

**ANADOLU<sup>H</sup>**

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In Affiliation with  
JOHNS HOPKINS MEDICINE

# Anestezi Bilgi Yönetim Sistemleri

“e-anestezi; verimli bilgi yönetimi”

Anadolu Sağlık Merkezi  
Anesteziyoloji Kliniği  
Dr. Yetkin Özer

# Anestezi Bilgi Yönetim Sistemleri

- **Elektronik Sağlık Kaydı**
- **Perioperatif hasta verileri;**
  - Toplanması
  - Saklanması
  - Sunumu (çıktı)

- **Fonksiyonları;**

- Temel özellik kayıt tutma
- Yönetimsel bilgi
- Kalite-performans değerlendirme
- Araştırma

- **Donanım**
- **Yazılım**
  - Fizyolojik monitörler
  - Ventilatör
  - HIS
  - LIS
  - PACS

- **1970'ler**
- **2006..%5**
- **2009..%44 (akademik merkezler)**
- **2015..6000 hastane (EHR)**

- **Neden ihtiya var;**
  - artan dzenleyici raporlama gereksinimleri
  - nitelikli belgeleme

## Hasta üzerine etkisi

Anestezi sürecinde hasta verilerinin daha doğru kayıt edilmesi

Geçmiş kayıtlara ulaşılabilirlikte artış

Kayıt tutma yerine hastaya odaklanma



## Anestezi pratięi üzerine etkisi

Daha kesin ve doęru kayıt nedeniyle kalite gvence iřlevsellięinde artıř

Spesifik olayların veya nadir durumların ok hızlı saptanabilirlięi

Zaman iinde bireysel performansı izlemek iin bir yol saęlar

Hasta sonularının dięer HBYS ile entegre deęerlendirilmesi

Eęitim amacıyla kesin doęru ve yksek öznrlkl ıktıların kullanılması

Doęru ve tarafsız bilgi sunması nedeniyle legal korumaya katkı

## Anestezi departman ynetimine katkı

Zamanında ve eksiksiz faturalama saęlaması

Hasta/uygulayıcı/cerrahi tipine gre tedarik maliyet analizi sunması

Uyumluluk ve dięer mevzuata uygunluk konularında yardımcı

Joint Commision istemi olan kapsamlı ve okunaklı kayıt sunması

Asistan eęitiminde vaka gereksinimlerini doęrulama

## ABYS spesifik yararları

### Maliyet ve faturalandırmada iyileşme

- Anestezi ilaç maliyetlerinin kontrolü ve düşürülmesi
- Anestezi girişimlerinin ücretlendirilmesi
- Hastane harcamalarında iyileşme

### Klinik karar desteği\*

- Uygulayıcı eğitimi

### Hasta güvenliği ve kalite

- Klinik bakımda iyileşme
- Klinik kalite iyileştirme programları
- Klinik risk yönetimi
- Kontrollü kullanılan ilaçların izlemi

### Klinik araştırmaların artışı

### İntraoperatif kayıt kalitesinde artış

- **Fonksiyonellik**

- Preoperatif modüller; demografik veriler, ASA, komorbidite, spesifik prosedüre uygun lab. testleri, risk indekslerinin kullanıldığı algoritmalar (*kişiyeye özel anestezi uygulaması*)
- İntraoperatif kayıt modülü; ABYS'nin temel özelliği.
  - Fizyolojik monitör verileri (vital bulgular, ventilatör ayarları, vapor)
  - Olguyla ilgili manuel girişler (*kullanıcı dostu arayüz*)
  - Kritik data vurgulama (renk/font değişimi)...CPB-heparin

- Klinik karar desteęi modülü; son kullanıcı görevini daha etkili yerine getirmeyi saęlayan tool-kit.
  - Pasif rehberlik
  - Aktif rehberlik
- Kalite iyileştirme; hızlı ve objektif veri toplanması, hasta bakım süreçlerindeki açıkların saptanması, iyileştirme planı.
  - Uygulama trendlerinin saptanması-izlenmesi
  - İyileştirme alanları için destek paketleri
  - Kalite geliştirme departmanı için doğrudan veri transferi

