



İzmir Bozyaka Eğitim ve Araştırma Hastanesi Acil Tıp Kliniği



Dr. İsmet

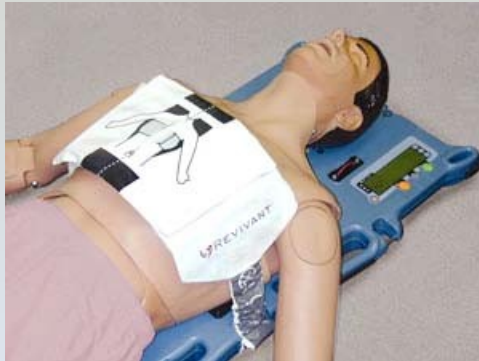
Tarihçe



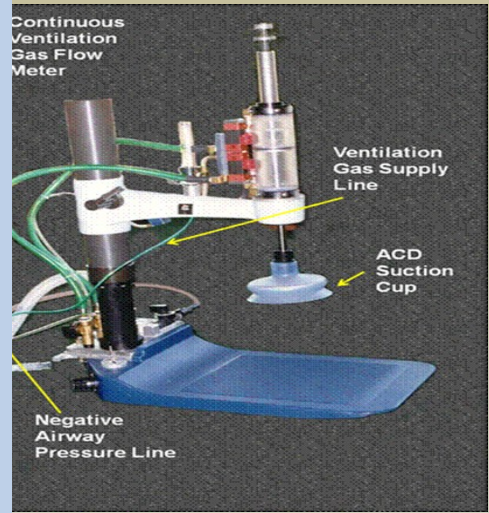


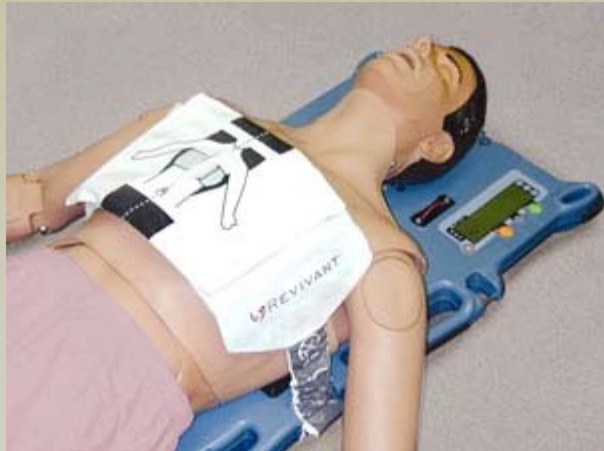
Mekanikleřmelimiyiz ???

Neden ???









ILCOR VE ERC

- Sağ kalım hala %6-13 arasında (Kanada)
 - Kuzey amerikada sağ kalım oranları (%3-16.3) bildirilmiş.
 - Nontravmatik, hastane dışı kardiyak arrest vakalarının oranı 189-598 /100.000 olarak Avrupa kaynaklarında belirtilmiştir
-
- The incidence of out-of-hospital cardiac arrest (OHCA) in USA has been estimated at 1.89/1,000 person-years and at 5.98/1,000 person-years in subjects with any clinically recognized heart disease [5]. Published survival rates for OHCA ranged from 3.0% to 16.3% in North America
 - Resuscitation and Emergency Medicine 2012, 20:39
 - <http://www.sjtrem.com/content/20/1/39>

- ‘scoop and run’ or stay and play
- The quality of CPR during OHCA is a key factor affecting survival The problem with standard CPR is that it provides only one third of normal blood supply to the brain and 10-20% of normal blood flow to the heart [8]. Good quality CPR is an even greater challenge in the setting of a moving ambulance.

cpr

- Başarının sırrı nerde
- Başarısızlığımıza farkındalık
- Bunları nasıl görebiliriz
- Kime inanacağız
- Nezamana kadar inanacağız niye ???
- Kanıtlarımız (LOE) ne kadar güvenilir ???
- Hangisi doğrudur???
- Hangisi daha doğru,

CPR

Otomatik mi, manuelmi !!!

Neden ???

CPR

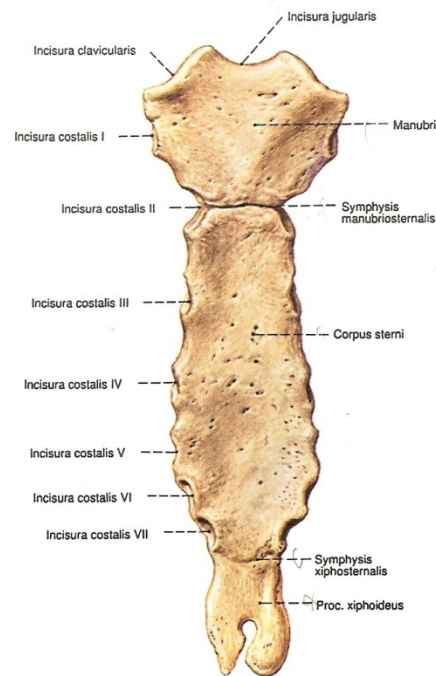
Otomatik mi, manuelmi !!!

- Tabiki manuel !!!
- Neden ???

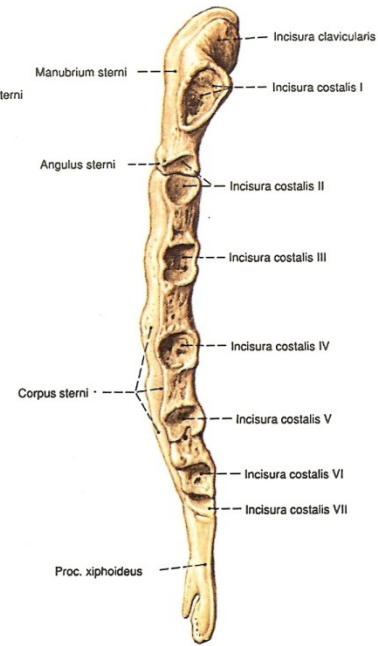
CPR

Otomatik mi, manuelmi !!!

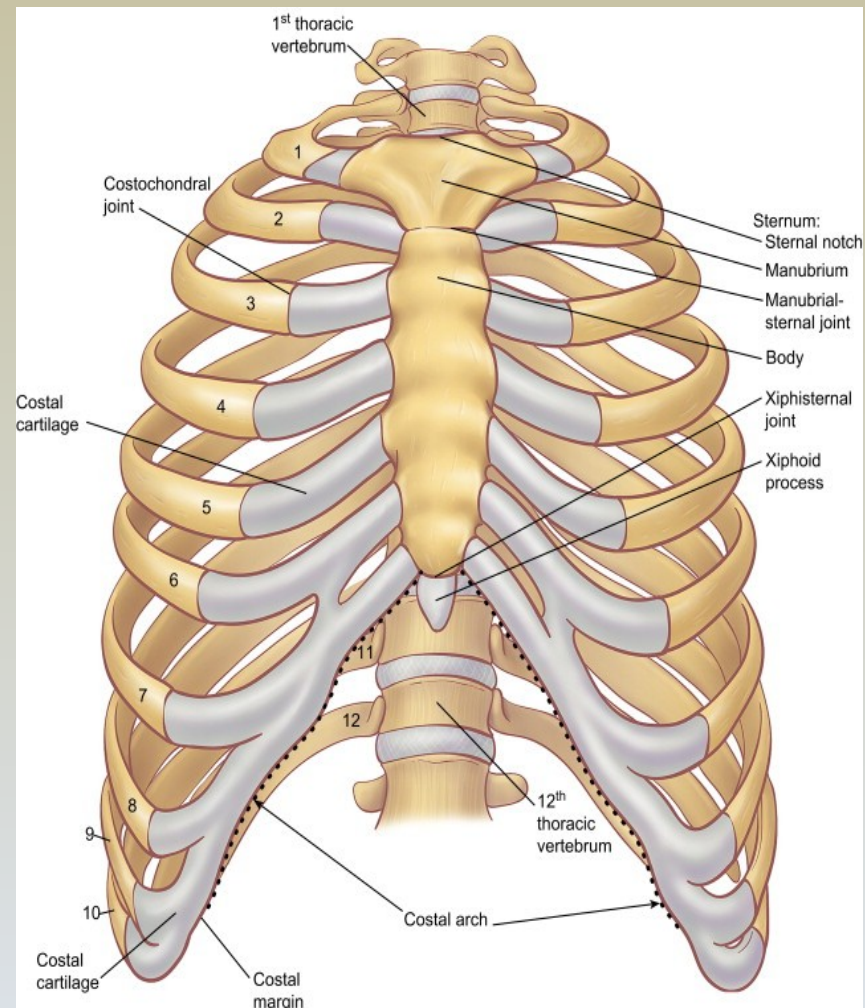
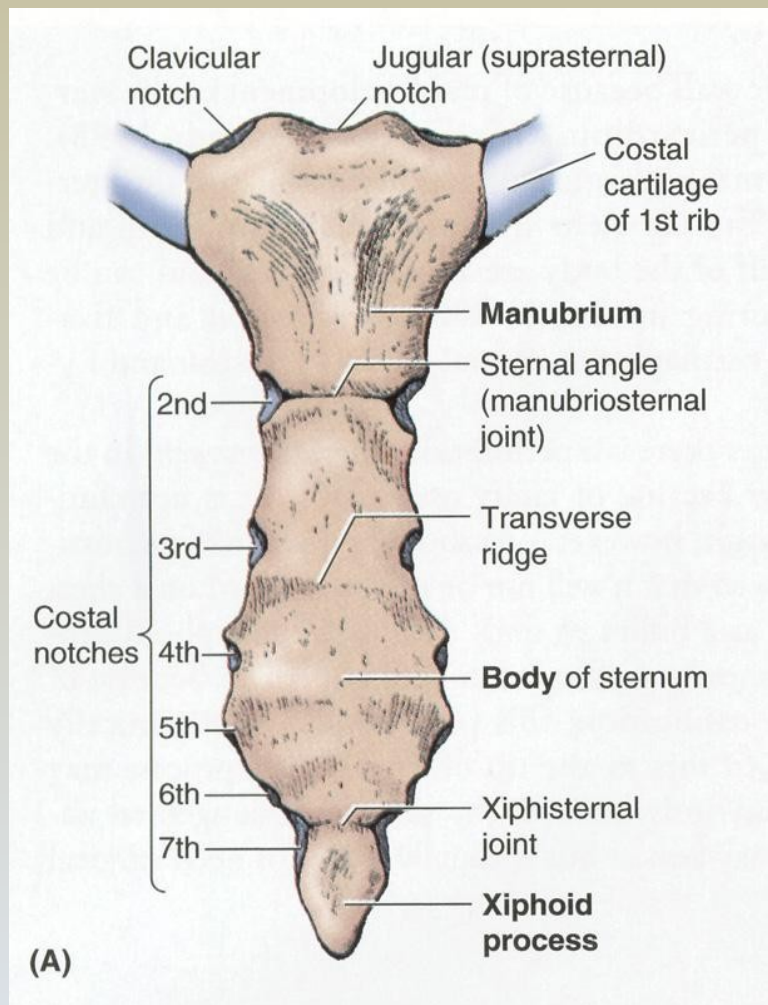
- Tabiki mekanik !!!
- Neden ???

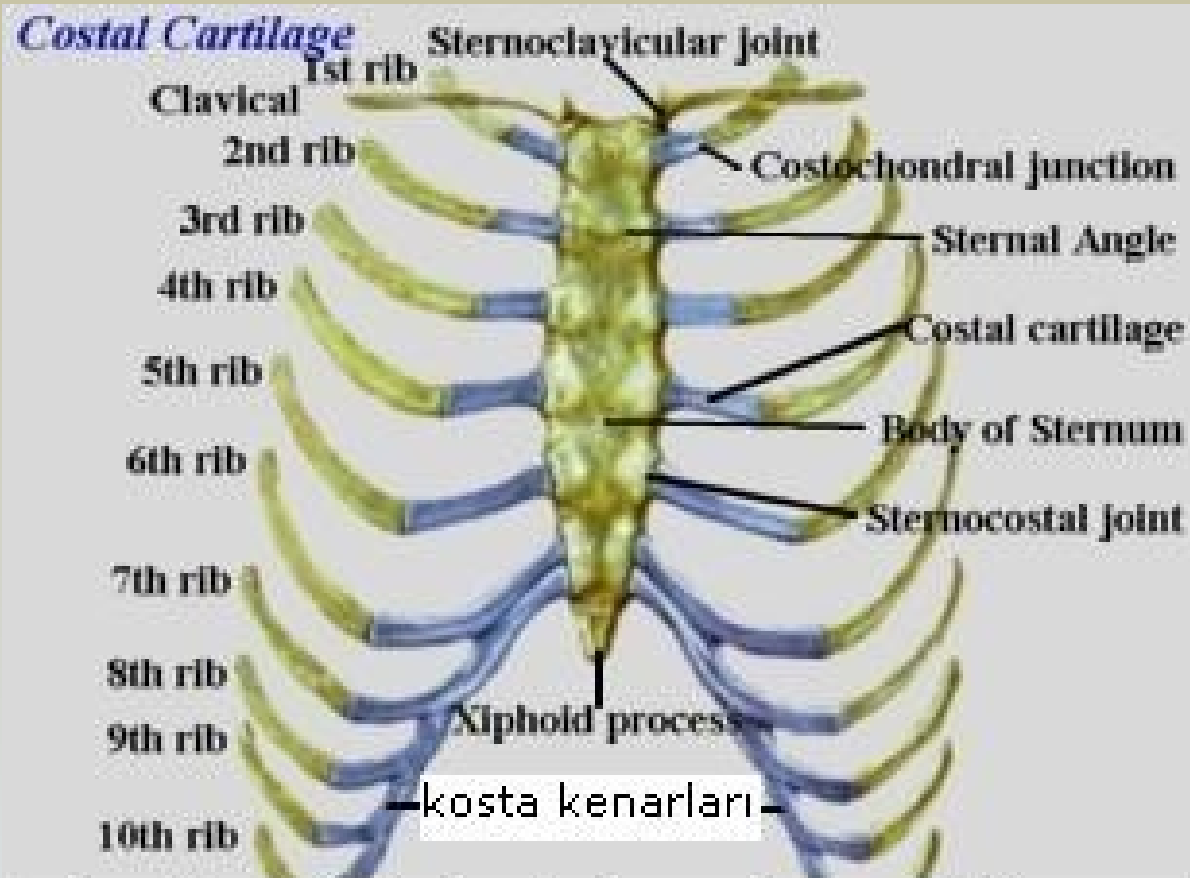


Gambar 804 Tulang dada, Sternum; tampak depan. Bentuk, panjang dan arah (ke arah dorsal atau ventral) Proc. xiphoideus sangat bervariasi.

