



4th INTERNATIONAL EMERGENCY AND FAMILY MEDICINE SYMPOSIUM

- BACK PAIN COURSE
- CARDIAC EMERGENCY COURSE
- PEDIATRIC EMERGENCY COURSE

March 21 - 24, 2019
Novotel City
Budapest / Hungary

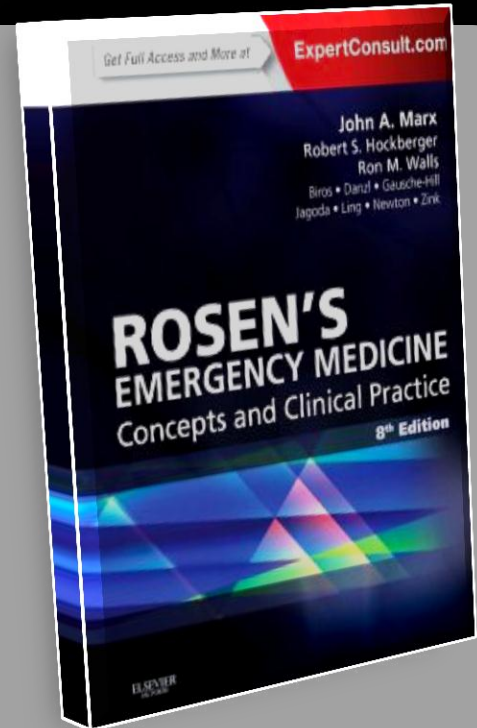
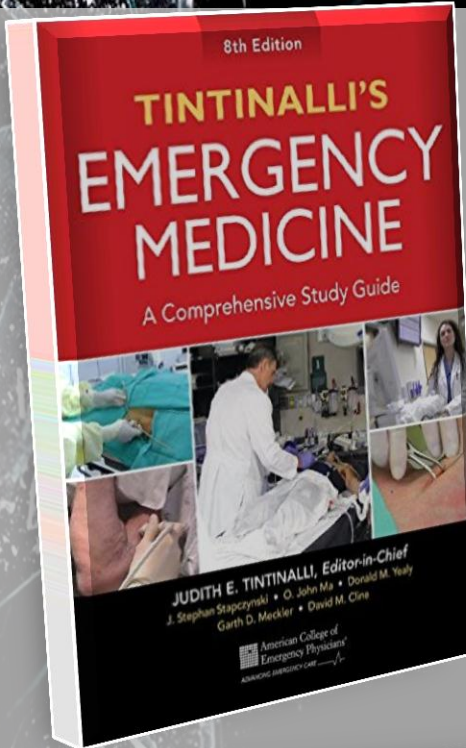
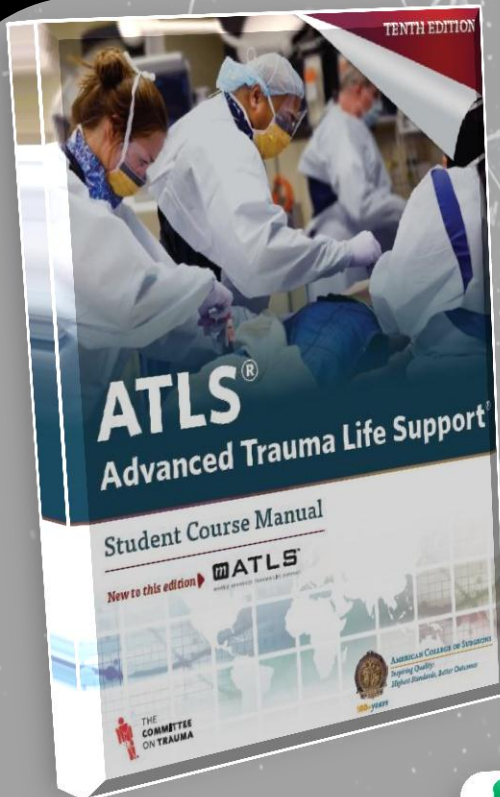
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TRAVMAYA GENEL YAKLAŞIM

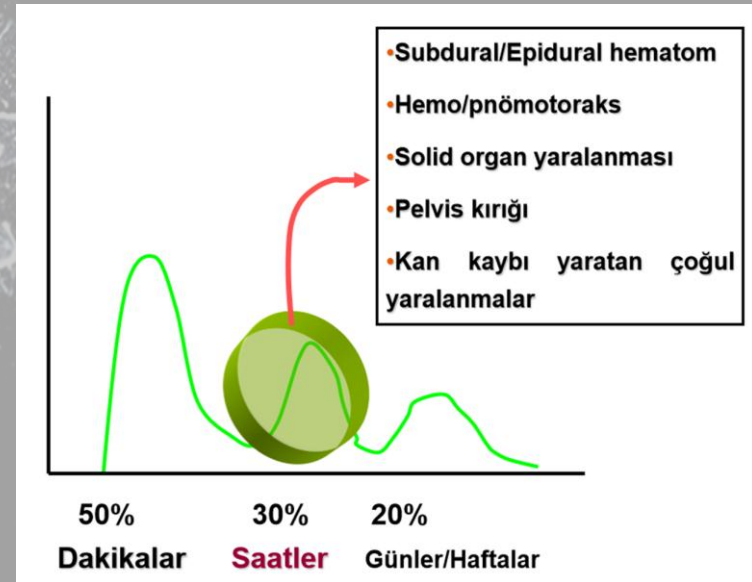
Prof. Dr. Dr. Yunsur Çevik
Sağlık Bilimleri Üniversitesi
Keçiören Eğitim ve Araştırma Hastanesi
Acil Tıp Kliniği
2019-Budapeşte

