13. ULUSAL ACİL TIP KONGRESİ
ATUDER Acil Tıp Uzmanları Derneği
EPAT Emergency Physicians Association of Turkey
4. INTERCONTINENTAL EMERGENCY MEDICINE CONGRESS
INTERNATIONAL CRITICAL CARE AND EMERGENCY MEDICINE CONGRESS
MARDAN PALACE HOTEL - ANTALYA
18-21 MAYIS 2017

Travma Yönetiminde Tüm Vücut Tomografisi

SON DURUM ve TARTIŞMALAR

Dr. Şeref Kerem Çorbacıoğlu
Keçiören EAH- Acil Tıp Kliniği

Sorun ne?

Travma hastalarında <u>hızlı</u> ve <u>doğru</u> tanı koymak ÖNEMLİ!!!

AZALIR

Mortalite

Morbitite

Bazı vaka ve açmaz örnekleri!!!

VAKA-1

55 yaş erkek, AİTK, stabil

ATLS

Tek kot kırığı
Pelvik ramus inferior kırığı

Özel Hastaneye gidiyor-
PAN-CT:
Ek olarak akciğer minimal kontüzyon ve htx.

VAKA-2

- 55 yaş erkek, AİTK,
- Vitaller stabil
- GKS:12, toraksta geniş ekimoz ve krepitasyon
- FAST (–)
- Femur şaft kırığı

ATLS

Pan-Scan

VAKA-3

- 55 yaş erkek, AİTK,
- TA<80/40mmHg (Sıvıya yanıt yok)
- GKS:12
- FAST (+)
- Femur şaft kırığı

ATLS

Operasyon

EPİDURAL

GERÇEK NE?; LİTERATÜRDE SON DURUM

Sunum metodolojisi;

PubMed ve Cochrane Review taraması;

- Whole body ct
- Whole body imaging
- Whole body scaning
- Pan-ct
- Non-selective CT

