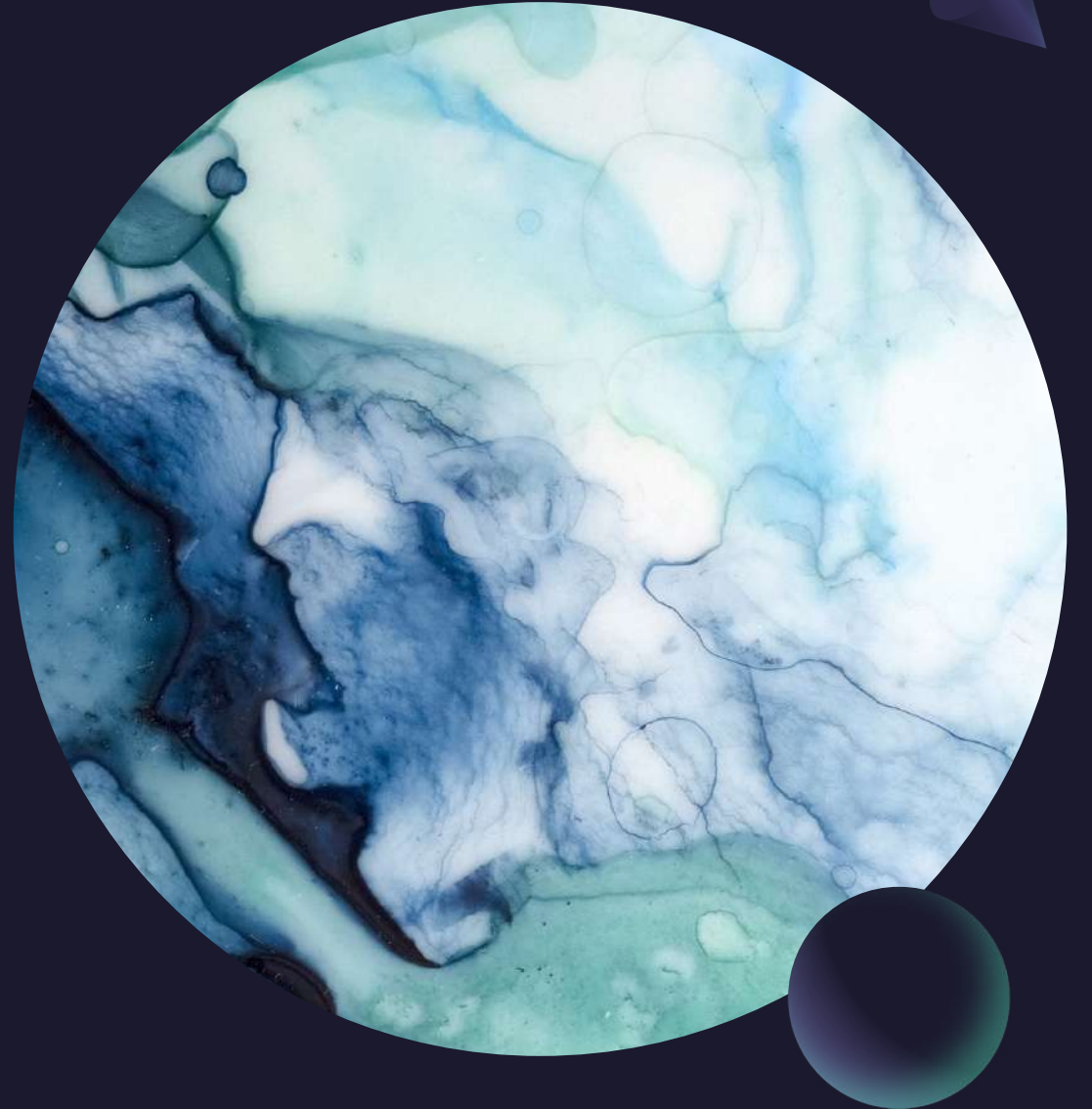


Travma Hastalarında Akılcı Antimikrobiyal Kullanımı

HÜSREV DİKTAŞ

SEYRANTEPE HAMİDİYE ETFAL EAH
ENFEKSİYON HAST. VE KLİN. MİKROB. AD



SUNU PLANI

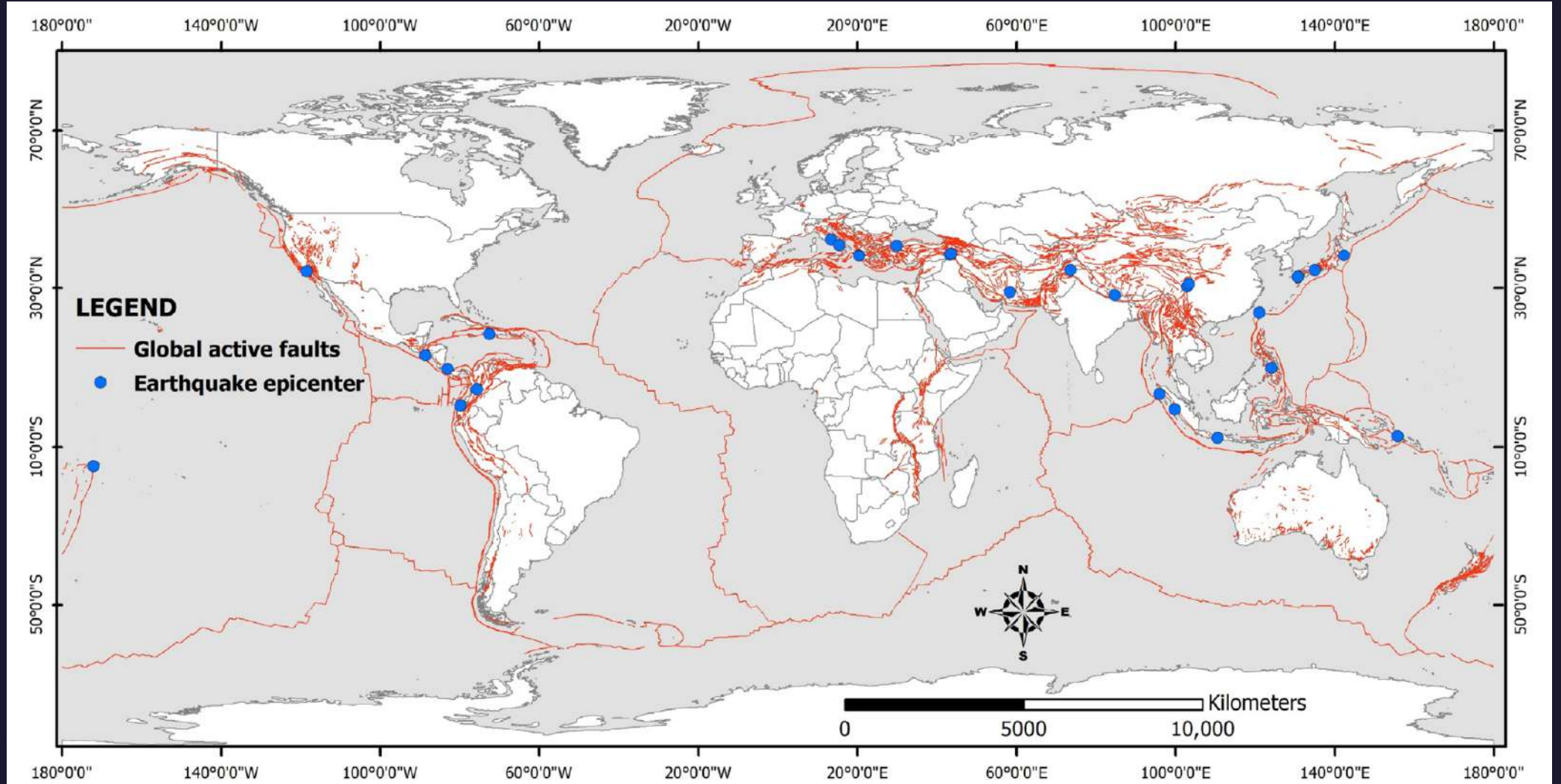
- Afet nedir ve Enfeksiyon Hastalıkları uzmanları açısından dönemsel farklılıklar
 - Cilt enfeksiyonları
 - Kemik kırıkları
 - Nekrotizan yumuşak doku enfeksiyonları
 - Tetanoz profilaksisi
 - Penetran göğüs ve abdomen yaralanmaları
 - Solunum yolu enfeksiyonları
 - GIS enfeksiyonları



