PREVENZIONE E TRATTAMENTO DELLE INFEZIONI BATTERICHE NEL PAZIENTE SOTTOPOSTO A TRAPIANTO DI ORGANO SOLIDO: UN APPROCCIO PER APPARATI

Infezioni dell'apparato respiratorio

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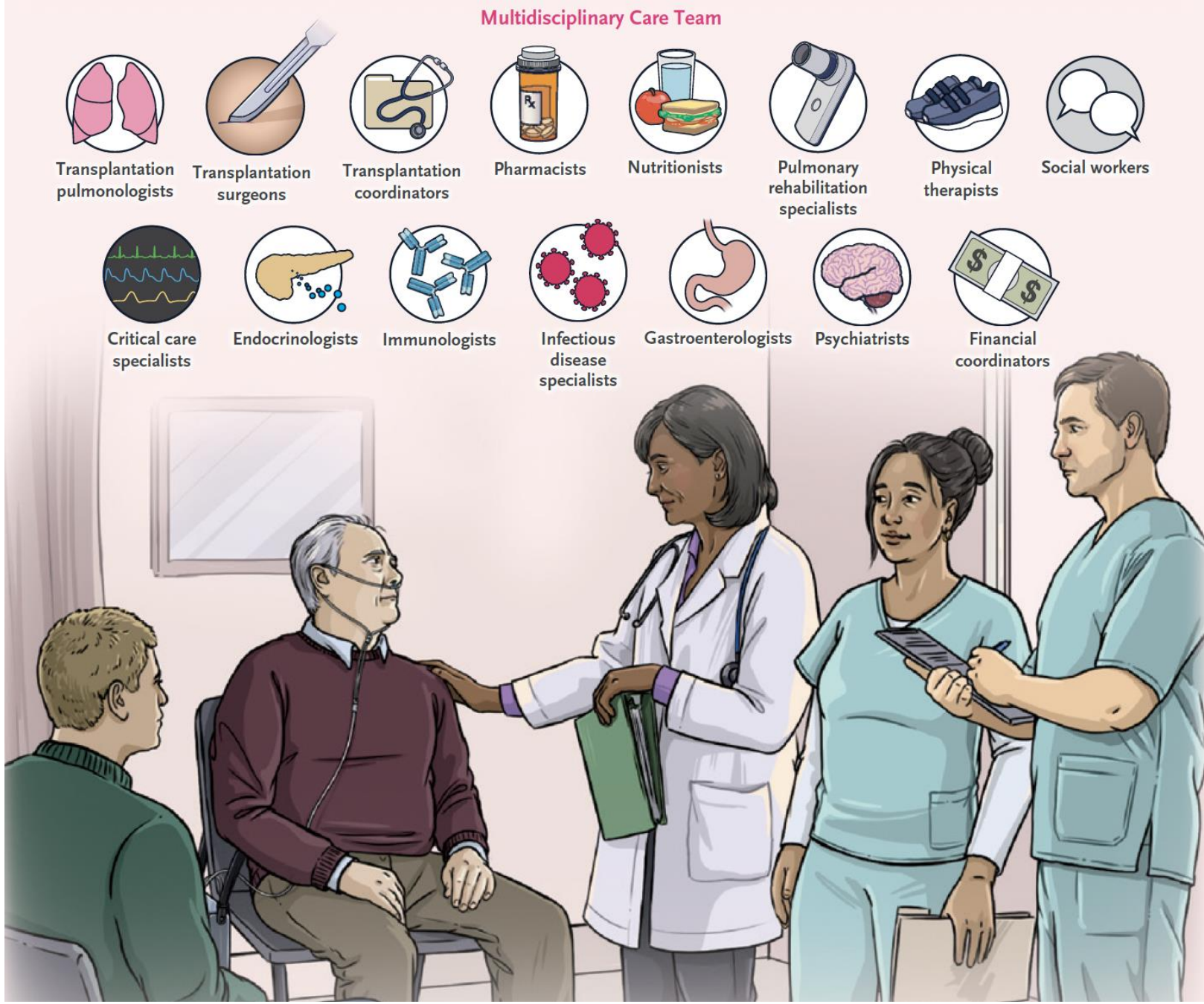
Infezioni respiratorie nel LuTx:

- PATOGENESI
- PREVENZIONE
- DIAGNOSI
- TERAPIA



N Engl J Med 391;19 nejm.org November 14, 2024

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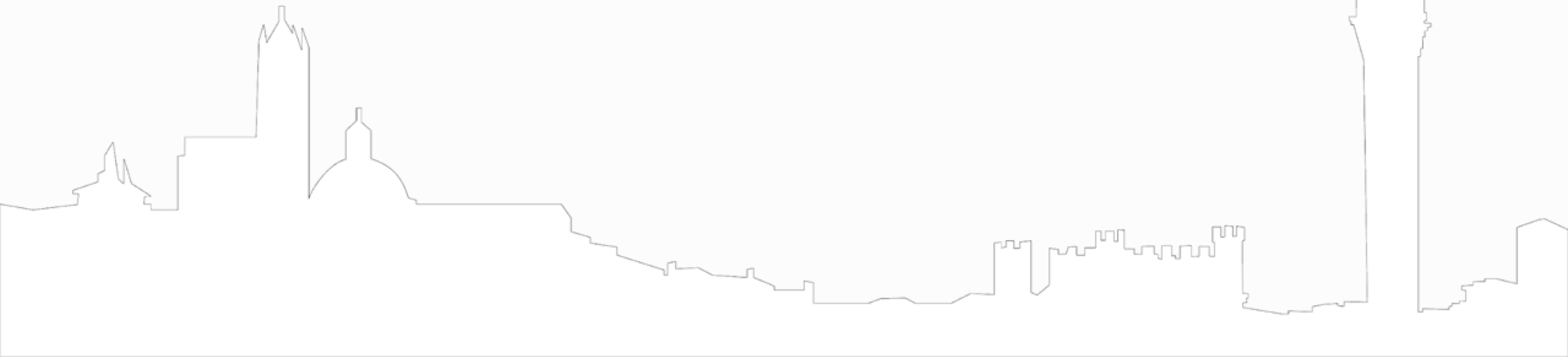
INFEZIONI RESPIRATORIE nel LuTx

- Infezioni del sito chirurgico
- Infezioni Donor-derived (DDI)
- IVAC, HAP
- Polmoniti “comunitarie”



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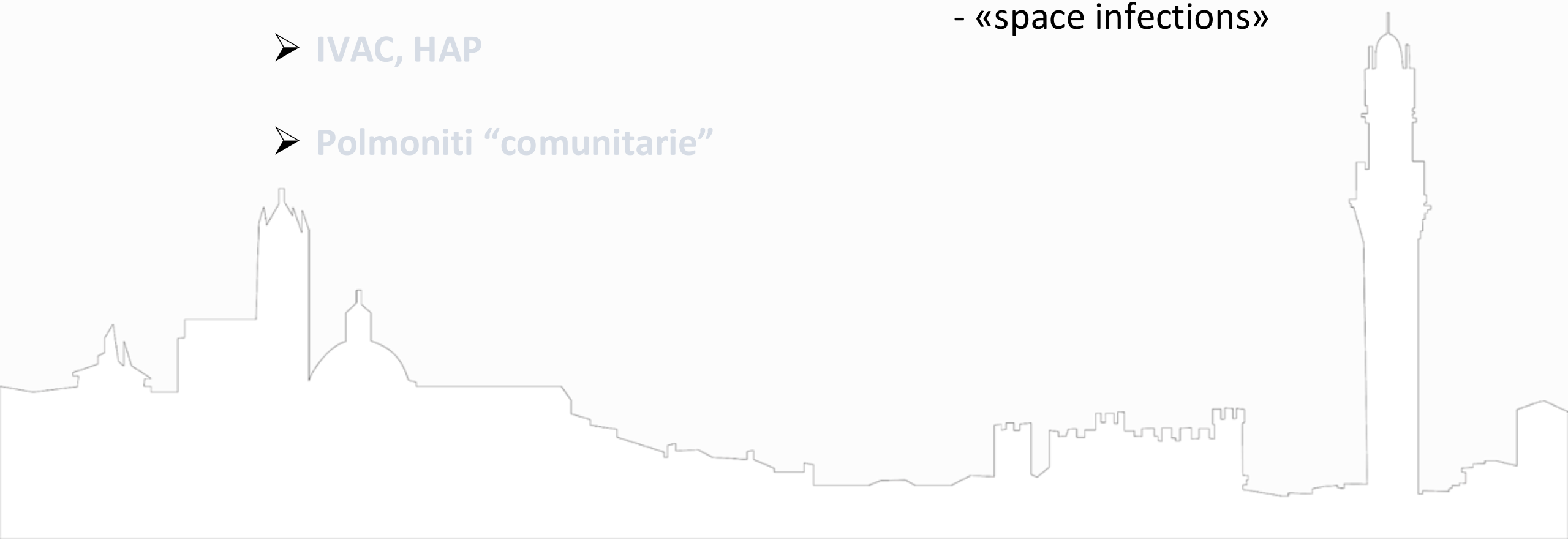
INFEZIONI RESPIRATORIE nel LuTx