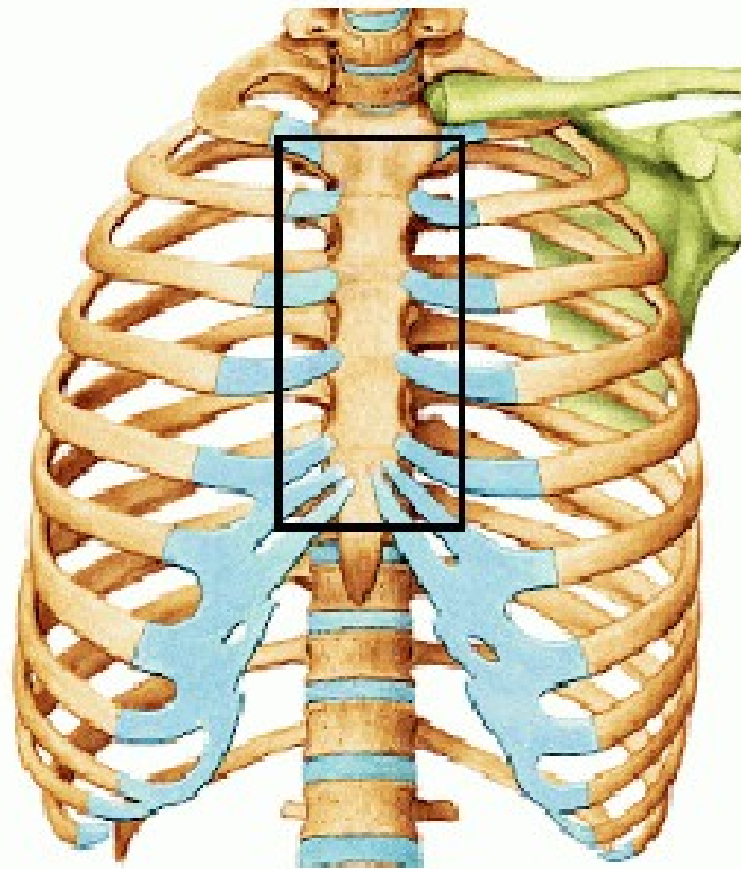


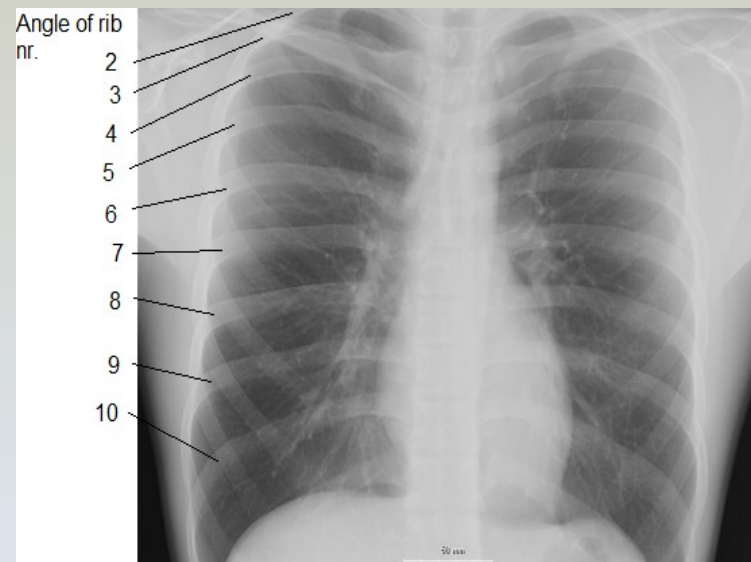
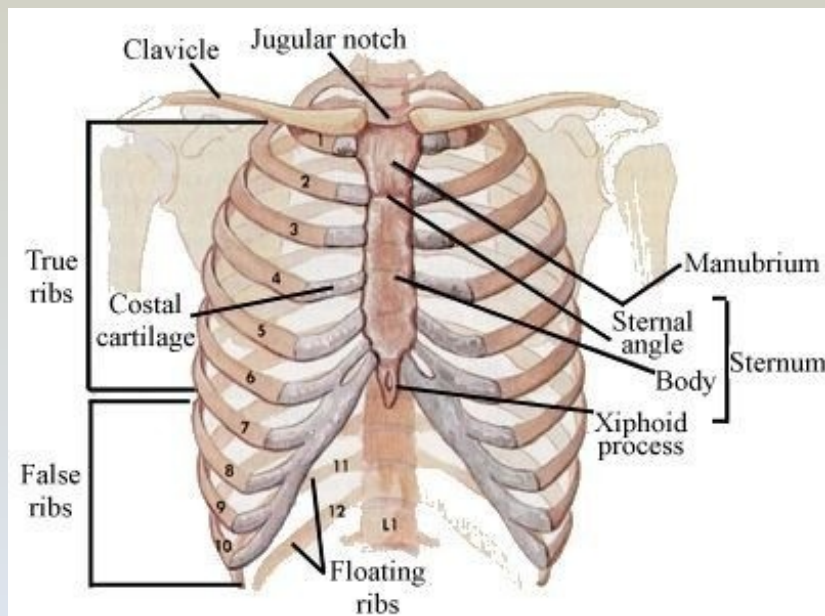
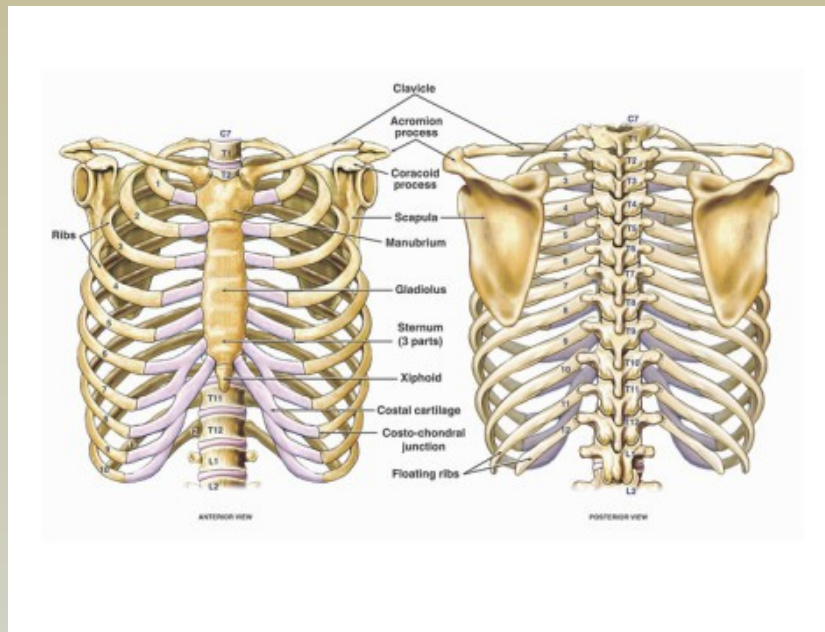
Gambar 805 Tulang dada, Sternum; tampak kiri lateral. Angulus sterni sangat membantu untuk menentukan orientasi tulang rusuk dan rongga interkonstal (Spatia intercostalia) pada dinding dada bagian depan.





kostokondritis kosta kenarlarını etkiler







DEESPONA 3D MODELS

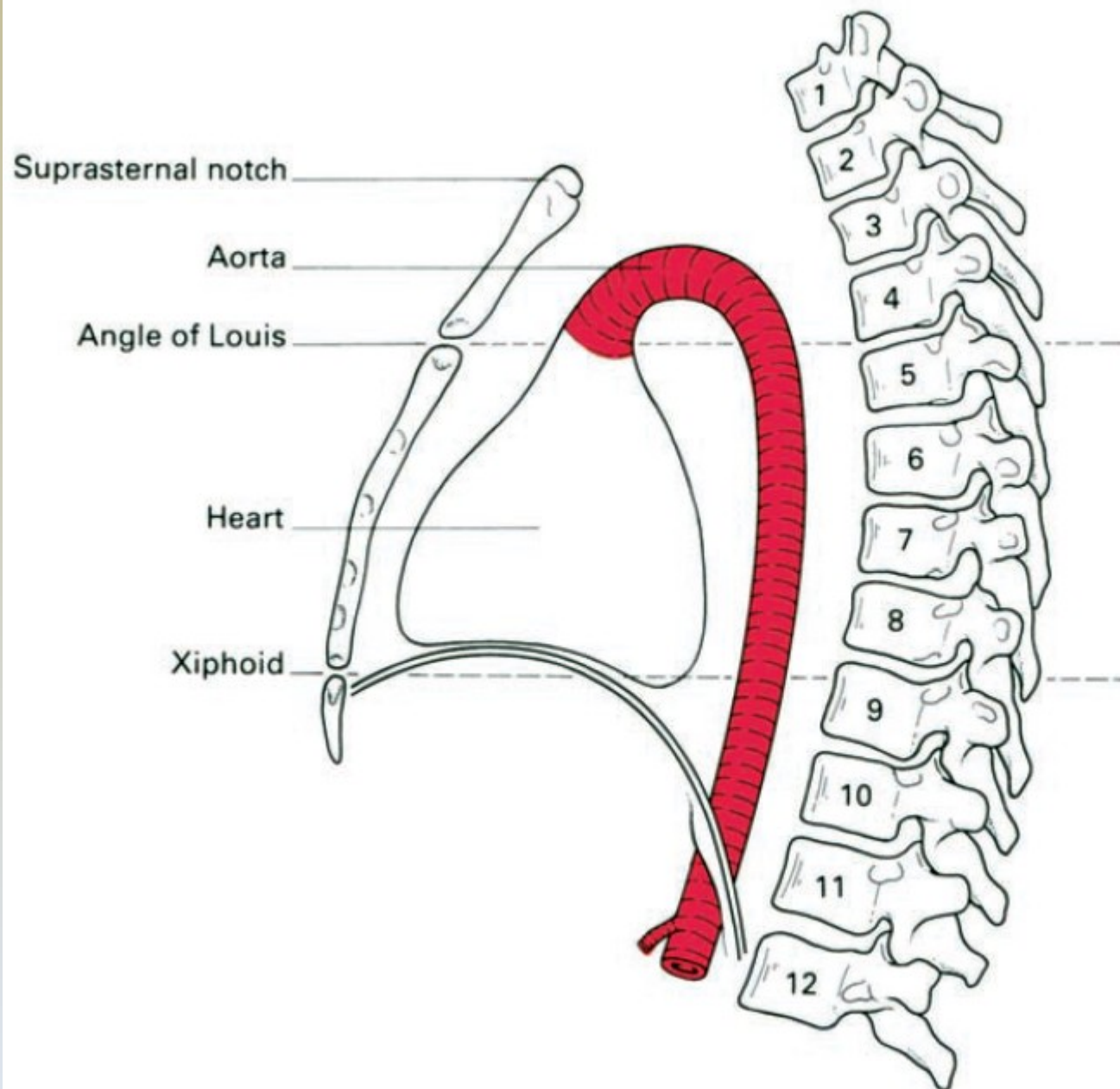
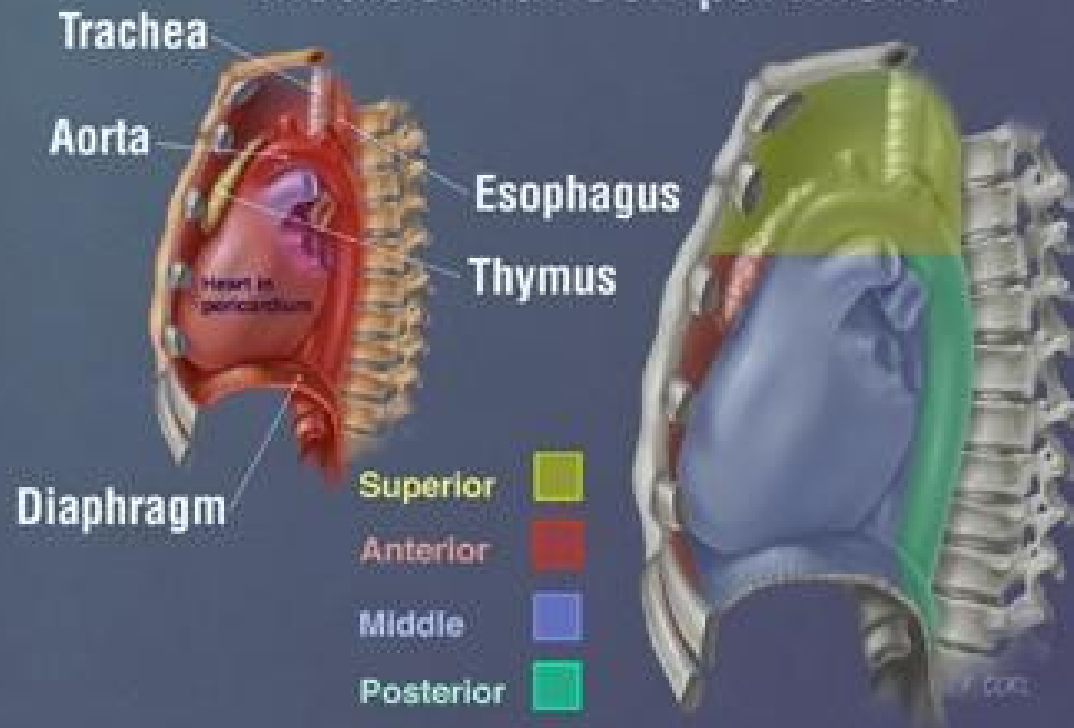
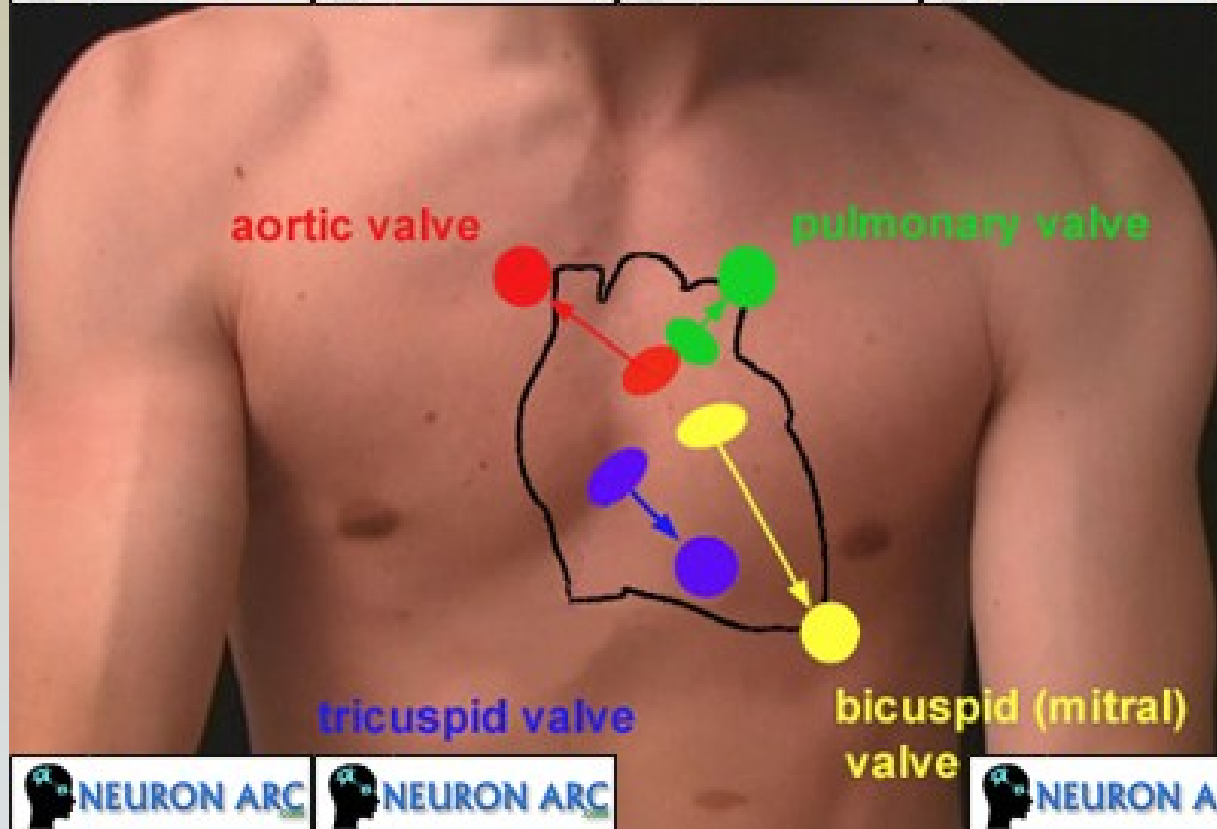
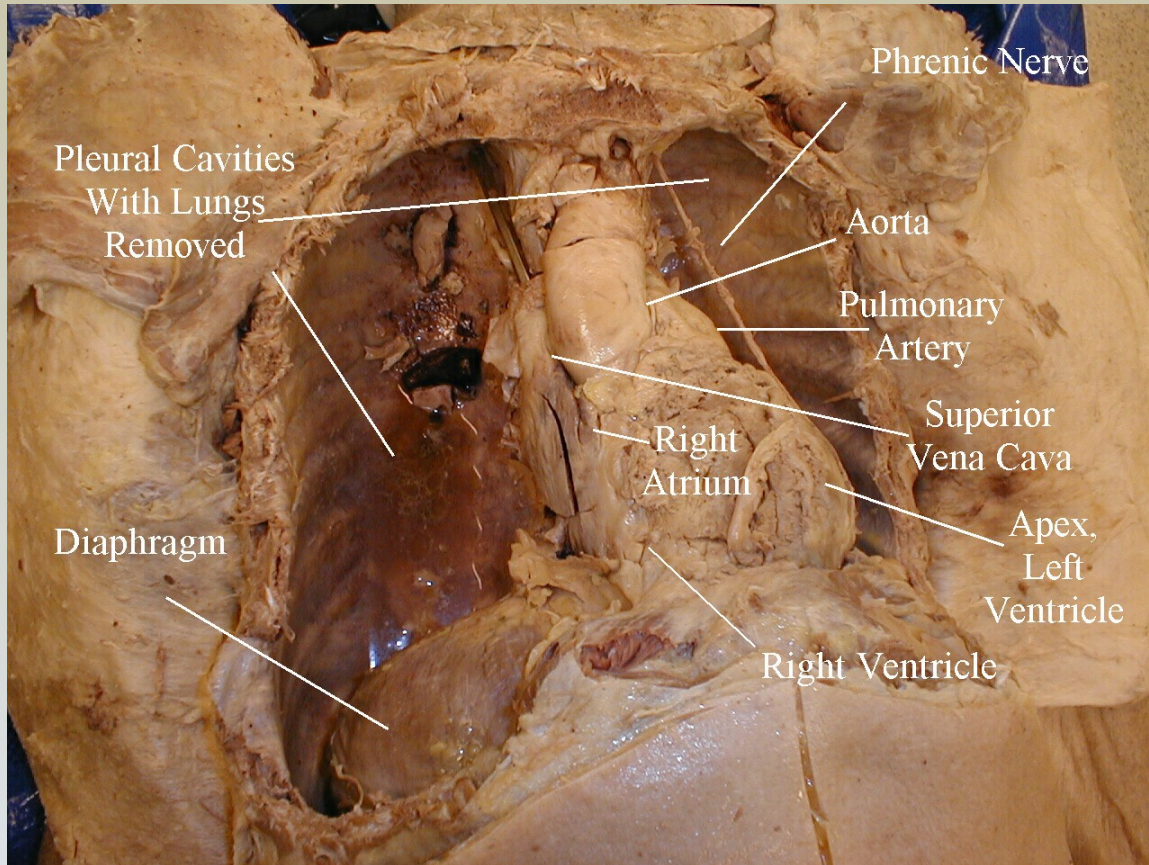


