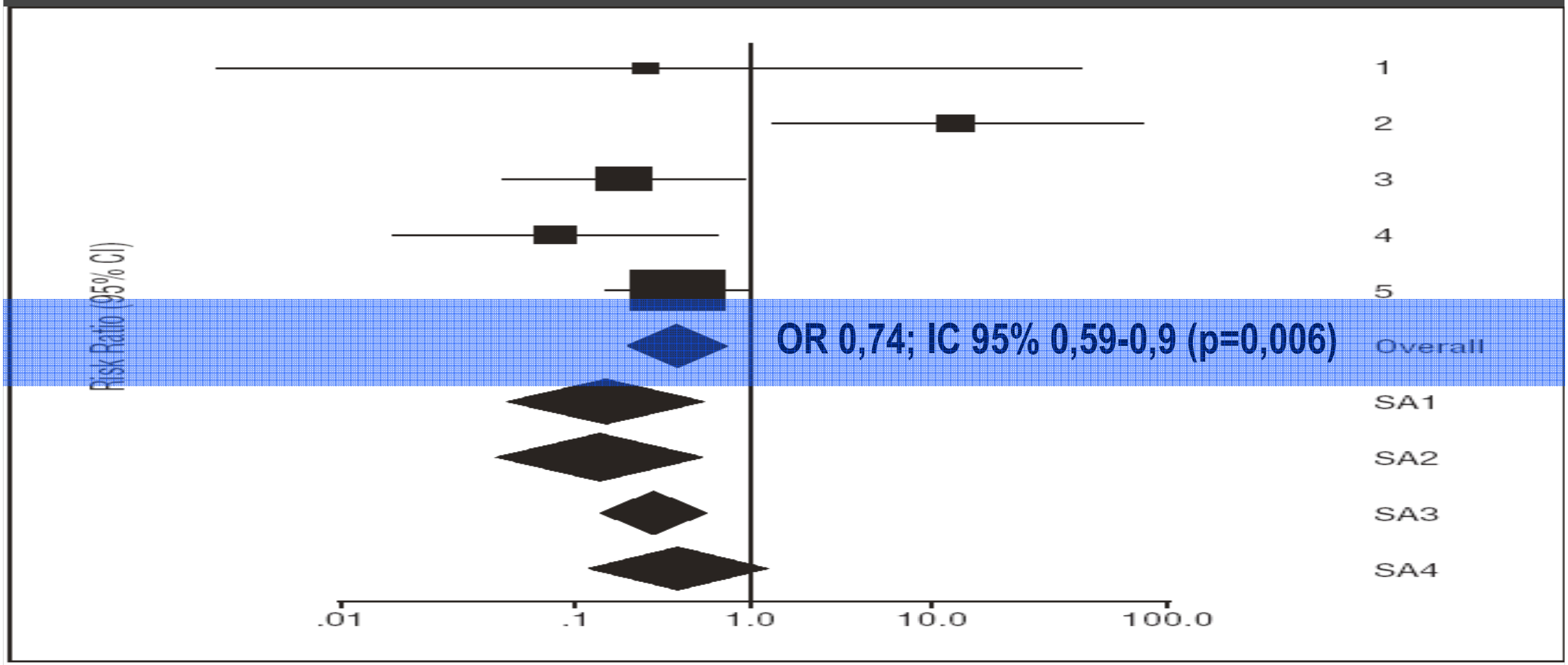