- **Infezioni del sito chirurgico**
  - di ferita
  - di organo
  - «space infections»
- Infezioni Donor-derived (DDI)
- IVAC, HAP
- Polmoniti “comunitarie”



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DOI: 10.1111/ctr.13589

SPECIAL ISSUE-TRANSPLANT INFECTIOUS DISEASES

Clinical TRANSPLANTATION
The Journal of Clinical and Translational Research

WILEY

Surgical site infections: Guidelines from the American Society of Transplantation Infectious Diseases Community of Practice

Lilian M. Abbo[1] | Paolo Antonio Grossi[2] | on behalf of the AST ID Community of Practice

SOT: Solid Organ Transplant
LuTx: Lung transplant

Clin Transplant. 2019 Sep;33(9):e13589. doi: 10.1111/ctr.13589

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SSIs: principali patogeni in LuTx

Organ transplant type	Incidence of SSIs (%)	Predominant pathogens causing SSIs	Secondary pathogens causing SSIs
Lung	5-19 **Fino al 40%** se si includono POLMONITI precoci del postTx	*Pseudomonas* spp *Escherichia coli* *Klebsiella* spp *Candida* spp *Staphylococcu aureus* *Enterococci* CoNS *Burkholderia* spp	*Stenotrophomonas* *Aspergillus*

Gram negativi prevalenti nel LTx

Clin Transplant. 2019 Sep;33(9):e13589. doi: 10.1111/ctr.13589

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SSIs: ANTIBIOTICOprofilassi in LuTx

Organ type	IDSA/ASHP/SIS/ SHEA guidelines	An alternative approach	Intra-op redosing	Post-op dosing	PCN-allergic	Duration post-op
Lung	Single first generation cephalosporin (e.g. cefazolin)	Vancomycin* plus third-generation cephalosporin or cefepime 2 g IV	Every 4 h	Cefepime 2 g q8 h, Vancomycin per weight/ GFR[b]	Vancomycin[b] plus levofloxacin 750 mg IV q24 h	≤72 h

Se non note colonizzazioni/infezioni in D/R nel preoperatorio, durata profilassi 48-72h

Clin Transplant. 2019 Sep;33(9):e13589. doi: 10.1111/ctr.13589

SSIs: ANTIBIOTICOprofilassi in SOT

3 | CUSTOMIZATION OF ANTIBIOTICS BASED ON UNIQUE CIRCUMSTANCES AND RECIPIENT AND DONOR COLONIZATION/ INFECTION

RICEVENTE colonizzato o infetto al momento del LuTx:

- Colonizzazione respiratoria (in pz con Fibrosi cistica): profilassi mirata, durata ??????? (la maggior parte dei centri 7 giorni)

- Infezione respiratoria: proseguire la terapia in atto in sala e nel postoperatorio, COME programmato nel PRE-LTx

Clin Transplant. 2019 Sep;33(9):e13589. doi: 10.1111/ctr.13589

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SSIs: ANTIBIOTICOprofilassi in LuTx

- POCHI studi su antibiotici peri- e post-operatori
- NESSUN trial randomizzato
- SCARSA letteratura su regimi e durata

Clin Transplant. 2019 Sep;33(9):e13589. doi: 10.1111/ctr.13589

BRIEF COMMUNICATION OPEN ACCESS

Infections Management in the Lung Transplant Setting in Italy: A Web-Survey

Andrea Lombardi[1,2] | Paolo Grossi[3] | Malgorzata Mikulska[4,5] | Maddalena Giannella[6,7] | Renato Pascale[6,7] | Serena Marinello[8] | Francesca Montagnani[9,10] | Elena Seminari[11] | Silvia Corcione[12,13] | Alessandra Bandera[1,2] | Alessandro Bertani[14] | Alessandra Mularoni[15] | for the Infection Prevention and Treatment Working Group of the LUNG-SITO study group

STUDY DESIGN: 52 questions web survey to assess infections management in lung transplant recipients and candidates in Italy

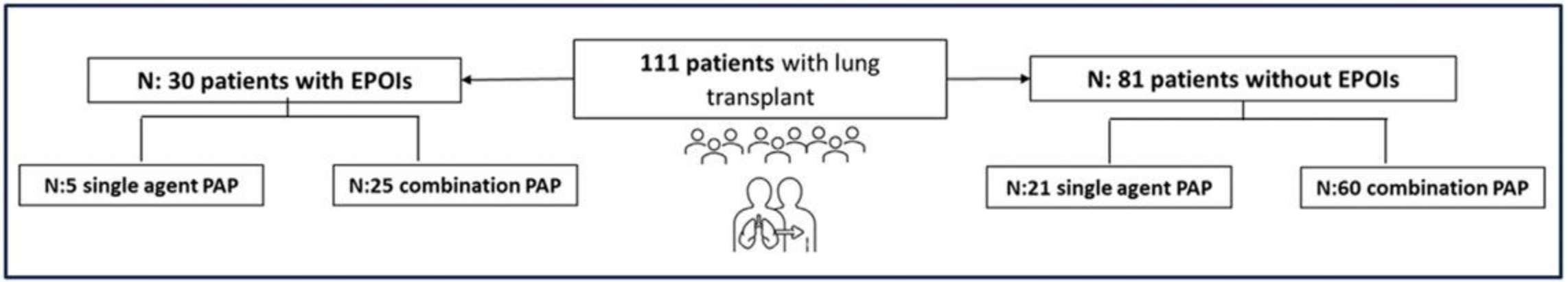
Regarding antibiotic prophylaxis, most centers (**6/9**, 67%) utilize a regimen based on **an anti-pseudomonal penicillin plus a glycopeptide**. The two most common **durations** of antibiotic prophylaxis are 72 hours and 7 days, each reported by 2 centers (22%).

There is considerable heterogeneity in infections management among Italian LuTx centres. Establishing a shared platform for data collection and outcome evaluation is essential to improve infections management

Transplant Infectious Disease, 2024; 0:e14413

Antibiotic prophylaxis in patients undergoing lung transplant: single-center cohort study

to compare single vs combination peri-operative antibiotic prophylaxis (PAP) on preventing early bacterial infections (EPOIs) after lung transplant over a 20-year period.



Lung disease

- Pulmonary arterial hypertension: 31.5%
- Idiopathic pulmonary fibrosis: 30.6%
- Pulmonary fibrosis autoimmune diseases: 20.7%

PAP regimen

- *Piperacillin/tazobactam* the most common agent:
  - monotherapy: 80.7%
  - combination with *levofloxacin:* 92.9%

PAP duration

- Median 10 (IQR 6-13) days.

EPOIs

- Pneumonia:73.3%)
- Bloodstream infections:3.3%
- Surgical site infections : 6.6%

Conclusion:

No advantages for combination regimens compared to single-agent PAP in preventing EPOI (*OR: 1.57, 95% CI: 0.488-5.068, p:0.448*).