1000’e yakın çalışma, derleme, metaanaliz

TRISS'e göre Pan-CT mortaliteyi düşürüyor

AR: %5.9

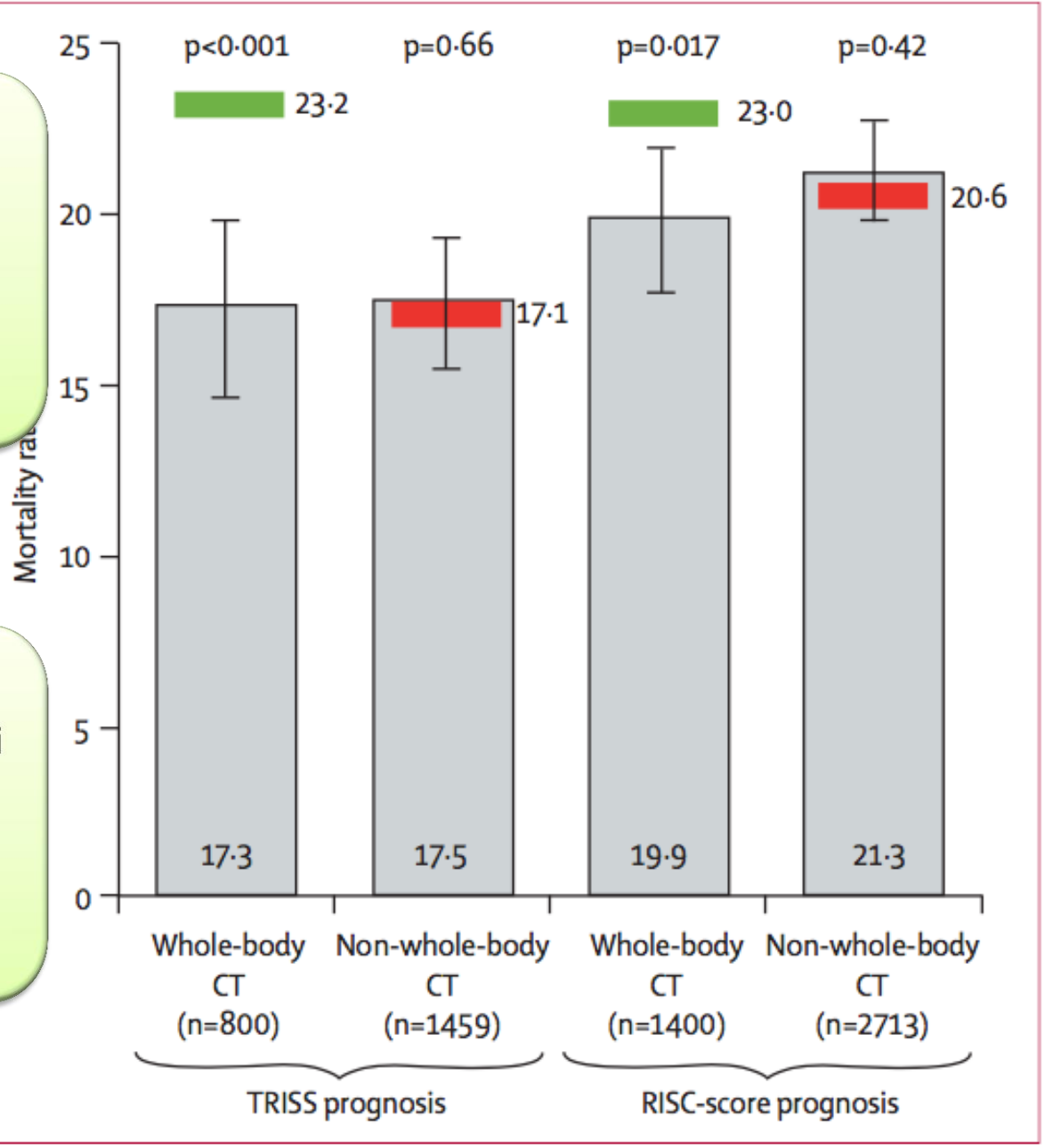
NNT:17

2259 hasta TRISS

RISC skoruna göre Pan-CT mortaliteyi düşürüyor

AR: %3.1

NNT:32



24 h

Overall

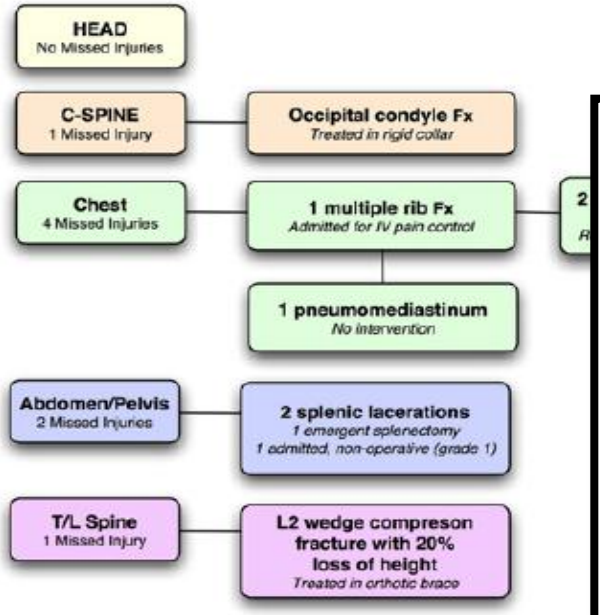
Data are number (%) or mean (SD), unle

PRBC=packed red blood cells. SBP=systolic blood pressure. *Defined as organ failure of two systems of >2 sepsis-related organ-failure assessment-score points for at least 2 days.[28]

Table 2: **Characteristics of patients with polytrauma with information about CT during trauma-room treatment**

VERY LOW RATING MISSED

Injuries that would have been missed without SCT in patients deemed very low pretest probability for clinically significant injury.



The an Journal of ncy Medicine
.com/locate/ajem

tients:

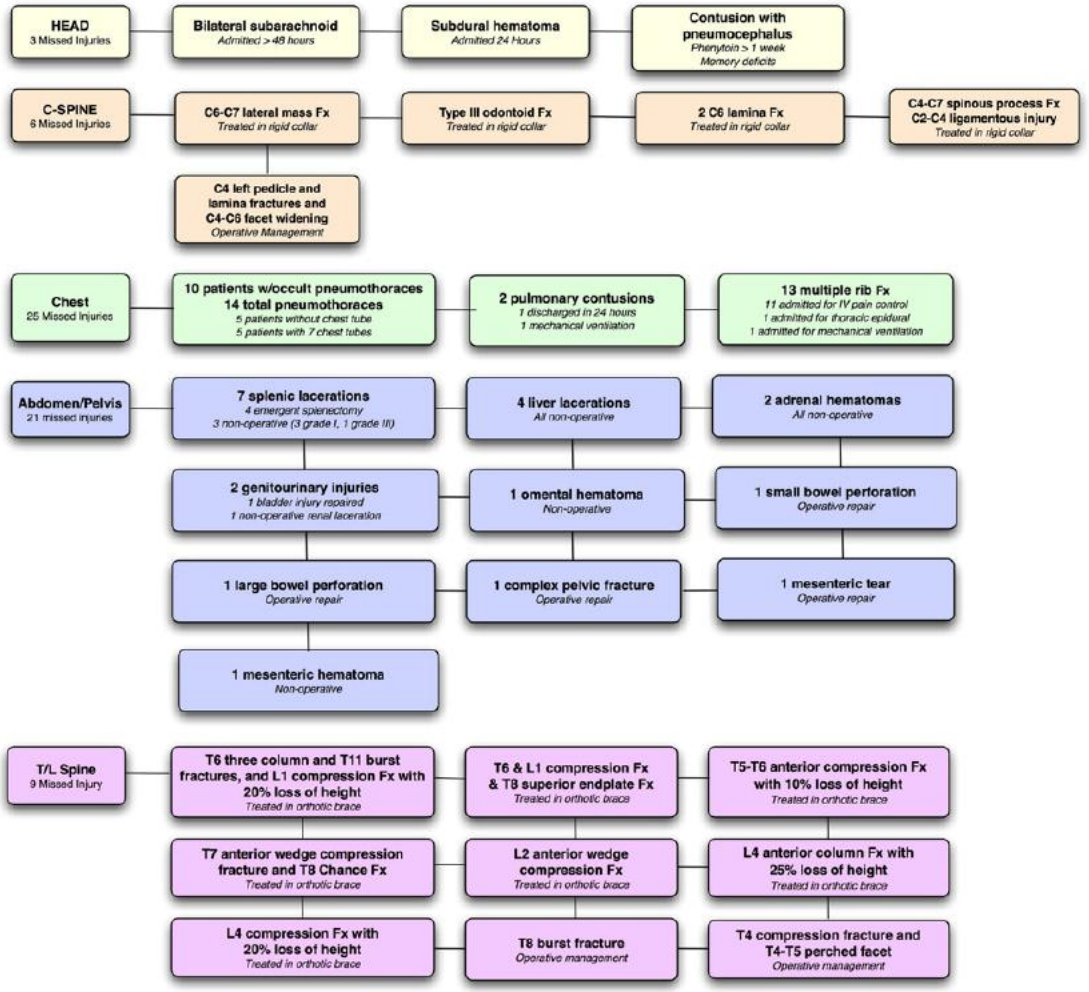
ou PhD[c],

Table 1 Injuries deemed clinically significant on CT for each body region before beginning the study

Head
Substantial epidural or subdural hematoma (1.0 cm in width or with mass effect)
Cerebral contusion 1.0 cm in diameter or at >1 site
Extensive subarachnoid hemorrhage—mass effect or sulcal effacement

LOW RATING MISSED

Injuries that would have been missed without SCT in patients deemed low pretest probability for clinically significant injury



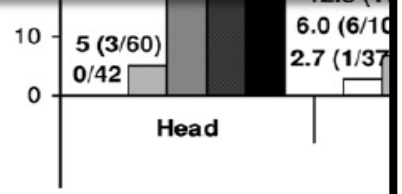


Fig. 1 Comparison of EPs' p

Çalışmalar devam etti…

Selective Use of C
Routine Whole Bod

Malkeet Gupta, MD, MS, David

Original article

The evolution of computed tomography from organ-selective to whole-body scanning in managing unconscious patients with multiple trauma

A retrospective cohort study

Zhi-Jie Hong, MD[a,b,c], Cheng-Jueng Chen, MD, PhD[a,b], Jyh-Cherng Yu, MD[a], De-Chuan Chan, MD[a], Yu-Ching Chou, PhD[d], Chia-Ming Liang, MD[a,b], Sheng-Der Hsu, MD[a,b,*]

Whole-body multislice computed tomography (MSCT) improves trauma care in patients requiring surgery after multiple trauma

