

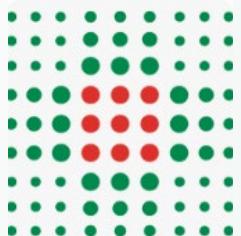


GiViTI - Gruppo italiano per la Valutazione
degli Interventi in Terapia Intensiva

Valutazione del Ruolo della Profilassi Antibiotica nella Toracostomia con Drenaggio nei Trauma toracico: Studio Retrospettivo Monocentrico

www.giviti.marionegri.it

Meeting GiViTI 2025
8 - 9 - 10 ottobre



- **Collaboratori:**
Avigdor Rotem, Michela Viscione, Giusi De Sario (Chirurgia Generale), Giulia Ciabatti (Chirurgia Generale), Elisa Marchionni (Malattie Infettive), Alessandro Monesi (Terapia Intensiva), Aimone Giugni (Terapia Intensiva)

- **Istituzione:**
Ospedale Maggiore, Bologna – Terapia Intensiva, Chirurgia Generale, Malattie Infettive



Qual è l'incidenza dell'empema nel paziente con trauma toracico dopo drenaggio toracico?

Contesto clinico	Incidenza di empiema riportata	Note / Fattori di rischio
Trauma toracico generale (tutti i pazienti con drenaggio toracico)	~ 3%	Dato medio complessivo riportato da EAST.
Trauma penetrante	Maggiore del 3% (non quantificato con precisione, ma superiore rispetto al contusivo)	Associato a rischio più elevato di infezioni pleuriche.
Trauma contusivo	<3%	Rischio inferiore rispetto al penetrante.
Retained hemothorax (emotorace residuo dopo drenaggio)	fino a 25–33%	Forte fattore di rischio; spesso richiede VATS precoce per ridurre complicanze.
Drenaggio toracico prolungato	Rischio aumentato	Durata elevata del tubo toracico → maggiore rischio di colonizzazione/infezione.
Più drenaggi nello stesso emitorace	Rischio aumentato	Trauma più complesso e manipolazioni ripetute → più empiema.

Practice Management Guidelines for Management of Hemothorax and Occult Pneumothorax



L'utilizzo della profilassi antibiotica nella toracostomia di emergenza nei pazienti con TT è ancora oggetto di dibattito



LG piu' recenti EAST-2022

Periodo: 1990- 2022

Metodologia: Revisione sistematicA + metanalisi con metodologia GRADE

Risultati:

- Metanalisi: antibiotici riducono significativamente empiema (OR 0.47, p=0.01).
- Effetto maggiore nei traumi penetranti (OR 0.25, p=0.002).
- Nessuna riduzione significativa di polmonite né mortalità.
- Beneficio meno chiaro nei traumi chiusi.

Raccomandazione condizionata: somministrare antibiotici profilattici al momento dell'inserzione di TT in pazienti adulti con trauma toracico, per ridurre rischio di empiema.



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Nº of studies	Study design	Risk of bias	Certainty assessment				No of patients		Effect		Certainty
			Inconsistency	Indirectness	Imprecision	Other considerations	prophylactic antibiotics	no antibiotics	Relative (95% CI)	Absolute (95% CI)	
Empyema (Prospective)											
11	randomised trials	not serious	not serious	not serious	not serious	none	7/659 (1.1%)	42/562 (7.5%)	OR 0.22 (0.11 to 0.45)	57 fewer per 1,000 (from 66 fewer to 40 fewer)	⊕⊕⊕⊕ High
Empyema (Prospective)											
2	observational studies	serious ^a	not serious	not serious	not serious	none	37/398 (9.3%)	54/456 (11.8%)	OR 0.95 (0.58 to 1.53)	5 fewer per 1,000 (from 46 fewer to 52 more)	⊕○○○ Very low
Empyema (Retrospective)											
1	observational studies	very serious ^a	serious ^b	not serious	not serious	none	19/740 (2.6%)	2/199 (1.0%)	OR 2.60 (0.60 to 11.24)	16 more per 1,000 (from 4 fewer to 92 more)	⊕○○○ Very low
Penetrating Empyema (Prospective)											
8	randomised trials	not serious	not serious	not serious	not serious	none	5/358 (1.4%)	29/326 (8.9%)	OR 0.25 (0.10 to 0.59)	65 fewer per 1,000 (from 79 fewer to 34 fewer)	⊕⊕⊕⊕ High
Blunt Empyema (Prospective)											
4	randomised trials	not serious	not serious	not serious	not serious	none	1/193 (0.5%)	5/129 (3.9%)	OR 0.25 (0.06 to 1.12)	29 fewer per 1,000 (from 36 fewer to 4 more)	⊕⊕⊕⊕ High