ESOT Leading the way in transplantation

Pascale R, et al. *Transpl. Int.* 2024 doi: 10.3389/ti.2024.13245

Transplant International

Transpl Int. 2024 Aug 16:37:13245. doi: 10.3389/ti.2024.13245

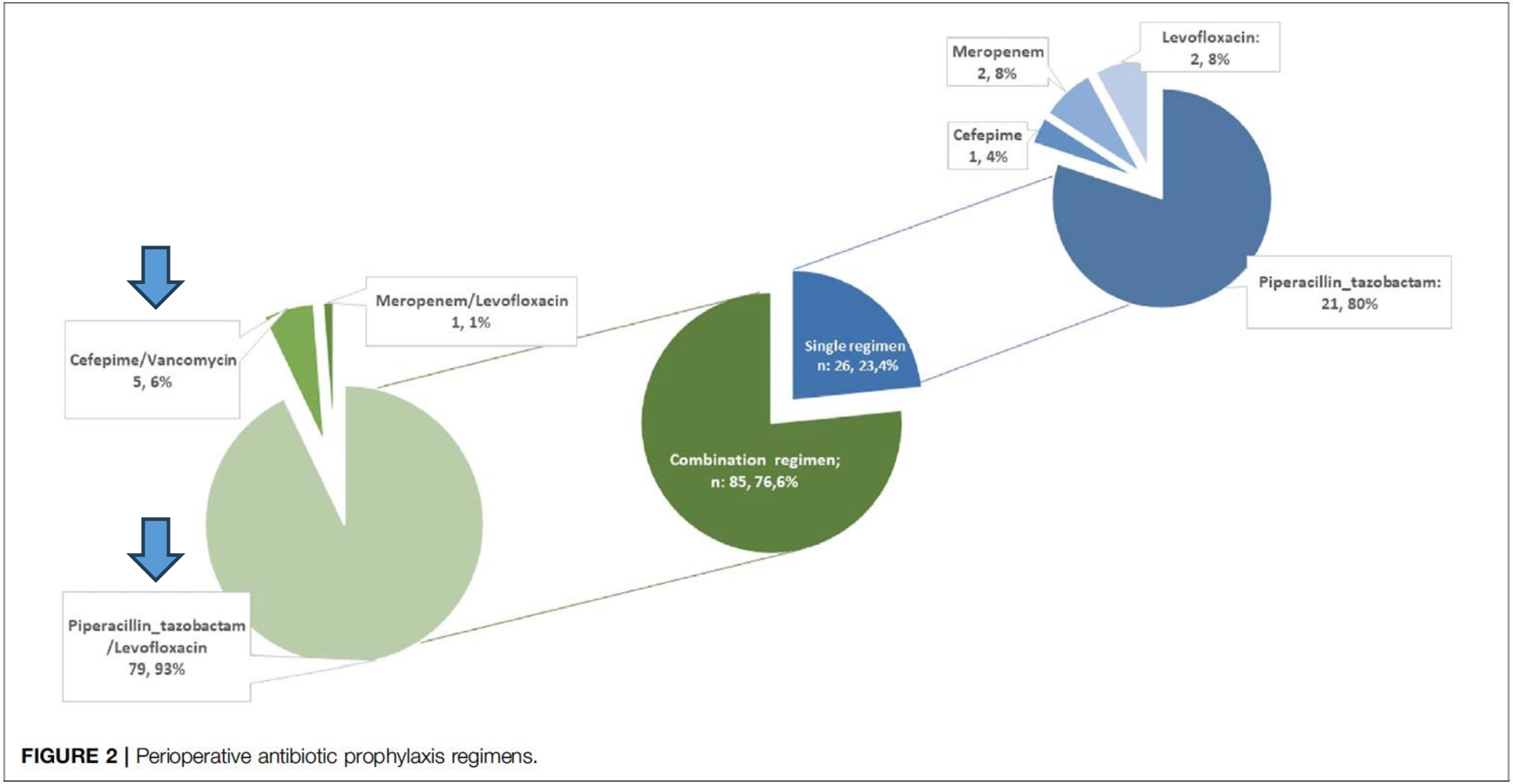


FIGURE 2 | Perioperative antibiotic prophylaxis regimens.

Transpl Int. 2024 Aug 16:37:13245. doi: 10.3389/ti.2024.13245

Received: 13 May 2019 | Accepted: 20 May 2019

DOI: 10.1111/ctr.13611

SPECIAL ISSUE-TRANSPLANT INFECTIOUS DISEASES

Clinical TRANSPLANTATION
The Journal of Clinical and Translational Research
WILEY

Methicillin-resistant *Staphylococcus aureus* in solid organ transplantation—Guidelines from the American Society of Transplantation Infectious Diseases Community of Practice

Marcus R. Pereira[1] | Meenakshi M. Rana[2] | on behalf of the AST ID Community of Practice

The use of active surveillance is not routinely recommended except as part of a special approach in the setting of high MRSA rates

Clin Transplant. 2019 Sep;33(9):e13611. doi: 10.1111/ctr.13611

Importanza diagnostica microbiologica pre-periLuTx D/R per MRSA:

- Prophylaxis with vancomycin should be considered in patients undergoing transplant **who are known to be colonized** or previously infected
- Organ recipients from **donors with MRSA bacteremia** should receive MRSA-directed antimicrobial therapy at the time of transplantation and should remain on treatment for 7-14 days.
- If MRSA transmission occurs, clinicians should consider extending treatment beyond 14 days, depending on the extent of infection

Clin Transplant. 2019 Sep;33(9):e13611. doi: 10.1111/ctr.13611

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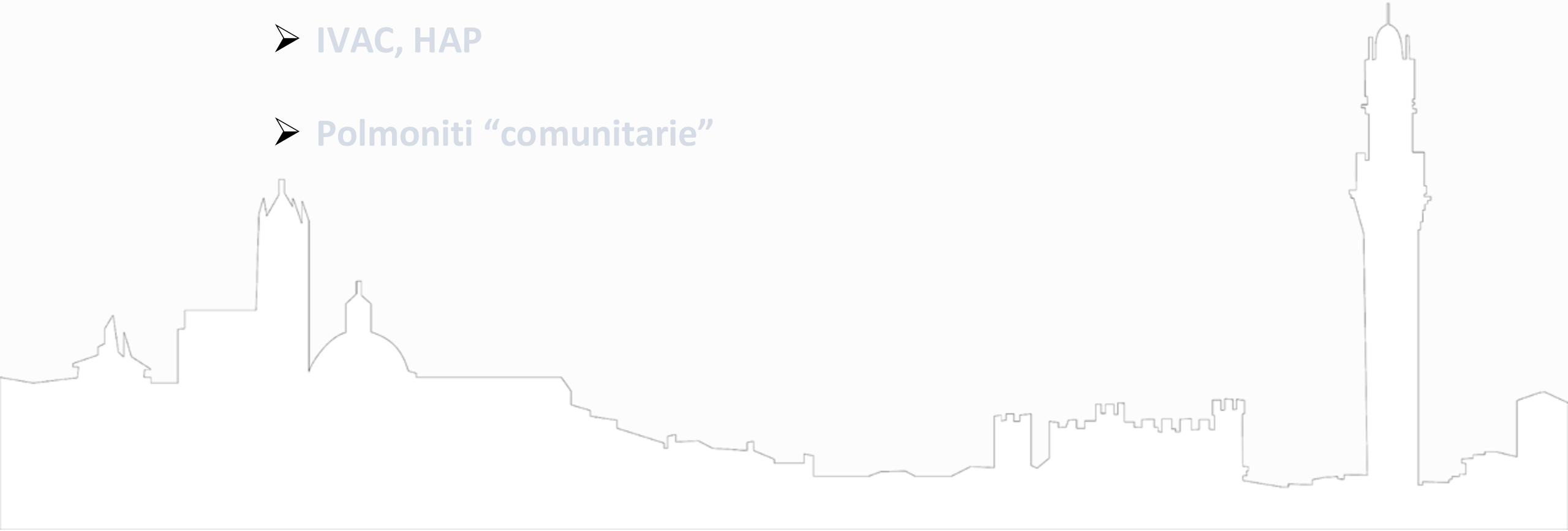
PATOGENESI

- Infezioni del sito chirurgico
- **Infezioni Donor-derived (DDI)**
- IVAC, HAP
- Polmoniti “comunitarie”



Received: 6 May 2019 | Accepted: 11 May 2019

DOI: 10.1111/ctr.13594

SPECIAL ISSUE-TRANSPLANT INFECTIOUS DISEASES

Clinical TRANSPLANTATION
The Journal of Clinical and Translational Research
WILEY

Multidrug-resistant Gram-negative bacterial infections in solid organ transplant recipients—Guidelines from the American Society of Transplantation Infectious Diseases Community of Practice

Stephanie M. Pouch[1] | Gopi Patel[2] | on behalf of the AST Infectious Diseases Community of Practice

La presenza di colonizzazione da ESBL; CRE, P. aeruginosa XDR (sia nel donatore che nel ricevente) NON è controindicazione assoluta a trapianto

Clin Transplant. 2019 Sep;33(9):e13594. doi: 10.1111/ctr.13594

Revisione 2.0 del 15/02/2024
Approvato dal CNT in data 15/02/2024
Documento operativo dall'11 marzo 2024

Sostituisce documento tecnico: "3. Valutazione dell'idoneità del donatore in relazione a patologie infettive" dell'ACSR del 24 gennaio 2018 (Rep. atti 17/CSR).

MDROs e Donazione

- **Infezioni sistemiche (batteriemie) da PDR:** in linea di principio è criterio di esclusione assoluta dalla donazione, ma necessita il parere della second opinion

- **Infezioni localizzate:** l'esclusione si applica unicamente agli organi interessati dal processo infettivo, mentre il livello di rischio per gli altri organi sarà valutato caso per caso, previo contatto con la second opinion.

- **Positività del tampone rettale** (*Acinetobacter baumannii e Klebsiella pneumoniae* resistenti ai carbapenemici) **non rappresenta criterio di esclusione dalla donazione**, fatta eccezione per la donazione di intestino e di pancreas. In questo caso il rischio per gli altri organi sarà valutato caso per caso, previo contatto con la second opinion.

La documentata colonizzazione (positività del tampone rettale) impone comunque il massimo rispetto delle procedure di asepsi al fine di evitare la contaminazione degli organi prelevati.

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Donor

Ideal Selection Criteria

- Age <55 years
- Clear serial chest radiograph
- Normal gas exchange (Pao_2–FIO_2 >300 mm Hg)
- Absence of chest trauma
- No evidence of aspiration or sepsis
- Absence of purulent secretions on bronchoscopy
- Absence of organisms on sputum gram stain
- No history of primary pulmonary disease
- No active pulmonary infection
- Tobacco history of <20 pack-years
- ABO compatibility
- No previous cardiopulmonary surgery
- Appropriate donor–recipient size match

Donor

Management

- PEEP of 8–20 cm of water
- Tidal volume of 6–8 ml/kg of body weight
- Lung recruitment once per hour after disconnection from ventilator
- Bronchoscopy and lavage after brain death
- PiCCO: EVLW of <10 ml/kg and CVP of <8 mm Hg
- Methylprednisolone, 15 mg/kg
- Alveolar recruitment with plateau air pressure of 35 mm Hg and PEEP of 18–20 cm of water
- Pao_2–FIO_2 <300 mm Hg, semilateral decubitus

N Engl J Med 391;19 nejm.org November 14, 2024

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Journal of Infection 80 (2020) 190–196

Contents lists available at ScienceDirect

Journal of Infection

journal homepage: www.elsevier.com/locate/jinf

Donor-derived (DDI)

e

MDR

Donor-derived bacterial infections in lung transplant recipients in the era of multidrug resistance

The lungs of donors colonized with multidrug-resistant bacteria may be safely used when recipients receive prompt tailored antibiotic treatment.