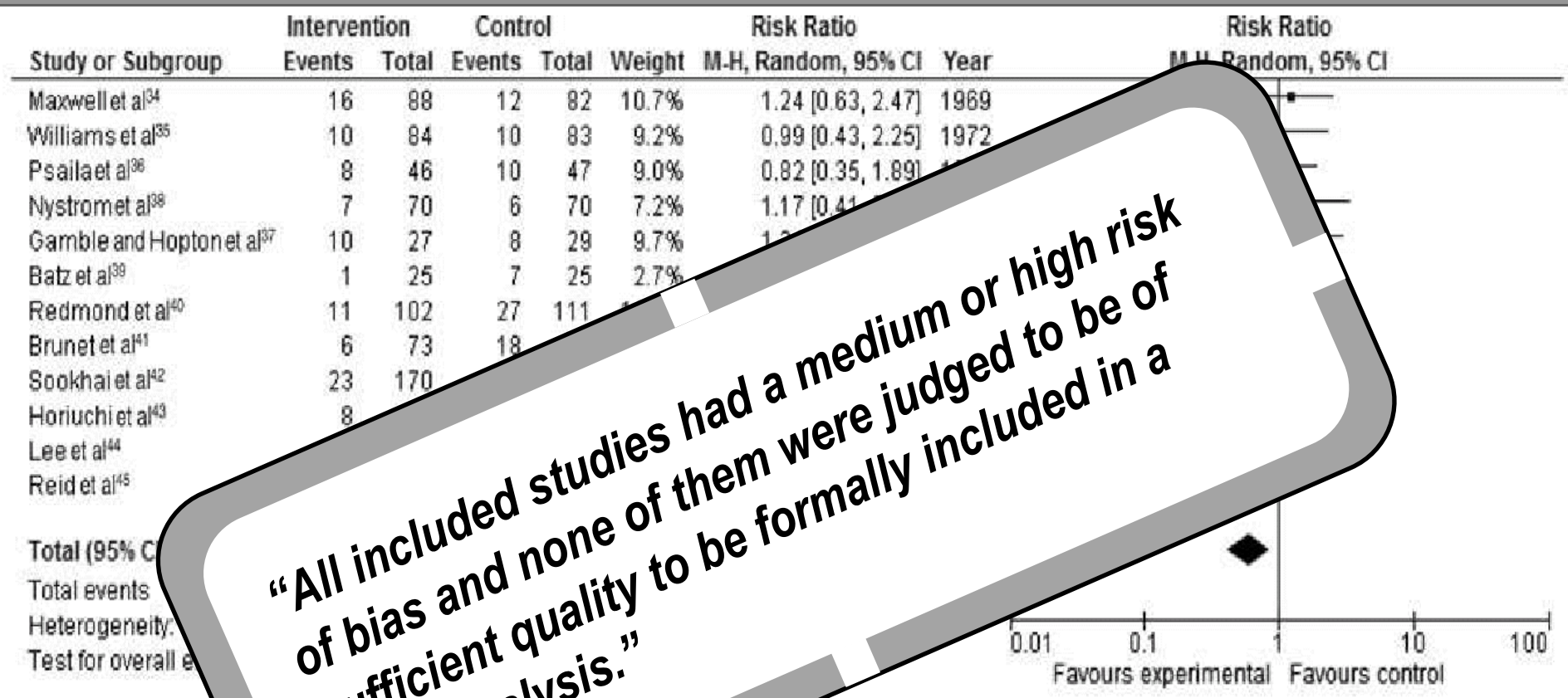