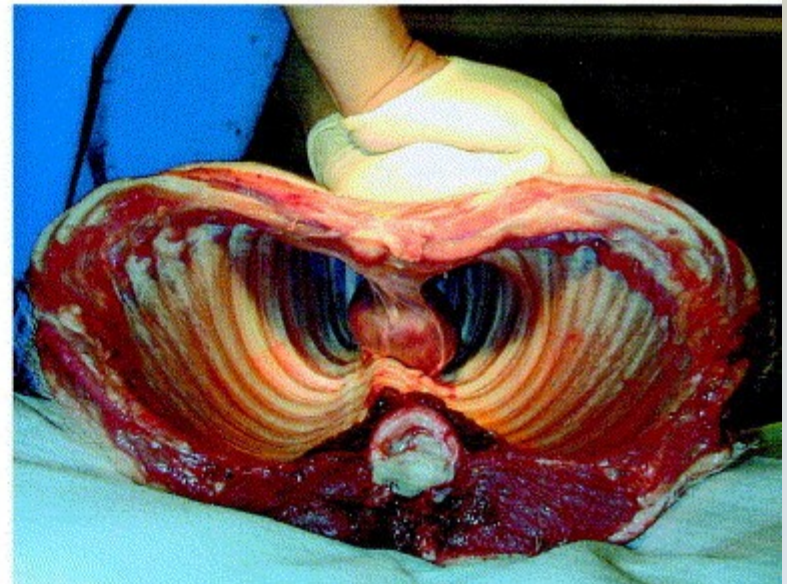
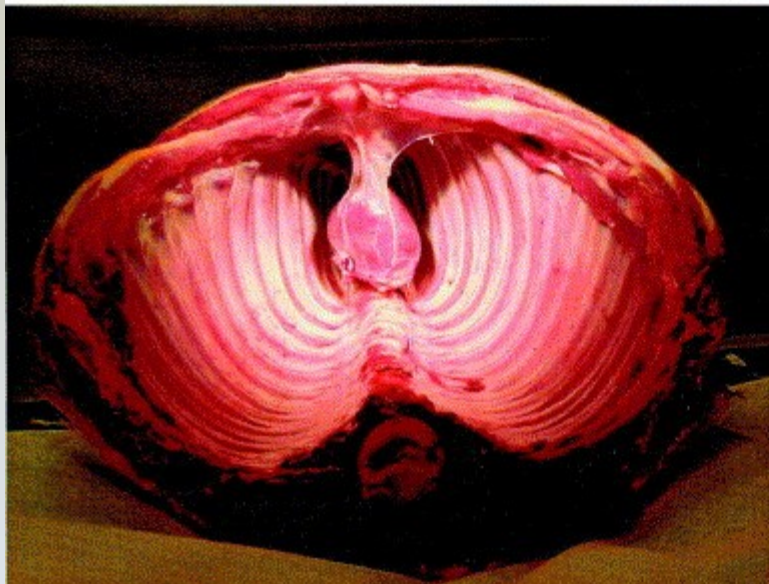
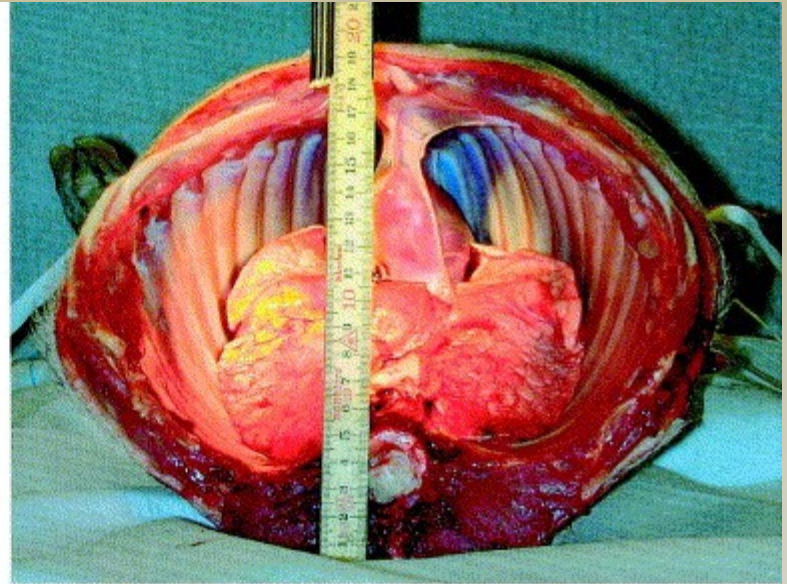
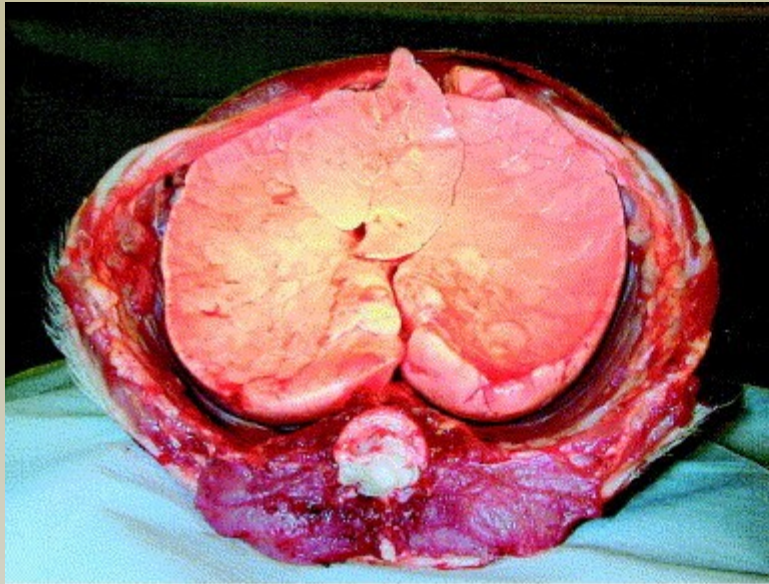
Fig. 1 Lateral view of the thorax—its surface markings and vertebral levels. (Note that the angle of Louis (T4/5) demarcates the superior mediastinum, the upper margin of the heart and the beginning and end of the aortic arch.)

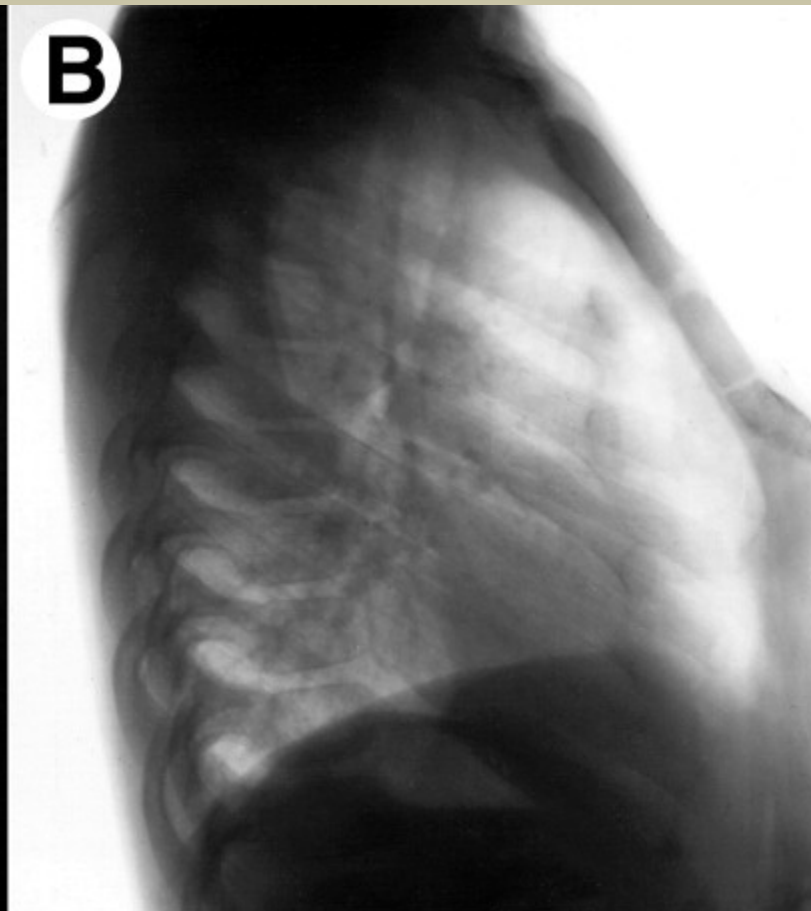
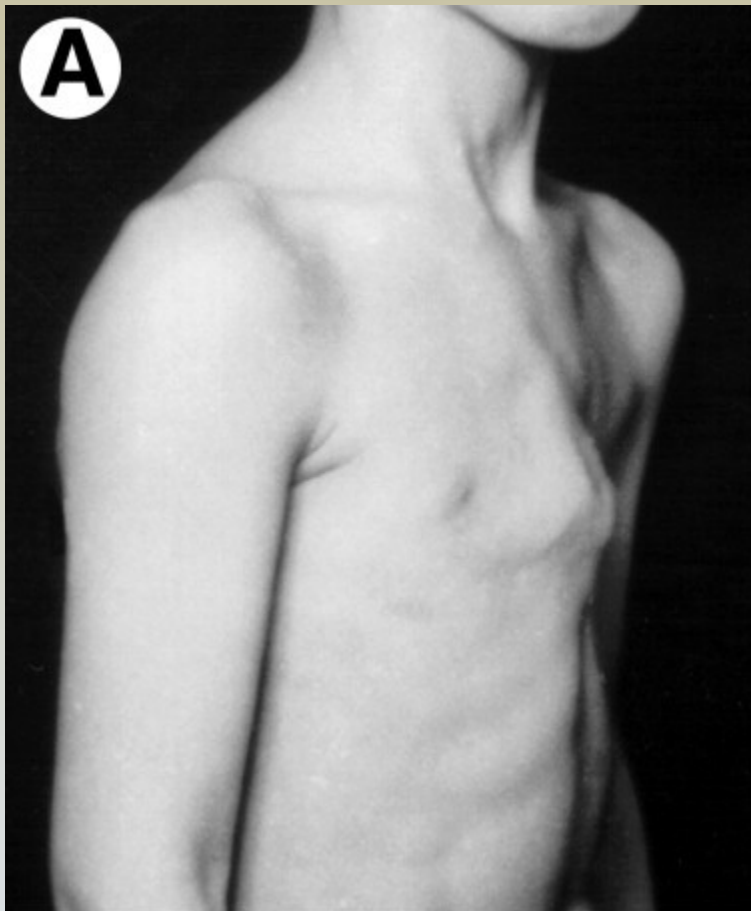
Mediastinal Compartments

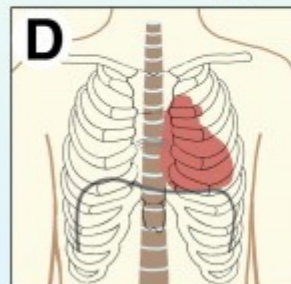
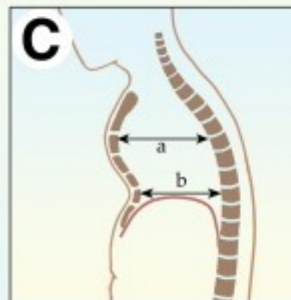
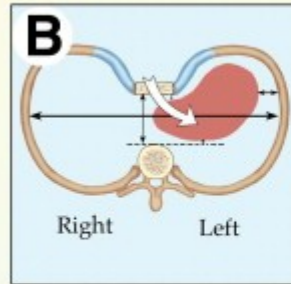