Kaynaklar



Epidemiyoloji

- Travma 45 yaş altı ölümlerin en sık nedeni
- %20-30'u önlenabilir
- Önlenabilir ölümlerin %66-80'i hemoraji kaynaklı



Travma yönetimi

- **Hazırlık**
- **Primer bakı**
----- acil müdahaleler
- **Sekonder bakı**
----- gerekli müdahaleler
- **Tekrar tekrar değerlendirme**
- **Kesin tedavi**

Hazırlık



- Sa
ek

Primer bakı

Adını ve ona ne olduğunu sorun!!!

Uygun cevap

=

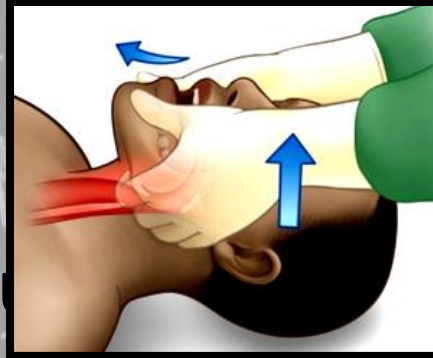
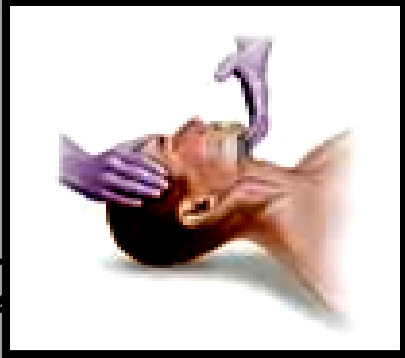
- **Havayolu açık**
- **Solunum baskılanmış**
- **Serebral perfüzyon yeterli**
- **Serebral işlev yeterli**



A- Havayolu

+Servikal omurgayı koruyarak

1. Hedef : havayolu açıklığı



Sekresyonların
aspirasyonu

HY manevraları

Chin Lift/Jaw Thrust

Airway uygulaması

O2

BVM

3. Hedef: ileri havayolu

Endotrakeal

entübasyon

Krikotiroidotomi

Primary Survey (rapid identification and management of immediately life-threatening injuries)

A. Airway and cervical spine

Assess, clear, and protect airway: jaw thrust/chin lift, suctioning.

Perform endotracheal intubation with in-line stabilization for patient with depressed level of consciousness or inability to protect airway.

Create surgical airway if there is significant bleeding or obstruction or laryngoscopy cannot be performed.