T E Wurmb,[1] C Quaisser,[1] H Balling,[2] M Kredel,[1] R Muellenbach,[1] W Kenn,[3] N Roewer,[1] J Brederlau[4]

CRITICAL CARE

Open Access

…nography on mortality and surgical management of severe blunt trauma

Jean-Michel Yeguiayan[1,2], Anabelle Yap[2], Marc Freysz[1,2*], Delphine Garrigue[3], Claude Jacquot[4], Claude Martin[5], Christine Binquet[1,6], Bruno Riou[7] and Claire Bonithon-Kopp[1,6], for the FIRST Study Group

Jiang et al. Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine 2014, 22:54
http://www.sjtrem.com/content/22/1/54

SCANDINAVIAN JOURNAL OF
trauma, resuscitation
& emergency medicine

ORIGINAL RESEARCH Open Access

Comparison of whole-body computed tomography vs selective radiological imaging on outcomes in major trauma patients: a meta-analysis

Libing Jiang†, Yuefeng Ma†, Shouyin Jiang†, Ligang Ye†, Zhongjun Zheng†, Yongan Xu† and Mao Zhang*

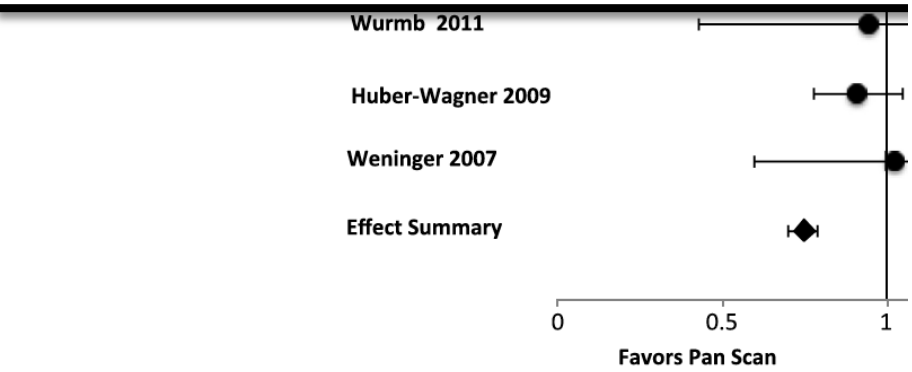


Figure 3. Forest plot of random-effects model, pooled ORs for selective scanning.

ORIGIN

Whole-body computed tomo survival as opposed to select A systematic revie

Nicholas D. Caputo, MD, MSc, Chris Stahmer, MD,

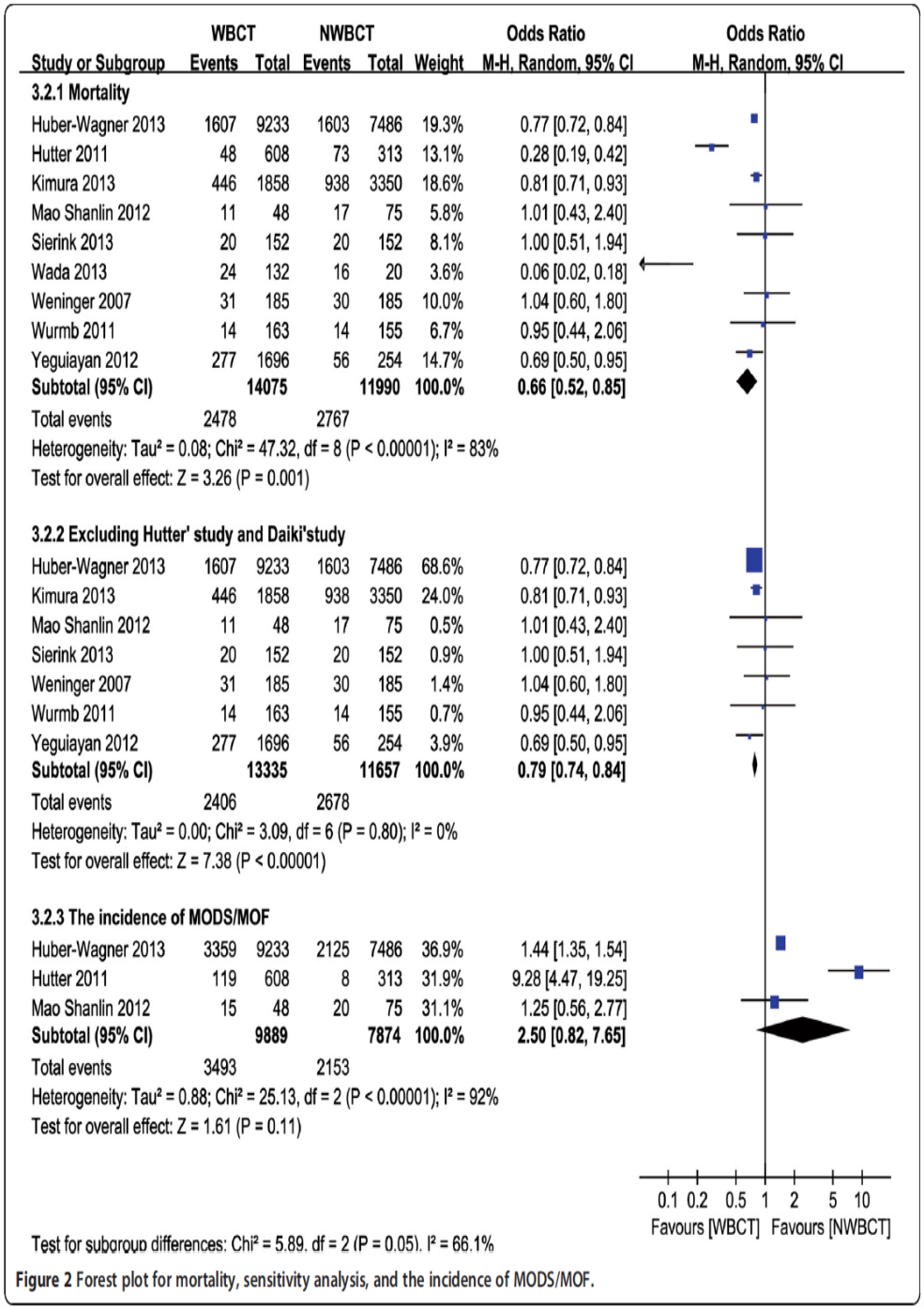


Figure 2 Forest plot for mortality, sensitivity analysis, and the incidence of MODS/MOF.