Antibiotic prophylaxis for tube thoracostomy placement in trauma: a practice management guideline from the Eastern Association for the Surgery of Trauma

Jennifer J Freeman ¹⁰,¹ Sofya H Asfaw,² Cory J Vatsas,³ Brian K Yorkgitis ¹⁰,⁴ Krista L Haines,³ J Bracken Burns,⁵ Dennis Kim,⁶ Erica A Loomis,⁷ Andy J Kerwin,⁴ Amy McDonald,⁸ Suresh Agarwal, Jr.,³ Nicole Fox,⁹ Elliott R Haut ¹⁰,¹⁰ Marie L Crandall ¹⁰,⁴ John J Como ¹⁰,¹¹ George Kasotakis ¹⁰,³

Nº of studies	Study design	Risk of bias	Certainty assessment				No of patients		Effect		Certainty
			Inconsistency	Indirectness	Imprecision	Other considerations	prophylactic antibiotics	no antibiotics	Relative (95% CI)	Absolute (95% CI)	
Pneumonia (Prospective)											
10	randomised trials	not serious	not serious	not serious	not serious	none	24/573 (4.2%)	47/477 (9.9%)	OR 0.37 (0.19 to 0.73)	60 fewer per 1,000 (from 78 fewer to 25 fewer)	⊕⊕⊕⊕ High
Pneumonia (Prospective)											
1	observational studies	very serious ^a	serious ^b	not serious	not serious	none	6/272 (2.2%)	4/272 (1.5%)	OR 1.51 (0.42 to 5.42)	7 more per 1,000 (from 8 fewer to 60 more)	⊕○○○ Very low
Pneumonia (Retrospective)											
1	observational studies	very serious ^a	not serious	not serious	not serious	none	21/740 (2.8%)	0/199 (0.0%)	OR 11.92 (0.72 to 197.69)	0 fewer per 1,000 (from 0 fewer to 0 fewer)	⊕○○○ Very low
Mortality (Prospective)											
2	randomised trials	not serious	not serious	not serious	not serious	none	1/56 (1.8%)	1/54 (1.9%)	OR 0.97 (0.10 to 9.58)	1 fewer per 1,000 (from 17 fewer to 135 more)	⊕⊕⊕⊕ High
Mortality (Prospective)											
1	observational studies	serious ^a	not serious	not serious	not serious	none	24/272 (8.8%)	29/272 (10.7%)	OR 0.81 (0.46 to 1.43)	18 fewer per 1,000 (from 55 fewer to 39 more)	⊕○○○ Very low
Mortality (Retrospective)											
1	observational studies	very serious ^a	not serious	not serious	not serious	none	3/740 (0.4%)	3/199 (1.5%)	OR 0.27 (0.05 to 1.33)	11 fewer per 1,000 (from 14 fewer to 5 more)	⊕○○○ Very low



E le raccomandazioni in passato?

LG EAST-2000

Practice Management Guidelines for Prophylactic Antibiotic Use in Tube Thoracostomy for Traumatic Hemopneumothorax: The EAST Practice Management Guidelines Work Group

Paul A. Lockhart, MD; Philip S. Barie, MD; Michael F. O'Donnell, MD; David A. Speer, MD; C. Donald Miller, PhD; Francis Palumbo, PhD, JD, and Michael D. Pungello, MD

TABLE 1. Prophylactic antibiotics in trauma patients with tube thoracostomy: evidentiary table