B- Solunum

1. Hedef: inspeksiyon

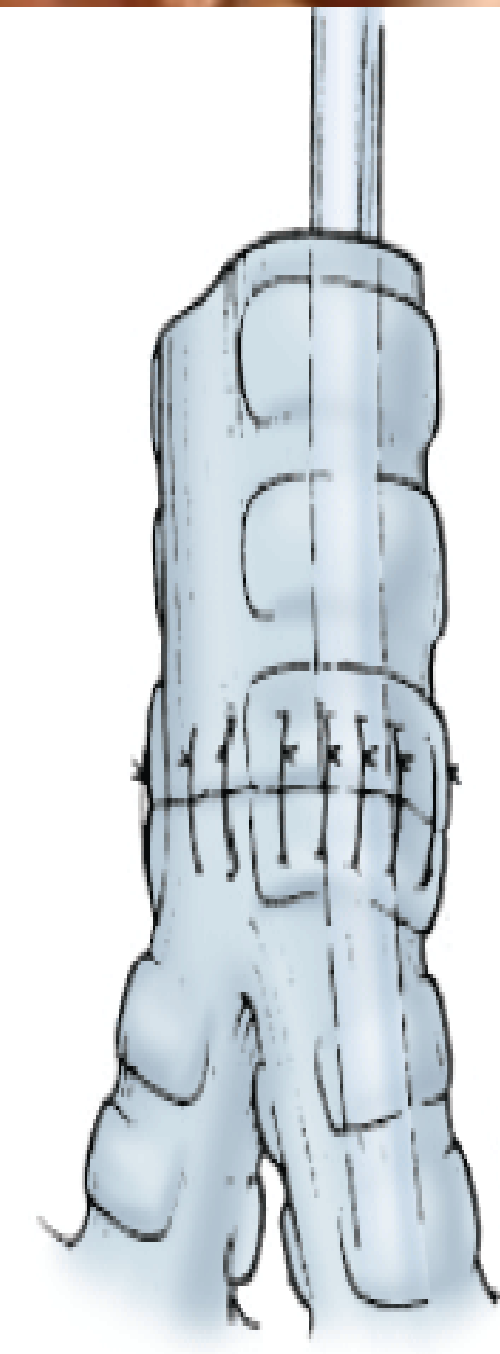
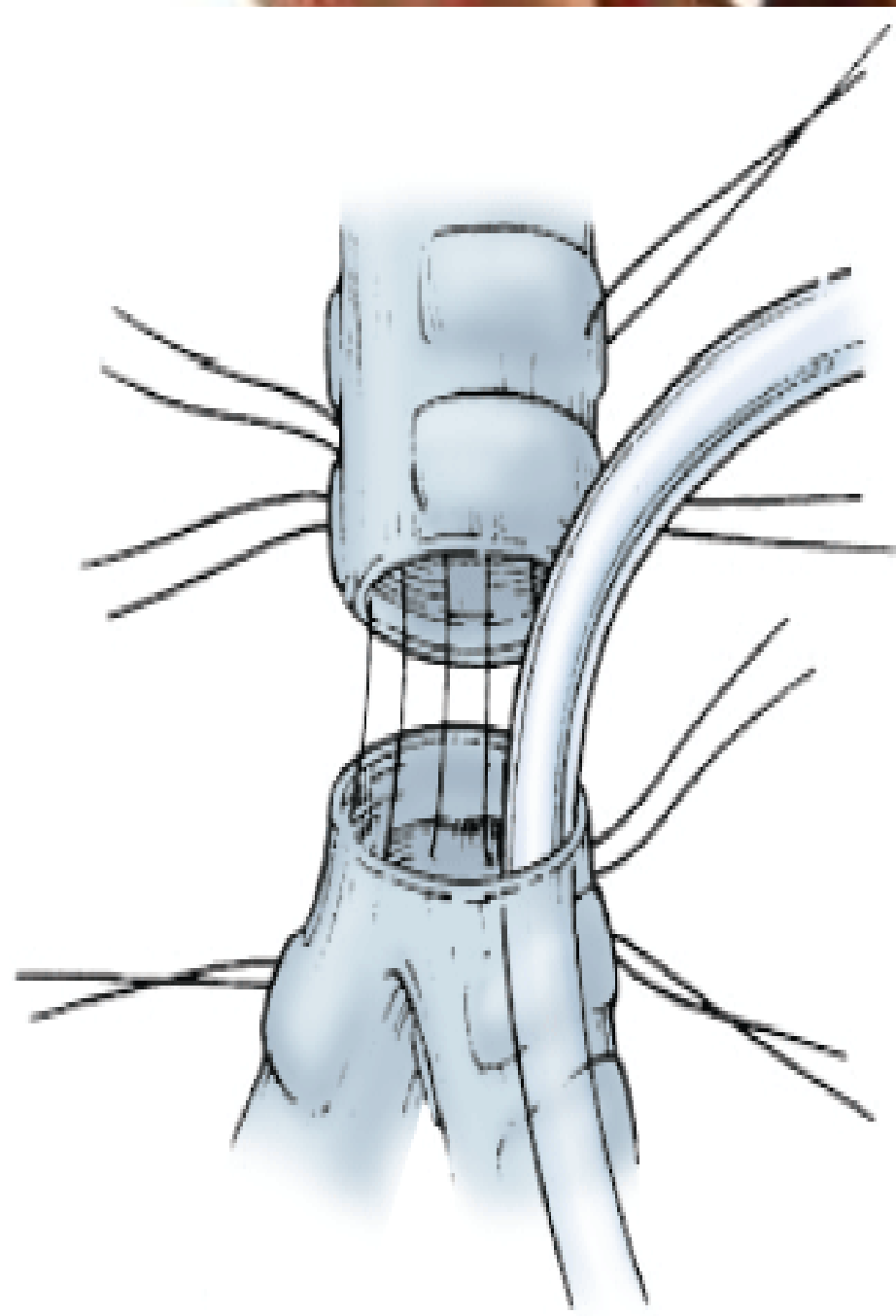
Spontan solunum varlığı
Trakeal deviasyon
Retraksiyonlar
Paradoksal göğüs duvarı hareketleri

2. Hedef: dinle

SS tüm toraksta alınıyor mu?
Eşit mi?

3. Hedef: palpe et

Trakea deviasyonu
Kot kırıkları
Krepitasyon



C- Dolaşım

1. Hedef: nabız
2. Hedef: serebral perfüzyon
3. Hedef: cilt perfüzyonu

Soluk cilt tonu
Kapiller dolum

Travma hastasında TA PNX ekarte edildikten sonra hipotansiyonun sebebini DAİMA **hemoraji** olarak kabul et!!!