Bi

TABLE 3. Methods of Primary Studies

Primary Studies	Aim	Inclusion/Exclusion Criteria	Differences Between Comparison Groups	Outcomes Evaluated	Conclusions	Newcastle-Ottawa Score
Weninger et al.[30]	To investigate the effects of a WBCT protocol immediately after admission, compared with a conventional imaging protocol	I: ISS > 17, at least one life-threatening injury of the head, thorax, or abdomen with an Abbreviated Injury Scale (AIS) score > 4 who survived at least until intensive care unit admission E: Dead at admission/ED, cardiac trauma, minor injuries	Time at which imaging was performed differed in both protocols: selective imaging after resuscitation and examination, WBCT immediately after admission Different MDCT scanners were used in each cohort—16-row for WBCT cohort and single row for comparison	Time to diagnosis In-hospital mortality rate Total ED time Length of stay in-hospital	WBCT leads to more accurate and faster diagnosis. WBCT seems safe and effective.	7/8
Wurmb et al.[31]	To describe the time requirement of WBCT protocol compared with a conventional	I: Suspicion of blunt multiple trauma E: Patients requiring immediate surgery, patients who were	Different MDCT scanners were used during data collection—16-row for WBCT cohort	Total ED time Time to diagnosis	WBCT may shorten the period from arrival to ED to diagnosis and management.	6/8
Huber-W et al.	reduces the interval to start emergency surgery compared with conventional imaging	surgery immediately after imaging E: Patients who required imm emergency s directly in th resuscitation without gett a complete	more injured	surgery	surgery. Mortality rates were unchanged, but the WBCT group was more severely injured, so an improvement of outcome might be assumed.	7/8
Wurmb		required emergency	WBCT patients		to start emergency	7/8
Hutte						7/8
Asha	dose in excess of 20 mSv and to document missed injuries before and after the introduction of a WBCT protocol for trauma	to hos the E: No cri			receiving radiation dose of ≥20 mSv regardless of age and ISS. difference in missed injury	7/8
	any effect on the mortality of severely injured patients in shock	press admission E: Dead or received emergency surgery within	about imaging protocol and CT may have been different across centers and cohorts		better survival rates	

PAN-CT

- Mortaliteyi
- Acilde kalış süresini
- Kapı tanı süresini

Kısaltıyor

Minör Travmalar

Unstable Hastalar

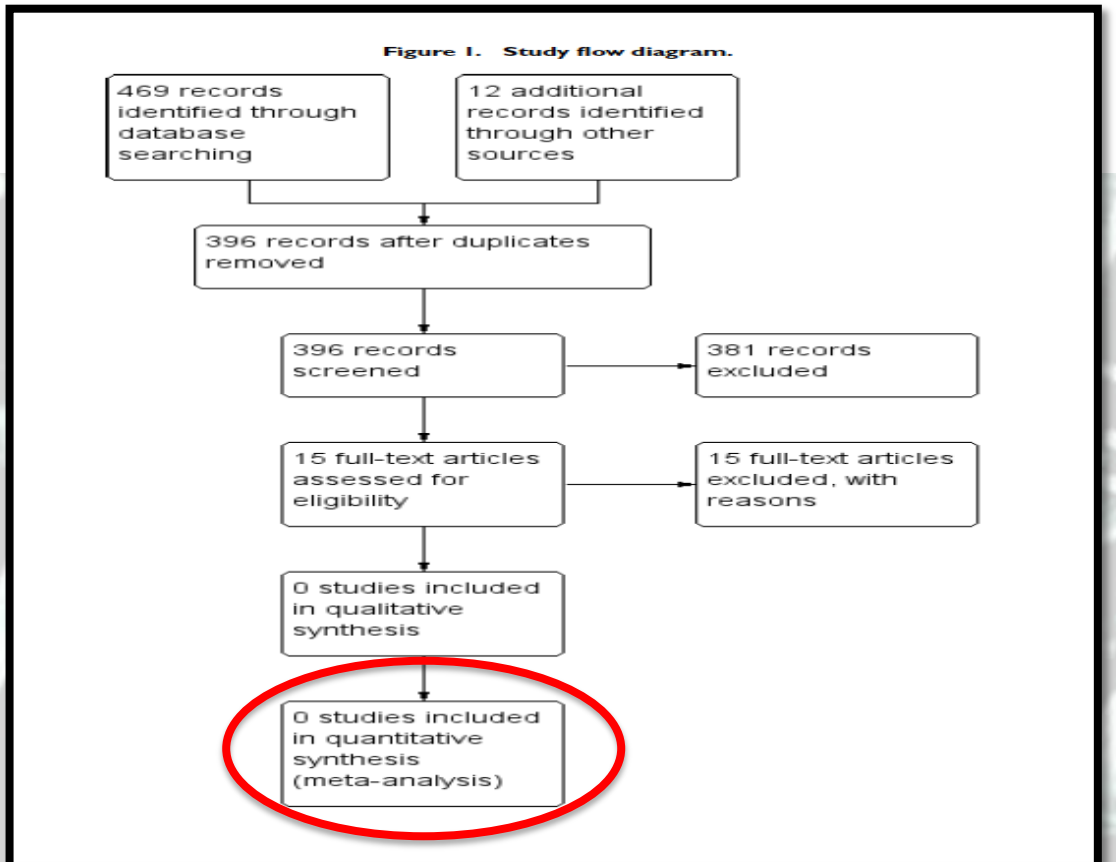
Table 3. Characteristics of severely injured patients who were in shock compared to those who were not.