**Figure 2.** Effect of perioperative supplemental oxygen therapy on surgical site infection risk reduction. Risk ratios (RRs) with 95% confidence intervals (CIs) are shown for individual, combined, and sensitivity analysis (SA) values. 1 indicates Mayzler et al[10] (RR, 0.667; 95% CI, 0.125-3.550; *P*=.64); 2, Pryor et al[11] (2.222; 1.078-4.580; *P*=.03); 3, Belda et al[12] (0.607; 0.375-0.983; *P*=.04);

***Gheorghe A et al. Systematic review of the clinical effectiveness of wound-edge protection devices in reducing surgical site infection in patients undergoing open abdominal surgery. Ann Surg 2012; 255:1017.***




**"All included studies had a medium or high risk of bias and none of them were judged to be of sufficient quality to be formally included in a meta-analysis."**

**FIGURE 4.** Summary data, ind al, and pooled effect estimates for the studies included in the meta-analysis (original RevMan 5.0 output).

## *Derouiche RO et al.* Clorhexidine-alcohol versus povidone-iodine for surgical-site antisepsis. *N Engl J Med 2010; 362:18-26*

**Table 2.** Proportion of Patients with Surgical-Site Infection, According to Type of Infection (Intention-to-Treat Population).

| Type of Infection | Chlorhexidine–Alcohol (N = 409) | Povidone–Iodine (N = 440) | Relative Risk (95% CI)* | P Value† |
|---|---|---|---|---|
| | *no. (%)* | | | |
| Any surgical-site infection | 39 (9.5) | 71 (16.1) | 0.59 (0.41–0.85) | 0.004 |
| Superficial incisional infection | 17 (4.2) | 38 (8.6) | 0.48 (0.28–0.84) | 0.008 |
| Deep incisional infection | 4 (1.0) | 13 (3.0) | 0.33 (0.11–1.01) | 0.05 |
| Organ-space infection | 18 (4.4) | 20 (4.5) | 0.97 (0.52–1.80) | >0.99 |
| Sepsis from surgical-site infection | 11 (2.7) | 19 (4.3) | 0.62 (0.30–1.29) | 0.26 |

* Relative risks are for chlorhexidine–alcohol as compared with povidone–iodine. The 95% confidence intervals were calculated with the use of asymptotic standard-error estimates.

† P values are based on Fisher's exact test.

# Conclusiones

1. Las infecciones del lugar quirúrgico continúan siendo uno de los acontecimientos adversos posquirúrgicos más frecuentes, incluso en situaciones de aparente “bajo riesgo” como la cirugía ambulatoria.
2. *S. aureus* continúa siendo el organismo más frecuente y problemático en cirugía limpia, pero es potencialmente erradicable.
3. Es esencial que se dediquen esfuerzos para mejorar el cumplimiento de las medidas clásicas de prevención (p.e. la profilaxis antibiótica, retirada apropiada del vello), implementar medias efectivas (detección y descolonización del estado de portador de *S. aureus*, antisépticos más eficaces) y dejar de dedicar esfuerzos a prácticas ineficaces (limpieza mecánica del colon)

# *Henriksen NA et al. Clinical relevance of surgical site infections as defined by the criteria of the CDCP. J Hosp Infect 2010;75:173*

**Table I**

Components used in the Centers for Disease Control and Prevention (CDC) criteria and the ASEPSIS score for diagnosing surgical site infection

| | CDC criteria[a] | ASEPSIS score |
|---|---|---|
| | | 0–10 points[b] |
| | | 0–5 points[b] |
| | | No |
| | | 0–5 points[b] |
| | | 0–10 points[b] |
| | | 10 points |
| | | No |
| | | 5 points |
| | | 10 points |
| | | No |
| Re | | 10 points |