Kanama

Site of fracture

Blood loss (approx)

Pelvic #	2500-4000ml
Femur #	1500-2000ml
Tibia & Fibula #	1000-1500ml
Humerus #	500-800ml
Forearm bones #	250-400ml

- Primer baki= eksternal kanama
- 1- direkt bası
- 2- turnike
- 3- hemostatik ajanlar

Major pressure points

DO APPLY
HERE:

Do apply
buckle on
inside of
mid upper
arm. If
bleeding

DO NOT
USE HERE:

Do not use
on neck or
head

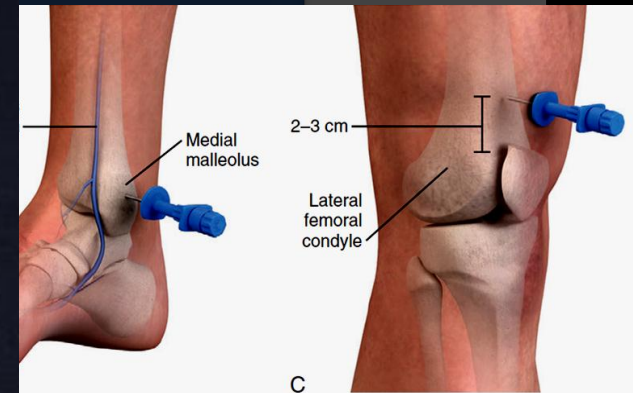
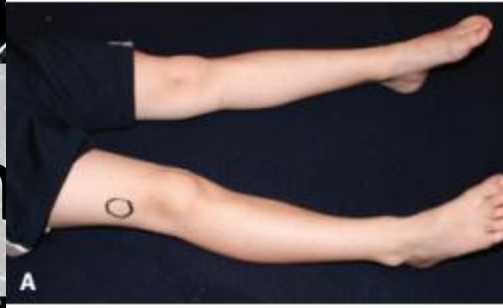


Bandage roll

Dolaşım

1- IV damar yolu

2-		Kan (cc/dk)	500
	14 g	172	
3-	16 g	118	
	18 g	45	
	20 g	31	
	22 g	18	



Kanama

- Isıtılmış sıvı replasmanı: 37-40 °C
- Kan tx
- Traneksamik asid



C. Circulation

Assess for blood volume status: skin color, capillary refill, radial/femoral/carotid pulse, and blood pressure.

Place two large-bore peripheral IV catheters.

Begin rapid infusion of warm crystalloid solution, if indicated.

Apply direct pressure to sites of brisk external bleeding.

Consider central venous or interosseous access if peripheral sites are unavailable.

Consider pericardiocentesis for suspected pericardial tamponade.

Consider left lateral decubitus position in late-trimester pregnancy.



D- Nörolojik değerlendirme

1. Hedef : bilinç durumu

GKS

- alkol
- madde
- hipoglisemi

2. Hedef: pupiller

3. Hedef: lateralizan defisit



D. Disability

Perform screening neurologic and mental status examination, assessing:

- Pupil size and reactivity

- Limb strength and movement, grip strength

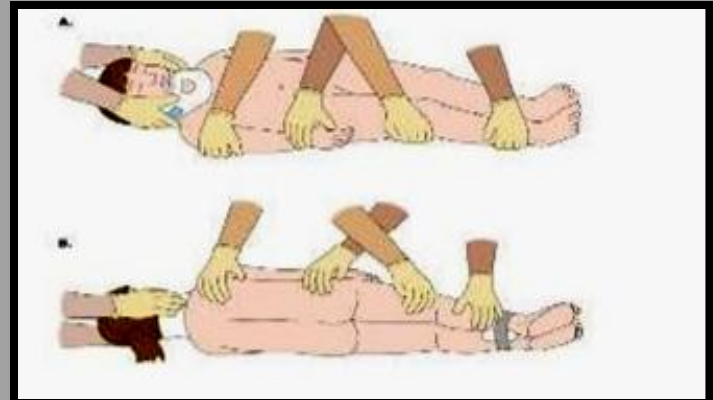
- Orientation, Glasgow coma scale score

Consider measurement of capillary blood glucose level in patients with altered mental status.



E- Exposure

- Hasta tümüyle soyulacak
- Kütük çevirme
- Hipotermiye dikkat!!!



E. Exposure

Completely disrobe the patient, and inspect for burns and toxic exposures.

Logroll patient, maintaining neutral position and in-line neck stabilization, to inspect and palpate thoracic spine, flank, back, and buttocks.

Primer bakıya ekler;

- Elektrokardiografik monitörizasyon
- Pulse oksimetri
- Solunum sayısı, kapnometre, arteryal kan gazı
- Üriner kataterizasyon
- Gastrik kataterizasyon
- X-ray; toraks&pelvis
- FAST, eFAST

Sekonder Bakı

- Amaç: mevcut tüm yaralanmaların tespiti
- Tepeden tırnağa ayrıntılı bakı
- Tam hikaye – Tam FM
- AMPLE?