Journal of Infection 88 (2024) 139–148

Contents lists available at ScienceDirect

Journal of Infection

journal homepage: www.elsevier.com/locate/jinf

Donor respiratory multidrug-resistant bacteria and lung transplantation outcomes

Donor respiratory MDR bacteria were not significantly associated with allograft survival or CLAD in adjusted hazard models.

Sensitivity analyses revealed an increased risk for 90-day mortality among recipients of allografts with MDR *Klebsiella pneumoniae*

MDR *Klebsiella pneumoniae* and *Stenotrophomonas maltophilia* were associated with an increased risk for CLAD compared to negative cultures.

Contents lists available at ScienceDirect

Clinical Microbiology and Infection

journal homepage: www.clinicalmicrobiologyandinfection.com

Original article

Colonization and infection due to carbapenemase-producing *Enterobacteriaceae* in liver and lung transplant recipients and donor-derived transmission: a prospective cohort study conducted in Italy

G. Errico [1], C. Gagliotti [4], M. Monaco [1], L. Masiero [2], P. Gaibani [5], S. Ambretti [5], M.P. Landini [5, §], S. D'Arezzo [3], A. Di Caro [3], S.G. Parisi [6], G. Palù [6], F. Vespasiano [2], F. Morsillo [4], M.L. Moro [4], F. Procaccio [2], A. Ricci [2], P.A. Grossi [7], A. Pantosti [1, *], A. Nanni Costa [2], the SInT Collaborative Study Group[†]

- Of 588 screened donors, 3.4% were colonized with CPE
- CPE colonization in 111 lung transplant recipients was 2.7% before SOT and **14.4% after SOT**
- CPE infections occurred in 5.3% of lung recipients
- Three events of donor-recipient CPE transmission occurred in lung recipients
- **Low risk of donor-recipient CPE transmission**
- Donor CPE colonization does not necessarily represent a contraindication for donation **unless colonization regards the organ to be transplanted**

Clinical Microbiology and Infection 25 (2019) 203–209

Lung donor bronchoalveolar lavage positivity: Incidence, risk factors, and lung transplant recipients' outcome

Jacopo Fumagalli, MD,[a] Veronica Punzi, MD,[b] Vittorio Scaravilli, MD,[a,c] Serena M. Passamonti, MD,[d] Letizia C. Morlacchi, MD,[e,f] Valeria Rossetti, MD,[f] Anna Maraschini, MD,[g] Caterina Matinato, MD,[g] Margherita Brivio, MD,[h] Ilaria Righi, MD,[h] Francesco Blasi,[e,f] Alessandra Bandera, MD,[e,i] Lorenzo Rosso, MD PhD,[e,h] Mauro Panigada, MD,[a] Alberto Zanella, MD,[a,e] and Giacomo Grasselli, MD[a,e]

Retrospective analysis: LuTx January 2016 - December 2022

- 36% of donors' BAL tested positive
- 23% of recipients receiving a graft with a positive BAL had DDI

Receiving a graft with a positive BAL, carries the risk of developing a DDI and is associated to a worse early graft function among **uncolonized recipients**

Table 3 Recipients' Outcomes

Outcome	All ($n = 169$)	R+/D- ($n = 64$)	R+/D+ ($n = 37$)	R-/D- ($n = 44$)	R-/D+ ($n = 24$)	Adjusted p value
Ventilatory Support @72 hours						< 0.01
IMV, n (%)	35 (21)	6 (9)	3 (8)	13 (29)	13 (54)	
Controlled	25 (15)	5 (8)	3 (8)	9 (20)	8 (33)	
Assisted	10 (6)	1 (1)	0 (0)	4 (9)	5 (21)	
NIMV-PSV, n (%)	85 (50)	35 (55)	22 (65)	20 (45)	8 (33)	
HFNC, n (%)	9 (5)	2 (3)	3 (8)	4 (9)	0 (0)	
LFNC, n (%)	38 (22)	19 (30)	9 (24)	7 (16)	3 (12)	
PaO_2/FiO_2 @72 hours[a]						< 0.01
> 300 mm Hg, n (%)	121 (73)	55 (85)	32 (86)	27 (65)	7 (32)	
200-300 mm Hg, n (%)	26 (16)	7 (11)	2 (5)	8 (19)	9 (41)	
100-199 mm Hg, n (%)	15 (9)	1 (2)	3 (8)	5 (12)	6 (27)	
< 100 mm Hg, n (%)	3 (2)	2 (3)	0 (0)	1 (2)	0 (0)	
PEEP @72 hours, cm H_2O	0 (0-8)	0 (0-1)	0 (0-7)	2 (0-10)	8 (4-10)	< 0.01
Postoperative ECMO, n (%)	24 (14)	12 (19)	6 (16)	4 (17)	2 (8)	0.52
ECMO duration, days	1 (1-2)	1 (1-1)	1 (1-2)	2 (1-3)	1 (1-2)	0.90
28-day VFD, days	28 (28-29)	29 (28-29)	29 (29-29)	28 (26-29)	25 (20-29)	< 0.01
ICU LOS, days	3 (2-6)	3 (2-4)	3 (2-4)	4 (2-9)	7 (4-14)	< 0.01
ICU readmission, n (%)	11 (6)	4 (6)	1 (3)	5 (11)	1 (4)	0.54
Hospital LOS, days	22 (19-28)	22 (19-27)	22 (20-27)	22 (19-30)	24 (20-30)	0.45
DDI, n (%)	14 (8)	-	7 (19)	-	7 (29)	-

The Journal of Heart and Lung Transplantation, Vol 43, No 8, August 2024

American Journal of Transplantation 24 (2024) 1046–1056

Contents lists available at ScienceDirect

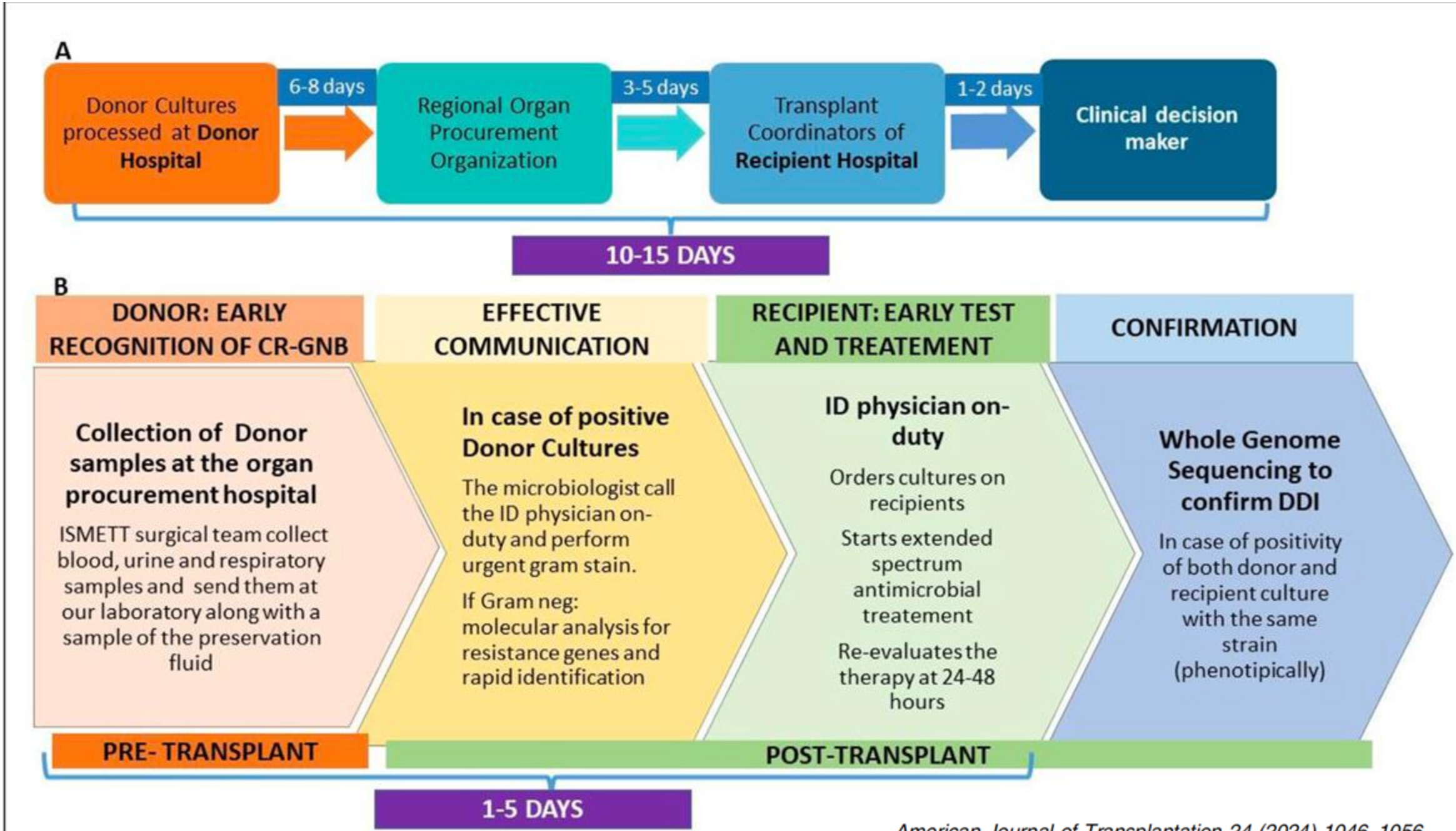
American Journal of Transplantation

journal homepage: www.amjtransplant.org

Original Article

Donor-derived carbapenem-resistant gram-negative bacterial infections in solid organ transplant recipients: Active surveillance enhances recipient safety