Afet nedir?



Dünya üzerinde aktif fay hatları



Ülkemizde fay hatları



Deprem sonrası dönemler

Faz-1

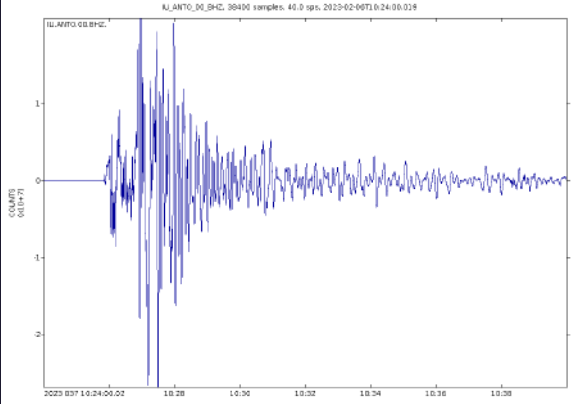
0-4. günler

Faz-3

30 günün üzerinde

4-30. günler

Faz-2

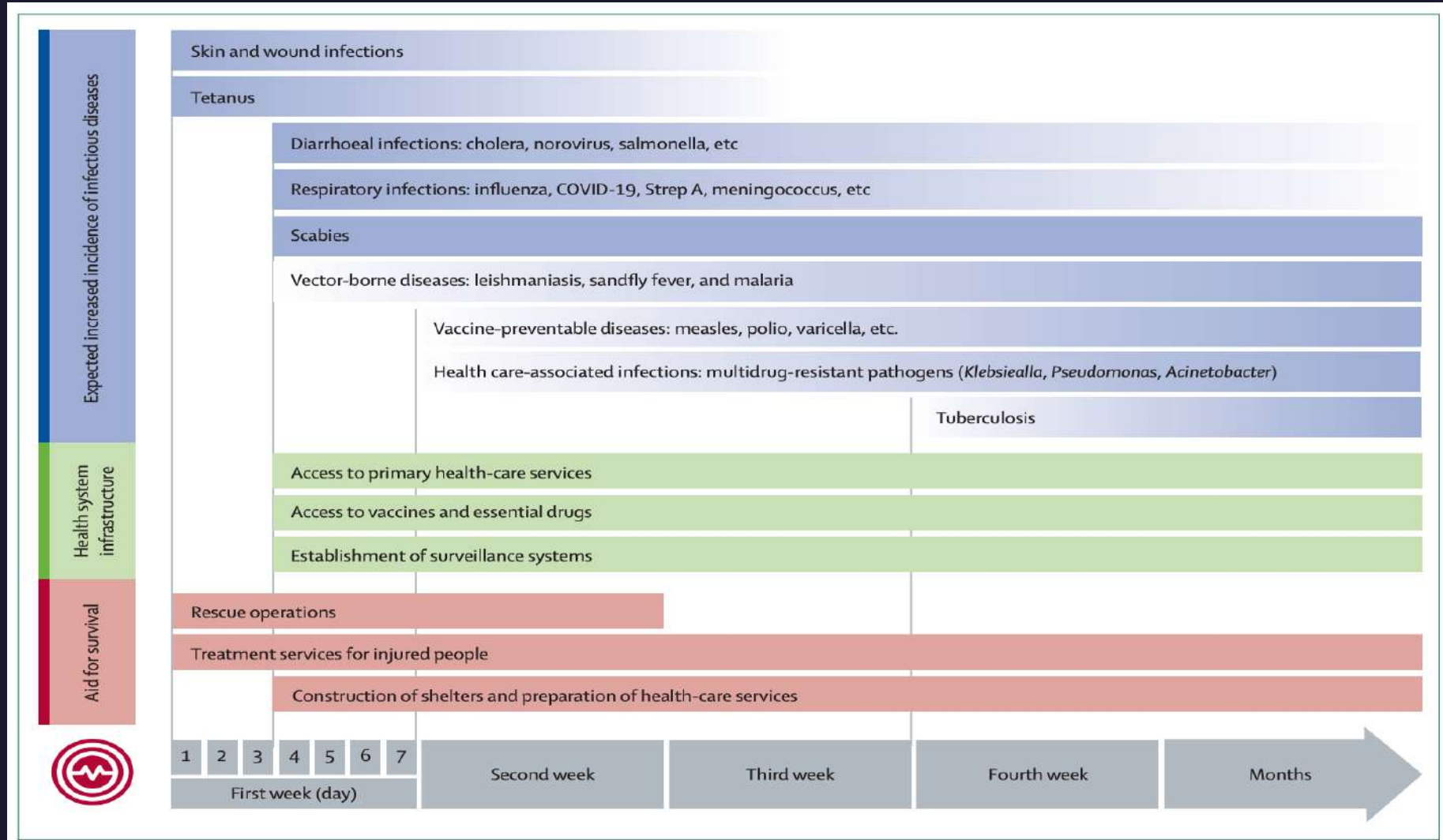


Enfeksiyonlara yatkınlık oluşturma

Table 2. Risk factors and onset of communicable diseases following natural disasters [†] .														
Major risk factors following natural disasters	Water-borne diseases			Air-borne/droplet diseases			Vector-borne diseases		Contamination from wounded injuries		Clinical phase of natural disasters			
	<i>Diarrhea (cholera; dysentery)</i>	<i>Leptospirosis</i>	<i>Hepatitis</i>	<i>ARI (pneumonia/ influenza)</i>	<i>Measles</i>	<i>Meningococcal meningitis</i>	<i>TB</i>	<i>Malaria</i>	<i>Dengue fever</i>	<i>Tetanus</i>	<i>Cutaneous mucormycosis</i>	<i>Impact phase (0–4 days)</i>	<i>Postimpact phase (4 days–4 weeks)</i>	<i>Recovery phase (>4 weeks)</i>
Population displacement from nonendemic to endemic areas								✓	✓					✓
Overcrowding (close and multiple contacts)	✓			✓	✓	✓	✓						✓	
Stagnant water after flood and heavy rains	✓	✓						✓	✓					✓
Insufficient/contaminated water and poor sanitation conditions	✓		✓										✓	
High exposure and proliferation to disease vectors		✓						✓	✓					
Insufficient nutrient intake/ malnutrition	✓			✓	✓		✓							✓
Low vaccination coverage					✓									
Injuries										✓	✓		✓	✓

[†]Disasters do not carry diseases/epidemics. Disease risk factors need to be in place and exacerbated as a result of the after effects of the disaster. ARI: Acute respiratory infection.