	Severe Shock on admission <90 mmHg			Moderate shock on admission 90–110 mmHg			No Shock on admission >110 mmHg		
	1821 (10.9%)			4280 (25.6%)			10618 (63.5%)		
Whole-body CT (WBCT)	WBCT 1036 (56.9%)	non-WBCT 785 (43.1%)	p value	WBCT 2462 (57.5%)	non-WBCT 1818 (42.5%)	p value	WBCT 5735 (54.0%)	non-WBCT 4883 (46.0%)	p value
Epidemiologic									
Age (years)	46.6±20.2	47.2±20.4	0.54	43.7±19.6	44.6±20.0	0.17	45.6±19.8	47.3±20.6	<0.001
Men	738 (71.2%)	541 (68.9%)	0.29	1711 (69.5%)	1305 (71.8%)	0.10	4290 (74.8%)	3633 (74.4%)	0.62
Prehospital									
Intubation	872 (84.2%)	647 (82.4%)	0.31	1719 (69.8%)	1178 (64.8%)	0.001	2925 (51.0%)	2222 (45.5%)	<0.001
GCS on scene (points)	8.1±4.9	7.8±5.0	0.06	10.1±4.8	10.2±4.8	0.38	11.0±4.6	11.1±4.6	0.81
Trauma Room/in hospital									
Mean blood pressure (mmHg)	68.1±19.6	61.1±26.1	<0.001	102.0±7.1	103.0±7.2	0.003	139.0±20.2	139.7±20.5	0.001
Haemoglobin concentration (mg/dL)	9.4±3.1	9.0±3.2	0.037	11.1±2.7	11.3±2.8	0.003	12.2±2.5	12.5±2.5	<0.001
Thromboplastin time (%)	59.8±26.2	57.7±27.0	0.12	74.1±23.0	75.4±23.1	0.019	81.0±21.0	83.8±21.2	<0.001
Base excess (mmol/L)	−7.7±6.7	−8.3±7.5	0.14	−4.0±4.4	−4.1±4.5	0.85	−2.7±4.0	−2.5±4.3	0.009
Chest x-ray	548 (52.9%)	613 (78.1%)	<0.001	1295 (52.6%)	1551 (85.3%)	<0.001	2956 (51.5%)	4026 (82.4%)	<0.001
Pelvic x-ray	400 (38.6%)	511 (65.1%)	<0.001	950 (38.6%)	1295 (71.2%)	<0.001	2143 (37.4%)	3289 (67.4%)	<0.001
Time from hospital admission to CT (min)	27.2±20.0	34.1±25.3	<0.001	25.7±18.8	35.3±26.1	<0.001	23.7±17.1	35.3±25.4	<0.001
Operation rate	831 (80.2%)	573 (73.0%)	<0.001	1936 (78.6%)	1455 (80.0%)	0.27	4328 (75.5%)	3604 (73.8%)	0.051
Transfusion of PRBC (any amount)	645 (62.3%)	513 (65.4%)	0.20	918 (37.3%)	665 (36.6%)	0.62	1176 (20.5%)	923 (18.9%)	0.035
Massive blood transfusion until ICU (≥10 PRBC transfused)	278 (26.8%)	198 (25.2%)	0.48	234 (9.5%)	171 (9.4%)	0.88	195 (3.4%)	137 (2.8%)	0.06
Multiorgan failure*	640 (61.8%)	415 (52.9%)	<0.001	1022 (41.5%)	616 (33.9%)	<0.001	1715 (29.9%)	1138 (23.3%)	0.002
Ventilation time (days)	10.4±16.2	7.4±13.5	<0.001	9.7±13.9	8.5±11.9	<0.001	7.1±10.7	6.6±10.4	<0.001
ICU stay (days)	14.4±18.7	10.2±16.0	<0.001	14.6±16.3	12.8±14.3	<0.001	11.6±12.8	10.5±12.4	<0.001
Hospital length of stay (days)	25.7±30.3	21.6±32.8	<0.001	29.3±29.4	30.0±31.7	0.25	25.8±30.0	25.4±26.1	0.002
AIS head ≥3	605 (58.4%)	461 (58,7%)	0.89	1365 (55.4%)	1052 (57.9%)	0.12	3259 (56.8%)	3173 (65.0%)	<0.001
AIS thorax ≥3	785 (75.8%)	510 (65.0%)	<0.001	1624 (66.0%)	958 (52.7%)	<0.001	3464 (60.4%)	2191 (44.9%)	<0.001
AIS abdomen ≥3	378 (36.5%)	255 (32.5%)	0.08	652 (26.5%)	432 (23.8%)	0.043	1004 (17.5%)	692 (14.2%)	<0.001
AIS extremities ≥3	581 (56.1%)	397 (50.6%)	0.02	1154 (46.9%)	708 (38.9%)	<0.001	2025 (35.3%)	1348 (27.6%)	<0.001
ISS (points)	37.9±15.2	37.5±16.5	0.14	31.3±12.5	29.1±12.4	<0.001	27.6±10.6	25.6±9.7	<0.001
RISC prognosis of death	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24 h mortality rate	322 (31.1%)	361 (46.0%)	<0.001	213 (8.7%)	204 (11.2%)	0.005	283 (4.9%)	331 (6.8%)	<0.001
Overall mortality rate	436 (42.1%)	431 (54.9%)	<0.001	446 (18.1%)	410 (22.6%)	<0.001	725 (12.6%)	762 (15.6%)	<0.001

Seviye-1 Kanıt Düzeyi?

Selective computed tomography (CT) versus routine thoracoabdominal CT for high-energy blunt-trauma patients (Review)

THE COCHRANE COLLABORATION®



BİRİNCİL SONLANIM NOKTASI:

Hastane içi mortalite

İkincil sonlanım noktaları;

- 24.saat, 30 gün ve 1 yıl mortalite
- Morbitide (6 aylık komplikasyon), YB ve ventilasyon günü
- Süreler (Kapı-CT vb.)
- Radyasyon maruziyeti
- Maliyet