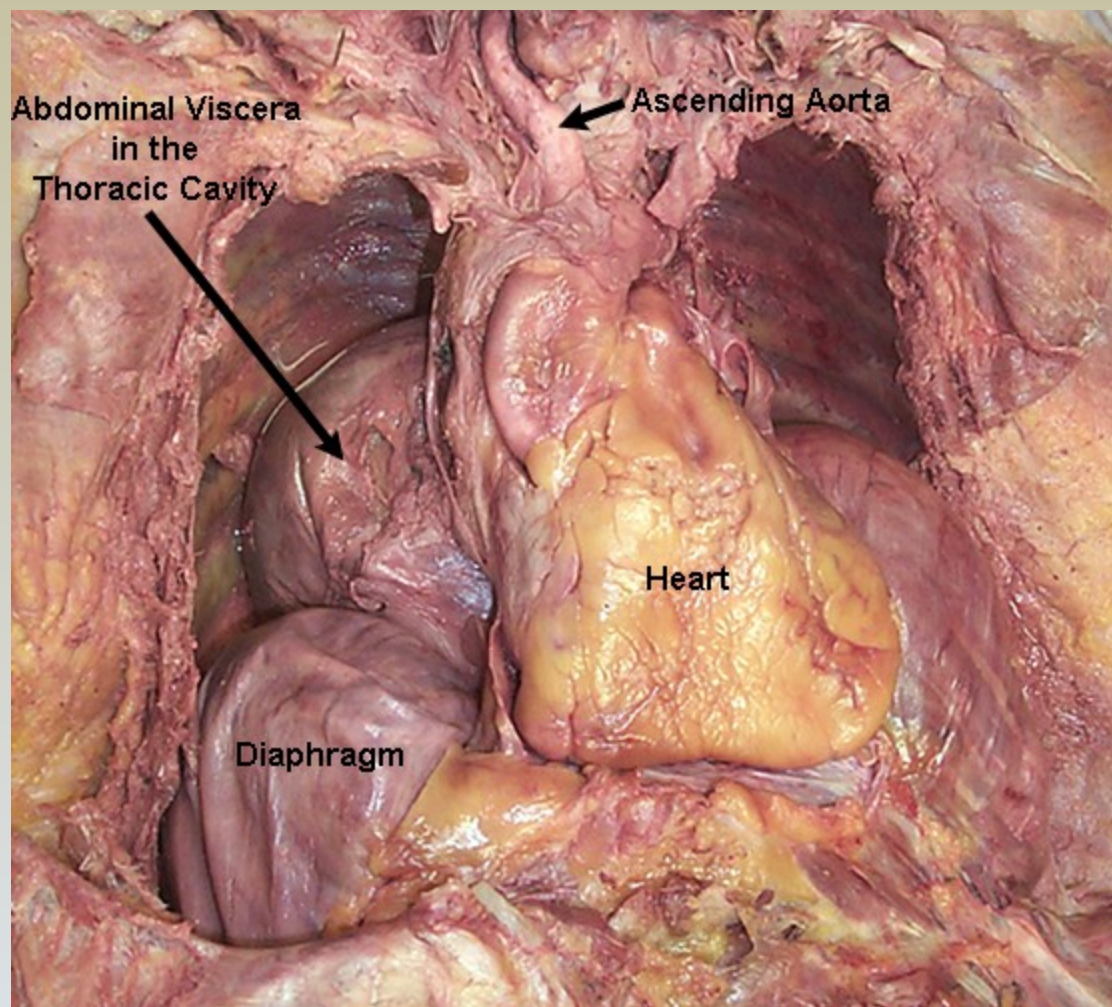


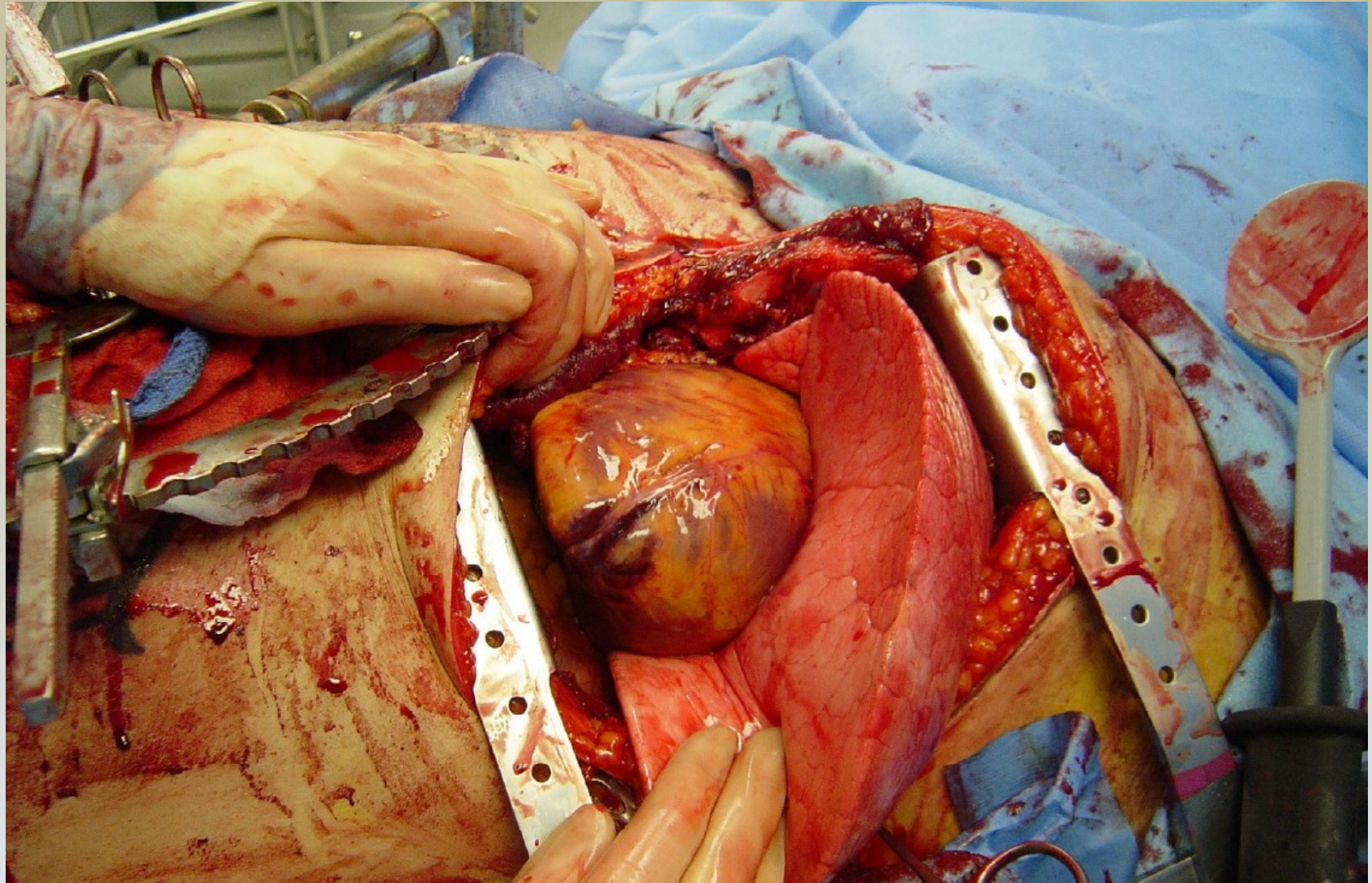












**Halk içinde muteber bir nesne yok devlet gibi /
Olmaya devlet cihanda bir nefes sıhhat gibi'**

Türkcell ve KVK nın hikayesi

- Yıllar önce Murat Vargı isimli bir girişimci yurtdışında gördüğü cep telefonlarının çalışma sistemlerini inceler ve Türkiye'ye getirmek ister
- Ancak yüksek yatırım maliyeti ve parasal prosedürler nedeniyle bunu büyük bir grupta yapmak ister.
- Önce Koç Holding'e gider. Türkiye'nin ilk cep telefonu şebekesinin kurulmasını anlatır.
- Yönetim kurulu "bizde tutmaz" gerekçesiyle

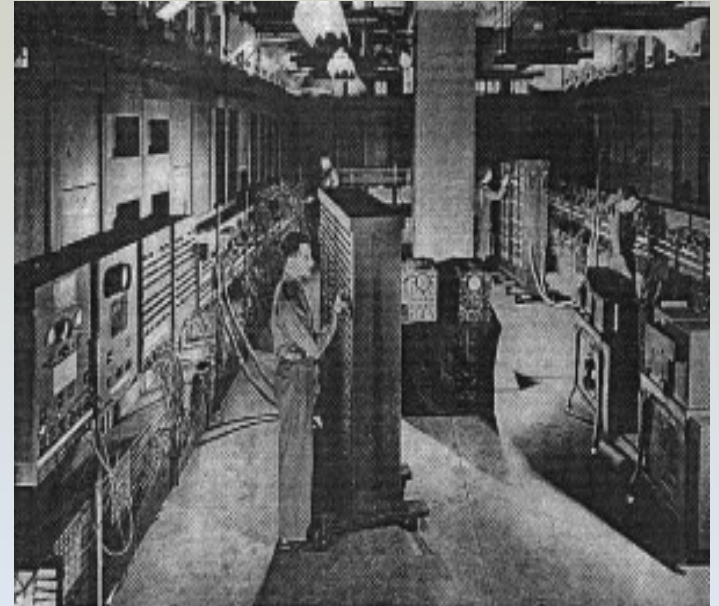
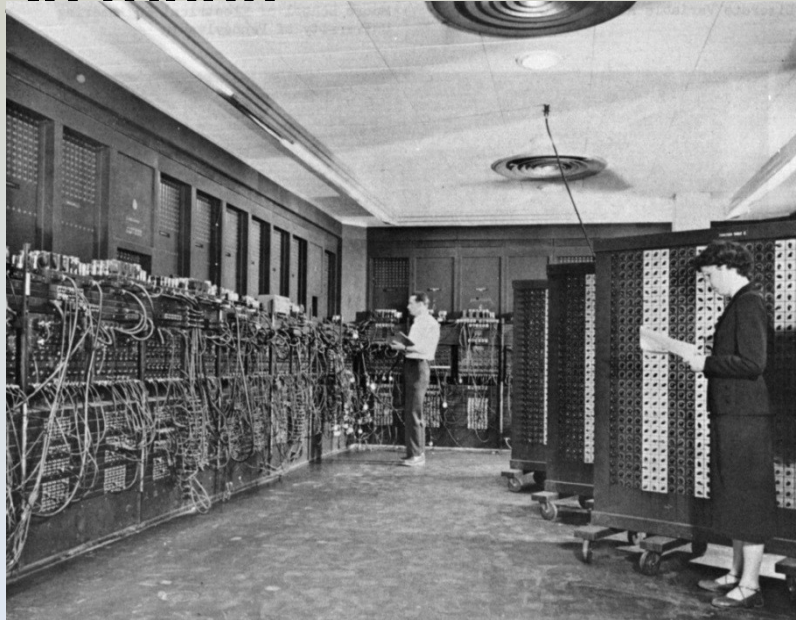
Geleceği görmek

- Üçüncü kapı Çukurova Grubudur. Bu grubun yönetim kurulunda da hayırlar evetlerden fazla çıkar ama Mehmet Emin Karam Mehmet kendi kişisel inisiyatifi kullanarak “kabul” kararını çıkartır.
- “Turkcell” ve “KVK” böylelikle doğar.
- Karam Mehmet ailesi bu sayede en zengin aile

Bill Gates liderliğini sekiz temel üzerine inşa ettiğini belirtir

- Ø İleriyi görmek,
- Ø Çok ama planlı çalışmak,
- Ø Akıllı kişileri çalıştırmak,
- Ø Elemanları şirketine ortak etmek,
- Ø Çalışanlara değer vermek,
- Ø Piyasada olup biteni takip etmek,
- Ø Belli noktaya odaklanmak,
- Ø Şımarmayıp mütevazı olmak

- **ENIAC**, elektrikle çalışan ve elektronik veri işleme kapasitesine sahip ilk bilgisayar.
- II. Dünya Savaşı esnasında ABD'li bilimadamları tarafından inşa edilen ENIAC ilk çıkan bilgisayardı
ENIAC, yaklaşık **167 m²** bir alana sığıyordu ve ağırlığı **30 ton**du



- Karl Linde **ilk elektrikli buzdolabını yapay olarak 1877'de** yapmayı başardı. Fakat bu buzdolabı aslında yiyeceklerin bozulmaması için soğuk ortamın gerekliliğinin ispatı niteliğindeydi. Çünkü bu haliyle kullanılabilir bir yapıdan oldukça uzaktı. Linde' nin cihazı, yiyecek kabininin arkasına freon gazı yerine metil ether gibi son derece patlayıcı bir gaz pompalıyordu. Güvenlik endişesi sebebiyle pek kullanılamadı. Sonraki yıllarda ise, freon gazı kullanılan ilk buzdolabını Balzer Von Platen ve Carl Munters birlikte tasaradı.





İlk lokanta: 13. yüzyılda Konya'da
açıldı.



- Türkiyede ***ilk kredi kartı*** kullanımına Aralık ***1991*** yılında başlandı.
- Türkiyede ***ilk cep telefonu kullanımı 1992*** yılında gerçekleşmiştir.
- Hatta Türkiye'deki ***ilk cep telefonu görüşmesi*** bir cep telefonu operatörünün açılışında dönemin Cumhurbaşkanı ***Süleyman Demirel*** ile Başbakanı ***Tansu Çiller*** arasında yapıldı.

Türkiye'de ilk otomobil yapımı 1959 yılında gerçekleşti. İlk Türk otomobili de Anadol markasıyla 1966 yılında satılıp kullanılmaya başlandı. Bundan önce 'Devrim' adlı bir otomobil, Eskişehir'de yapılsa da denendi ve vazgeçildi



İlk yerli Buzdolabı : 1960 yılında üretildi.

- İlk Türk Uçağı: 1934 yılında Kayseri'de monte edilmiştir.



CPR kaderi

- 112 nin ulaşma süresi (8 dk↓)
- Yanıbaşındakilerin kompresyona başlaması
- Yaşadığı ülke/şehir/mahalle/nöbetçi ekip/ekibin gününde olması, mesaidışı günler ve saat dilimleri
- Kişinin özelliği (üst düzey bürokrat, üst düzey amirlerimiz, üst düzeydekilerin yakını yada bizim yakınımız
- Kardiak arrestin nedeni
- Kişinin yaşı cinsi ek hastalıkları
- Etkin resussitasyonun başlatılması ve sürdürülmesi

Etkin CPR

- End-tidal CO2 değerinin 15mmHg ↑
- Göğüs kafesinin bası uygulanan yerine
- Uygulayıcıların performansına
- Kardiak arrestin nedenine
- Arrestin süresine
- Alanda cpr uygulanmasına
- Şahitli ve alanda cpr uygulamasına
- Ritmin VF veya Nabızsız VT

Artmış mortalite

- Asistoli
- Endtidal CO₂ değerinin 14 mmHg altında seyretmesi
- 112 ulaşma süresinin 8 dk↑
- Hastanın transportu esnasında mekanik cpr uygulanmaması
- Hastaya ulaşıldığında ritim yokluğuna



animax

Control panel for the animax resuscitator, featuring a digital display and various adjustment knobs and buttons.

