

**European Study Group on  
Nosocomial Infections (ESGNI)  
and  
European Workgroup of  
Cardiothoracic Intensivists (EWCI)**

**Incidence Study of Ventilator-Associated  
Pneumonia (VAP) in patients undergoing  
Major Heart Surgery during a one-month  
period  
(December 2002)**

**STUDY ESGNI 009**

Please complete **ONE** report form **per patient**.  
You can use as many "VAP Form" sheets as you need, depending on the number of new VAP cases that  
you have between December 1<sup>st</sup> 2002 and December 31<sup>st</sup> 2002

Please return completed forms to:

**E. Bouza**  
Rocinante 5, 3º A. 28034 Madrid. Spain  
Fax: +34.91.7355446  
E. mail: [esgni@esgni.org](mailto:esgni@esgni.org) Web: [www.esgni.org](http://www.esgni.org)

**STEP 1****1.1: GENERAL DATA (COMPLETE ONLY ONCE FOR THE WHOLE STUDY)**

PROTOCOL COMPLETED BY (Please use block capitals)

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Position: \_\_\_\_\_

Unit: \_\_\_\_\_

Hospital: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ Post code: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE:

**1.2: GENERAL INFORMATION ABOUT YOUR INSTITUTION AND UNIT IN 2001****DATA REGARDING YOUR HOSPITAL**

Your institution is best defined as 1: Teaching, 2: Non-teaching

Your institution is best defined as 1: Private, 2: Public, 3: Both

Number of inhabitants in the area served by your hospital

Total number of beds in your institution

Number of overall hospital admissions in December 2002 (>24 Hs)

**DATA REGARDING YOUR UNIT (ICU)**

Total number of beds available in your ICU

Your ICU is best defined as 1: Only for MHS\*, 2: Mixed

Total number of patients undergoing MHS\* in (Dec) 2002

\*MHS: Major Heart Surgery

**FROM NOW ON, PLEASE COMPLETE A REPORT FORM FOR EVERY SINGLE PATIENT ADMITTED**

## STEP 2

### 2.1: INDIVIDUAL REPORT.

(Please complete one form for every patient admitted to the ICU during December 2002, at death or discharge). All patients must be included

Center number   
(Will be filled by us)

Patient's initials

Person completing the report:

### 2.2: DEMOGRAPHIC DATA

Age:

Report the current age in years.

Sex:

1: Male 2: Female

Date of admission to the hospital (\*)

Date of admission to the ICU

Date of surgery

Date of discharge or death from ICU

**Brief report on the patient (free text):**

**Completed by:** \_\_\_\_\_

### 2.3: PRE-SURGICAL INFORMATION

**McCabe and Jackson groups** (Consider only underlying diseases before hospital admission)

1. Rapidly fatal (Death of underlying disease expected to occur before two months).
2. Ultimately fatal (Death expected to occur between two months and four years).
3. Non-fatal (Death not expected to occur before four years caused by the underlying diseases)

**Weighted Index of Comorbidity** (tick all that apply).

Assign 1 point each if present	Y	N	Assign 2 points each if present	Y	N
Myocardial infarction			Hemiplegia		
Congestive heart failure			Moderate/severe renal disease		
Peripheral vascular disease			Diabetes with end organ damage		
Cerebrovascular disease			Any tumor		
Dementia			Leukemia		
Chronic pulmonary disease			Lymphoma		
Connective tissue disease					
Ulcer					
Mild liver disease					
Diabetes					
Assign 3 points each if present	Y	N	Assign 6 points each if present	Y	N
Moderate/severe liver disease			Metastatic tumor		
			AIDS		
<b>Total Comorbidity:</b> (please sum up the points scored):					