A	Allergies
M	Medications
P	Past illness/Pregnancy
L	Last meal
E	Events/Environment relating to injury:



Baş-boyun değerlendirmesi

Head

Inspect and palpate face and scalp

Eye examination

Visual acuity (if alert)

Pupillary size

Hemorrhage (conjunctiva, fundi)

Penetrating injury

Contact lenses (remove if indicated)

Ocular entrapment

Periorbital ecchymosis (Raccoon eyes)

Ear examination

Hemotympanum, bleeding, perforation

Retro-auricular ecchymosis (Battle's sign)

Midface examination

Inspect for nasal swelling, deformity, bleeding, or clear rhinorrhea

Inspect for oral trauma, malocclusion, intraoral lacerations

Palpate maxilla for evidence of LeFort fracture (palatal instability with anterior to posterior pressure on the upper teeth)

Canadian CT Head Rule^[2]

Inclusion Criteria

- GCS 13-15
- Age \geq 16yr
- No coagulopathy nor on anti-coagulation
- No obvious open skull fracture

Rule

Head CT not required if NONE of the following are present

- Age \geq 65 years
- Vomiting $>$ 2 time
- Suspected open or depressed Skull Fracture
- Signs suggesting basal skull fracture:
 - Hemotympanum
 - Raccoon eyes
 - CSF otorrhea or rhinorrhea
 - Battle's sign (bruising around mastoid process)
- GCS $<$ 15 at 2 hours post injury
- Retrograde Amnesia $>$ 30min
- Dangerous mechanism
 - Pedestrian struck by vehicle
 - Ejection from motor vehicle
 - Fall from elevation $>$ 3 feet or 5 stairs

Baş-boyun değerlendirilmesi

NEXUS Criteria for C-Spine Imaging ☆

Clears patients from cervical spine fracture clinically, without imaging.

When to Use ▾	Pearls/Pitfalls ▾	Why Use ▾
Focal neurologic deficit present	No 0	Yes +1
Midline spinal tenderness present	No 0	Yes +1
Altered level of consciousness present	No 0	Yes +1
Intoxication present	No 0	Yes +1
Distracting injury present	No 0	Yes +1

If none of the above criteria are present, the C-Spine can be cleared clinically by these criteria.

Imaging is not required.

Any HIGH risk factors?
Any of the following:

- Age \geq 65 years
- Dangerous Mechanism*
- Paresthesias in extremities

NO

YES

Any LOW risk factors?
Any of the following:

- Simple rear-end MVC**
- Ambulatory at any time
- Delayed onset of neck pain
- Absence of midline C-spine tenderness

NO

YES

NO

Able to ROTATE neck actively?
• 45° left & right

YES

No Spine Injury

Canadian C-spine Rule

Cannot apply CCR if:

- Patient is NOT awake, alert, & reliable
- Unstable vital signs
- < 16 years
- Acute paralysis
- Known vertebral disease
- Previous C-spine surgery

Possible Spine Injury

*Dangerous Mechanism

- Fall from elevation \geq 3 feet or 5 stairs
- Axial load to head
- MVC high speed (> 100 km/hr) rollover, ejection
- Motorized recreational vehicles
- Bicycle struck or collision

**Simple rear-end MVC excludes:

- Pushed into oncoming traffic
- Hit by bus/large truck
- Rollover
- Hit by high speed vehicle

Toraks değerlendirilmesi

Chest

Inspect and palpate chest, including the clavicle, ribs, and sternum

Open pneumothorax/large flail segment

Crepitus

Tenderness/bony deformity

Auscultate

Breath sounds

Heart sounds



Immediately life-threatening (usually suspected on initial assessment)

Airway obstruction

Open pneumothorax

Flail chest

Tension pneumothorax

Massive hemothorax

Cardiac tamponade

Potentially life-threatening (usually noted on secondary survey, radiograph, ECG, or reevaluation)

Tracheobronchial tear

Pulmonary contusion

Myocardial contusion

Ruptured diaphragm

Esophageal rupture

Aortic transection

Generally not life-threatening

Simple pneumothorax

Small hemothorax

Rib fracture

Chest wall laceration/contusion

Batın-Pelvis değerlendirmesi

Abdomen

Inspect and palpate abdomen

Seat belt sign/bruises (Cullen's sign)

Distention

Focal tenderness

Peritoneal signs

Masses

Auscultate for bowel sounds

Pelvis

- Pelvik instabilite
- Perine
- Genital



Ekstremit  deęerlendirmesi

Ekstremit 

- Deformite, krepitasyon
- Eklem stabilizasyonu
- Distal nabızlar
- Vask ler yaralanma
- Yumuřak doku yaralanmaları
- Tendon deęerlendirmesi
- Kompartman

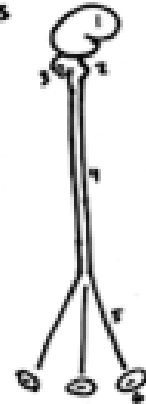


Nörolojik değerlendirme

Nörolojik değerlendirme

- GKS, tekrar tekrar
- Lateralizan bulgu
- Tam motor duyu muayenesi
- Refleksler

1. Mental status
2. Brainstem
3. Cerebellum
4. DTRs
5. Sensory
6. Motor



Sekonder Bakı

Identify and control scalp wound bleeding with direct pressure, sutures, or surgical clips.

Identify facial instability and potential for airway instability.

Identify hemotympanum.

Identify epistaxis or septal hematoma; consider tamponade or airway control if bleeding is profuse.

Identify avulsed teeth or jaw instability.

Evaluate for abdominal distention and tenderness.

Identify penetrating chest, back, flank, or abdominal injuries.

Assess for pelvic stability; consider pelvic wrap or sling.

Inspect perineum for laceration or hematoma.

Inspect urethral meatus for blood.

Consider rectal examination for sphincter tone and gross blood.

Assess peripheral pulses for vascular compromise.