First Author	Year	Reference	Class	Antibiotic	No. of Patients	Duration*	Pneumonia (%)	Empyema (%)
Grover FL	1977	Prophylactic antibiotics in the treatment of penetrating chest wounds: A prospective double-blinded study. <i>J Thorac Cardiovasc Surg</i> 74:528-536	I	Clindamycin Placebo	38 37	1-5 days N/A	10.5 35.1	2.6 16
Stone HH	1981	Cefamandole for prophylaxis against infection in closed tube thoracostomy. <i>J Trauma</i> 21:975-977	I	Placebo Cefamandole	43 40	48 h after CT discontinued	12 0	4.7 2.5
Cent PJ	1993	Antibiotic prophylaxis is indicated for chest stab wounds requiring closed tube thoracostomy. <i>Br J Surg</i> 80:464-466	I	Cefazolin Placebo	57 58	24 h 24 h	12 34	0 9
Nichols RL	1994	Preventive antibiotic usage in traumatic thoracic injuries requiring closed tube thoracostomy. <i>Chest</i> 106:1493-1498	I	Cefonicid	63	Until CT removed	0	0
LeBlanc KA	1985	Prophylactic antibiotics and closed tube thoracostomy. <i>Surg Gynecol Obstet</i> 160:259-263	II	Placebo Cephapirin Placebo	56 26 26	24 h after CT discontinued	5 3.8 3.8	5 0 3.8
Mandal AK	1985	Prophylactic antibiotics and no antibiotics compared in penetrating chest trauma. <i>J Trauma</i> 25:639-643	II	Doxycycline	40	Until CT removed	0	0
LoCurto JJ Jr	1986	Tube thoracostomy and trauma: antibiotics or not? <i>J Trauma</i> 26:1067-1072	II	Placebo Placebo Cefoxitin	40 28 30	12 h after CT discontinued	2.5 14 3	0 18 0
Brunner RG	1990	The role of antibiotic therapy in the prevention of empyema in patients with an isolated chest injury (S55 9-10): A prospective study. <i>J Trauma</i> 30:1148-1154	II	No antibiotics Cefazolin	46 44	Until CT removed	6.5	13
Demetriades D	1991	Antibiotic prophylaxis in penetrating injuries of the chest. <i>Ann R Coll Surg Engl</i> 73:348-351	II	Ampicillin IV before tube insertion Oral until CT discontinued	95 93	Pre-tube insertion Oral until CT discontinued	3.1 2.1	0 1.1

Conclusions

III Meta-analysis performed of 6 randomized studies. Outcomes evaluated included empyema, effusion, pneumonia, wound infection, tracheitis. Concluded: Antibiotics should be used and maximize therapy for *Staphylococcus aureus*.

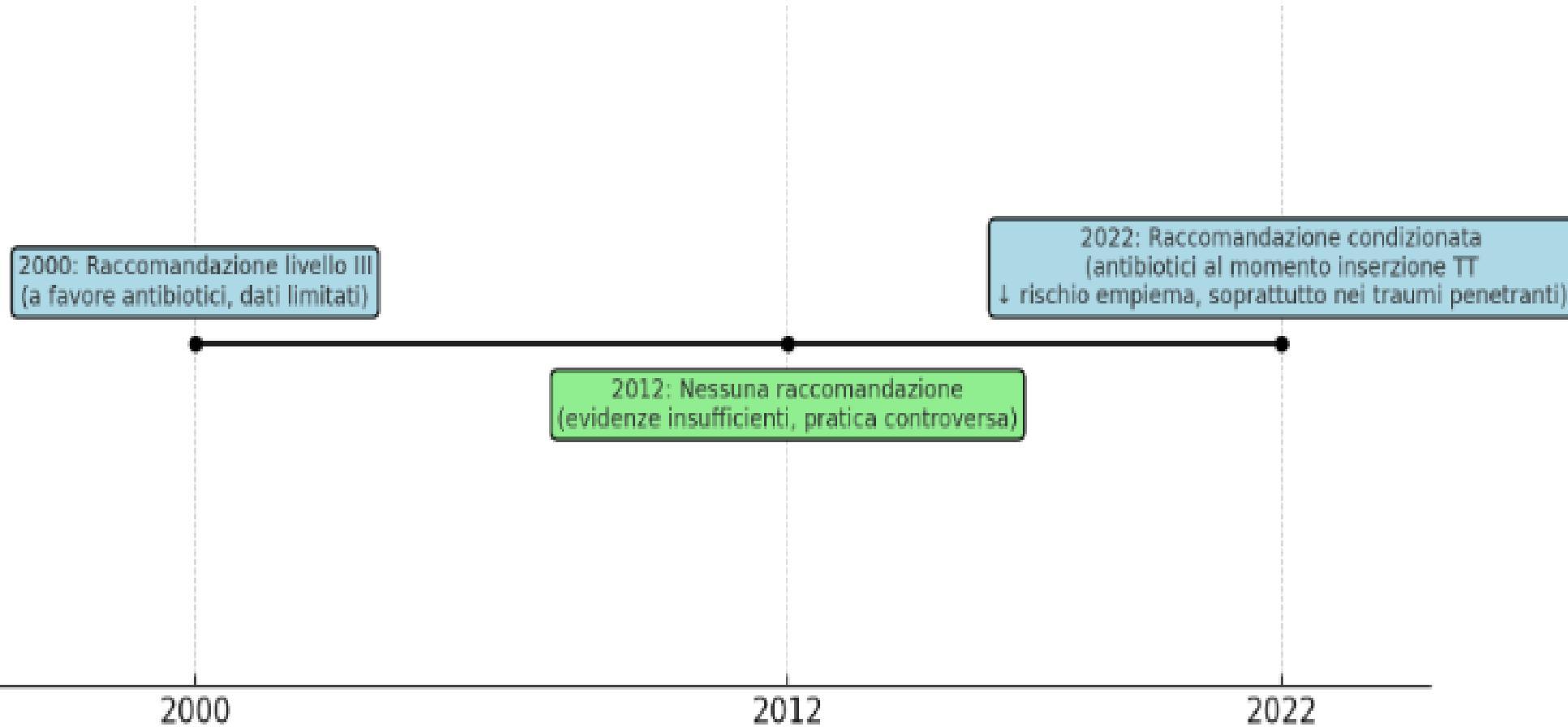
Evans JT 1995: Meta-analysis of antibiotics in tube thoracostomy. *Am Surg* 61:215-219