Alessandra Mularoni [1], Andrea Cona [1,*], Maria Campanella [1], Floriana Barbera [2], Alice Annalisa Medaglia [1,3], Adriana Cervo [1,4], Nicola Cuscino [5], Giuseppina Di Mento [2], Elena Graziano [1,6], Jana Dib El Jalbout [1,7], Rossella Alduino [5], Fabio Tuzzolino [5], Francesco Monaco [2], Antonio Cascio [3], Maddalena Peghin [6], Salvatore Gruttadauria [8], Alessandro Bertani [9], Pier Giulio Conaldi [5], Malgorzata Mikulska [10,11], Paolo Antonio Grossi [6]



American Journal of Transplantation 24 (2024) 1046–1056

- ***Transmission did not occur in 27 (71%) cases**, whereas DDIs occurred in 9 of 25 of CRE and 2 of 13 of CRAB cases*
- ***Incidence of CR-GNB DDI was 1.4%***

Table 1
Risk stratification according to the organ transplanted and the positive donor sample.

Positive donor sample / Organ transplanted	Blood	Urine	Respiratory specimen	Preservation fluid
Liver	High Risk	Low Risk	Low Risk	High Risk
Kidney	High Risk	High Risk	Low Risk	High Risk
Heart	High Risk	Low Risk	Low Risk	High Risk
Lung	High Risk	Low Risk	High Risk	High Risk
Pancreas	High Risk	Low Risk	Low Risk	High Risk

Application of Syndromic Panels for respiratory Tract Infections in Lung Transplantation: A Critical Review on Current Evidence and Future Perspectives

Andrea Lombardi[1,2] | Giulia Renisi[1] | Arianna Liparoti[1] | Chiara Bobbio[2] | Alessandra Bandera[1,2]

Transplant Infectious Disease, 2025; 0:e14448

Universal Multiplex Panel Testing of Donor Lungs as a Strategy to Optimize Antibiotic Prophylaxis Against Multidrug-Resistant Bacteria

Rayid Abdulqawi[1,2] | Rana A. Saleh[1] | Reem M. Alameer[3] | Roaa Alabiri[4] | Ruba Alabiri[4] | Khaled Alkattan[1,2] | Reem S. Almaghrabi[4] | Zainab Al Duhailib[2,5] | Sahar Althawadi[6] | Najib M. Rahman[7] | Waleed Saleh[1,2] | Amani H. Yamani[4] | Eid A. Al-Mutairy[1,2]

Transplant Infectious Disease, 2025; 0:e14446

Dealing With Antibiotic Prophylaxis in Lung Transplantation in the Era of Multidrug Resistance: The Milano Algorithm

Andrea Lombardi[a,b*], Davide Mangioni[a], Giulia Renisi[a], Jacopo Fumagalli[c], Letizia Morlacchi[b,d], Lorenzo Rosso[b,e], Alessandro Palleschi[b,e], Valeria Rossetti[d], Mauro Panigada[c], Chiara Abbruzzese[c], Lisa Cariani[f], Annapaola Callegaro[f], Mario Nosotti[b,e], Francesco Blasi[b,d], Giacomo Grasselli[b,c], and Alessandra Bandera[a,b]

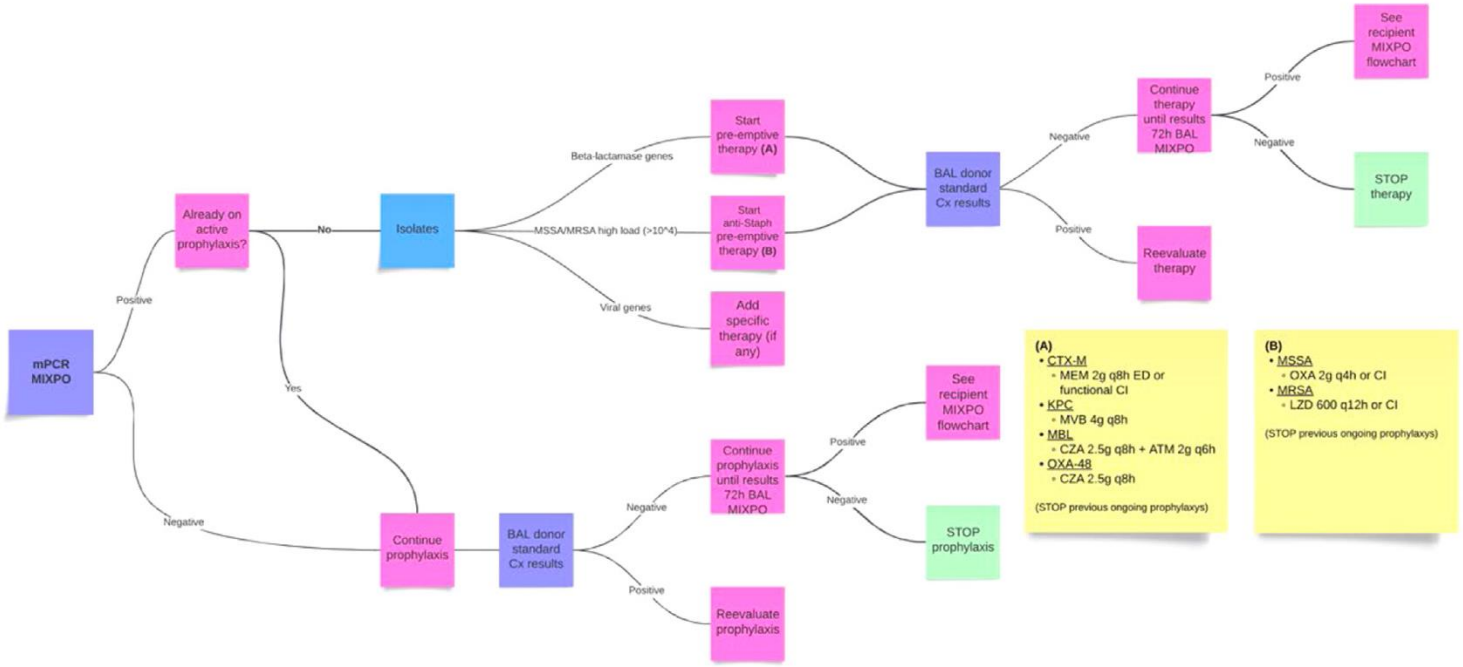
Studio ongoing : NCT05960383

-BAL at organ procurement (donor)
-BAL 72hours after surgery (recipient)

Standard microbiological culture + PCR-test BIOFIRE FILMARRAY PneumoniaPanelPlus

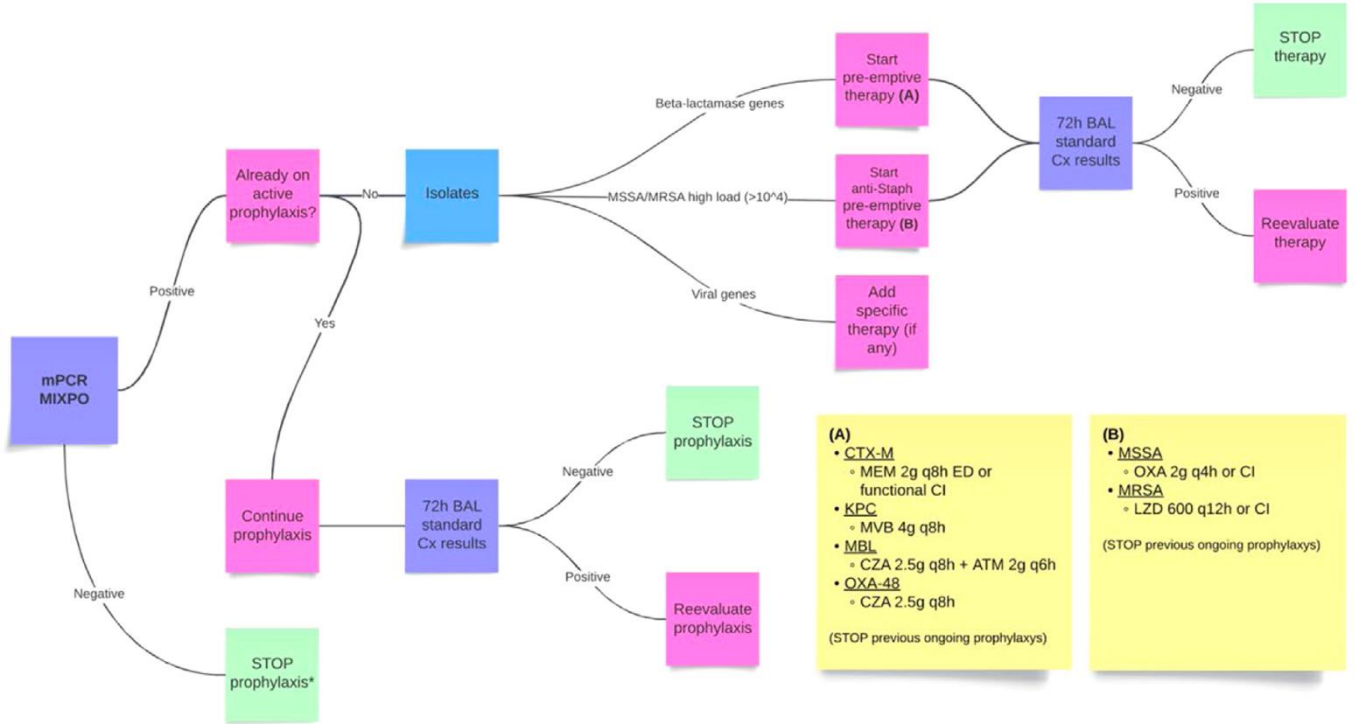
Transplantation Proceedings, 57, 339–341 (2025)