Deprem sonrası dönemler



Deprem sonrası dönemler

Scand J Infect Dis 35: 110–113, 2003

Taylor & Francis
healthsciences

Infectious Complications after Mass Disasters: The Marmara Earthquake Experience

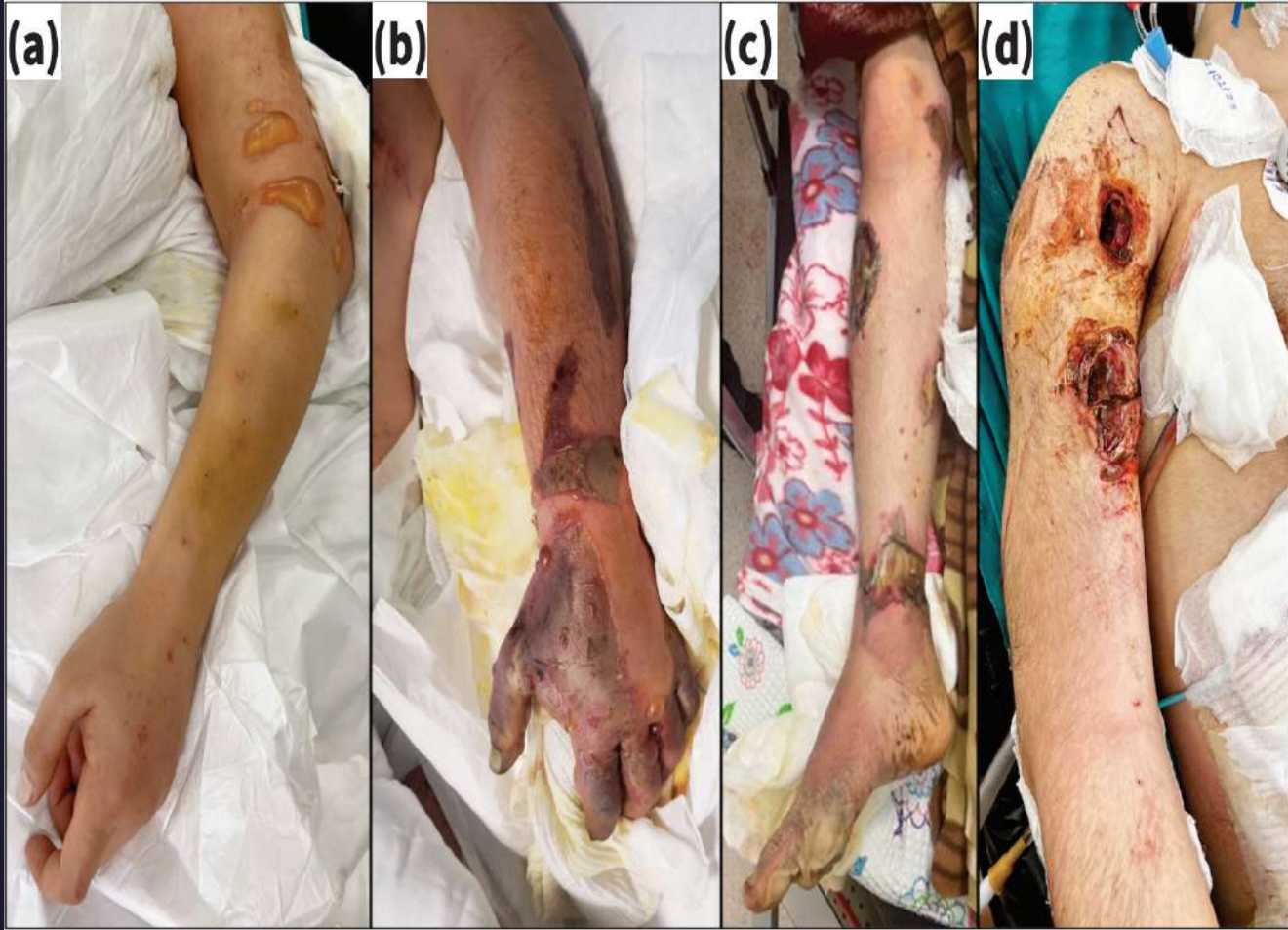
KENAN KEVEN¹, KENAN ATES¹, MEHMET SUKRU SEVER², MUJDAT YENICESU³,
BASOL CANBAKAN⁴, TURGAY ARINSOY⁵, NURHAN OZDEMIR⁶,
MURAT DURANAY⁷, BULENT ALTUN⁸ and EKREM EREK⁹

From the Department of Nephrology, ¹Ankara University Medical School, Ankara, ²Istanbul School of Medicine, Istanbul, ³Gulhane Military Hospital, Ankara, ⁴Ankara Numune State Hospital, Ankara, ⁵Gazi University Medical School, Ankara, ⁶Baskent University Medical School, Ankara, ⁷Diskapi Social Security Hospital, Ankara, ⁸Hacettepe University Medical School, Ankara, and ⁹Cerrahpasa School of Medicine, Istanbul, Turkey

Table I. Frequency of infectious complications in patients with nephrological problems after the Marmara earthquake