Identify extremity deformities, and immobilize open and closed fractures and dislocations.

Travmatik Şokta Yönetim

- kan kaybının önlenmesi
- intravasküler volüm restorasyonu
- yeterli O₂ transportu

Kanama

%30

- Total kan volümü ??? akut kaybı → hipotansiyon

	CLASS I	CLASS II	CLASS III	CLASS IV
Blood loss (mL)	Up to 750	750–1500	1500–2000	>2000
Blood loss (% blood volume)	Up to 15%	15%–30%	30%–40%	>40%
Pulse rate (BPM)	<100	100-120	120-140	>140
Systolic b pressure	Normal	Normal	Decreased	Decreased
Pulse pressure (mm Hg)	Normal or increased	Decreased	Decreased	Decreased
Respiratory rate	14–20	20–30	30–40	>35
Urine output (mL/hr)	>30	20–30	5–15	Negligible
CNS/mental status	Slightly anxious	Mildly anxious	Anxious, confused	Confused, lethargic
Initial fluid replacement	Crystalloid	Crystalloid	Crystalloid and blood	Crystalloid and blood

İdeal Resüsitatif Sıvı

- Beklenen değere ulaştıran ve sürdürülebilen intravasküler volüm sağlayabilmeli
- Hücre dışı sıvıya benzer kimyasal kompozisyonda olmalı
- Birikim olmaksızın tüm dokulardan metabolize edilebilmeli ve atılabilmeli
- Yan etki oluşturmamalı

3 kategori;

- kristaloid solüsyonlar
- kolloid solüsyonlar
- kan ve kan rünleri

Kristaloidler

- normal salin, ringer laktat, dekstroz, isolayt..
- ucuz, yaygın olarak kullanımda
- 3 ml kristaloid=1 ml kan????

- pulmoner ödem
- serebral ödem
- asidoz
- hipotermi
- inflamatuvar kaskad aktivasyonu
- dilüsyonel koagülopati
- vasküler yaralanma alanlarında pıhtıların yerinden oynaması

>10 lt

Kristaloidler

NS:

- 154 mEq/L Na
- 154 mEq/L Cl
- 308 mOsm/L
- pH 4 – 5

½ NS (%0.45 salin):

- 77 mEq/L Na
- 77 mEq/L Cl
- 154 mOsm/L
- pH 4 - 5
- 450 cc serbest su/L

%5 dekstroz:

- 50 g/L glukoz
- 200 kalori/L
- pH 4.5
- 252 mOsm/L

RL:

- 130 mEq/L Na
- 109 mEq/L Cl
- 4.0 mEq/L K
- 3.0 mEq/L Ca

>40 L/24 sa RL →
serum elektrolit
dengesi bozulmaz

Kolloidler

- Gelatin, dextran, HES, albumin...
- intravasküler volüm genişletme avantajı → kolloid (kristaloide göre 1,5-3 kat)
- pahalı, pratik değil
- pulmoner fonksiyon koruyucu etki???
- solüt yük fazla → renal hasar...
- koagülopati...

Kolloidler

Dekstran:

- Macrodex[®]
- Reomacrodex[®]

Gelatin:

- süksinillenmiş/hidroksillenmiş
- Gelofusin[®] %4
- üre bağlı jelatin
- Polygeline[®], Haemaccel[®] %3.5

Hydroxy Ethyl Starch:

- hetastrach → - HES[®], Hespan[®]
- pentastarch → - Pentaspan[®]
- yüksek MW 480 kDa → Plasmasteril[®]
- orta MW 200 kDa → - Haes-Steril[®], Isohes[®], Hemohes[®]
- düşük MW 130 kDa → Voluven[®]

Colloids versus crystalloids for fluid resuscitation in critically

Cochrane Database Syst Rev. 2000;(2):CD000567.

Colloids versus crystalloids for fluid resuscitation in critically ill patients.

Alderson P¹, Schierhout G, Roberts I, Bunn F.

⊕ Author information

Update in

Colloids versus crystalloids for fluid resuscitation in critically ill patients. [Cochrane Database Syst Rev. 2004]

Abstract

BACKGROUND: Colloid solutions are widely used in fluid resuscitation of critically ill patients. There are several choices of colloid and there is ongoing debate about the relative effectiveness of colloids compared to crystalloid fluids.

OBJECTIVES: To assess the effects on mortality of colloids compared to crystalloids for fluid resuscitation in critically ill patients.

SEARCH STRATEGY: We searched the Injuries Group specialised register, Cochrane Controlled Trials Register, MEDLINE, EMBASE and BIDS Index to Scientific and Technical Proceedings and checked the reference lists of trials and review articles.

SELECTION CRITERIA: All randomised and quasi-random trials of colloids compared to crystalloids, in patients requiring volume replacement. Cross-over trials and trials in pregnant women and neonates were excluded.

DATA COLLECTION AND ANALYSIS: Two reviewers independently extracted data and rated quality of allocation concealment. Trials with a 'double-intervention' such as those, which compared colloid in hypertonic crystalloid to isotonic crystalloid, were analysed separately. The analysis was stratified according to colloid type and quality of allocation concealment.