(A)



-Standard prophylaxis: cefepime (2gr q8h) + a single dose of vancomycin
-Targeted prophylaxis: known MDROs colonization in recipients

--**Adjusted antibiotic prophylaxis**: according to Donor's and Recipients's BAL



Transplantation Proceedings, 57, 339−341 (2025)

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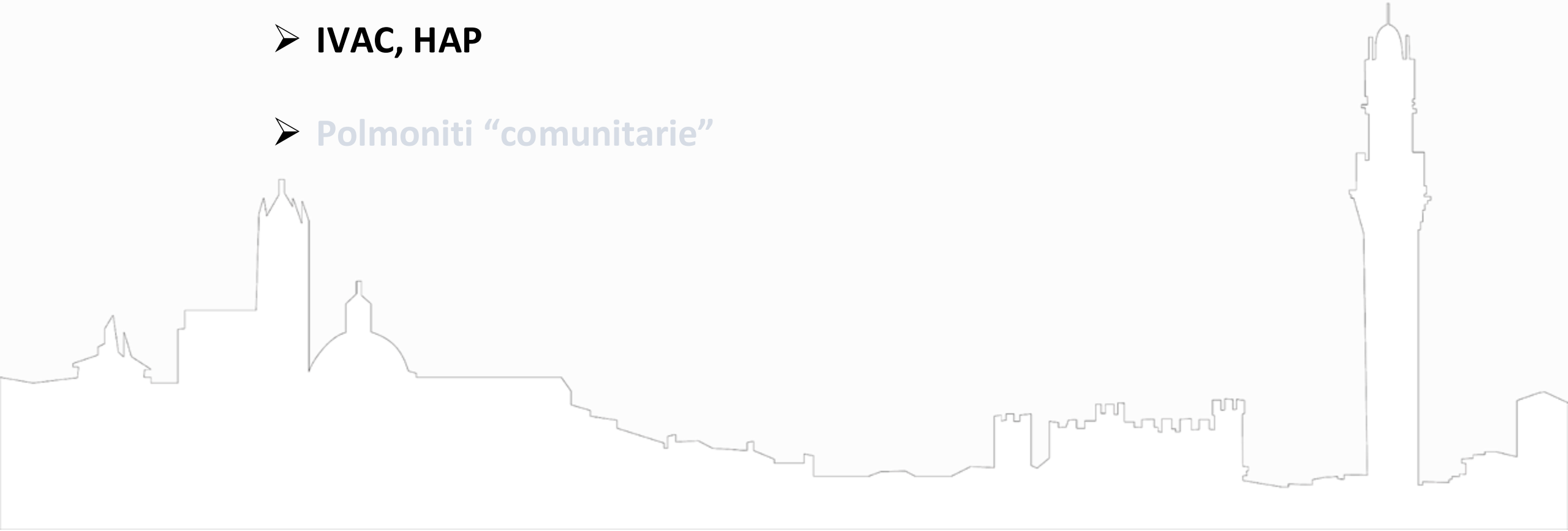
PATOGENESI

- Infezioni del sito chirurgico
- Infezioni Donor-derived (DDI)
- **IVAC, HAP**
- Polmoniti “comunitarie”



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Incidence and risk factors for respiratory tract bacterial colonization and infection in lung transplant recipients

L. Paglicci[1] · V. Borgo[1] · N. Lanzarone[2] · M. Fabbiani[1] · C. Cassol[1,3] · MG. Cusi[3,4] · M. Valassina[4] · S. Scolletta[5] · E. Bargagli[2] · L. Marchetti[6] · P. Paladini[7] · L. Luzzi[7] · A. Fossi[2] · D. Bennett[2] · F. Montagnani[1,3]

Retrospective study

33% of patients developed lower respiratory bacterial **colonization**.

Peptic diseases conferred a higher risk of MDR colonization

Table 3 Risk factors for respiratory bacterial colonization at 30-day post-LT (logistic regression)

	Univariate			Multivariate		
	OR	CI 95%	*p* value	aOR	CI 95%	*p* value
Overall 30-day colonization						
Double LT	2.75	1.11–6.68	**0.02**	3.61	1.35–9.60	**0.01**
Chronic coronary heart disease	4.80	1.11–20.72	**0.04**	6.67	1.36–32.82	**0.02**
MDR 30 days colonization						
Peptic disease	8	1.76–36.38	**0.007**	7.66	1.48–39.77	**0.01**
Aerosol prophylaxis, mean time, per 1-day increase	0.95	0.91–1.00	**0.046**	0.95	0.90–1.00	**0.04**

LT, lung transplant; *MDR*, multi-drug resistant bacteria

European Journal of Clinical Microbiology & Infectious Diseases (2021) 40:1271–1282

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Table 5 Risk factors for respiratory bacterial infection at 30-day post-LT (logistic regression)

	Univariate			Multivariate		
	OR	95% CI	*p* value	aOR	95% CI	*p* value
30-day overall infection						
Transplant indication						
- COPD vs. IPF	0.22	0.06–0.76	**0.02**	0.17	0.05–0.66	**0.01**
- Others vs. IPF	0.47	0.17–1.28	0.14	0.52	0.17–1.59	0.25
BMI (per 1 kg/m^2 increase)	0.90	0.81–1.00	**0.049**	0.87	0.78–0.98	**0.03**
Aerosol						
- No aerosol prophylaxis	REF	REF	REF	REF	REF	REF
- Taurolidine aerosol	4.5	0.95–21.38	**0.06**	5.86	1.05–32.69	**0.04**
- Taurolidine + other antibiotic	3.5	0.21–51.77	0.38	5.72	0.29–110.7	0.24
Antibiotic aerosol in addition to systemic therapy	10.5	1.03–107.17	**0.047**	10.32	0.81–130.33	0.07
Atypical[a] prophylaxis	2.83	0.94–8.52	0.06	2.27	0.64–8.07	0.20
30-days MDR infection						
Transplant indication:						
- COPD vs. IPF	0.08	0.01–0.84	**0.02**	0.07	0.01–0.77	**0.03**
- Other vs. IPF	0.31	0.08–1.10	**0.06**	0.17	0.03–0.86	**0.03**
Pre-LT respiratory colonization	3.69	0.78–16.88	**0.03**	5.37	1.02–28.28	**0.04**
Pre-LT respiratory infection	8.8	0.59–1.40	**0.02**	16.84	1.18–239.39	**0.04**
PGD	10.4	1.13–82.48	**0.03**	6.45	0.75–56.37	0.09
Atypical[a] prophylaxis	2.86	0.88–9.27	0.08	1.83	0.34–9.92	0.48

35% of lung recipients developed **bacterial infection**

A higher risk of MDR infection was observed in those with pre-transplant colonization (AOR 5.37, 95% CI 1.02–28.28, p = 0.04) and pre-transplant infections (AOR 16.84, 95% CI 1.18–239.39, p = 0.01).

European Journal of Clinical Microbiology & Infectious Diseases (2021) 40:1271–1282

Clinical Infectious Diseases
MAJOR ARTICLE
IDSA Infectious Diseases Society of America
hivma hiv medicine association
OXFORD
Clinical Infectious Diseases 2022;74(3):395–406

Molecular Epidemiology, Natural History, and Long-Term Outcomes of Multidrug-Resistant Enterobacterales Colonization and Infections Among Solid Organ Transplant Recipients

M. Hong Nguyen,[1,2,3] Ryan K. Shields,[1,2] Liang Chen,[4] A. William Pasculle,[5] Binghua Hao,[2] Shaoji Cheng,[1] Jonathan Sun,[2] Ellen G. Kline,[1] Barry N. Kreiswirth,[3] and Cornelius J. Clancy[1,2,6]

Prospective study

25% (40 of 162) of patients were MDR-E GI-colonized. Klebsiella pneumoniae was the most common CRE and CefR-E. Klebsiella pneumoniae carbapenemases and CTX-M were leading causes of CR and CefR, respectively

35% of GI colonizers developed MDR-E infection vs 2% of noncolonizers (P < .0001).