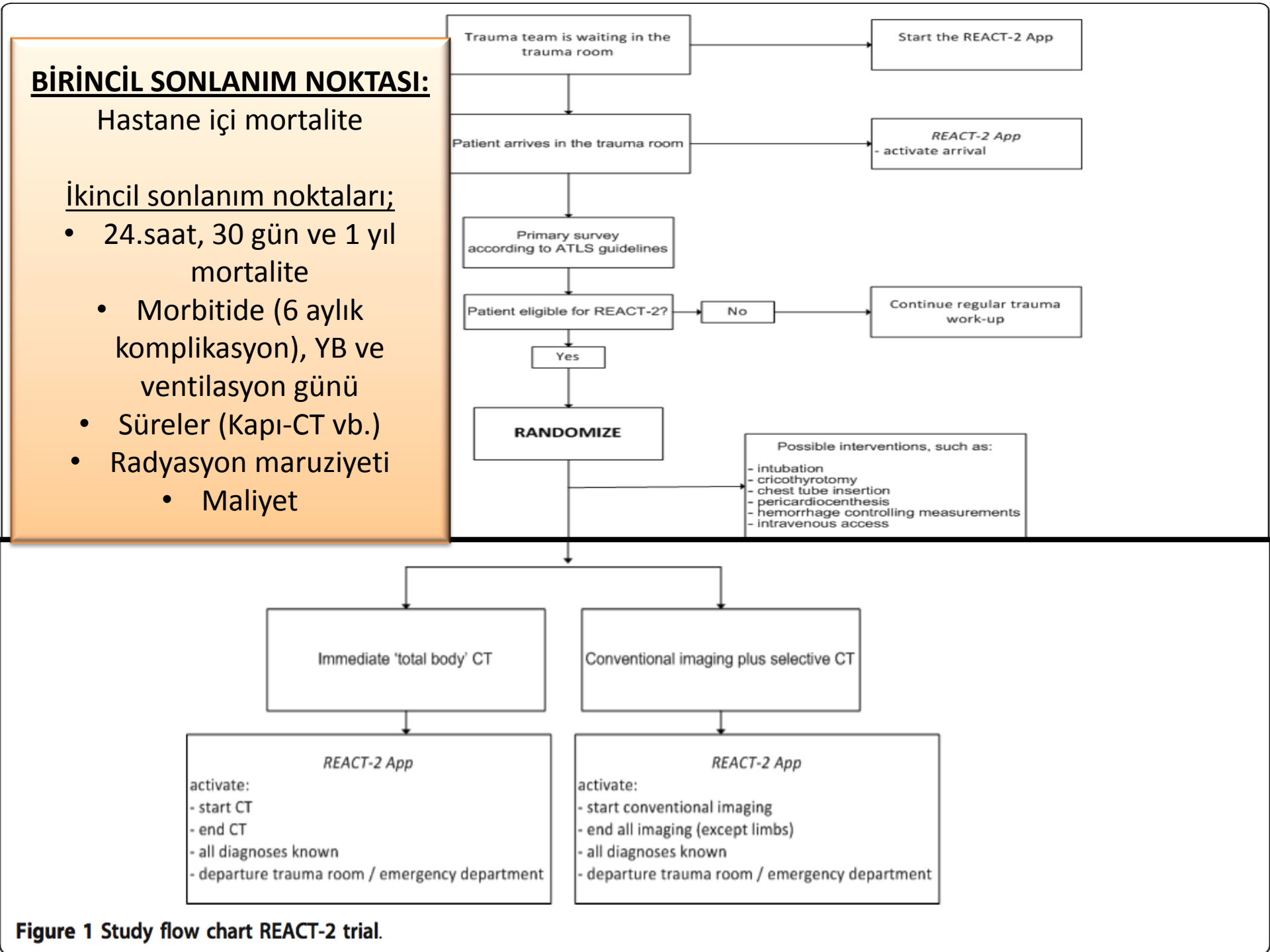
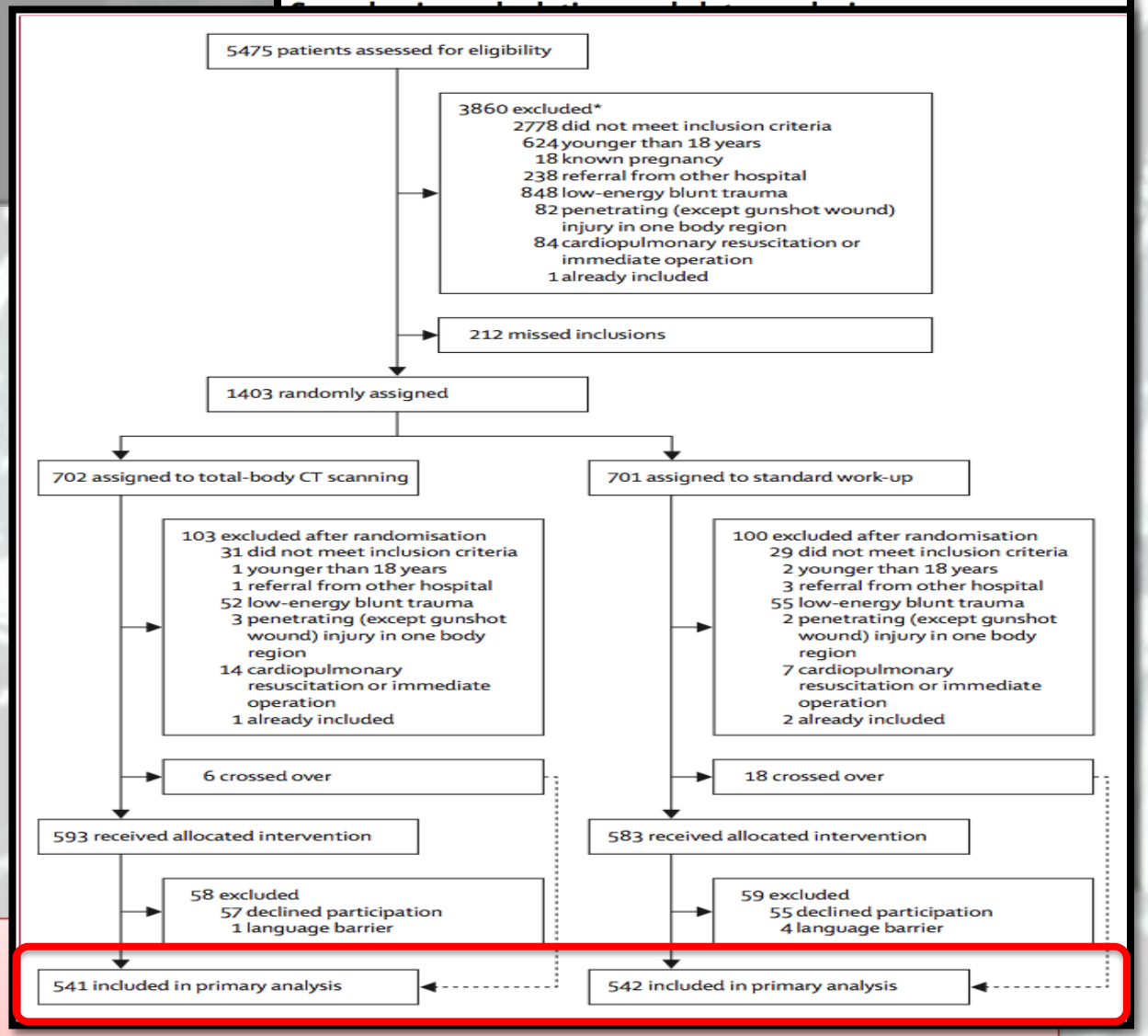


Figure 1 Study flow chart REACT-2 trial.

REACT-2



Örneklem büyüklüğü mortalitenin **%5**[illegible]ış!!!