**Functional status before Surgery:** NYHA

**Canadian Cardiac Score**

Class	New York Heart Association Functional Classification	Canadian Cardiovascular Society Functional Classification
I	Patients with cardiac disease but without resulting limitations of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea or anginal pain.	Ordinary physical activity such as walking or climbing stairs does not cause angina. Angina with strenuous or rapid or prolonged exertion at work or recreation.
II	Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain.	Slight limitation of ordinary activity. Walking or climbing stairs rapidly, walking uphill, walking or stair climbing after meals, in cold, in wind or when under emotional stress, or only during the few minutes after awakening. Walking more than two blocks on the level and climbing more than one flight of ordinary stairs at normal pace and in normal conditions.
III	Patients with cardiac disease resulting in marked limitation of physical activity. They are comfortable at rest. Less than ordinary physical activity causes fatigue, palpitation, dyspnea, or anginal pain.	Marked limitation of ordinary physical activity. Walking one to two blocks on the level and climbing more than one flight in normal condition.
IV	Patients with cardiac disease resulting in inability to carry on any physical activity without discomfort. Symptoms of cardiac insufficiency or of the anginal syndrome may be present even at rest. If any physical activity is undertaken, discomfort is increased	Inability to carry on any physical activity without discomfort: anginal syndrome may be present at rest.

**ASA Score:** 1: Healthy, 2: Mild, 3: Severe but not vital risk, 4: Severe with death risk, 5: Imminent death risk

American Society of Anesthesiology

<b>EUROSCORE: SCORING SYSTEM</b>			
PATIENT-RELATED FACTORS	SCORE	CARDIAC-RELATED FACTORS	SCORE
Age <small>(Per 5 years or part thereof over 60 years)</small>	1	Unstable angina on i/v nitrates	2
		Left Ventricle function EF 30% -50%	1
Female	1	EF <30%	3
Chronic Pulmonary Disease	1	Recent infarct (<90 days)	2
Extracardiac arteriopathy	2	Systolic pressure >60	2
Neurological dysfunction	2	OPERATION-RELATED FACTORS	SCORE
Serum creatinine >200 µmol/L	2	Emergency	2
Previous cardiac surgery	3	Other than isolated CABG	2
Active Endocarditis	3	Surgery on thoracic aorta	3
Critical preoperative state	3	Postinfarction septal rupture	4
<b><u>EUROSCORE</u></b>		LOW RISK: 0 - 2	<b>Total</b> <div style="border: 1px solid black; width: 40px; height: 40px; margin: 5px auto;"></div>
		MODERATE RISK: 3 - 5	
		HIGH RISK: > 6	
<b>2.4: SURGICAL DATA</b>			
Indication	<input style="width: 40px; height: 20px;" type="text"/>	(1: elective / 2: urgent / 3: emergent)	
Surgery	<input style="width: 40px; height: 20px;" type="text"/>	(1: Valvular / 2: coronary graft / 3: both / 4: transplant / 5: other)	
<b>TIME (in minutes) of:</b>			
Extracorporeal circulation	<input style="width: 100px; height: 20px;" type="text"/>		
Aortic clamp	<input style="width: 100px; height: 20px;" type="text"/>	Surgery	<input style="width: 100px; height: 20px;" type="text"/>
Antimicrobial prophylaxis	<input style="width: 40px; height: 20px;" type="text"/>	(1: Cefazolin / 2: Vancomycin / 3: Other / 4: None)	
Transfusions (number of units required at death or discharge)	<input style="width: 60px; height: 20px;" type="text"/>		
Overall period with one or more drainages	<input style="width: 40px; height: 20px;" type="text"/>	Number of Re-operations	<input style="width: 40px; height: 20px;" type="text"/>
Inotropic support	<input style="width: 40px; height: 20px;" type="text"/>	Intra-aortic balloon	<input style="width: 40px; height: 20px;" type="text"/>
Circulatory assistance	<input style="width: 40px; height: 20px;" type="text"/>		
<small>1: Yes, 2: No</small>		<small>1: Yes, 2: No</small>	
		<small>1: Yes, 2: No.</small>	

## 2.5: PREVENTIVE METHODS FOR VAP: Is your patient...?

**CRITERIA** 1: Always, 2: Sometimes, 3: Never

- Under continuous subglottic secretion suctioning
- Ventilated in semi-recumbent position
- Under selective digestive decontamination
- Under stress ulcer prophylaxis(\*)
- With humidification with HMEs(§)
- With maintenance of tube cuff pressure
- With postural oscillation/rotation every day
- Under continuous sedation

(\*)Specific drug name: sucralfate  H2 blockers  Proton inhibitor

(§): Specific type of HMEs: Hygroscopic  Hydrophobic

## 2.6: CLINICAL DATA

Regarding Mechanical Ventilation (MV): Total number of days on MV

Number of days on MV at the time of VAP or TB diagnosis\*  (\*Only if your patient has Lower Respiratory Tract Infection)