Vent.
liter

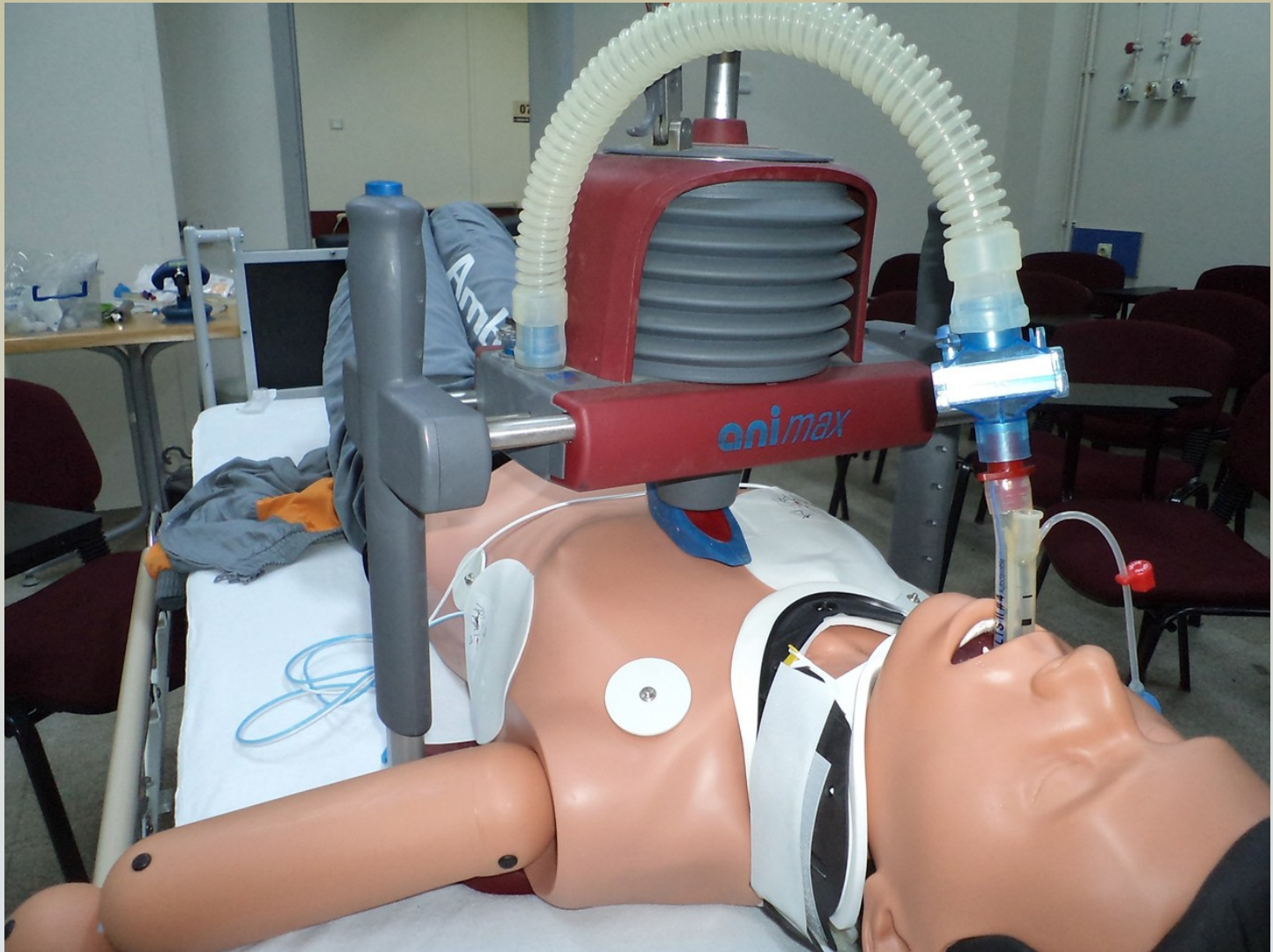
Ambu*

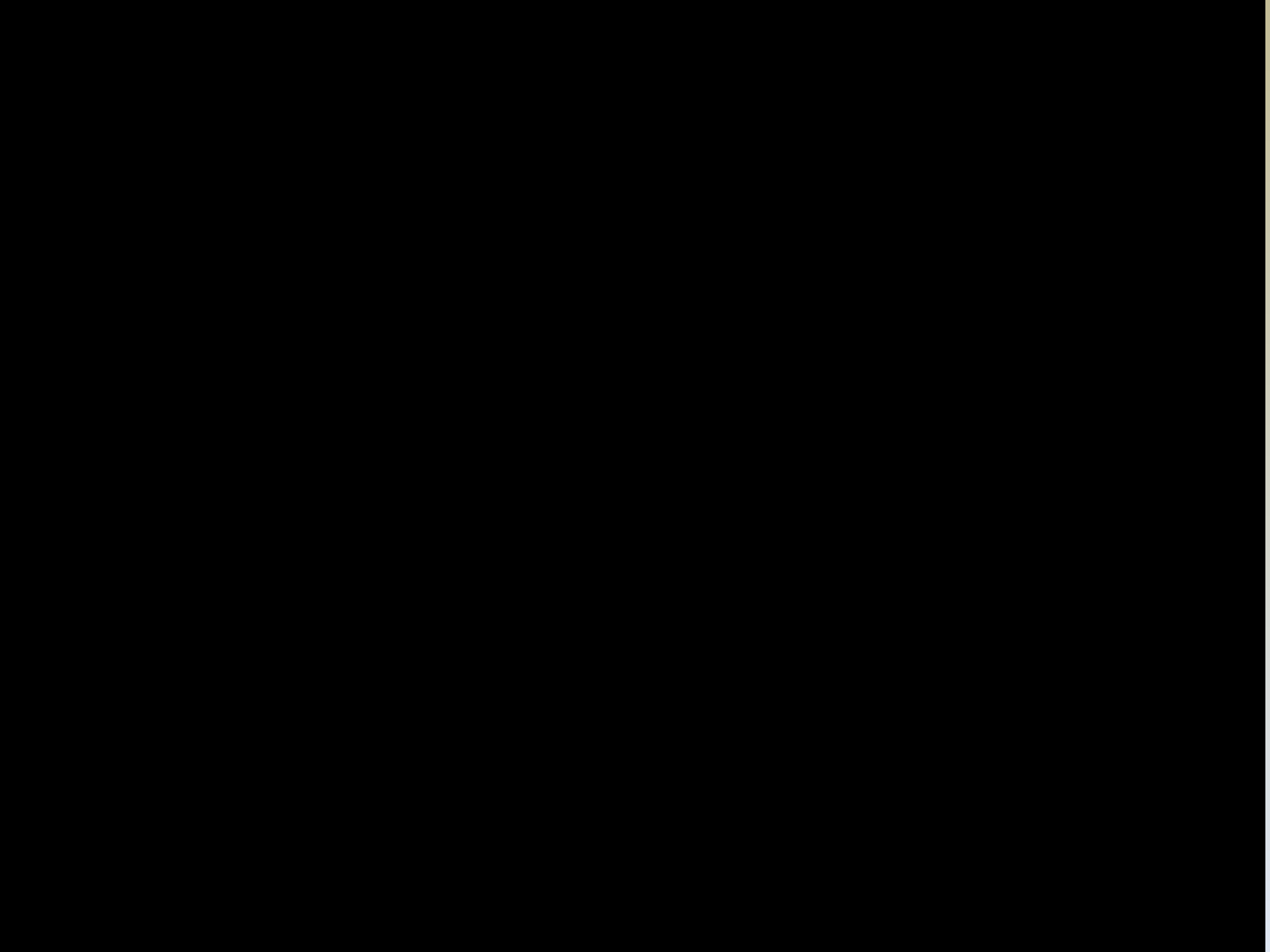
Comp.
mm

0.2 0.4 0.6 0.8 1.0 1.2

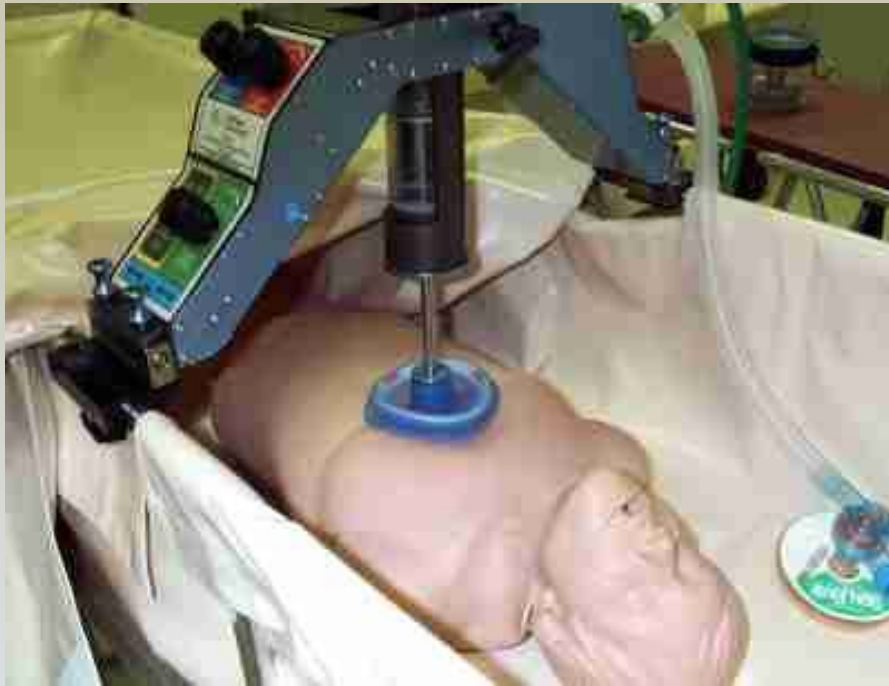
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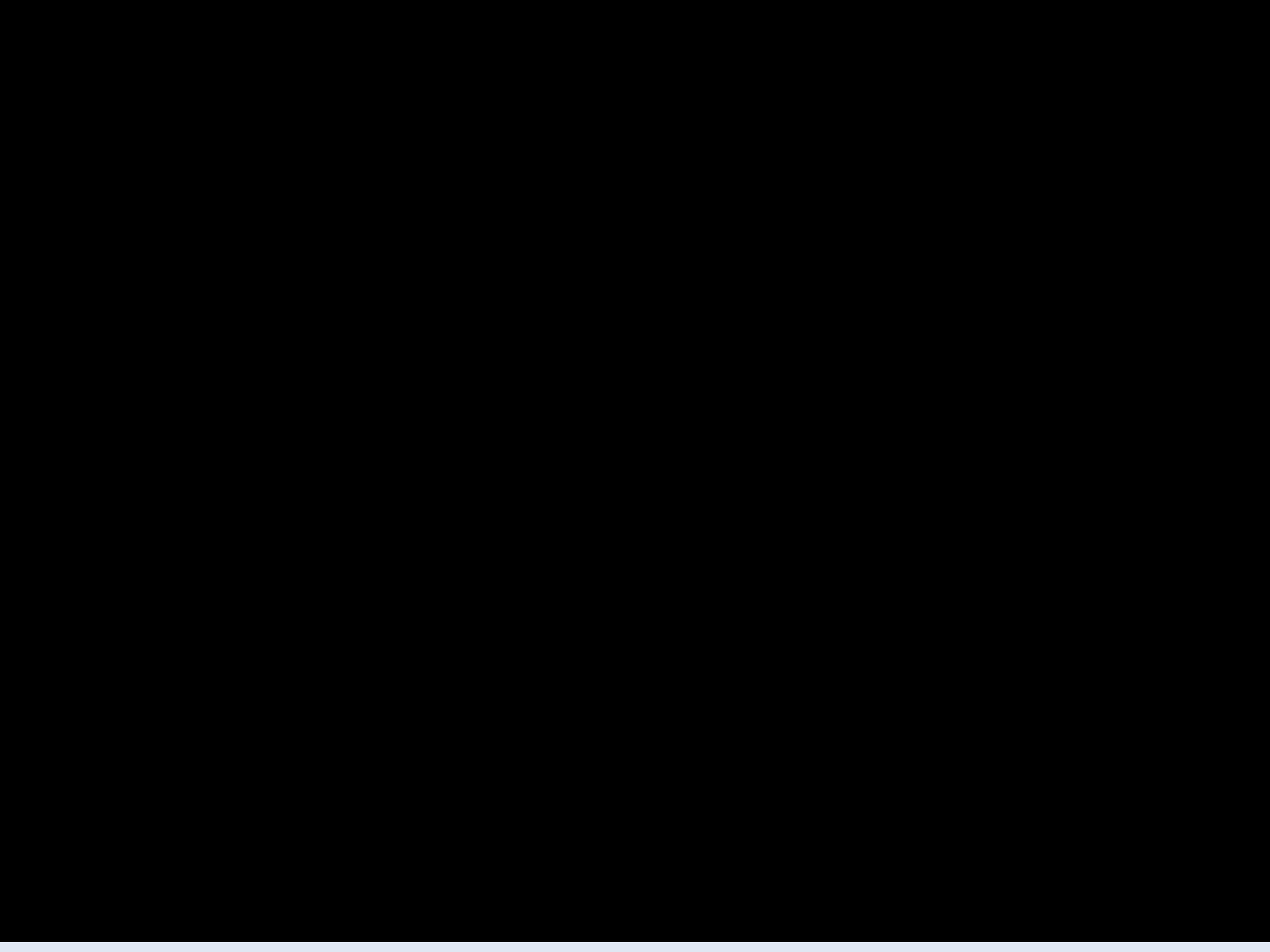