Fallon WF Jr 1992: Prophylactic antibiotics for the prevention of infectious complications including empyema following tube thoracostomy for trauma: Results of meta-analysis. *J Trauma* 33:110-117

III Meta-analysis of same 6 studies as Evans et al. Only evaluated 4 studies which used first- or second-generation cephalosporins. Determined impact on early empyema and other infectious complications. Concluded: Antibiotic prophylaxis with broad-spectrum first-generation cephalosporin may reduce the potential infectious complications, including empyema that are associated with tube thoracostomy.



Evoluzione delle linee guida EAST sugli antibiotici in TT per trauma toracico





Cosa succede da noi?

- Studio retrospettivo osservazionale monocentrico condotto nel nostro Trauma Center dal gennaio 2022 a Luglio 2025
- Obiettivo: incidenza di empiema in pazienti sottoposti a drenaggio toracico entro 72H dal ricovero

ANNO	N.DRENAGGI <=72 ORE	ATB_SI	ATB_NO	N. DRENAGGI <=72 ORE (NO PIG TAIL)	ATB_SI	ATB_NO
2022	59	16	43	55	16	39
2023	48	13	35	47	13	34
2024	47	15	32	44	13	31
07/2025 (stima)	30	9	21	28	8	20
TOTALE	184	53	131	174	50	124

ANNO	EMPIEMA SI	EMPIEMA NO	TOTALE RIGA
ATB_SI	1	49	50
ATB_NO	1	123	124
TOTALE COLONNA	2	172	174



Risultati

Gruppo	Empiema Si / Totale	Incidenza (%)	Odds Ratio (vs ATB No)	IC 95%
ATB si	1 / 50	2,0%	2,51	0,15 – 40,93
ATB no	1 / 124	0,8%	Ref.	–
Totale	2 / 174	1,1%	—	—