**APACHE II Score on first day ICU\***

A  + B  + C  =

\* Without Glasgow

	+4	+3	+2	+1	0	+1	+2	+3	+4
Temp	>=41	39-40.9		38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	≤29.9
Blood Press mean	>160	130-159	110-129		70-109		50-69		≤49
Heart rate	>180	140-179	110-139		70-109		55-69	40-54	≤39
Breathing rate	>50	35-49		25-34	12-24	10-11	6-9		
FI02>=0.5 A-AdO2	>500	350-499	200-349		<200				
FI02<0.5 PaO2					>70	61-70		55-60	<55
Blood pH	>7.7	7.6-7.69		7.5-7.59	7.33-7.49		7.25-7.32	7.15-7.24	<7.15
Na	>180	160-179	155-159	150-154	130-149		120-129	111-119	≤110
K	>7	6-6.9		5.5-5.9	3.5-5.4	3-3.4	2.5-2.9		<2.5
Creat *	>3.5	2-3.4	1.5-1.9		0.6-1.4		<0.6		
Ht	>60		50-59.9	46-49.9	30-45.9		20-29.9		<20
WBC	>40		20-39.9	15-19.9	3-14.9		1-2.9		<1

\*Double point in Acute Renal Failure

B) Age ≤44: 0 points, 45-54: 2 points, 55-64: 3 points, 65-74: 5 points, ≥75: 6 points

C) If your patient has a Multiorgan Failure or immunocompromised host add:   
 Non-surgical patients or urgent surgery: 5 points. Elective surgery: 2 points

**Maximum severity of illness until the moment of discharge or death of the patient:**

**1: Sepsis. 2: Severe sepsis. 3: Septic shock. 4: Multiorgan failure due to Sepsis**

In this section, you have to record the maximum severity reached throughout the infectious episode, if any.

Severity of illness:

\* **SEPSIS:** Systemic response manifested by two or more of the following conditions as a result of infection: a) Temperature >38°C or <36 °C, b) Heart rate>90 beats/min, c) Respiratory rate >20 breaths/min or PaCO<sub>2</sub> <32 mmHg, d) WBC >12,000 cells/mm<sup>3</sup>, <4,000 cells/mm<sup>3</sup>, or >10% immature (band) forms.

\* **SEVERE SEPSIS:** Sepsis associated with organ dysfunction, hypoperfusion, or hypotension. Hypoperfusion and perfusion abnormalities may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status.

\* **SEPTIC SHOCK:** Sepsis with hypotension, despite adequate fluid resuscitation, along with the presence of perfusion abnormalities that may include, but are not limited to, lactic acidosis, oliguria, or an acute alteration in mental status. Patients who are on inotropic or vasopressor agents may not be hypotensive at the time that perfusion abnormalities are measured.

**MULTIORGANIC FAILURE:** Failure of three or more organ systems during at least a 24-hour period, as a consequence of bacteremia.