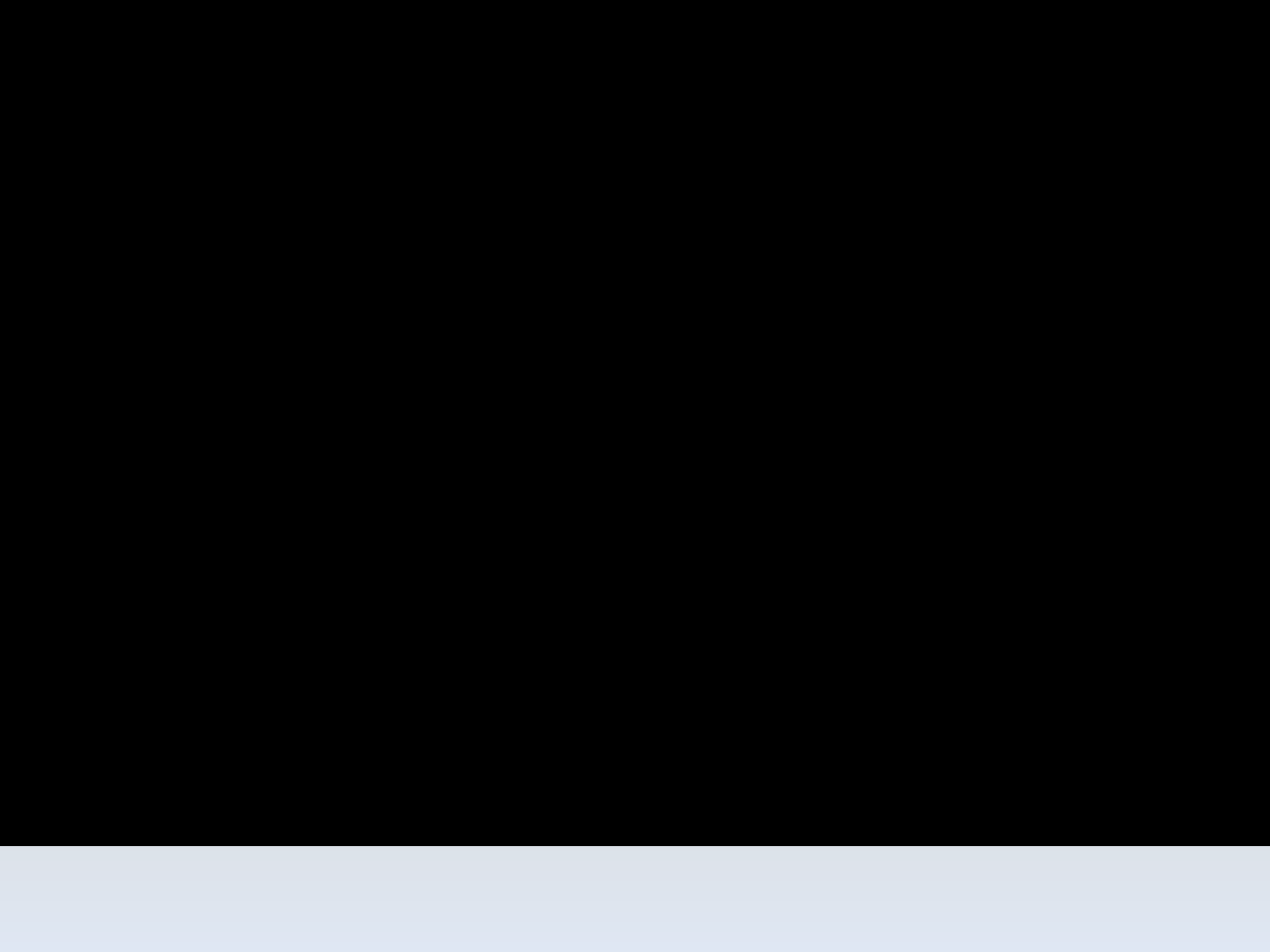
















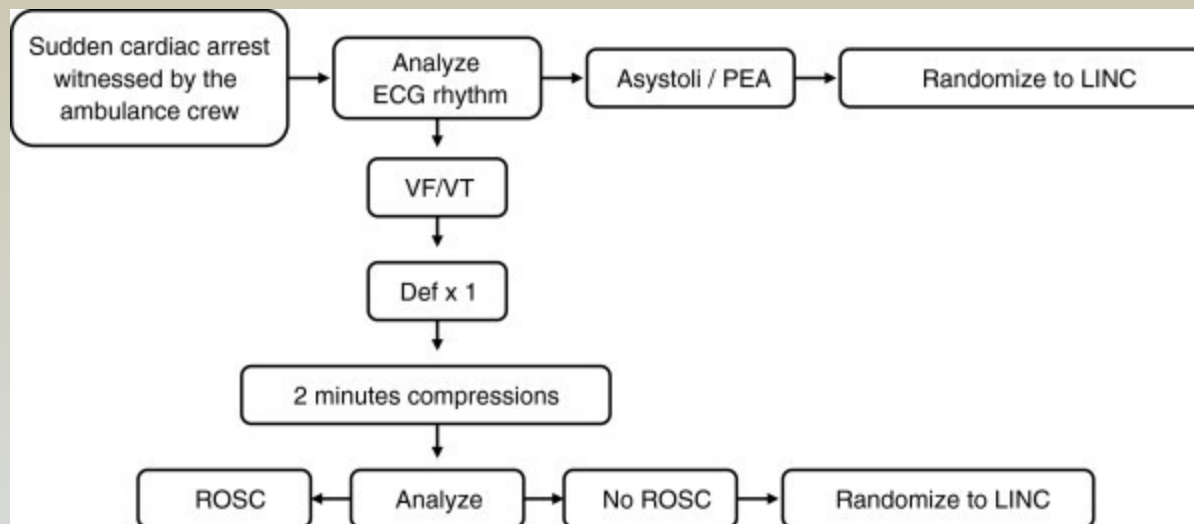




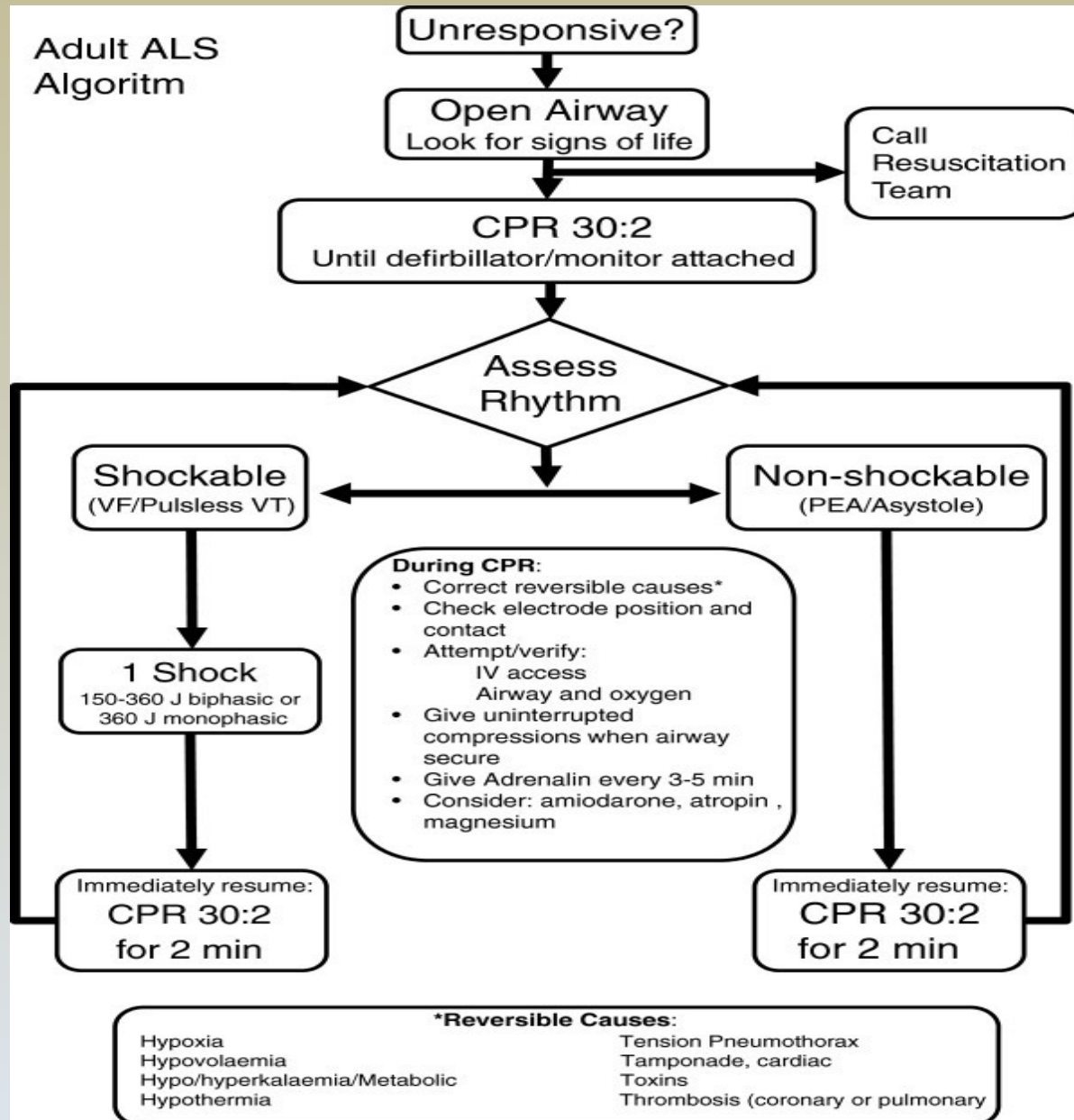




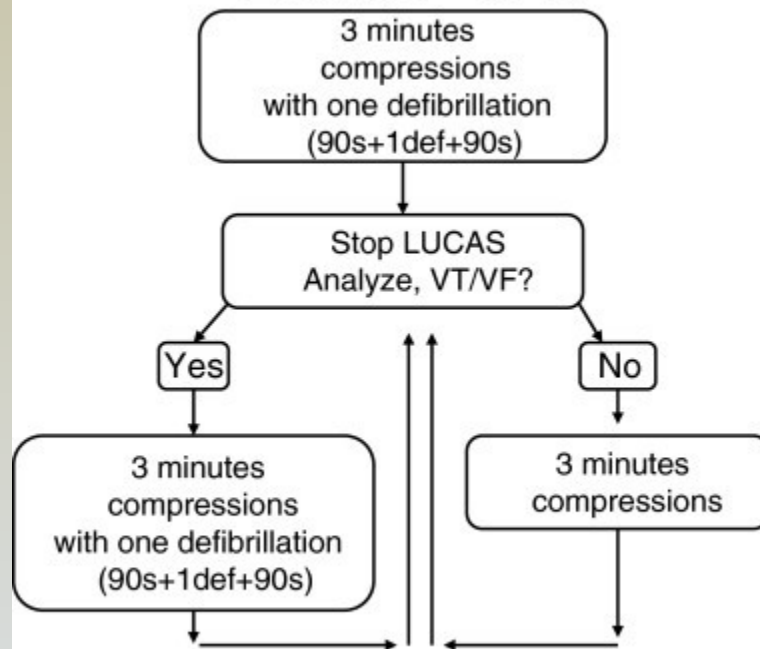




Adult ALS Algorithm



LUCAS™ CPR



Medications

Patients with VT/VF

Adrenalin 1 mg i.v. or i.o.

After 3 defibrillations.

There after every 3rd minute.

(Alternatively 3 mg in the ET tube)

Amidarone 300 mg after

4 defibrillations, 150 mg

after 7 defibrillations

Patients with asystoli / PEA

Adrenalin 1 mg i.v. or i.o.

as soon as possible, there after every 3rd minute.

(Alternatively 3mg in the ET tube)

Cardiac arrest witnessed by the ambulance crew, should if VT/VF be defibrillated x 1 as quick as possible.

See separate algorithm!

- Manken çalışması
- Manuel göğüs basıları yetersiz düzeyde kalmış
- LUCAS mekanik cpr ile sürekli ve optimum bası sağlanmış
- Güvenli ve daha az insan kaynağına ihtiyaç gösterdiği vurgulanmış

- Acute Card Care. 2013 Mar;15(1):1-6. doi: 10.3109/17482941.2012.735675.
- **Mechanical versus manual chest compression CPR under ground ambulance transport conditions.**

Transport esnasından hareket halinde iken LUCAS cpr, tecrübeli sağlık çalışanlarından daha etkin bulunmuş (2/3 doğru kompresyon %99 yeterli derinlikte olmuş)

- Out of 88 articles identified, only 10 studies met the inclusion criteria for further review.
- *Of these 10 articles,*
- **1 was Level of Evidence (LOE) 1,**
- **4 LOE 2,**
- **3 LOE 3,**
- **0 LOE 4,**
- **2 LOE 5.**
- 4 studies evaluated the quality of CPR in terms of compression adequacy while the remaining six studies evaluated on clinical outcomes in terms of return of spontaneous circulation (ROSC), survival to hospital admission, survival to discharge and Cerebral Performance Categories (CPC).
- 7 studies were supporting the clinical question, 1 neutral and 2 opposing.

- Mekanik cpr nörolojik durumu kötüleştirdiği ve rutin öneri için veri yetersizliği mevcuttur

JAMA. 2006 Jun 14;295(22):2620-8.

Manual chest compression vs use of an automated chest compression device during resuscitation following out-of-hospital cardiac arrest: a randomized trial.

- Primer sonuç 112 arandıktan sonra 4 saat yaşaması
- Sekonder sonuç hastaneden taburculuk
- Kötü nörolojik sonuçlar ve hayatta kalımda azalma bildirilmiştir
- (Standard EMS care for cardiac arrest with an LDB-CPR device (n = 554) or manual CPR (n = 517))

Resuscitation. 2013 Jan 23. pii: S0300-9572(13)00045-2. doi: 10.1016/j.resuscitation.2013.01.014. [Epub ahead of print]
The analysis of efficacy for AutoPulse™ system in flying helicopter.

- Japonya daki helikopter ambulansı ile transferdeki manuel ve mekanik cpr sonuçları
- Mekanik cpr daha etkili bir çok açıdan buna vurgu yapılıyor(sürekli, standart, kesintisiz ve tanımlandığı gibi)

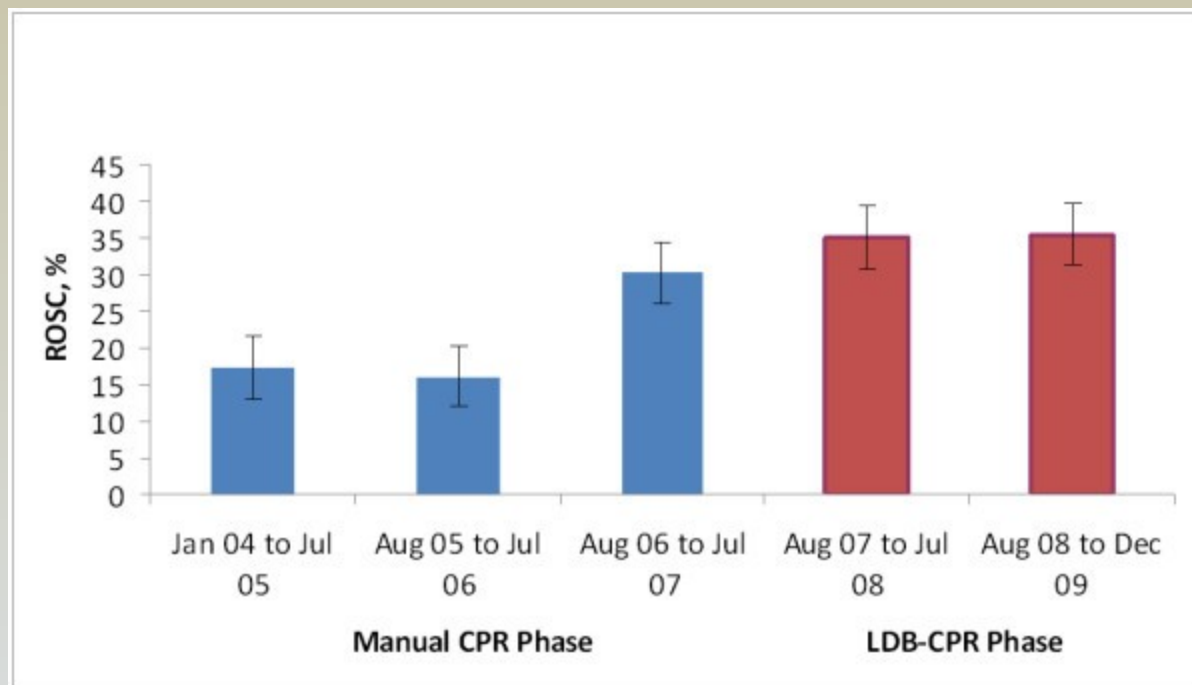
Crit Care. 2012; 16(4): R144.