## ABYS klinik karar destek özellikleri:

### İlaç uygulamaları

Doz hesaplaması

İlaç-ilaç etkileşimi kontrolü

İlaç allerjisi kontrolü

Tekrar doz hatırlatma

### Bakım kalitesi

Normoterminin devam ettirilmesinde klavuzluk

Cerrahi öncesi kullanılan antibiyotiklerin hatırlatılması

### Kritik olay algoritmaları

Kritik olayın yakalanması (kaotik EKG + pulse ox. dalga yok...VF!!!)

Algoritma sunumu (İYD, MH, LAST, ..)

- **Firma seçimi;**
  - Donanımsal ihtiyaçlar, maliyet
  - Yazılım ihtiyaçları, maliyet
  - Canlı uygulamalar
  - Sistem kararlılığı
  - Güvenlik
  - Bakım-destek

- **Sistemi yaşama geçirme**
  - Klinik ve yönetim iş akışının değişimi
  - Kararlı bir klinik şampiyonun belirlenmesi
  - Kurulum-test süreci
  - Klinik içi ve dışı ekibin bilgilendirilmesi
  - Beklenmedik durum planı



- **Ergonomi**

- Fiziksel kurulum ve iş istasyonunun çalışma özelliđi



- **Son kullanıcı eğitimi**
  - Zamanlama
  - İçerik
  - Canlıya geçişte destek

- **Veri tanımları ve çıktılar**

- ABYS içindeki verilerin gücünü girdiler belirliyor.
- Tanımlamalar;
  - OR time, anestezi süresi, cerrahi süre (standart..)
  - Hazırlık dönemi (antisepsi, arıtım-örtüm, pozisyon...)
  - Belgelerin tutarlılığı (karar destek sistemi, faturalama, raporlama)

## Anesthesia Information Management Systems: Past, Present, and Future of Anesthesia Records

Bassam Kadry, MD,<sup>1</sup> William W. Feaster, MD, MBA,<sup>2</sup> Alex Macario, MD, MBA,<sup>1</sup> and Jesse M. Ehrenfeld, MD, MPH<sup>2</sup>