2011-2014 yılları arasında

	Total-body CT		Standard work-up		p value
	Number of patients	Data	Number of patients	Data	
Mortality					
In-hospital mortality					
All patients, ITT (primary endpoint)	541	86 (16%)	542	85 (16%)	0·92*
Patients with polytrauma	362	81 (22%)	331	82 (25%)	0·46*
Patients with TBI	178	68 (38%)	151	66 (44%)	0·31*
Patients with TBI	141	49 (39–63)	114	54 (41–73)	0·070†
Patients with TBI		22·7 (20·6–26·4)	146		
Hospital outcomes					
Hospital costs (€)		24 967 (95% CI 21 880–28 752)	488		
Complications		129 (24%)	540		
Blood transfusions in hospital§		147 (27%)	542		
Duration of stay¶					
Days in intensive care unit		3 (1–8)	295		
Ventilation days		2 (1–5)	295		
Readmission within 6 months‖		67 (17%)	412		
Serious adverse events (safety endpoint)**	541	3 (1%)	542		

Örneklem büyüklüğü mortalitenin **%5'lik azalması (AR)** için hesaplanmış!!!

Eğer saptanmak istenen mortalite farkı;

%4 → 881
%3 → 1636
%2 → 3837
%1 → 15957

Radyasyon ???

1250'de 1 /%0.08

DOZ SINIRLARI

		Radyasyon Görevlileri	Halk
Etkin doz	Yıllık Ortalama	20 mSv/yıl	1mSv/yıl
	Tek Yıl	50 mSv/yıl	5 mSv/yıl
Eşdeğer Doz	Göz	150 mSv/yıl	15 mSv/yıl
	Cilt	500 mSv/yıl	50 mSv/yıl
	El-Ayak	500 mSv/yıl	50 mSv/yıl

	Etkin doz	Eşdeğer Akciğer Grafisi Sayısı
Akciğer radyografisi (tek yön)	0,02 mSv	1
Uçak yolculuğu (6 saat)	0,04 mSv	2
Doğal radyasyon (yıllık)	3 mSv	150
Beyin BT	2-4 mSv	100-200
Toraks BT	5-7 mSv	250-350
Abdominopelvik BT	12-15 mSv	600-750

Sonuçlar ve Boşluklar…

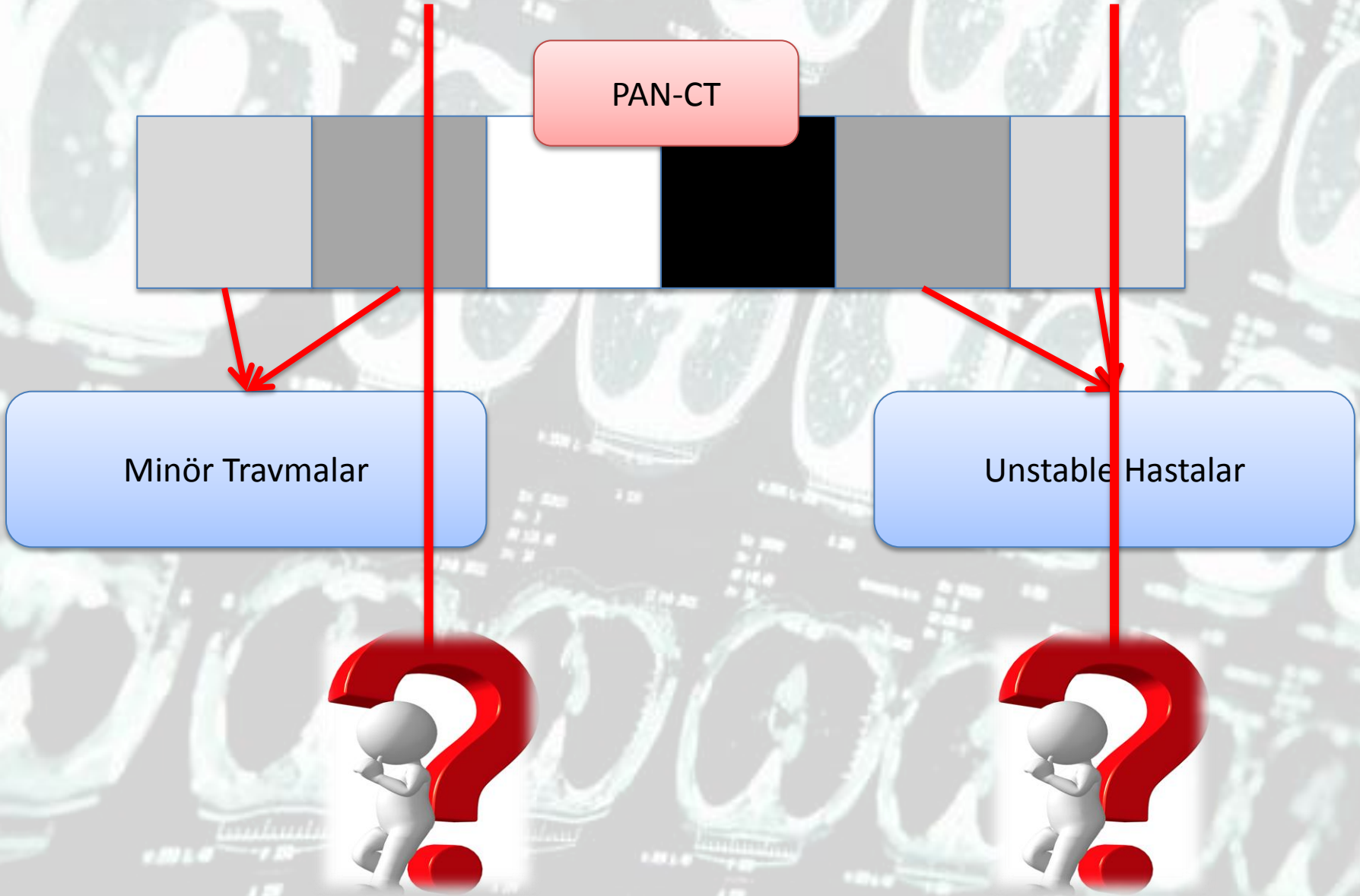
MEVCUT RETROSPEKTİF KOHORT ÇALIŞMALARININ ETKİSİ İLE İBRE MORTALİTEYİ AZALTTIĞI YÖNÜNDE.

Klinik anlamı üzerine fikir birliği yok?