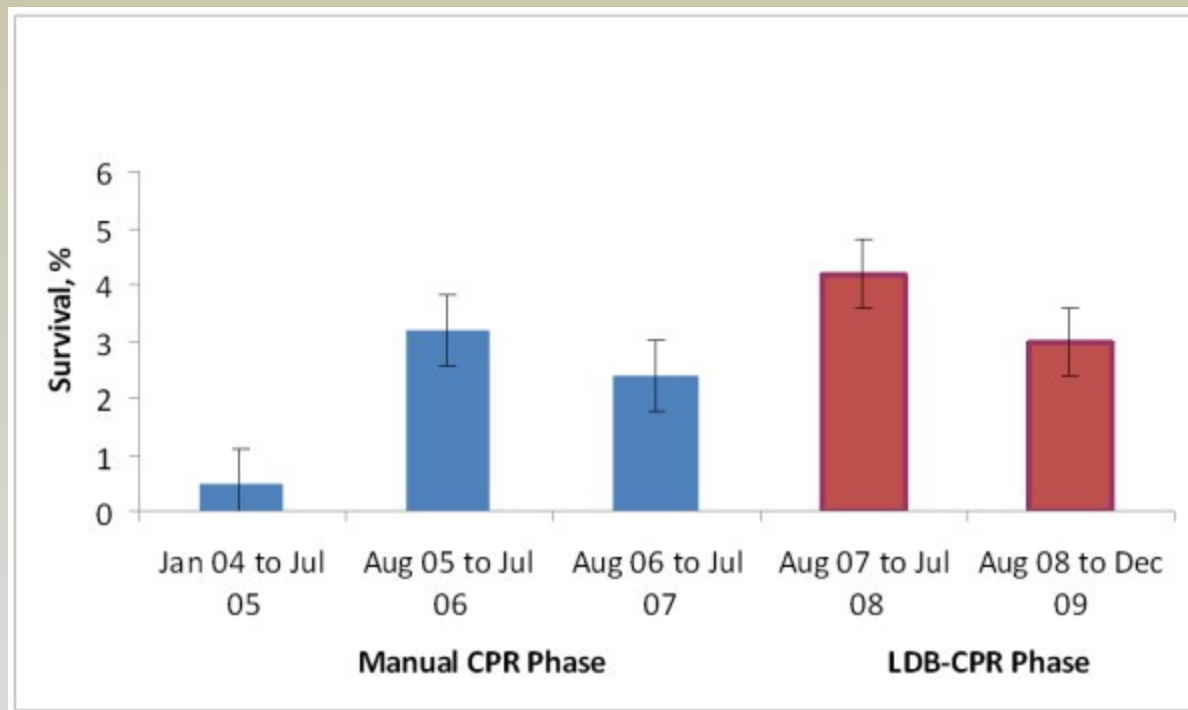
Published online 2012 August 3. doi: 10.1186/cc11456

PMCID: PMC3580732

Improved neurologically intact survival with the use of an automated, load-distributing band chest compression device for cardiac arrest presenting to the emergency department

- 1011 hasta çalışmaya alınmış bu hastaların demografik özelliklerinde fark yok
- 459 manuel
- 552 LDB-CPR
- Hastaya ulaşma süreleri benzer (34,33dk)
- Hayatta kalım LDB-CPR da % 3.3, Manuel de %1.3 de





Effect of the AutoPulse automated band chest compression

device on hemodynamics in out-of-hospital cardiac

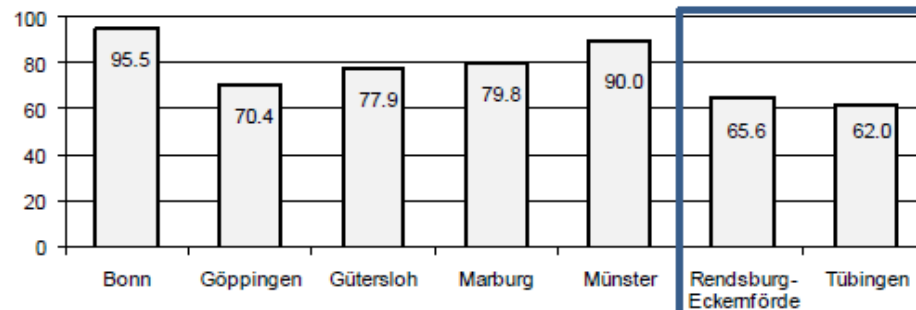
- **Results**—Hemodynamics^{arrest resuscitation} are reported and analyzed in 29 patients. Median diastolic BP increased after starting Autopulse™ from 17[11–25] mmHg to 23[18–28] mmHg ($p<0.001$). Median systolic BP increased from 72[55–105] mmHg to 106[78–135] mmHg ($p=0.02$). Mean BP increased from 29[25–38] mmHg to 36[30–45] mmHg ($p=0.002$). On the other hand, ETCO₂ did not increase significantly with Autopulse™ (21[13–36] vs 22[12–35] mmHg, $p=0.80$).

Table 1 Sociodemographic characteristics of the centres

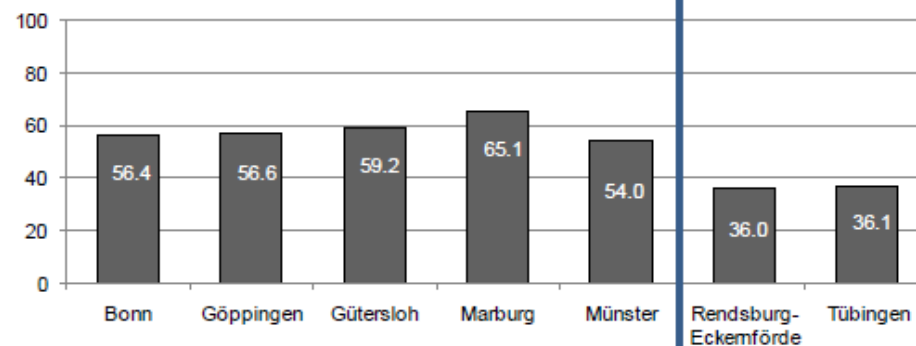
Sociodemographic characteristics	Bonn	Göppingen	Gütersloh	Marburg	Münster	Rendsburg-Eckemförde	Tübingen	P-value	Totals or averages
Served population, (n)	315,000	192,000	319,732	251,800	280,199	272,488	218,692		1,849,911
Service area (km ²)	141.0	354.0	864.0	1,262.6	302.9	2,185.9	519.2		5,629.6
Population density (1/km ²)	2,234.0	542.4	370.1	199.4	925.0	124.7	421.2		328.6
Time frame	1 Jan 2007 to 31 Dec 2009	1 May 2006 to 31 Dec 2009	1 Nov 2007 to 31 Dec 2009	1 Jan 2008 to 31 Dec 2008	1 Jun 2007 to 31 Dec 2009	1 Jan 2006 to 31 Dec 2007	1 Jan 2007 to 31 Dec 2009		
Person-years	945,000	704,000	692,753	251,800	723,847	544,976	656,076		4,518,452
CPR attempted (n)	533	399	410	164	391	196	237		2,330
CPR incidence (1/year/100,000 inhabitants)	56.4	56.7	59.2	65.1	54.0	36.0	36.1	< 0.001	50.6
Rate of first vehicle's reaching emergency patient within 8 minutes (%)	95.5	70.4	77.9	79.8	90.0	65.6	62.0	< 0.001	80.0
Rate of CPR started within 8 minutes (%)	67.9	60.6	57.6	57.9	64.2	56.0	53.0	< 0.001	60.3
Witnessed (%)	64.2	58.1	58.3	67.7	59.6	65.8	49.4	< 0.001	60.2
Witnessed by bystander (%)	53.8	45.6	47.1	58.5	53.2	59.7	38.4	< 0.001	50.4
CPR performed by bystander (%)	23.3	10.0	20.2	17.1	28.6	24.0	1.3	< 0.001	18.8
Witnessed and CPR performed by EMS (%)	10.3	12.5	11.2	9.1	6.4	6.1	11.0	0.09	9.8
Males (%)	64.4	66.9	66.1	68.3	68.0	71.9	66.7	0.64	66.9
Mean age (years)	66.9	68.9	67.9	65.9	67.4	65.2	65.3		67.1
Median age (years)	70.6	73.0	70.9	69.4	70.2	68.6	70.0		70.2
Age (SD)	17.7	16.1	16.6	16.6	17.0	16.5	19.8		17.2
> 65 years old (%)	65.5	71.4	67.3	57.9	63.4	62.2	66.2	< 0.05	
Location of cardiac arrest (%)									
Home	70.5	68.2	77.6	71.3	68.0	69.4	69.2	0.05	70.8
Public	17.4	17.3	16.6	15.9	22.0	20.9	18.1	0.37	18.3
Other	12.0	14.5	5.9	12.8	10.0	9.7	12.7	< 0.01	10.9

CPR = cardiopulmonary resuscitation; EMS = emergency medical service. Data are for service areas and populations served by the EMS systems. Unit hours = fully equipped response unit on a response or waiting for a response for 1 hour. P-values were calculated by t-test or χ^2 test, with significance set at $P < 0.05$.

Response time reliability: rate of first vehicle arriving within 8 minutes [%]



CPR incidence [1 / 100,000 inhabitants / year]



Admitted to hospital [1 / 100,000 inhabitants / year]

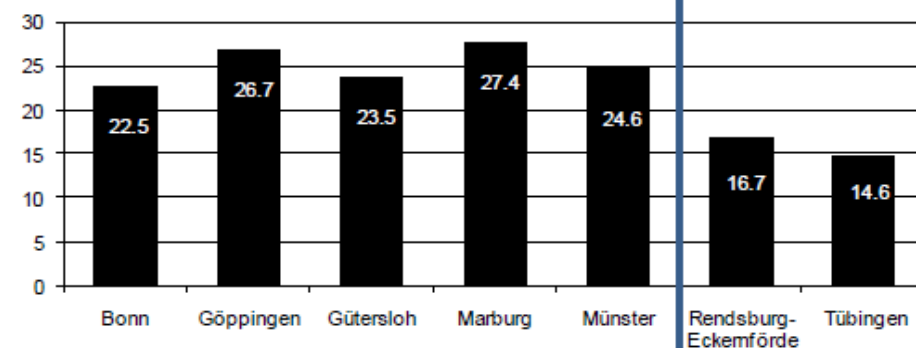


Figure 1 Response time reliability rate of first vehicle stop within 8 minutes of dispatch, cardiopulmonary resuscitation (CPR) incidence (1/100,000 inhabitants/year) and patients admitted to the hospital (1/100,000 inhabitants/year).

- The calculated incidence of sudden cardiac death followed by resuscitation attempt was between 36.0 and 65.1/100,000 inhabitants/year

Table 1 International Liaison Committee on Resuscitation (ILCOR) 2010 Levels of Evidence for Studies of Therapeutic Interventions

LOE 1:	Randomized Controlled Trials (or meta-analyses of RCTs)
LOE 2:	Studies using concurrent controls without true randomization (e.g. "pseudo"-randomized)
LOE 3:	Studies using retrospective controls
LOE 4:	Studies without a control group (e.g. case series)
LOE 5:	Studies not directly related to the specific patient/population (e.g. Different patient/population, animal models, mechanical models etc.)

Notes for Table 1:

LOE 1

Randomized Controlled Trials:

These studies prospectively collect data, and randomly allocate the patients to intervention or control groups.

LOE 2

Studies using concurrent controls without true randomization:

These studies can be:

experimental - having patients that are allocated to intervention or control groups concurrently, but in a non-random fashion (including pseudo-randomization: e.g. alternate days, day of week etc.), or observational – including cohort and case control studies

A meta-analysis of these types of studies is also allocated a LOE=2.

LOE 3

Studies using retrospective controls:

These studies use control patients that have been selected from a previous period in time to the intervention group.

LOE 4

Case series:

A single group of people exposed to the intervention (factor under study), but without a control group.

LOE 5

As with other categories of Levels of Evidence, we have used LOE 5 to refer to studies that are not directly related to the specific patient/population. These could be different patients/population, or animal models, and could include high quality studies (including RCTs).

Table 4 Review of eligible studies

S/N	Title	Description of Subjects	Study Design	Outcomes	Results	Conclusion
1	Comparing CPR ambulance transport: Manual versus Mechanical methods [18]	144 simulated runs conducted on a manikin.	Prospective observational study comparing between both types of CPR in different environment settings such as vehicle type, road conditions, vehicle speed. Thumper was used.	Compression adequacy (defined as 1.5 to 2 inches in depth, 60 compressions per min +/- 10% and correct hand position).	Thumper provided pre-defined correct compressions for 97% of the runs (n=70) while manual compressions were performed correctly 37% of the runs (n=27). 97% rate for the device remains valid for different environment settings while 37% rate for manual CPR varied in different settings.	The device is able to deliver higher number of effective and consistent compression at correct position as compared to manual CPR.
2	Quality of mechanical, manual standard and active compression-decompression CPR on the arrest site and during transport in a manikin model [19]	36 runs conducted on a manikin which runs are split between 3 groups.	Randomized, cross-over, out-of-hospital study comparing between three type of CPR at cardiac arrests sites and during transportation.	Compression depth, frequency, compression – decompression ratio based on European Resuscitation Council Guidelines (ERC).	Compression depth, frequency and compression ratio in mechanical CPR device were within recommended guidelines during ambulance transports as compared to other 2 groups.	Mechanical CPR adhered more closely to ERC guidelines. Working conditions for standard CPR in ambulance transport is undesirable.
3	Quality of cardiopulmonary resuscitation before and during transport in out-of hospital cardiac arrest [22]	Adult patients over 18 years of age suffering from non-traumatic OHCA for all causes and received CPR before and during transportation. Manual CPR during transport: 66 Mechanical CPR during transport: 9	Retrospective, observational study. LUCAS was used.	Chest compression and ventilation rates, hands-off ratio (time without compressions divided by total CPR time).	Hands-off ratio were lower for mechanical CPR both before (p=0.016) and during transport (p=0.002). Compression rates for mechanical CPR were closer to recommended guidelines (100/min) while manual CPR was higher (96/min vs. 119/min). No difference in CPC scores between two groups.	For manual CPR, Time without chest compressions during transport and compression rate was lower due to difficult conditions. As such, the device is more appropriate. No conclusion is drawn about patient outcomes due to small sample size.
4	Video-recording and time motion analysis of manual versus mechanical cardiopulmonary resuscitation during ambulance transport [25]	Adult patients over 18 years of age with OHCA for all rhythms. Manual: 12 Mechanical: 8	Prospective and randomized study where video-recording and time-motion studies was conducted. Thumper was used.	Chest compression rate, instantaneous compression rates, unnecessary no chest compression interval, based on guidelines in ILCOR.	No-chest compression interval (Mechanical: 33.4% vs. Manual: 31.63%, p=0.160). Average chest compression rate excluding no chest compression interval (mechanical: 52.3/min vs. manual: 113.3/min, p<0.050). Lower ventilation rate excluding no chest compression interval (mechanical 11.7/min vs. manual 16.1/min, p<0.050). Higher variability in chest compression rates for manual CPR.	Due to small sample size, short ambulance transport (average 4 minutes) and difficulty in setting/removal of device, it is hard to identify potential benefits of mechanical CPR.
5	The impact of a New CPR Assist Device on rate of return of spontaneous Circulation in Out of hospital Cardiac Arrest [23]	Adult patients with OHCA. No exclusions listed. Manual: 138 Mechanical: 124	Retrospective case-control study with matched control subjects.	ROSC upon arrival at Emergency Department (Asystole/ Agonal, PEA and VT/VF).	ROSC for case matched subjects in all rhythms (mechanical: 39% versus manual: 29%, p=0.003), Asystole/agonal (mechanical: 37% vs. manual: 22%, p=0.008), PEA (mechanical: 38% vs. manual:	Mechanical CPR may improve ROSC and benefit patients with non-shockable rhythms.