MAIN RESULTS: Colloids compared to crystalloids: Albumin or plasma protein fraction: Eighteen trials reported data on mortality, including a total of 641 patients. The pooled relative risk from these trials was 1.52 (95% confidence interval 1.08 to 2.13). The risk of death in the albumin treated group was 6% higher than in the crystalloid treated group (1% to 11%). When the trial with poor quality allocation concealment was excluded the pooled relative risk was 1.34 (0.95 to 1.89). Hydroxyethylstarch: Seven trials compared hydroxyethylstarch with crystalloids including a total of 197 randomised participants. The pooled relative risk was 1.16 (0.68 to 1.96). Modified gelatin: Four trials compared modified gelatin with crystalloid including a total of 95 randomised participants. The pooled relative risk was 0.50 (0.08 to 3.03). Dextran: Eight trials compared dextran with a crystalloid including a total of 668 randomised participants. The pooled relative risk was 1.24 (0.94 to 1.65). Colloids in hypertonic crystalloid compared to isotonic crystalloid: Eight trials compared dextran in hypertonic crystalloid with isotonic crystalloid, including 1283 randomised participants. The pooled relative risk was 0.88 (0.74 to 1.05).

REVIEWER'S CONCLUSIONS: There is no evidence from randomised controlled trials that resuscitation with colloids reduces the risk of death compared to crystalloids in patients with trauma, burns and following surgery. As colloids are not associated with an improvement in survival, and as they are more expensive than crystalloids, it is hard to see how their continued use in these patient types can be justified outside the context of randomised controlled trials.

Cochrane Database Syst Rev. 2013 Feb 28;2:CD000567. doi: 10.1002/14651858.CD000567.pub6.

Colloids versus crystalloids for fluid resuscitation in critically ill patients.

Perel P¹, Roberts J, Ker K.

⊕ Author information

Abstract

BACKGROUND: Colloid solutions are widely used in fluid resuscitation of critically ill patients. There are several choices of colloid, and there is ongoing debate about the relative effectiveness of colloids compared to crystalloid fluids.

OBJECTIVES: To assess the effects of colloids compared to crystalloids for fluid resuscitation in critically ill patients.

SEARCH METHODS: We searched the Cochrane Injuries Group Specialised Register (17 October 2012), the Cochrane Central Register of Controlled Trials (The Cochrane Library) (Issue 10, 2012), MEDLINE (Ovid) 1946 to October 2012, EMBASE (Ovid) 1980 to October 2012, ISI Web of Science: Science Citation Index Expanded (1970 to October 2012), ISI Web of Science: Conference Proceedings Citation Index-Science (1990 to October 2012), PubMed (October 2012), www.clinicaltrials.gov and www.controlled-trials.com. We also searched the bibliographies of relevant studies and review articles.

SELECTION CRITERIA: Randomised controlled trials (RCTs) of colloids compared to crystalloids, in patients requiring volume replacement. We excluded cross-over trials and trials involving pregnant women and neonates.

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MAIN RESULTS: We identified 78 eligible trials; 70 of these presented mortality data. **COLLOIDS COMPARED TO CRYSTALLOIDS:** Albumin or plasma protein fraction - 24 trials reported data on mortality, including a total of 9920 patients. The pooled risk ratio (RR) from these trials was 1.01 (95% confidence interval (CI) 0.93 to 1.10). When we excluded the trial with poor-quality allocation concealment, pooled RR was 1.00 (95% CI 0.92 to 1.09). Hydroxyethyl starch - 25 trials compared hydroxyethyl starch with crystalloids and included 9147 patients. The pooled RR was 1.10 (95% CI 1.02 to 1.19). Modified gelatin - 11 trials compared modified gelatin with crystalloid and included 506 patients. The pooled RR was 0.91 (95% CI 0.49 to 1.72). (When the trials by Boldt et al were removed from the three preceding analyses, the results were unchanged.) Dextran - nine trials compared dextran with a crystalloid and included 834 patients. The pooled RR was 1.24 (95% CI 0.94 to 1.65). **COLLOIDS IN HYPERTONIC CRYSTALLOID COMPARED TO ISOTONIC CRYSTALLOID:** Nine trials compared dextran in hypertonic crystalloid with isotonic crystalloid, including 1985 randomised participants. Pooled RR for mortality was 0.91 (95% CI 0.71 to 1.06).

AUTHORS' CONCLUSIONS: There is no evidence from randomised controlled trials that resuscitation with colloids reduces the risk of death, compared to resuscitation with crystalloids, in patients with trauma, burns or following surgery. Furthermore, the use of hydroxyethyl starch might increase mortality. As colloids are not associated with an improvement in survival and are considerably more expensive than crystalloids, it is hard to see how their continued use in clinical practice can be justified.