**Criterios de relevancia clínica de las infecciones del lugar quirúrgico:**

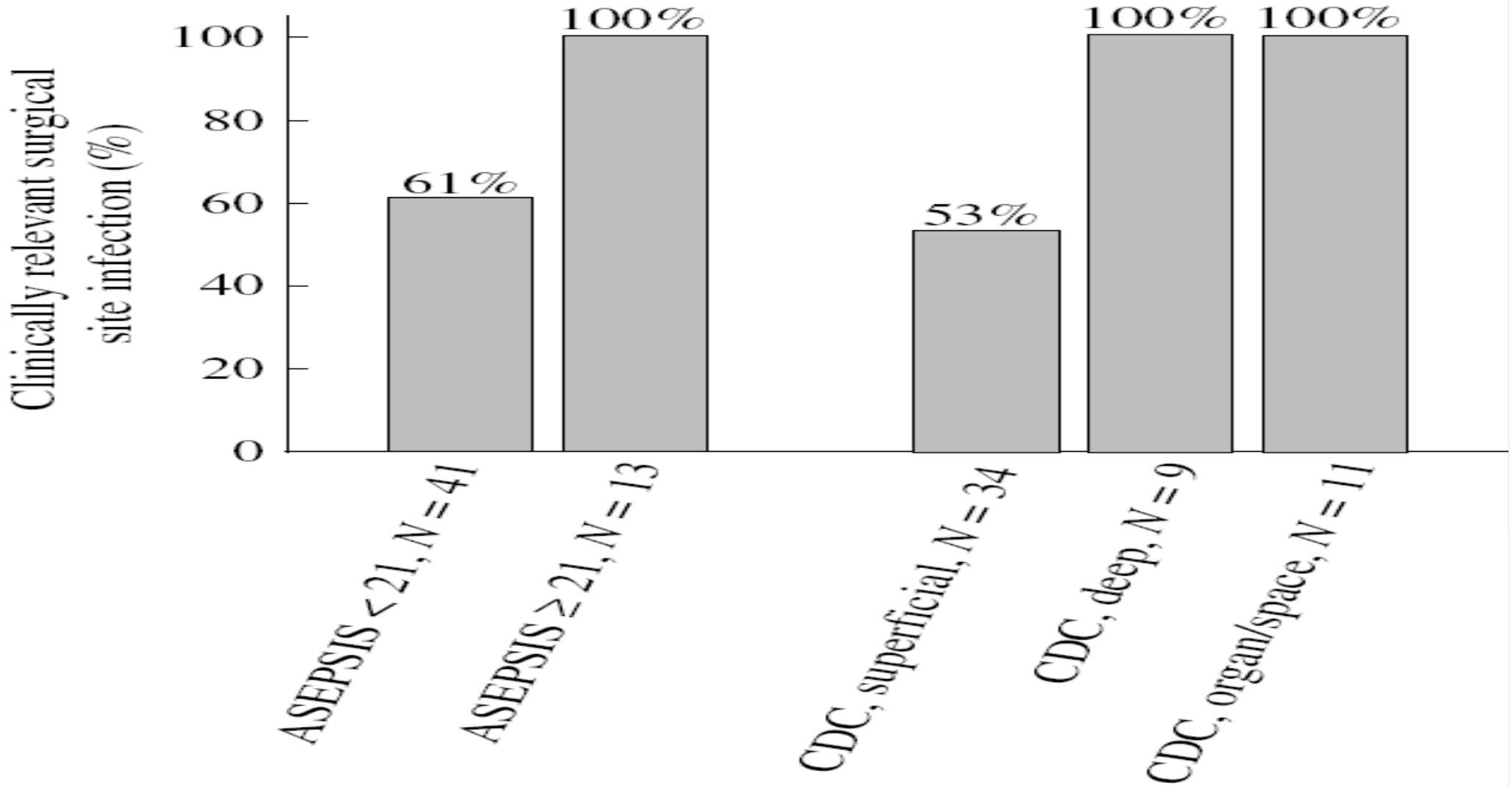
- *Requieren intervención quirúrgica*
- *Requieren tratamiento antibiótico*
- *Prolongan la estancia hospitalaria*
- *Llevan al paciente a una unidad de cuidado intensivo*
- *Se asocian con purulencia o cultivo positivo*

ASEPSIS: Additional treatment, presence of Serous discharge, Erythema, Purulent exudate, Separation of the deep tissues, Isolation of bacteria and duration of Stay.

[a] The criteria include infection that occurs within 30 days after the operation.[2]

[b] Score is allocated only on five of the first seven postoperative days. An ASEPSIS score ≥21 indicates a surgical site infection.[4]

## *Henriksen NA et al. Clinical relevance of surgical site infections as defined by the criteria of the CDCP. J Hosp Infect 2010;75:173*



## *Lepelletier D et al. Agreement among health care proffesionals in diagnosing case vignette-based surgical site infections. Plos One 2012;7 (4):e3S131*

**Table 3.** Assessment of surgical site infection (SSI) diagnosis for 40 vignettes (20 cardiac surgery cases and 20 gastrointestinal surgery cases) developed based on real patients in three French university hospitals.

| | SSI diagnosis score, 7-point Likert scale categorized in 2 classes (1,2,3,4 vs 5,6,7) | | |
|---|---|---|---|
| | Scoring without the SSI definition (95%CI) | | |
| | Number of vignettes scored* | Observed agreement (%) (95%CI) | Kappa coefficient (95%CI) |
| **Intraspecialty** | | | |
| Anesthesiologist | 40 | 65.0 (40.8–84.6) | 0.15 (−0.28–0.57) |
| Surgeon | 32** | 68.8 (41.3–89.0) | 0.38 (−0.05–0.80) |
| Public health specialist | 40 | 75.0 (50.9–91.3) | 0.52 (0.20–0.84) |
| Infection control physician | 40 | 65.0 (40.8–84.6) | 0.21 (−0.24–0.64) |
| Infection control nurse | 40 | 55.0 (31.5–76.9) | 0.12 (−0.30–0.53) |
| Infectious diseases specialist | 40 | 85.0 (62.1–96.8) | 0.66 (0.30–1.00) |
| Microbiologist | 40 | 80.0 (56.3–94.3) | 0.60 (0.26–0.94) |