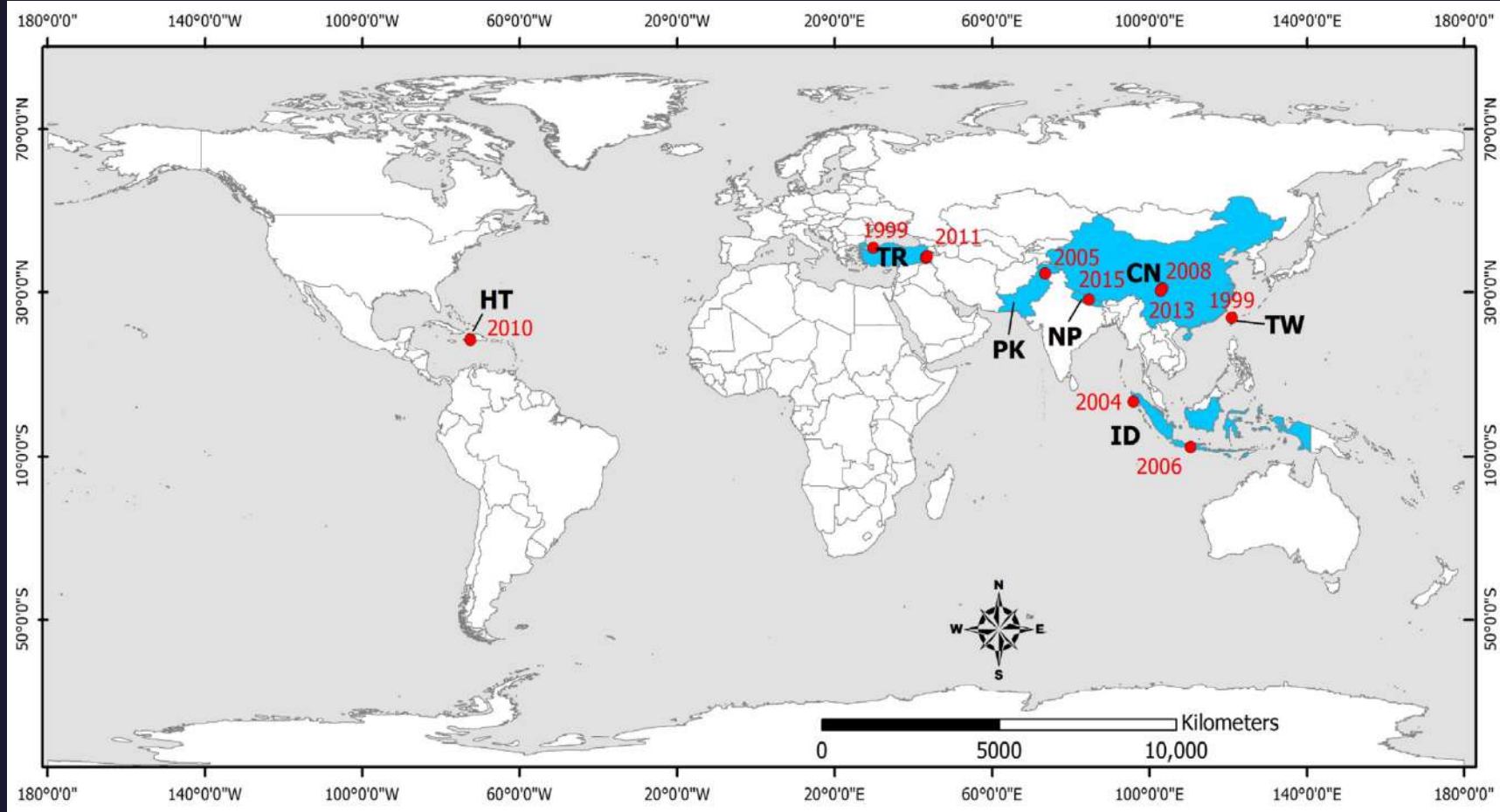
Type of infection	Patients <i>n</i> (%)
Sepsis	121 (18.9)
Wound infection	53 (8.3)
Pneumonia	41 (6.4)
Urinary infection	14 (2.2)
Gastroenteritis	5 (0.8)
Catheter infection	4 (0.6)

Deprem sonrası faz-1:Cilt enfeksiyonları



Komplike olmayan	Komplike
İmpetigo	Nekrotizan enfeksiyonlar
Ektima	Nekrotizan fasit
Folikülit	Fournier gangreni
Karbonkül	Anaerob gangren
Erizipel	Derin apse
Selülit	Perianal enfeksiyon
Deri apsesi	Diyabetik ayak enfeksiyonu
Travmaya bağlı enfeksiyon	İnfekte dekübitis ülseri
	Ağır selülit
	İnsan/hayvan ısırığı ilişkili

Deprem sonrası faz-1:Cilt enfeksiyonları



Deprem sonrası faz-1:Cilt enfeksiyonları



Review

The Impact of Earthquakes on Public Health: A Narrative Review of Infectious Diseases in the Post-Disaster Period Aiming to Disaster Risk Reduction

Maria Mavrouli ^{1,*}, Spyridon Mavroulis ², Efthymios Lekkas ² and Athanassios Tsakris ¹

Table 5. Wound and skin infectious diseases transmitted during the post-earthquake earthquake-affected areas.

Earthquake Occurrence (DD/MM/YYYY)	Earthquake-Affected Area	Infectious Diseases (Causative Factors/Cases, Outbreaks, Epidemics)
		Infections/infestations, cutaneous superficial fungal infections (<i>Tinea pedis</i>), cases of viral skin diseases, insect bites
17/08/1999	Izmit, Turkey	Infectious complications (wound infections): gram-negative bacteria (mainly <i>Acinetobacter</i> spp.), <i>Staphylococcus</i> spp.
		Wound infections: Gram-negative bacteria (<i>Acinetobacter baumannii</i> , <i>P. aeruginosa</i> , <i>Escherichia coli</i> , <i>Klebsiella pneumoniae</i> , <i>Stenotrophomonas maltophilia</i>) and <i>Staphylococcus</i> spp. (630 injured)

KEMİK KIRIKLARI

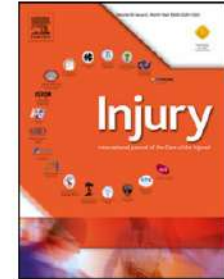


ELSEVIER

Contents lists available at [ScienceDirect](#)

Injury

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



Prevention of infection in open fractures: Where are the pendulums now?★

Markus Rupp, Daniel Popp, Volker Alt*

Department of Trauma Surgery, University Medical Centre Regensburg, Franz-Josef-Strauss-Allee 11, 93053 Regensburg, Germany



CURRENT CONCEPTS REVIEW

Gram-Negative Antibiotic Coverage in Gustilo-Anderson Type-III Open Fractures

Thomas L. Hand, MD, Elizabeth O. Hand, PharmD, BCIDP, Amber Welborn, PharmD, and Boris A. Zelle, MD

Investigation performed at UT Health San Antonio, San Antonio, Texas

TABLE III Grades of Recommendation

Recommendation	Grade*
Cefazolin monotherapy for open fracture prophylaxis (types I, II, and III)	B
24-hr duration of antibiotic prophylaxis (types I, II, and III)	B
24 to 72-hr duration of antibiotic prophylaxis (type III)	C
Routine use of EGN antibiotic coverage for type-III open fractures	I
Routine use of ceftriaxone for type-III open fractures	I
Routine use of piperacillin-tazobactam for type-III open fractures	I

KEMİK KIRIKLARI



**Cochrane
Library**

Cochrane Database of Systematic Reviews

Antibiotics for preventing infection in open limb fractures (Review)

Gosselin RA, Roberts I, Gillespie WJ

Açık kırıkların sonrasında erken enfeksiyon riskini önemli ölçüde azaltan bir profilaktik antibiyotik rejimi olarak, mümkün olan en kısa sürede başlanan, gram-pozitif organizmalara karşı etkili bir rejim (örneğin, dikloksasilin veya flukloksasilin gibi dar spektrumlu bir beta-laktam ajan veya birinci nesil bir sefalosporin), iyi bir yara yönetimi ile birlikte kullanıldığında etkili olmaktadır.

KEMİK KIRIKLARI

EFFECTS OF ANTIBIOTIC PROPHYLAXIS IN PATIENTS WITH OPEN FRACTURE OF THE EXTREMITIES

A Systematic Review of Randomized Controlled Trials

Randomize kontrollü çalışmaların sonuçları, antibiyotik profilaksisinin sonraki enfeksiyonları azalttığına dair kanıtlar sunmakta ve **bir gün süren uygulamaların 3-5 gün süren rejimler kadar etkili** olduğunu göstermektedir.