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Sıvı Replasmanı

- Isıtılmış izotonik elektrolit solüsyon; NS/ RL
- 250 ml.lik IV sıvı bolusları
- >500 ml den sonra cevap görmek önemli

■ TABLE 3.2 Responses to Initial Fluid Resuscitation¹

	RAPID RESPONSE	TRANSIENT RESPONSE	MINIMAL OR NO RESPONSE
Vital signs	Return to normal	Transient improvement, recurrence of decreased blood pressure and increased heart rate	Remain abnormal
Estimated blood loss	Minimal (10%–20%)	Moderate and ongoing (20%–40%)	Severe (>40%)
Need for more crystalloid	Low	Low to moderate	Moderate as a bridge to transfusion
Need for blood	Low	Moderate to high	Immediate
Blood preparation	Type and crossmatch	Type-specific	Emergency blood release
Need for operative intervention	Possibly	Likely	Highly likely

Kan Transfüzyonu

- hemorajiye bağlı ölümlerin %81'i ilk 6 saatte
- sonlanıma olumlu etki için hedefe yönelik replasman önemli
- tx pratiği tam kandan → kan ürünlerine (amaç; daha iyi kaynak yönetimi + enfeksiyöz hastalıkların transmisyonunu azaltmak)

Eritrosit/ TDP/ Trombosit???

1 : 1 : 1 (random plt)

6 : 6 : 1 (aferez plt)

Ne zaman? İlk 1 sa >4 Ü ERT

Crossmatch: 1 sa
Kan grubu: 10 dk

O Rh (-)

Nonhemorajik şok
sebepleri akla
gelmeli!!!

Traneksamik asit

- ilk 3 saatte
- 1 gr IV bolus 10 dk
- +
- 1 gr IV int 8 saatte

**It's Time for
Tranexamic Acid
(TXA) in Massive
Hemorrhage**



CRASH₂
Clinical Randomisation of an Antifibrinolytic
in Significant Haemorrhage

Kontrollü resüsitasyon/ permisif hipotansiyon

SKB: 70-110 mmHg
250 ml IV boluslar

Penetran torso
travmalarında

Hedef :
Hipotansiyon değil
Organ perfüzyonu x
kanama artış riski
dengesinin sağlanması

Kafa travması KE
Künt travma???

TBI → SKB >120 mmHg
MAP >65 mmHg



Permissive hypotension in penetrating trauma patients with hemorrhagic shock

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Institution: University of Calgary
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Status: ● Yellow (Internal BestBET edit)

Three Part Question

In [adult patients with penetrating trauma who are in hemorrhagic shock], does [permissive hypotension resuscitation] decrease [morbidity and mortality]?

Delayed fluid resuscitation prior to surgery is safe and is associated with better survival and shorter hospital stay
in the setting of hemorrhagic shock from penetrating torso injuries

Comment(s)

The traditional approach to resuscitation of hypotensive shock from hemorrhage involves IV bolus of large volume of isotonic crystalloid to restore blood pressure. Contrary to this approach, recent evidence suggest that rapid fluid resuscitation in hemorrhagic shock may actually increase mortality. The mechanism is thought to be that high-volume fluid resuscitation in hemorrhagic shock may increase mortality by increasing intravascular volume thus exacerbating hemorrhage, diluting blood in circulation causing coagulopathy, and ultimately reducing oxygen delivery to tissue (Ley et al., 2011). There has been several studies using animal models that showed hypotensive resuscitation result in decreased hemorrhage and better survival outcome compared to aggressive fluid resuscitation during uncontrolled hemorrhage. Clinical studies of permissive hypotension in the resuscitation of trauma patients with penetrating torso injuries showed similar trends. The RCT by Bickell et al. on penetrating torso injuries showed a statistically significant overall mortality rate that was lower in delayed fluid resuscitation group compared to that of the immediate fluid resuscitation prior to operative control of hemorrhage. The most recent and still ongoing RCT by Morrison et al. focuses on the intraoperative fluid resuscitation instead of prehospital and ED fluid resuscitation. The preliminary result did not show any significant outcome due to limited sample size. The RCT by Dutton et al. suffered from several methodological flaws and did not find statistically significant difference in mortality between the conventional SBP group and low SB group likely due to a small sample size. The retrospective study by Ley et al. observed that IV fluid replacement of 1.5L or more in the ED was an independent risk factor for mortality for trauma patients. However, the retrospective study did not specify hemorrhagic shock and penetrating trauma in the inclusion criteria thus less applicable to our clinical question. Furthermore, the methodology to control for confounders is less rigorous than an RCT. A search through clinical guidelines shows that hypotensive resuscitation is "accepted" in a national guideline, clearhouse guideline. <http://www.guideline.gov/content.aspx?id=37846&search=permissive+hypotension> Trauma injuries can have a number of different mechanisms (penetrating vs. blunt) and locations (brain vs. torso) of. The effect of hypotensive resuscitation may be different depending on different types of trauma. Based on the RCT by Bickell et al., permissive hypotension seemed to be associated with better outcome in penetrating torso trauma but this cannot be extrapolated to other types of injuries. More clinical research on this topic is needed.

Editor Comment

JS

Clinical Bottom Line

Delayed fluid resuscitation prior to surgery is safe and is associated with better survival and shorter hospital stay compared to immediate fluid resuscitation in the setting of hemorrhagic shock from penetrating torso injuries that requires surgical operation. These results should not be extrapolated to all age groups, to pregnant patients, to hypotensive patients with blunt trauma or severe head injuries, or to rural trauma care settings.



TEŐEKKRLER
Ksznm