POLMONE e MDR-E:
23/88 (26%) LuTx colonizzati post-LuTx

⇩

9/23 (39%) hanno sviluppato infezione

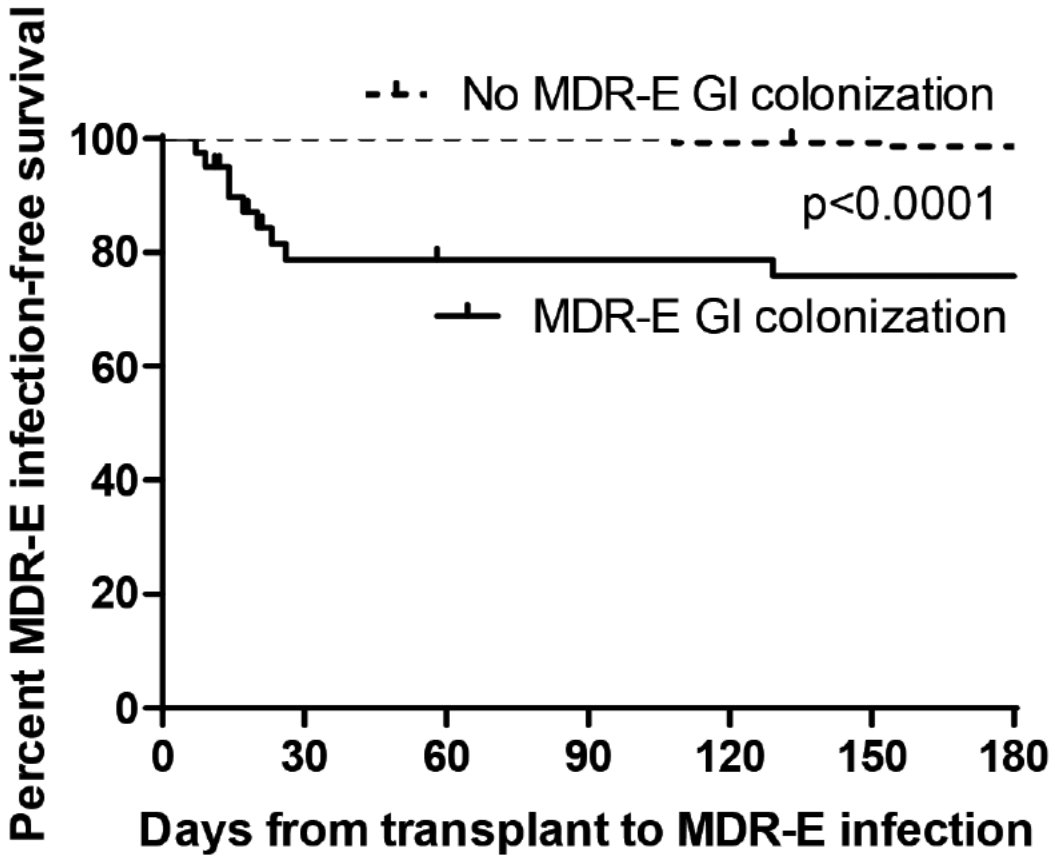

Figure 2. MDR-E infection-free survival after solid organ transplantation. The Kaplan-Meier curve was stratified by MDR-E GI colonization status. Abbreviations: GI, gastrointestinal; MDR-E, multidrug-resistant Enterobacterales.

Table 4. Risk Factors for Multidrug-Resistant-Enterobacterales Infections

A. Risk factors for MDR-E infections

	Univariate Analyses			Multivariate Analyses	
Risk Factor	Infection (N = 17)	No Infection (N = 145)	*P* Value	*P* Values	OR (95% CI)
Hospitalization within 90 days before transplant	65% (11)	36% (52)	.03	.25	…
Recipient's BMI before transplant	31 (17–44)	26 (17–36)	.026	.004	1.2 (1.1–1.4)
Post-transplant MDR-E colonization	82% (14)	18% (26)	<.0001	<.0001	29.4 (6.5–132.5)
Reexploration after transplant	47% (9)	21% (30)	.006	.134	…

B. Risk factors for CefR-E infections[a]

	Univariate Analyses			Multivariate Analyses	
Risk Factor	Infection (N = 5)	No Infection (N = 145)	*P* Value	*P* Value	OR (95% CI)
Hospitalization within 90 days before transplant	80% (4)	36% (52)	.065	NA	NA
Recipient's BMI before transplant	36 (23–44)	26 (17–36)	.03	.004	1.4 (1.1–1.9)
CefR-E colonization	80% (4)	15% (21)	.003	.008	88 (3.2-2404)
Reexploration after transplant	20% (1)	21% (30)	1.0	NA	NA

C. Risk factors for CRE infections[b]

	Univariate Analyses			Multivariate Analyses	
Risk Factor	Infection (N = 10)	No Infection (N = 145)	*P* Value	*P* Value	OR (95% CI)
Hospitalization within 90 days before transplant	50% (5)	36% (52)	.50	…	…
Recipient's BMI before transplant	29 (17–35)	26 (17–36)	.11	…	…
CRE colonization	80% (8)	5% (8)	<.0001	<.0001	74.7 (11–508.4)
Re-exploration after transplant	70% (7)	21% (30)	.002	.016	10.2 (1.6–66.4)

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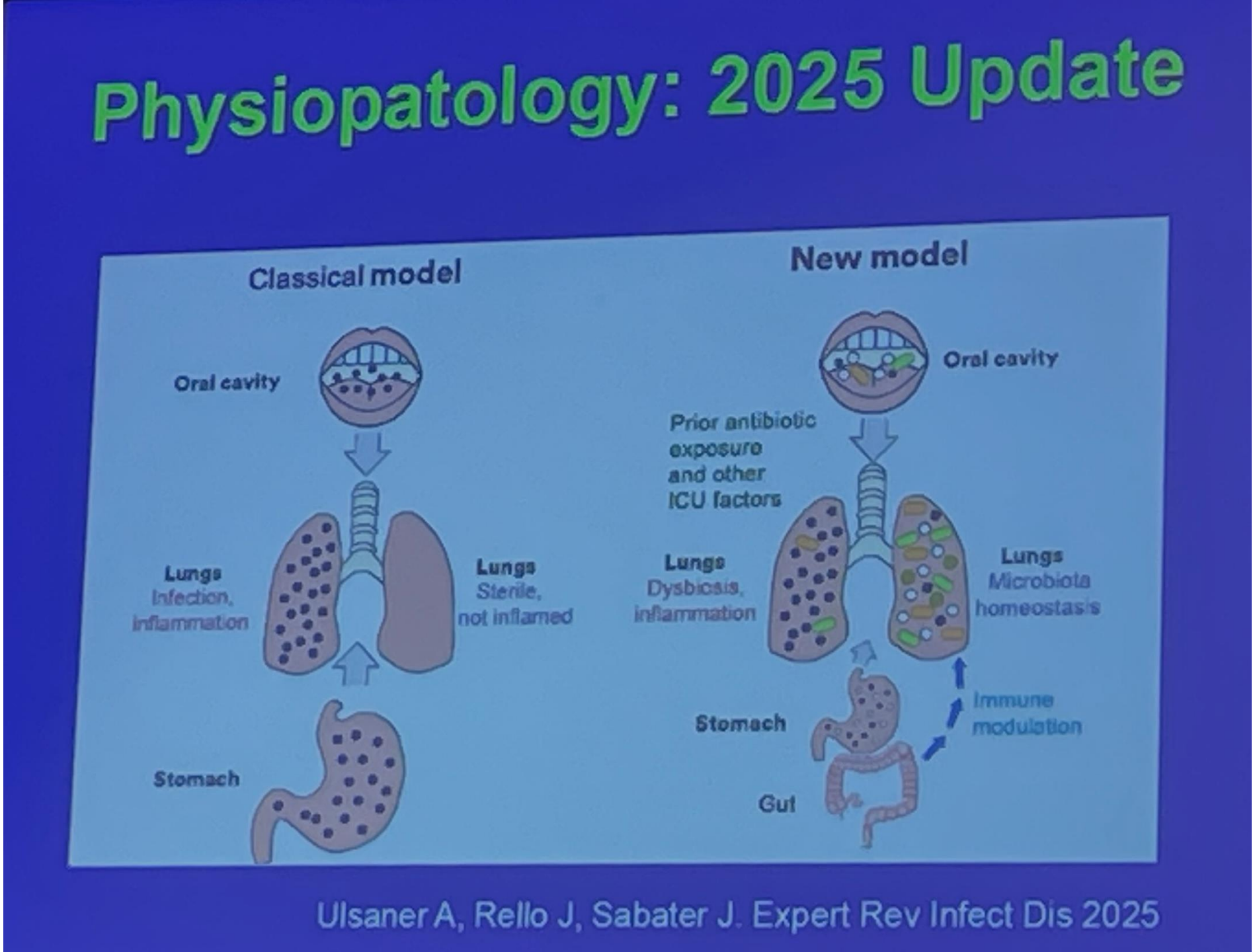
Rello J:
Management of ventilator-associated pneumonia: antibiotics and beyond.