EĞER MORTALİTEYİ AZALTIYORSA BUNU SÜREYİ KISALTARAK MI YOKSA GÖZDEN KAÇAN YARALANMAYI YAKALAYARAK MI YAPIYOR?
Yada
İNSAN FAKTÖRÜNÜ AZALTIYOR?

MORTALİTE ÜZERİNDEKİ ETKİSİ KONUSUNDA FİKİR BİRLİĞİ YOK.

Kime çekelim?



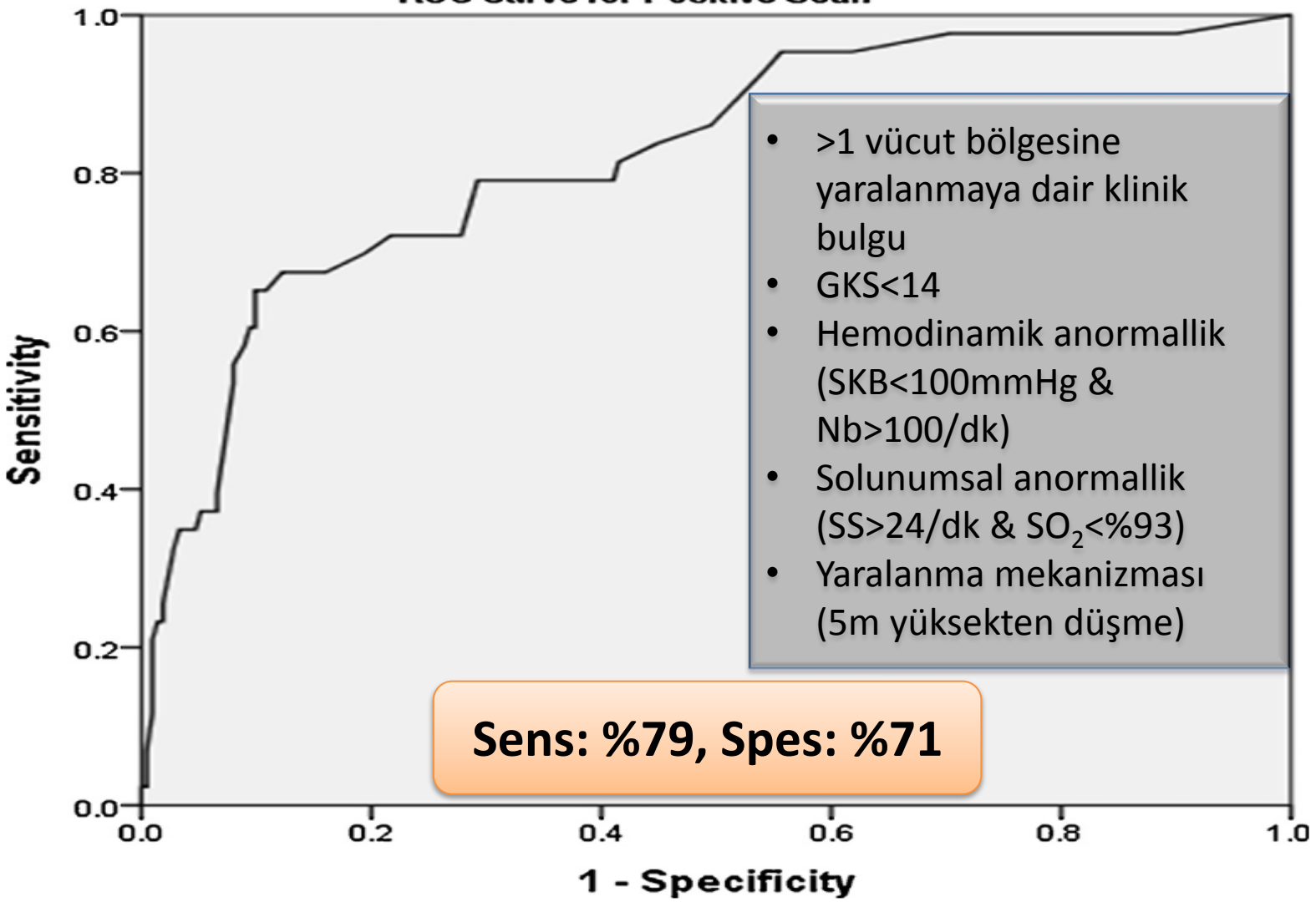
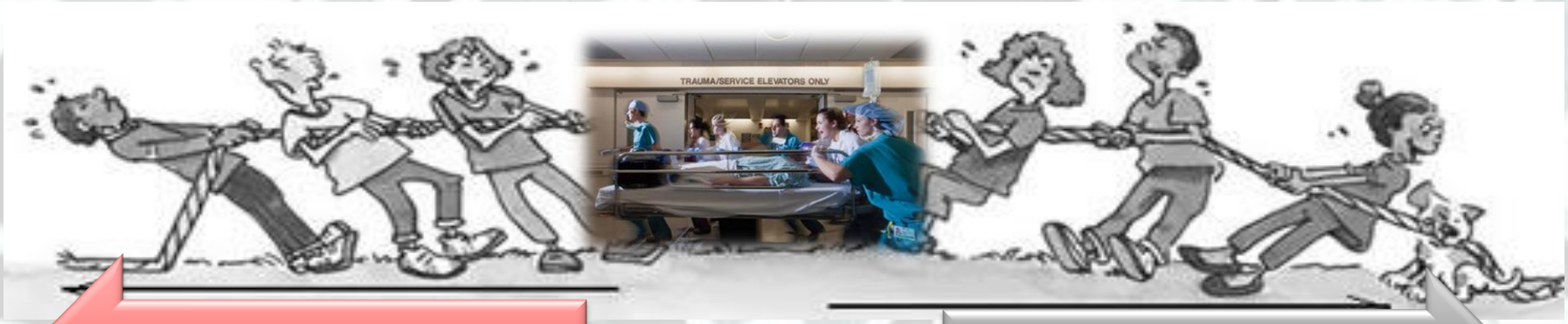


Fig. 2. Receiver operating characteristic for the multivariable model. The area under curve is 0.82 (95% CI 0.75–0.90).

SONUÇ



ATLS

PAN-CT

- Yeni RKÇ'ler mortaliteyi netleştirmeli.
- PAN-CT çekme kuralları geliştirilmeli ve geliştirilenler farklı kohortlarda validiye edilmeli.

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TEŞEKKÜRLER...

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Keçiören EAH- Acil Tıp Kliniği