KEMİK KIRIKLARI

SURGICAL INFECTIONS
Volume 18, Number 8, 2017
© Mary Ann Liebert, Inc.
DOI: 10.1089/sur.2017.108

Review

Duration of Administration of Antibiotic Agents for Open Fractures: Meta-Analysis of the Existing Evidence

Juergen Messner,¹ Costas Papakostidis,² Peter V. Giannoudis,¹ and Nikolaos K. Kanakaris¹

GustiloAnderson type I and II veya Gustilo-Anderson type III kırıklarda profilaktik olarak başlanılan antibiyotik tedavisinin 72 saat veya üzerinde kullanılmasının herhangi olumlu bir etki yapmadığı gösterilmiştir.

KEMİK KIRIKLARI

ORIGINAL ARTICLE

Type III Open Tibia Fractures: Immediate Antibiotic Prophylaxis Minimizes Infection

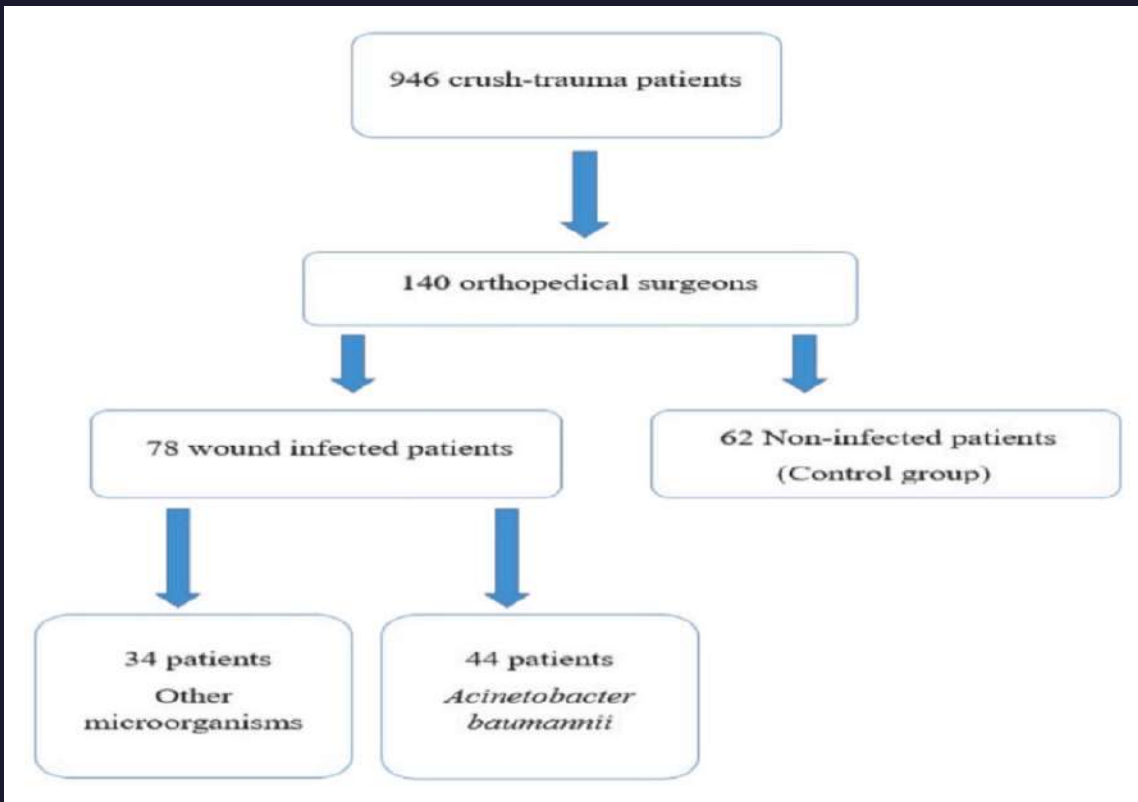
William D. Lack, MD, Madhav A. Karunakar, MD,† Marc R. Angerame, MD,†
Rachel B. Seymour, PhD,† Stephen Sims, MD,† James F. Kellam, MD,† and Michael J. Bosse, MD†*

Yaralının hastaneye yatışından önce, kazanın meydana geldiği yerde birincil bakım sırasında **antibiyotiklerin derhal uygulanmasını kesin bir şekilde önermektedir.**

KEMİK KIRIKLARI

INJURY	INITIAL SURGICAL INTERVENTION	COMMON PATHOGENS	PREFERRED THERAPY	**SEVERE ALLERGY TO PREFERRED THERAPY	FREQUENCY/DURATION	COMMENTS
Extremity Bones (Orthopedic Surgery) – Gustilo-Anderson Classification¹⁸⁻²²						
Grade I	Skin wound < 1 cm in length and clean	Skin flora including <i>S. aureus</i>	Cefazolin	Vancomycin	Once	Irrigate using antiseptic (e.g., povidone-iodine solution) then pack (6-8)
Grade II	Skin wound >1 cm in length without extensive tissue damage, flaps, or avulsions	Skin flora including <i>S. aureus</i>	Cefazolin	Vancomycin +Metronidazol	24hr after debridement & coverage. 72hr if debridement but no coverage.	
Grade III	> 10 cm wound with extensive soft tissue injury or traumatic amputation	Skin flora including <i>S. aureus</i> , Gram-negatives	Ceftriaxone	Vancomycin + Aztreonam		
Open Fracture with farm soil, fecal, or freshwater[^] contamination, crush injury, compartment syndrome or vascular injury	Any size skin wound	[^] Additional pathogens: Anaerobes, <i>Clostridium</i> (soil), <i>P. aeruginosa</i> , <i>Aeromonas hydrophilia</i> (freshwater), <i>Vibrio vulnificus</i> (saltwater)	Piperacillin-tazobactam ** if saltwater contamination: add doxycycline	Vancomycin + Aztreonam + Metronidazole ** if saltwater contamination: add doxycycline		

KEMİK KIRIKLARI



	Control n = 62 (%)	<i>Acinetobacter baumannii</i> n = 44 (%)	P
Result of wound			
Amputation requirement	3 (4.8)	14 (31.8)	<.001
Progression on the amputation line	1 (1.6)	9 (20.5)	
Recovery	58 (93.5)	21 (47.7)	