**SAPS II (first day ICU)**

<b>Age</b>			<b>0</b>	<b>7</b>	<b>12</b>	<b>15</b>	<b>16</b>	<b>18</b>
				40-59	60-69	70-74	75-79	≥ 80
<b>HR</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>4</b>		<b>7</b>		
	< 40	40 -69	70 -119	120-159		≥ 160		
<b>SBP</b>	<b>13</b>	<b>5</b>	<b>0</b>	<b>2</b>				
	< 69	70-99	100-199	≥ 200				
<b>T °C</b>			<b>0</b>	<b>3</b>				
			< 38,9°	≥ 39°				
<b>PAFI</b>	<b>11</b>	<b>9</b>	<b>6</b>	<b>0</b>				
	< 100	100-199	≥ 200					
<b>UO</b>	<b>11</b>	<b>4</b>	<b>0</b>					
	< 499	500-999	> 1000					
<b>BUN(mm/L)</b>			<10	10-29,9		≥ 30		
<b>BUN (mg/dL)</b>			<b>0</b>	<b>6</b>		<b>10</b>		
			< 28	29-83		≥ 84		
<b>WBC</b>			<b>12</b>	<b>0</b>	<b>3</b>			
			< 1.0	1.0-19.9	≥ 20.0			
<b>K+</b>			<b>3</b>	<b>0</b>	<b>3</b>			
			< 2.9	3.0-4.9	≥ 5.0			
<b>Na +</b>			<b>5</b>	<b>0</b>	<b>1</b>			
			< 125	125-144	≥ 145			
<b>HCO<sub>3</sub></b>	<b>6</b>	<b>3</b>	<b>0</b>					
	< 14	15-19	> 20					
<b>Bilirubin</b>			<b>0</b>	<b>4</b>	<b>9</b>			
			< 4	4 -5	≥ 6			
<b>GCS</b>	<b>26</b>	<b>13</b>	<b>7</b>	<b>5</b>	<b>0</b>			
	<6	7-8	9-10	11-13	14-15			
<b>Chronic Disease</b>			<b>9</b>		<b>10</b>		<b>17</b>	
			Metastatic cancer		Hematologic malignancy		AIDS	
<b>Type of Admission</b>			<b>0</b>		<b>6</b>		<b>8</b>	
			Scheduled surgery		Medical admission		Urgent surgery	

**DEFINITIONS:** Age in years. Heart rate (beats per minute). Systolic blood pressure. Body temperature (°C). FIO<sub>2</sub>/PaO<sub>2</sub> ratio. Urinary output (L/24 hours). Blood urea nitrogen in mg/dl. Hematocrit in percentage. White blood cells (1000/μl). Serum potassium in mEq/l. Serum sodium in mEq/l. HCO<sub>3</sub> in mEq/l. Serum Bilirubin in mEq/l. Glasgow Coma Scale

## 2.7: OTHER NOSOCOMIAL INFECTIONS IN THIS PATIENT

Did the patient have a nosocomial infection      1. Yes   2. No     

Type/s            and     

1-Urinary Tract Infection   2- Surgical Wound Infection   3- Mediastinitis   4- Bacteremia   5- Catheter-Related Bloodstream Infection,   6 - A second episode of VAP,   7-Other

### Patient evolution

1. Alive at ICU discharge  
 2. Death due to the Lower Respiratory Tract Infection (LRTI)  
 3. LRTI probably contributed to the death of the patient  
 4. Death due to other causes.

**Alive:** The patient survived LRTI with completed antibiotic treatment or discharge from ICU without active LRTI  
**Death due to LRTI** is considered as attributable to the LRTI if it occurs during active infection or while the patient is undergoing antibiotic treatment and no other obvious causes of death are present.

**THIS PATIENT CAN BE CLASSIFIED AS HAVING (\*):**

0. No respiratory infection  
 1. Ventilator-Associated Pneumonia  
 2. Tracheobronchitis  
 3. VAP evolving from tracheobronchitis  
 4. Airway colonization

(\* **Purulent tracheobronchitis:** Presence of purulent tracheobronchial secretions plus two or more of the following criteria: fever  $\geq 38.5^\circ\text{C}$  or hypothermia  $< 36^\circ\text{C}$ , leukocytosis  $\geq 12 \times 10^9/\text{L}$  or significant bacteriologic counts in respiratory secretions in patients without pulmonary infiltrates suggesting pneumonia on chest radiograph.

**Ventilator-Associated Pneumonia:** was clinically suspected upon the presence of new and/or progressive pulmonary infiltrates on chest radiograph plus two or more of the following criteria: fever  $\geq 38.5^\circ\text{C}$  or hypothermia  $< 36^\circ\text{C}$ , leukocytosis  $\geq 12 \times 10^9/\text{L}$ , purulent tracheobronchial secretions or a reduction of  $\text{PaO}_2/\text{FiO}_2 \geq 15\%$  in the last 48 hours according to CDC definitions. We also included as pneumonia those with a Pugin's score higher than 6.

**Airway colonization:** we considered as colonized all patients with the isolation of potentially pathogenic bacteria in respiratory secretions (in any count) not fulfilling either the diagnosis of tracheobronchitis or VAP.

We considered as non-pathogenic the isolation at any concentration of the following micro-organisms: *Streptococcus viridans*, Coagulase-negative Staphylococci, *Neisseria* spp, *Corynebacterium* spp and *Candida* spp., unless proven otherwise.