TOP5 IN INFECTIOUS DISEASES Venice, April 3rd-5th, 2025



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Active
Variable
Not recommended

		Enterobacterales					Lactose non-fermenting organisms	
	Typical dosing regimen for serious infections[11,110,111]	Extended-spectrum β-lactamase-producing Enterobacterales	AmpC β-lactamase-producing Enterobacterales	Ambler class A carbapenemases (eg, KPC and IMI)	Metallo-β-lactamases (eg, NDM, VIM, and IMP)	Ambler class D carbapenemases (eg, OXA-48)	Difficult-to-treat resistant *Pseudomonas aeruginosa*	Carbapenem-resistant *Acinetobacter baumannii*
β-lactam								
Ceftolozane–tazobactam	3 g IV every 8 h, infused over 3 h							
Ceftazidime–avibactam	2·5 g IV every 8 h, infused over 3 h							
Meropenem–vaborbactam	4 g IV every 8 h, infused over 3 h							
Imipenem–relebactam	1·25 g IV every 6 h, infused over 30 min							
Cefiderocol	2 g IV every 8 h, infused over 3 h							
Ceftazidime–avibactam and aztreonam	Ceftazidime–avibactam: 2·5 g IV every 8 h, infused over 3 h plus aztreonam: 2 g IV every 8 h, infused over 3 h*							
Aztreonam–avibactam	2 g/0·67 g loading dose then 1·5 g/0·5 g every 6 h, infused over 3 h							
Cefepime–enmetazobactam	2 g/0·5 g every 8 h, infused over 4 h							
Sulbactam–durlobactam†	1 g of each drug IV every 6 h, infused over 3 h†							
Tetracycline derivative								
Eravacycline	1 mg per kg IV every 12 h							

Multidrug-resistant Gram-negative bacterial infections. Nenad Macesic, Anne-Catrin Uhlemann, Anton Y Peleg. Lancet 2025; 405: 257–72

Indicazioni American Society of Transplantation

- CAZ/AVI and MER/VAB **monotherapy** should be used in the treatment of **CRE infections**
- In suspected infections due to **XDR or PDR *P. aeruginosa:* empiric combination therapy**
- Therapeutic options for MBL-producing *Enterobacteriaceae* include **combination therapy with CAZ/AVI and aztreonam**
- β-lactams: **high-dose continuous-infusion** therapy

Clin Transplant. 2019 Sep;33(9):e13594. doi: 10.1111/ctr.13594

How to tailor recommendations on the treatment of multi-drug resistant Gram-negative infections at country level integrating antibiotic stewardship principles within the GRADE-ADOLOPMENT framework

Elena Carrara, Paolo Antonio Grossi, Andrea Gori, Lorenza Lambertenghi, Massimo Antonelli, Andrea Lombardi, Filippo Bongiovanni, AIFA-OPERA Working Group, Nicola Magrini, Carlo Manfredi, Stefania Stefani, Mario Tumbarello, Evelina Tacconelli*

The GRADE-ADOLOPMENT methodology is an evidence-based methodology that allows the adoption, adaptation, and update of existing recommendations to specific settings without performing de novo systematic reviews and grading of the evidence

Key messages*

- Development and implementation of therapeutic recommendations is a key strategy in improving the appropriateness of antimicrobial prescription at local level.
- Recommendations need to be tailored on local resistance rates and availability of diagnostics and antibiotics, which can differ widely from one country to another.
- The GRADE-ADOLOPMENT methodology, as an evidence-based methodology, allows rapid and efficient adaptation of existing evidence to the local setting.
- The AIFA-OPERA calibration of recommendations for the treatment of multidrug-resistant Gram-negative infections at the country level can be used as a model for other countries calibration and tailoring of existing recommendations.

AIFA=Italian Medicine Agency. AIFA-OPERA=Italian Medicine Agency's Working Group to optimise antibiotic use. *From the experience of the AIFA-OPERA group.

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DOI: 10.1111/ajt.16394

ORIGINAL ARTICLE

Association between *Mycoplasma* and *Ureaplasma* airway positivity, ammonia levels, and outcomes post–lung transplantation: A prospective surveillance study

Bruno F. Buzo[1] | Jutta K. Preiksaitis[1] | Kieran Halloran[2] | Jayan Nagendran[3] | Derek R. Townsend[4] | Nathan Zelyas[5] | Wendy I. Sligl[1,4]

Serum Ammonia Screening and Donor Mollicutes Detection for Hyperammonemia Syndrome Post–Lung Transplantation: A Prospective Observational Study

Walti et al., 2025 | *Clinical Infectious Diseases*

IDSA Infectious Diseases Society of America

BACKGROUND

Hyperammonemia syndrome (HS) is a potentially fatal complication of lung transplantation (LT).

Optimal screening is unknown.

Here we investigated serum ammonia screening (SAS) for HS and compared it with PCR for Mollicutes (Urease-producing bacteria).

METHODS

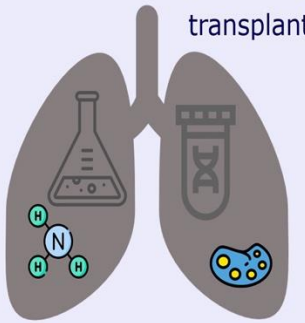
- **o** LT recipients with available donor bronchial samples.
- **o** Commercially available Mollicutes-PCR kits.
- **o** Daily ammonia serum levels for 14 d post-LT.
- **o** Prospectively followed for 30 d post-LT.

HS was defined by new neurological symptoms and the presence of elevated serum ammonium (>1x >70 µmol/L) in the absence of an identified cause.

2% of LT recipients (5/241) **experienced HS,** all within 14 d post-LT.

Elevated serum ammonia levels (>1x >70 µmol/L) outside of HS **were rare** (4 LT recipients with liver injury).

In HS patients **median ammonia level was relatively low**: 106 (IQR 106-116) µmol/L at diagnosis.



8% of donor Mollicutes PCR (19/241) and **1% of recipient Mollicutes PCR** were positive (1/72) in bronchial wash samples at transplant.

However, only in **2/5** recipients (40%) who developed HS a positive donor Mollicutes PCR was found.

No LT-recipient (0%) diagnosed with HS **died** within 90 d post-LT.

CONCLUSION

HS was rare in our cohort. Daily post-LT SAS might add to early HS diagnosis and treatment and is potentially associated with improved outcome. Donor screening with Mollicutes-PCR had limited predictive value for HS post-LT.

Clinical Infectious Diseases https://doi.org/10.1093/cid/ciaf078

Clin Infect Dis, ciaf078, https://doi.org/10.1093/cid/ciaf078

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PATOGENESI

- Infezioni del sito chirurgico
- Infezioni Donor-derived (DDI)
- IVAC, HAP
- **Polmoniti “comunitarie”**

Respiratory infections in lung transplant recipients

Christopher Alexander Hinze[a,b], *Susanne Simon*[a] *and Jens Gottlieb*[a,b]

KEY POINTS

- Respiratory infections following lung transplantation carry significant risks, including immediate graft damage and chronic lung allograft dysfunction (CLAD).
- Community-acquired respiratory viruses (CARV) often cause serious complications in lung transplant recipients, including prolonged cough and graft dysfunction.
- Diagnostic approaches, including PCR, bronchoalveolar lavage, and point-of-care testing, are essential for rapid and accurate identification of infections to initiate timely treatment.
- Preventive strategies such as vaccination, lifelong prophylactic drug therapy and early antiviral treatment aim to reduce infection-related risks and improve survival for lung transplant patients.

Terapia precoce

Terapia mirata

VACCINI

Non solo Pneumococco ed Haemophilus

….

Curr Opin Infect Dis 2025, 38:150–160

Vaccines	Name	Inactivated (IA) or live attenuated	Age or disease-specific recommendations	Dose and timing
Herpes zoster	Shingrix	IA	VZV IGG positive in ≥ 19 years old & immunocompromised or will be immunocompromised	2 doses: 0, 2–6 months
Hepatitis A				
Hepatitis B				
Hepatitis A and B combination				
HPV	Gardasil 9			
Influenza	–	IA		Once a year during Influenza season
COVID	–	IA		Booster based on guidelines
RSV	Abryvso or Arexvy	IA	≥ 60 years old	One dose

Antigene F di prefusione ricombinante

Abryvso (bivalente ricombinante):
- Gravida 24-34° SdG (protezione passiva del neonato 0-6 mesi)
- >= 60 anni

Arexy (ricombinante adiuvato):
- >= 60 anni
- **50-59 anni con fattori di rischio per malattia da RSV**

Modificato da: Curr Opin Pulm Med. 2024 Jul 1;30(4):382-390

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CONCLUSIONI

- ✓ Popolazione peculiare
- ✓ Incremento resistenze (D/R)
- ✓ Epidemiologia locale
- ✓ Profilassi standard versus profilassi target -> individuale?
- ✓ Stewardship antibiotica

Necessità di studi prospettici, multicentrici

SCUOLA DI SPECIALIZZAZIONE IN MALATTIE INFETTIVE E TROPICALI

PANDORA

ID - 25

TIME TO WEBINAR IN INFECTIOUS DISEASES

PROGETTO DI FORMAZIONE

Anno Accademico

24/25