Journal of Infection Control

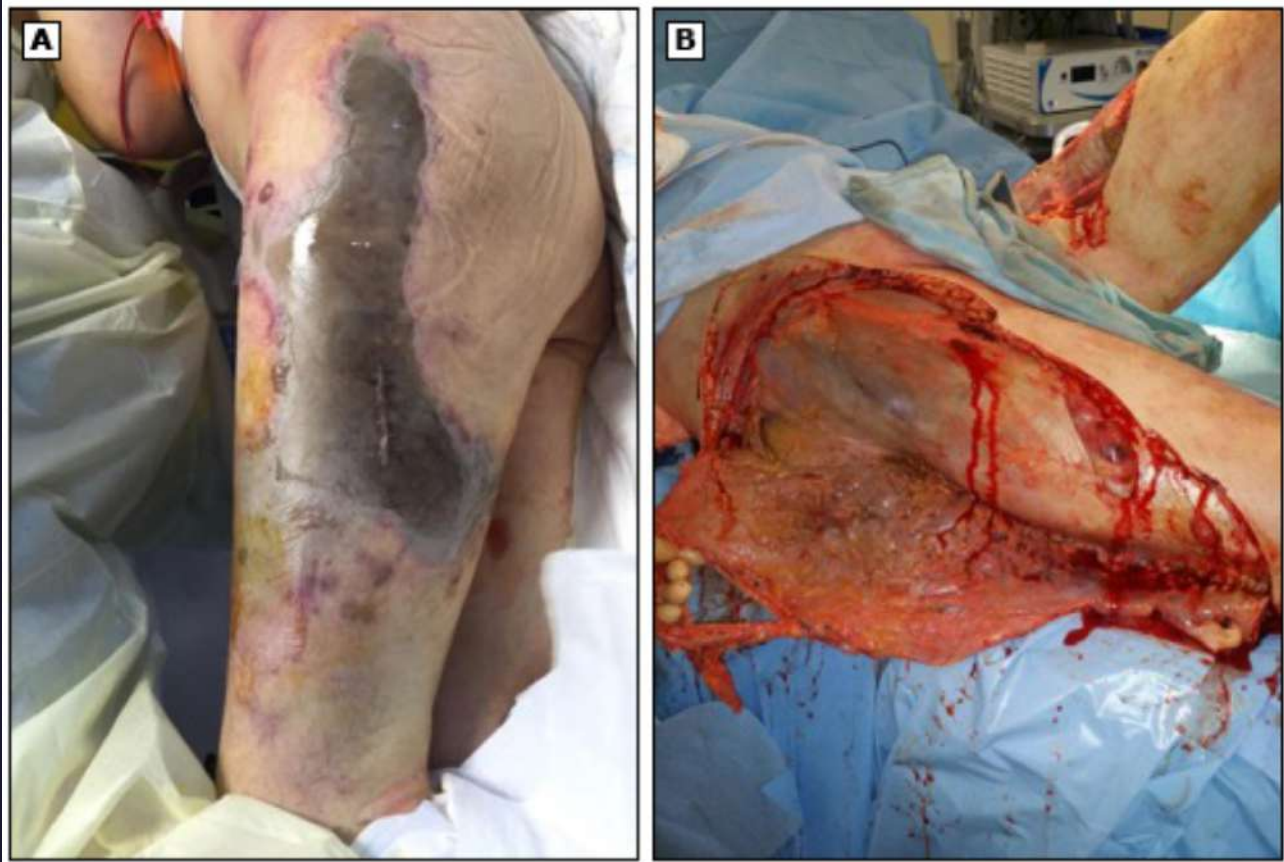
page: www.ajicjournal.org



infection due to *Acinetobacter baumannii*

Firat Ozan^d, Esma Saatci MD^e,
Toker^a, İlhami Celik^a

NEKROTİZAN YUMUŞAK DOKU ENFEKSİYONLARI



NEKROTİZAN YUMUŞAK DOKU ENFEKSİYONLARI

Presence of gas in soft tissue (on radiographic imaging)*

Polymicrobial (gram-positive cocci, gram-positive rods, gram-negative cocci, and gram-negative rods)

Absence of gas in soft tissue (on radiographic imaging)*

Gram-positive cocci

Necrotizing fasciitis type II (monomicrobial)

- Group A *Streptococcus* or other beta-hemolytic streptococci
- *Staphylococcus aureus* (methicillin-sensitive [MSSA] or methicillin-resistant [MRSA])

Necrotizing myositis due to group A *Streptococcus* or other beta-hemolytic streptococci

Gram-negative rods

Aeromonas species – Freshwater exposure

Vibrio species – Saltwater exposure

- Clostridial (anaerobic) cellulitis
 - *C. perfringens* – More common
 - *C. septicum* – Less common

NEKROTİZAN YUMUŞAK DOKU ENFEKSİYONLARI

Vankomisin V Daptomisin

Karbepenem V Pip-Tazo

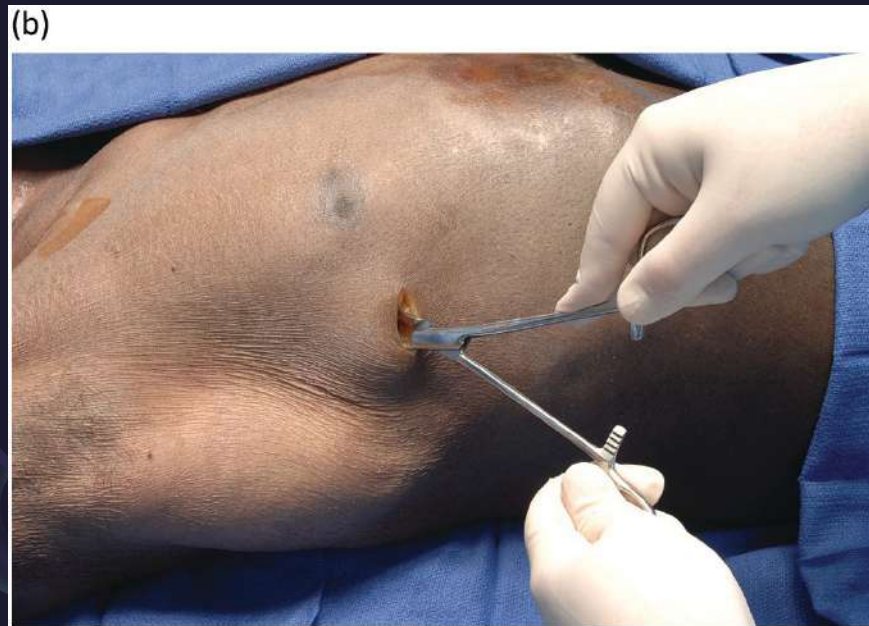
Klindamisin

TETANOZ PROFİLAKSİSİ

Bağışıklama Durumu	Temiz ve minör yaralanma		Tüm diğer yaralanmalar	
	Td	TIG	Td	TIG (250 I.U)
Bilinmiyor veya < 3 doz	Evet	Hayır	Evet	Evet
≥ 3 doz	Son dozdan sonra ≥10 yıl geçmişse 1 doz	Hayır	Son dozdan sonra ≥5 yıl geçmişse	Hayır

PENETRAN GÖĞÜS TRAVMALARI

INJURY	INITIAL SURGICAL INTERVENTION	COMMON PATHOGENS	PREFERRED THERAPY	**SEVERE ALLERGY TO PREFERRED THERAPY	FREQUENCY/DURATION	COMMENTS
Penetrating thoracic injury	Chest tube ¹⁻³	Skin flora including <i>S. aureus</i>	Cefazolin	Vancomycin	One-time dose Pre-procedural	



ABDOMEN TRAVMALARI

CLINICAL MANAGEMENT UPDATE

Practice Management Guidelines for Prophylactic Antibiotic Use in Penetrating Abdominal Trauma: The EAST Practice Management Guidelines Work Group

Luchette, Fred A. MD; Borzotta, Anthony P. MD; Croce, Martin A. MD; O'Neill, Patricia A. MD; Whittmann, Dietmar H. MD; Mullins, C. Daniel PhD; Palumbo, Francis PhD, JD; Pasquale, Michael D. MD

[Author Information](#) 

The Journal of Trauma: Injury, Infection, and Critical Care 48(3):p 508-518, March 2000.