**If your patient had VAP or tracheobronchitis, please continue with the next step. Complete a new form if your patient has two episodes of Lower Respiratory Tract Infection.**

Completed by: \_\_\_\_\_

## 2.8: CRITERIA AT DIAGNOSIS OF VAP OR TRACHEOBRONCHITIS

(Please mark whether or not the following criteria are present)

<b>CRITERIA 1: Present, 2: Absent, 0: Not available</b>	
Significant changes in body temperature (< 35.5 or > 38°C)	<input type="checkbox"/>
New or increasing lung infiltrates not clearly explained by other reasons	<input type="checkbox"/>
Abnormal purulent bronchial secretions	<input type="checkbox"/>
Histologic evidence of pneumonia (biopsy)	<input type="checkbox"/>
A significant quantitative culture obtained by bronchoscopy	<input type="checkbox"/>
A significant quantitative culture obtained by a non-bronchoscopy method	<input type="checkbox"/>
Significant positive blood cultures	<input type="checkbox"/>
Other significant positive cultures (pleural fluid, lung biopsies, etc)	<input type="checkbox"/>

## 2.9: CLINICAL PULMONARY INFECTION SCORE AT DIAGNOSIS† (Pugin)

Criteria	Points	
<b>Temperature (°C)</b> > or equal to 36.5 and < or equal to 38.4 > or equal to 38.5 and < or equal to 38.9 > or equal to 39 and < or equal to 36	0 points 1 point 2 points	<input type="checkbox"/>
<b>Blood leukocytes, mm<sup>3</sup></b> > or equal to 4,000 and , or equal to 11,000 < 4,000 or >11,000 + 1 band forms > equal to 50%	0 points 1 point add 1 point	<input type="checkbox"/>
<b>Tracheal secretions</b> Absence of tracheal secretions Presence of non-purulent tracheal secretions Presence of purulent tracheal secretions	0 points 1 point 2 points	<input type="checkbox"/>
<b>Oxygenation: PaO<sub>2</sub> /FI O<sub>2</sub>, mm Hg</b> >240 or ARDS (ARDS defined as PaO <sub>2</sub> /FI O <sub>2</sub> or equal to 200, (Pulmonary arterial wedge pressure < or equal to 18 mm Hg and acute bilateral infiltrates) < or equal to 240 and no ARDS	0 points 2 points	<input type="checkbox"/>
<b>Chest x-ray</b> No infiltrate or no radiographic progression Diffuse (or patchy) infiltrate Localised infiltrate or radiographic progression (after CHF and ARDS excluded)	0 points 1 point 2 points	<input type="checkbox"/>
<b>Culture of tracheal aspirate</b> Pathogenic bacteria ‡ cultured in rare or light quantity or no growth Pathogenic bacteria cultured in moderate or heavy quantity Same pathogenic bacteria seen on Gram stain	0 points 1 point add 1 point	<input type="checkbox"/>
<b>TOTAL SCORE (please sum up the points scored)</b>		

**Definition of abbreviations:** ARDS =acute respiratory distress syndrome; CHF = congestive heart failure; PaO<sub>2</sub> /FI O<sub>2</sub> = ratio of arterial oxygen pressure to fraction of inspired oxygen. † A score > 6 at baseline or at 72 h is considerate suggestive of pneumonia.

‡ Predominant organism in the culture.