Table 4 Review of eligible studies (Continued)

			All mechanical CPR subject groups received manual CPR prior to deployment of the device. AutoPulse was used.	23%, p =0.079) and VF/VT (no difference).		
6	Use of an Automated, Load-distributing Band Chest Compression Device for Out-of-Hospital Cardiac Arrest Resuscitation [12]	Adult patients over 18 years of age with non-traumatic OHCA. Manual: 499 Mechanical: 210	Phased, non-randomized observational study of clinical outcomes of patients treated before and after transition from manual CPR to using mechanical CPR device, AutoPulse.	ROSC, survival to hospital admission and hospital discharge, and neurological outcome at discharge.	ROSC (mechanical: 34.5% vs. manual: 20.2%), Survival to hospital admission (mechanical: 20.9% vs. manual: 11.1%), Survival to hospital discharge (mechanical: 9.7% vs. manual: 2.7%). No difference in CPC (p=0.360) and OPC (p=0.400) Better mechanical CPR performance if ambulance response time is less than 8 minutes.	Mechanical CPR is better.
7	Manual Chest Compression vs. Use of Automated chest compression device during resuscitation following out of hospital cardiac arrest: a randomized trial [13]	Adult patients over 18 years of age, non-traumatic OHCA and resuscitation attempted by EMS. Manual: 517 Mechanical: 554	Multi-centre randomized trial. AutoPulse was used.	Survival with spontaneous circulation 4 hours after emergency call is made, Survival to hospital discharge, CPC at hospital discharge.	No difference in survival to 4 hours (mechanical: 29.5% vs. manual: 28.5%, p=0.740), survival to discharge (mechanical: 5.8% vs. manual: 9.9%, p=0.060). Difference in CPC score at hospital discharge (mechanical: 3.1% vs. manual: 7.9%, p=0.006).	Study was terminated when it was found that mechanical CPR was associated with worse neurological outcomes and a trend towards worse survival than manual CPR
8	Clinical consequences of the introduction of chest compression in the EMS system for treatment of out-of-hospital cardiac arrest – a pilot study [24]	Adult patients over 18 years of age, witnessed, non-traumatic OHCA. Manual: 169 Mechanical: 159	Non-randomized, controlled trial. LUCAS was used.	ROSC at any time during treatment, Survival at hospital admission, survival to hospital discharge with neurological recovery.	No significant difference in ROSC, survival to hospital admission or hospital discharge. No difference in CPC scores between 2 groups (majority 1 and 2).	No sufficient evidence to support that Mechanical CPR would improve outcome. This was due to long delay between arrival of ALS vehicle and use of Mechanical CPR (6 minutes).
9	Mechanical active compression-decompression cardiopulmonary resuscitation (ACD-CPR) versus manual CPR according to pressure of end tidal carbon dioxide (PETCO2) during CPR in out-of-hospital cardiac arrest (OHCA) [20]	Adult patients over 18 years of age, non-traumatic OHCA. Manual: 62 Mechanical: 64	Prospective, cluster level, pseudo-randomized trial. LUCAS was used.	ETCO2 was measured after tracheal intubation for 15 minutes or until detection of ROSC. Readings were categorized to initial, minimum, average and maximum.	ETCO2 was significantly higher in mechanical CPR as compared to manual CPR according to initial (3.38 vs. 2.71, p=0.010), average (3.26 vs.2.69, p=0.040) and minimum (2.24 vs. 1.69, p=0.010). No significant differences according to maximum value between 2 groups (4.88 vs.4.48, p=0.230).No differences in survival outcomes and there was a long time interval between cardiac arrest to start of CPR and to ROSC for both groups.	Mechanical CPR performed compressions with higher cardiac output than manual chest compressions.
10	Effectiveness of mechanical versus manual chest compressions in out-of-hospital cardiac arrest resuscitation: a pilot study [21]	Adult patients over 16 years of age with non-traumatic OHCA. Manual: 10 Mechanical:10	Prospective, odd/even day randomization study. Odd days were using mechanical CPR and even days using manual CPR. Thumper was used.	ETCO2 measurements at 5 minutes after intubation and CPR began, and a second measure at initiation of transport to hospital.	Statistical significant between both groups. 80% in manual group has decreasing ETCO2 while 20% has increasing ETCO2. All patients (3 excluded) in mechanical CPR do not have decreasing ETCO2. No difference in patient outcomes.	Mechanical CPR produced better cardiac output, overall, when compared to manual CPR.

Conclusion

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<http://www.sjtrem.com/content/20/1/39>

- In this review, we found insufficient evidence to support or refute the use of mechanical CPR devices in settings of out-of-hospital cardiac arrest and during ambulance transport.
- While there is some low quality evidence suggesting that mechanical CPR can improve consistency and reduce interruptions in chest compressions, there is no evidence that mechanical CPR devices improve survival, to the contrary they may worsen neurological outcome.

Mekanikleşmenin avantajı

- Hastaların tüm transportlarında(evden, dağdan, uçan/uçmayan tüm ambulans transferlerinde, hastane içi transportunda = hareket halinde cpr yapılması gereken her yerde)
- Kişisel performanstan bağımsız standart bir bası
- Çalışanların konforunu ve memnuniyetini arttırır
- Hastaların fiziksel özelliklerinden ve anatomik varyasyonlarından en az etkilenir
- Sedye, ayaklık, yükseklik vs gibi pozisyon zorluklarına bağlı basının etkinliğini değiştirmez

Göğüs basılarında en uygun el pozisyonu nedir ???

- Resuscitation. 2013 Mar 15. pii: S0300-9572(13)00162-7. doi: 10.1016/j.resuscitation.2013.03.010. [Epub ahead of print]
- Clinical pilot study of different hand positions during manual chest compressions monitored with capnography.

Göğüs basılarında en uygun el pozisyonu nedir ???

- Meme uçlarından geçen çizgi
- Meme uçlarından geçen çizginin 2cm altından
- Meme uçlarından geçen çizginin 2cm altından ve soldan
- Meme uçlarından geçen çizginin 2cm altından ve sağdan yapılması
- 30 sn aralıklarla ölçülen endtidal co2 ölçümü ile sonuçlar değerlendirilmiştir

Göğüs kompresyonlarını hangi
şartlarda ve nasıl yapıyoruz

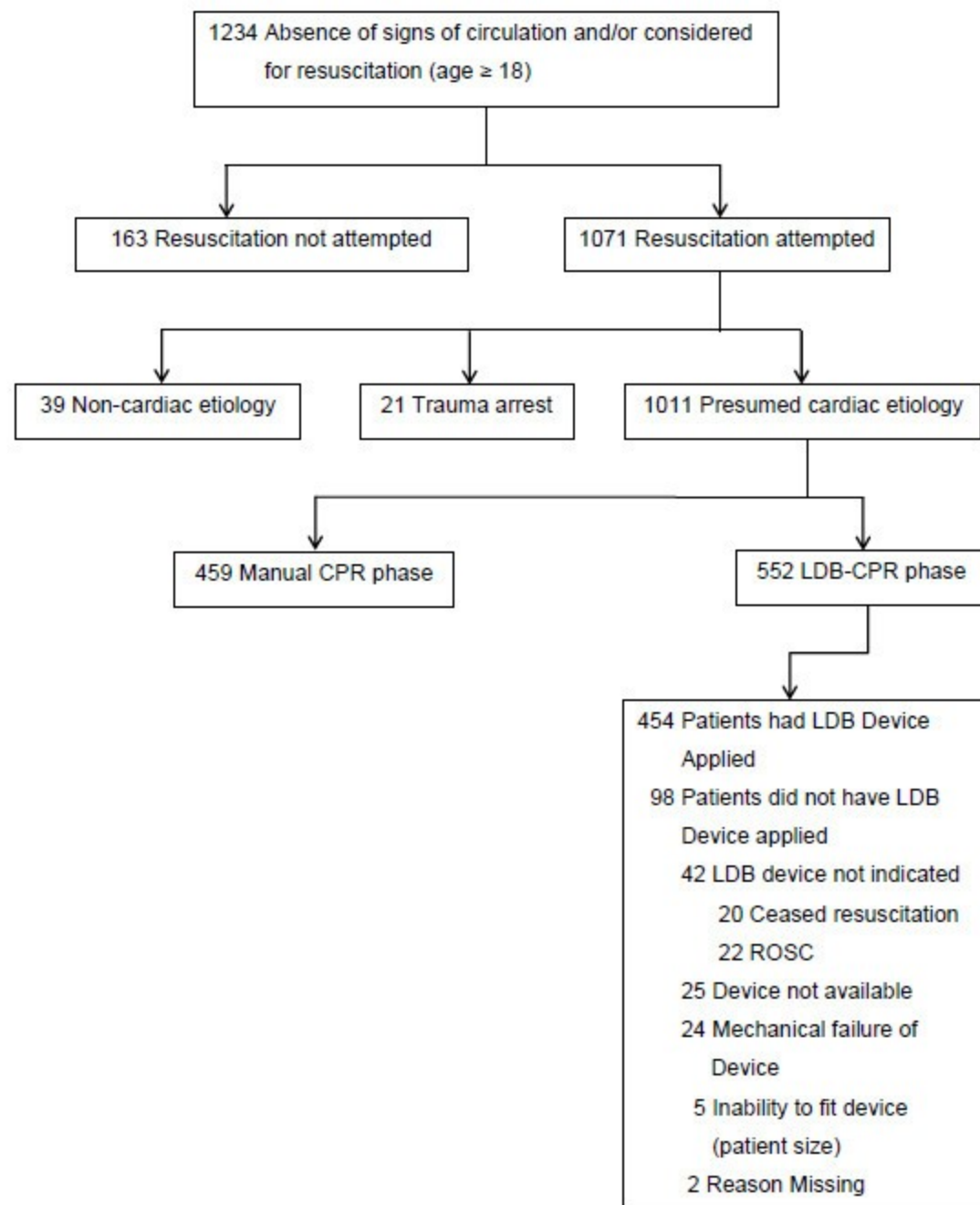
Göğüs kompresyonlarını hangi şartlarda ve nasıl yapıyoruz

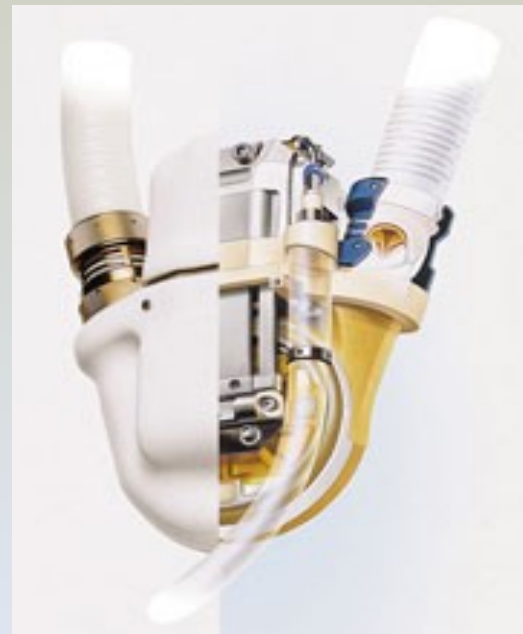
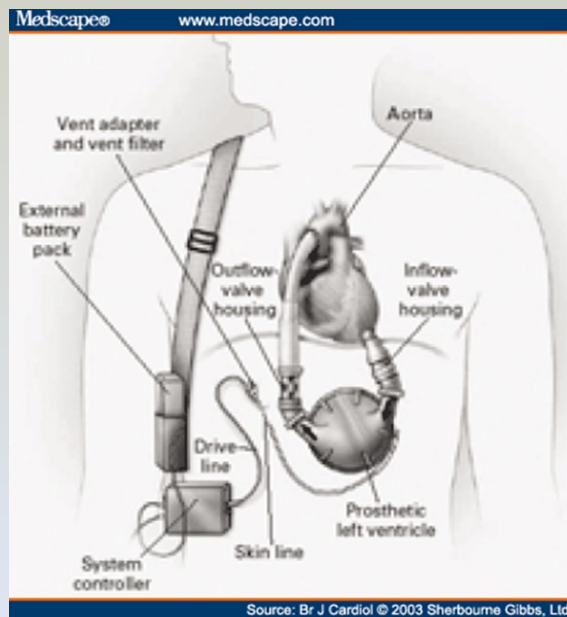
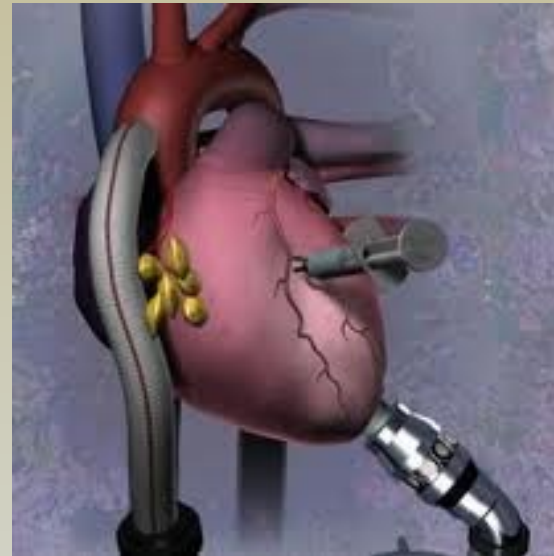
- 112 sedyelerinde uygunsuz
- Resusitasyon odasına alınırken
- Yerde niye yapmıyoruz ???
- Hastanın sağından mı, yoksa solundan mı??
- Başka bir şekilde olabilir mi???
- Kaç acil servisimizde end-tidal CO2 ölçer var?(neden)
- Kaç acil servisimizde mekanik cpr aleti var ?(neden)

Cpr esnasında refleks olarak arrest nedenlerini hatırlayıp hangilerini nasıl doğruluyoruz yada dışlıyoruz

- ?
- ?
- ?
- ?
- ?
- ?

- Ekokardiyografi ile neleri
- Ekg ile neleri
- End-tidal CO2 ile neleri
- Yatak başı kan gazı cihazları ile neleri
- Yatak başı toksikolojik kalitatif ölçümlerle neleri
- Stick kan ölçümleri







Doğru

- Tüm değişkenlerin standardize edildiği (hastanın tüm demografik özelliklerinin, hekim ve ekibi vs)
- Tüm uygulayıcıların optimum performansta
- Aynı demografik özelliklere sahip olan deneklerin
- Verilerin doğru kayıt altına alındığı ve işlendiği
- Tüm bu süreçlerin kanıta dayalı sorgulana bildiği