Level I önerisi, penetran karın yaraları olan travma hastaları için **geniş spektrumlu aerobik ve anaerobik kapsama sahip bir tek doz antibiyotiğin** standart bakım olduğunu belirtmiştir. Bağırsak yaralanması yoksa ek antimikrobiyal dozlar gerekli değildir. Boş organ yaralanması olduğunda **antibiyotiklerin 24 saat devam ettirilmesini destekleyen** bir level II önerisi bulunmaktadır. Ayrıca, hemorajik şokla başvuran hastalar için antibiyotik dozajının değiştirilmesiyle ilgili seviye 3 önerileri yapılmıştır.

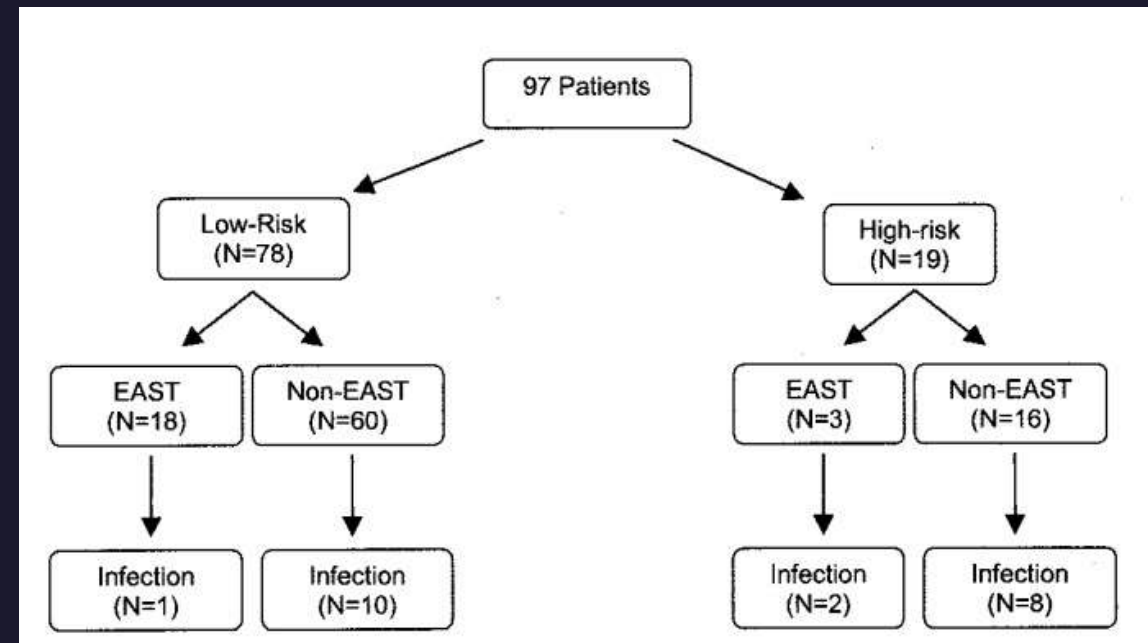
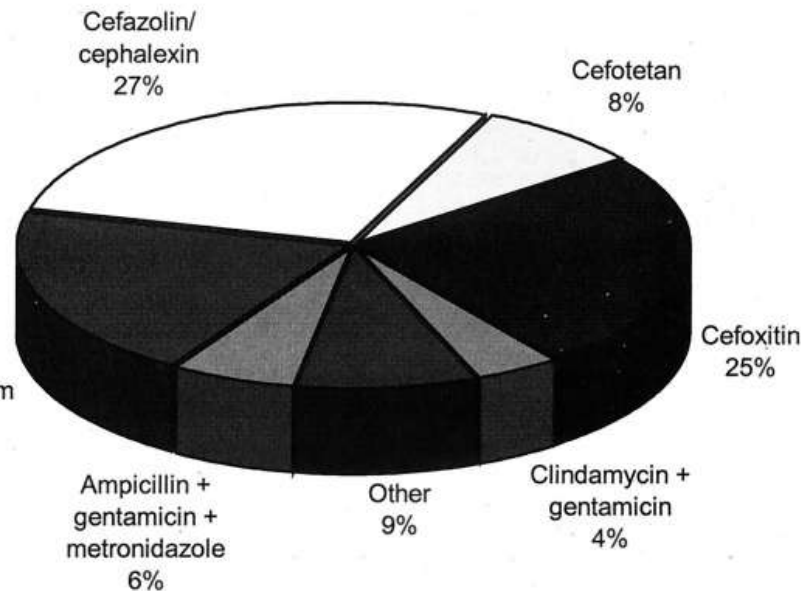
ABDOMEN TRAVMALARI

INJURY	INITIAL SURGICAL INTERVENTION	COMMON PATHOGENS	PREFERRED THERAPY	**SEVERE ALLERGY TO PREFERRED THERAPY	FREQUENCY/DURATION	COMMENTS
<p>Penetrating injury to abdomen</p> <p><i>Note: blunt trauma without hollow viscous injury does not require antimicrobial therapy</i></p>	Exploratory laparotomy +/- hollow viscus injury ^{4,5,6}	Skin flora including <i>S. aureus</i> +/- Gram-negatives, anaerobes	Cefazolin + Metronidazole	Vancomycin + Aztreonam + Metronidazole	One-time dose Pre-operative *	<p>* Duration dependent on surgical findings:</p> <ul style="list-style-type: none"> • If clean, no post-op antibiotics necessary • If spillage found, consider 24 hours only <p>**Consider 4-day course post source control of Piperacillin-tazobactam (Vancomycin + Aztreonam + Metronidazole if severe allergy)</p>

ABDOMEN TRAVMALARI

Characteristics of Prophylactic Antibiotic Strategies after Penetrating Abdominal Trauma at a Level I Urban Trauma Center: A Comparison with the EAST Guidelines

George Delgado, Jr., PharmD, Jeffrey F. Barletta, PharmD, Salmaan Kanji, PharmD, James G. Tyburski, MD, Robert F. Wilson, MD, and John W. Devlin, PharmD



ABDOMEN TRAVMALARI

CLINICAL MANAGEMENT UPDATE

Practice Management Guidelines for Prophylactic Antibiotic Use in Penetrating Abdominal Trauma: The EAST Practice Management Guidelines Work Group

Luchette, Fred A. MD; Borzotta, Anthony P. MD; Croce, Martin A. MD; O'Neill, Patricia A. MD; Whittmann, Dietmar H. MD; Mullins, C. Daniel PhD; Palumbo, Francis PhD, JD; Pasquale, Michael D. MD

Prophylactic antibiotic use in penetrating abdominal trauma: An Eastern Association for the Surgery of Trauma practice management guideline

Stephanie R. Goldberg, MD, Rahul J. Anand, MD, John J. Como, MD, Tracey Dechert, MD, Christopher Dente, MD, Fred A. Luchette, MD, Rao R. Ivatury, MD, and Therese M. Duane, MD

Deprem sonrası faz-2:

Earthquake Occurrence (DD/MM/YYYY)	Earthquake Affected Area	Infectious Diseases (Causative Factors–Cases, Outbreaks, Epidemics)
12/01/2010	Haiti	Acute respiratory infection (16.3%)
		Increase in tuberculosis in the affected population: 3-fold in a camp for internally displaced persons (693/100,000) and 5-fold in an urban slum (1165/100,000)
11/03/2011	Tōhoku, Japan	Tuberculosis
		43% of cases-community pneumonia (<i>Streptococcus pneumoniae</i> , <i>Moraxella catarrhalis</i> and <i>Haemophilus influenzae</i>)
20/04/2013	Lushan, China	Respiratory tract infections
		Respiratory infection (45.7%)
15/10/2013	Bohol, Philippines	Acute respiratory infections
		476/3555 children: positive to tuberculin skin reaction–TST, 16 with active tuberculosis
26/01/2014 03/02/2014	Cephalonia, Greece	Increase of respiratory infection cases
25/04/2015	Gorkha, Nepal	Pneumonia and post-streptococcal glomerulonephritis: high incidence among children from affected areas
		Upper respiratory tract infections
		Infections of the respiratory tract (42.3%)
		1 case of tuberculous peritonitis (1 girl 14 years old with fever, abdominal pain and vomiting)
14/04/2016, 16/04/2016	Kumamoto, Japan	Upper respiratory infections

Deprem sonrası faz-2:

Sađlık Bakanı Koca, Deprem Bölgelerindeki Sađlık Hizmetlerine İlişkin Son Durumu Paylaştı

1386

Transient Increase in Diarrheal Diseases after the Devastating Earthquake in Kocaeli, Turkey: Results of an Infectious Disease Surveillance Study

**Haluk Vahaboglu,¹ Sibel Gundes,¹ Aynur Karadenizli,²
Birsen Mutlu,¹ Sila Cetin,¹ Fethiye Kolayli,²
Figen Coskuncan,¹ and Volkan Dünder²**

*¹İnfeksiyon Hastalıkları ve Klinik Mikrobiyoloji and ²Mikrobiyoloji
ve Klinik Mikrobiyoloji Anabilim Dalı, Kocaeli Üniversitesi Tıp
Fakültesi, Kocaeli, Turkey*

<https://www.saglik.gov.tr/TR,94838/saglik-bakani-koca-deprem-bolgelerindeki-saglik-hizmetlerine-iliskin-son-durumu-paylasti.html>

Deprem sonrası faz-2:

- Haiti 2010 deprem sonrası kolera salgını



Deprem sonrası faz-2:

Dicle Tıp Dergisi /
Dicle Medical Journal

2014; 41 (2): 313-318
doi: 10.5798/diclemedj.0921.2014.02.0423

ÖZGÜN ARAŞTIRMA / ORIGINAL ARTICLE

Van depreminin su-kaynaklı bazı bulaşıcı hastalıklar üzerine etkisi

Impact of Van earthquake on some water-borne infectious diseases

Yasemin Bayram¹, Mehmet Parlak¹, Aytekin Çıkman², Cenk Aypak³

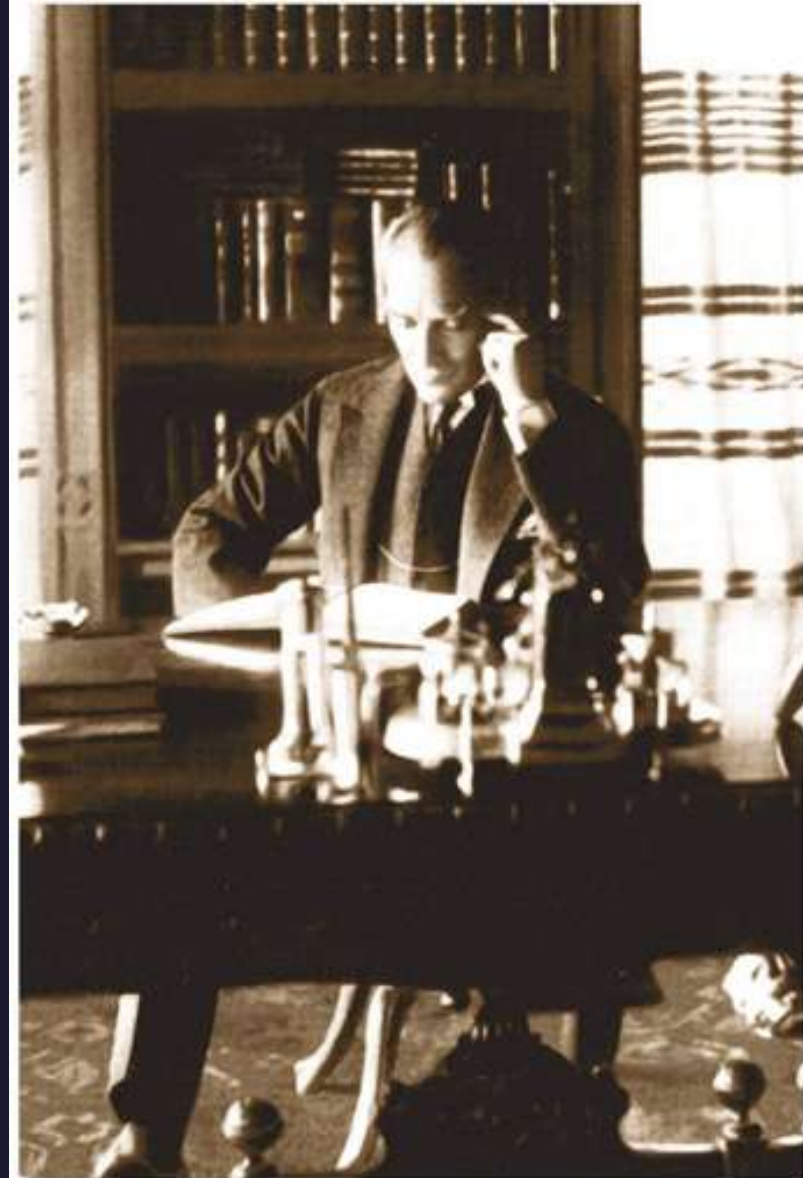
2011 yılındaki Van depremi sonrasında ilk 6 aylık dönemde 0-14 yaş ishali çocuklarda Adenovirus, Rotavirus, Hepatit A, Giardia intestinalis ve Entamoeba histolytica dispar'a yönelik olarak yapılan araştırmada yalnızca **G. intestinalis'in görülme oranının deprem öncesine göre artmış olduğu bildirilmiştir.**

Enfeksiyondan korunma

Table 3. Prevention and control checklist of recorded infectious diseases following natural disasters.

Prevention and control of infectious diseases following natural disasters	Water-borne diseases			Air-borne/droplet diseases				Vector-borne diseases		Contamination from injury/wound	
	Diarrhea (cholera; dysentery; others)	Leptospirosis	Hepatitis	ARI/pneumonia/ influenza	Measles	Meningococcal meningitis	TB	Malaria	Dengue fever	Tetanus	Cutaneous mucormycosis
Site planning	✓			✓	✓	✓					
Clean water	✓										
Good sanitation (e.g., excreta disposal)	✓		✓								
Solid waste management								✓	✓		
Water and food hygiene	✓		✓								
Nutrition and supplements				✓	✓		✓				
Vaccination					✓						
Vector control								✓	✓		
Personal hygiene (e.g., hand washing)	✓		✓	✓			✓				
Personal protection		✓		✓				✓	✓		
Insecticide-treated nets								✓			
Isolation of the sick				✓			✓				
Prophylactic treatment								✓			
Wound/injury care										✓	✓
Health education	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Disease management/treatment and or supportive care (follow national guidelines)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Specific communicable diseases applicable to the preventive and control measure given.
ARI: Acute respiratory infection.



Ankara, 12 Şubat 1925