### 3.0: MICROBIOLOGICAL DATA

<p><b>Microorganisms responsible for pneumonia or TB (isolated in significant counts from significant samples)</b></p> <p><b>A:</b> <input style="width: 40px; height: 20px;" type="checkbox"/></p> <p><b>B:</b> <input style="width: 40px; height: 20px;" type="checkbox"/> (Complete only when polymicrobial)</p> <p><b>C:</b> <input style="width: 40px; height: 20px;" type="checkbox"/> (Complete only when polymicrobial)</p> <p>(*): _____</p>	<p><b>Microorganism list:</b></p> <ol style="list-style-type: none"> <li>1: <i>Streptococcus pneumoniae</i></li> <li>2: <i>Staphylococcus aureus</i> ( methicillin-resistant)</li> <li>3: <i>Staphylococcus aureus</i> (M-susceptible)</li> <li>4: <i>Moraxella</i> sp.</li> <li>5: <i>Haemophilus influenzae</i></li> <li>6: <i>Enterobacter</i> sp.</li> <li>7: <i>Klebsiella</i> sp.</li> <li>8: <i>Proteus</i> sp.</li> <li>9: <i>E.coli</i></li> <li>10: <i>Serratia</i> sp.</li> <li>11: <i>Morganella</i> sp.</li> <li>12: <i>Pseudomonas aeruginosa</i></li> <li>13: <i>Acinetobacter</i> sp.</li> <li>14: <i>Stenotropomonas maltophilia</i></li> <li>15: Virus</li> <li>16: Fungal pathogen</li> <li>17: Parasites</li> <li>19: None</li> <li>20: <i>Any other microorganisms</i> (*)</li> </ol> <p>(*): <b>Specify if not included</b></p>																																												
<p><b>Please check the source or sources of the samples</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 15%;"><b>A</b></th> <th style="width: 15%;"><b>B</b></th> <th style="width: 10%;"><b>C</b></th> </tr> </thead> <tbody> <tr> <td>Sputum</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Plain endotracheal aspirate</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Non-bronchoscopically-guided plugged telescopic catheter</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Mini BAL (non-guided)</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Bronchoscopically-guided plugged catheter</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Bronchoscopically-guided BAL</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Bronchoscopically-guided mini BAL</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Transbronchial biopsy</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Blood cultures</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Other method</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>			<b>A</b>	<b>B</b>	<b>C</b>	Sputum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plain endotracheal aspirate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Non-bronchoscopically-guided plugged telescopic catheter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mini BAL (non-guided)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bronchoscopically-guided plugged catheter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bronchoscopically-guided BAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bronchoscopically-guided mini BAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Transbronchial biopsy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Blood cultures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other method	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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### ANTIBIOTIC SENSITIVITY PROFILE PER ISOLATE

Antibiotic	Isolate	A	B	C	Antibiotic	Isolate	A	B	C
	S/R/X	S/R/X	S/R/X	S/R/X		S/R/X	S/R/X	S/R/X	
Penicillin					Levofloxacin				
Ampicillin					Cotrimoxazole				
Ticarcillin					Gentamicin				
Amoxicillin/clavulanate					Tobramycin				
Methicillin					Amikacin				
Cefazolin					Streptomycin				
Cefuroxime					Rifampin				
Cefotaxime					Erythromycin				
Ceftazidime					Clindamycin				
Cefepime					Vancomycin				
Imipenem					Tetracycline				
Aztreonam					Chloramphenicol				
Ciprofloxacin					Piperacilin/Tazobactam				

S: Sensitive; R: Resistant or intermediate at critical concentration used in your laboratory. X: Not performed at your laboratory

### 3.1: TREATMENT

**Time elapsed from clinical diagnosis to start of therapy**  
 1. <8h 2. 8-24h 3. 24-48h 4. >48h

**Empirical antimicrobial therapy:** 1. None, 2. One drug, 3. Two drugs, 4. > 3 drugs

**Did you change your empirical therapy?** 1. Yes 2. No

**If you did change, what was the reason**  
 1. Microbiological data 2. Clinically unresponsive 3. Both 4. None

**Definitive antimicrobial therapy:** 1. None, 2. One drug, 3. Two drugs, 4. > 3 drugs

**Was empirical antibiotic treatment adequate?**  
 1: Yes 2: No 3: Unknown

**Definitive antimicrobial therapy:**  and  and

**Antibiotic list:**

- Broad spectrum penicillins (including antistaphylococcal penicillins)
- Beta-lactams with betalactamase inhibitors
- Glycopeptides
- Cefazolin or other first-generation cephalosporins
- Second-generation cephalosporins
- Third-generation cephalosporins
- Ceftazidime
- Cefepime
- Quinolones
- Aminoglycosides
- Macrolides or lincosamines treatment.
- Monobactams
- Carbapenems
- Piperacillin/Tazobactam
- Linezolid
- Quinupristin/Dalfopristin
- Cotrimoxazole
- Rifampicin
- Antifungals
- Other

**Number of days of antimicrobial treatment**  
**Days of treatment:** Consider only the number of days of adequate treatment.