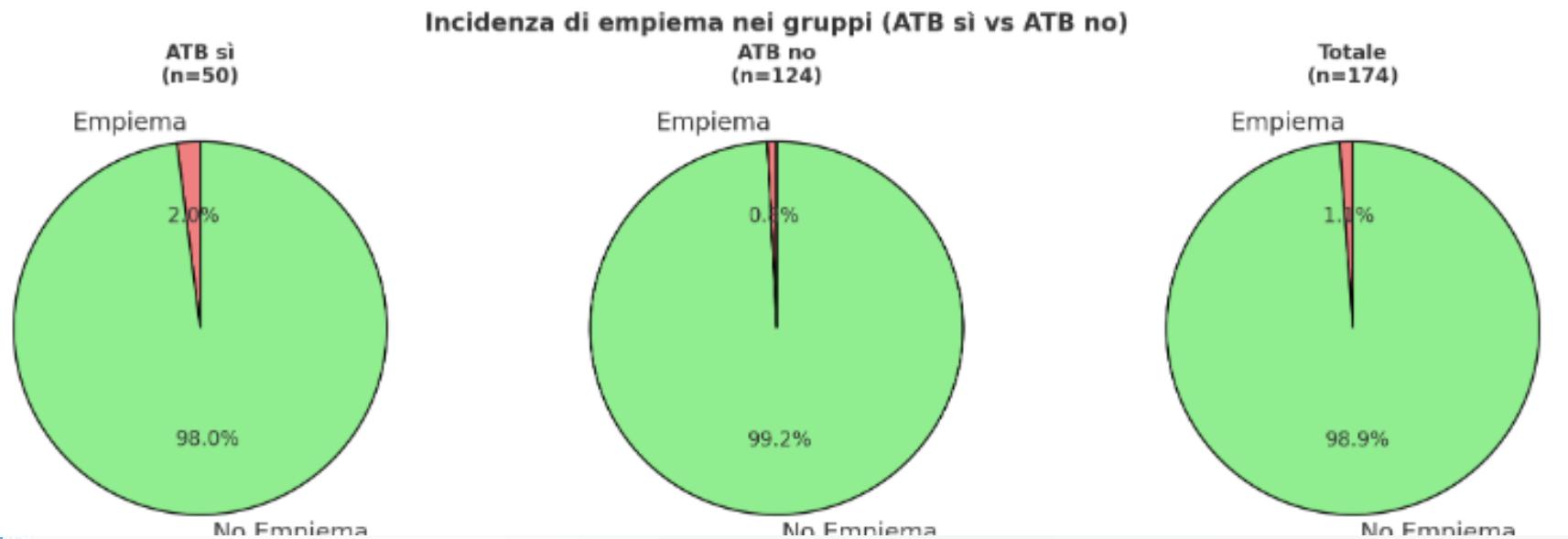


Categoria	ATB (casi/N)	Incidenza %	NO ATB (casi/N)	Incidenza %
Tutti i traumi – prospettici_EAST	44 / 1057	4,2 %	96 / 1018	9,4 %
Traumi penetranti – RCT_EAST	5 / 358	1,4 %	29 / 326	8,9 %
Traumi contusivi – RCT_EAST	N.R.	—	N.R.	—
Tutti i traumi – retrospettivi_EAST	19 / 740	2,6 %	2 / 199	1,0 %
Casistica Ria_OM	1 / 50	2 %	1 / 124	0,8%



Conclusioni

- L'incidenza di empiema post-drenaggio nel TT è risultata molto bassa(1%)
- Nessuna evidenza di beneficio della profilassi antibiotica
- I risultati sottolineano l'importanza del setting



Antibiotic prophylaxis in trauma: Global Alliance for Infection in Surgery, Surgical Infection Society Europe, World Surgical Infection Society, American Association for the Surgery of Trauma, and World Society of Emergency Surgery guidelines

Federico Coccolini ¹, Massimo Sartelli, Robert Sawyer, Kemal Rasa, Marco Ceresoli, Bruno Viaggi, Fausto Catena, Dimitrios Damaskos, Enrico Cicuttin, Camilla Cremonini, Ernest E Moore, Walter L Biffl, Raul Coimbra

Affiliations + expand

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Thoracic trauma

- Antibiotic prophylaxis in healthy patients sustaining blunt thoracic trauma is not indicated (moderate recommendation, intermediate-quality evidence).
- Antibiotic prophylaxis is not indicated in blunt thoracic trauma patients undergoing chest tube placement (moderate recommendation, intermediate-quality evidence).
- Antibiotic prophylaxis is indicated in penetrating thoracic trauma patients undergoing chest tube placement (moderate recommendation, intermediate-quality evidence).
- Antibiotic prophylaxis is indicated in all cases of delayed drainage of retained hemothorax (moderate recommendation, intermediate-quality evidence).
- Antibiotic prophylaxis is indicated in blunt and penetrating thoracic trauma cases undergoing surgical exploration (thoracotomy/thoracoscopy) (moderate recommendation, intermediate-quality evidence).



Take Home message

- L'uso della profilassi mirata appare ragionevole nei casi a maggior rischio, come procedure invasive in emergenza o condizioni di asepsi subottimale utilizzando uno shot singolo di cefazolina. In queste occasioni il potenziale beneficio supera il rischio di uso inappropriato di antibiotici.
- Il razionale delle linee guida GAIA 2024 può essere considerato valido e condivisibile
- Necessità di ulteriori studi, soprattutto multicentrici



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Grazie per l'attenzione