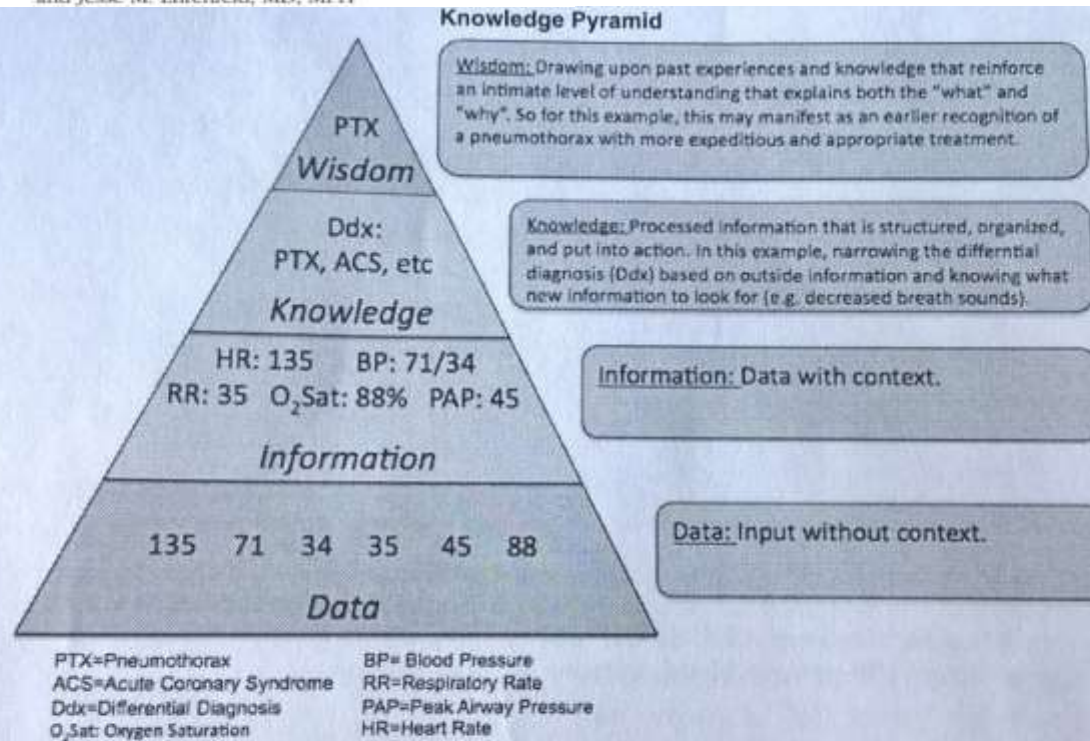


Fig 2. Knowledge Pyramid illustrates how clinical data is converted into actionable information to treat a life-threatening intraoperative pneumothorax. **Abbreviations:** ACS, acute coronary syndrome; BP, blood pressure; Ddx, differential diagnosis; HR, heart rate; O<sub>2</sub>Sat, oxygen saturation; PAP, peak airway pressure; PTX, pneumothorax; RR, respiratory rate.

## Avantajlar

İntraop verilerin otomatik ve doğru olarak toplanması, anestezi kayıt kalitesinde artış

Gerçek zamanlı 'karar desteği' sunması

Hasta bakımına ayrılan zamanı artırması

Klinik kalite ve süreçlerin iyileşmesine katkı

Ücretlendirilebilecek girişim/işlemlerin faturaya yansıtılması

Klinik araştırmalar için verilerin kalite ve ulaşılabilirliğini artırması

Süreçlerin otomatik olarak izlenmesi ve kontrolüne destek



### FAST & EASY DOCUMENTATION

Automatic data capture and calculations



### EVIDENCE-BASED CARE

Meet best practices and promote standardisation



### IMPROVED PATIENT SAFETY

Fewer documentation & medication errors



### QUALITY REPORTING

Collect and export data for key quality initiatives



### BETTER DATA QUALITY

Complete, accurate, legible records



### EXPANDED RESEARCH OPPORTUNITIES

Easily extract data for clinical studies

## Sınırlamalar

Dikey entegrasyonda yetersizlik (bilginin diđer faza taşınması)

Kısıtlı hareketlilik (preop ve postop verilerin farklı lokasyonlarda temini)

Üretici firmalar arasında ABYS standardı olmayışı

Sistem hatalarında veri toplanamaması

Kurulum maliyeti

Eđitim ve kurulum döneminde ciddi zaman ve efor gereksinimi

Elektronik kayıtlar içindeki potansiyel monitör ve kayıt artefaktları

Diđer elektronik hastane sistemleriyle uyumluluk

- **Yakın gelecekte:**
  - Maliyet optimizasyonu
  - Yüksek bakım kalitesi
  - Kişiyeye özel anestezi uygulaması  
..... gerekli/zorunlu cihazlar.



## The incidence of hypoxemia during surgery: evidence from two institutions

[Jesse M. Ehrenfeld](#), MD, MPH,<sup>✉</sup> [Luke M. Funk](#), MD, MPH, [Johan Van Schalkwyk](#), MB, [Alan F. Merry](#), MB, [Warren S. Sandberg](#), MD, PhD, and [Atul Gawande](#), MD, MPH

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See other articles in PMC that [cite](#) the published article.

### Abstract

[Go to:](#)

#### Purpose

The incidence of hypoxemia in patients undergoing surgery is largely unknown and may have a clinical impact. The objective of this study was to determine the incidence of intraoperative hypoxemia in a large surgical population.

#### Methods

We performed a retrospective study of electronically recorded pulse oximetry data obtained from two large academic medical centres. All adults (age  $\geq 16$  yr) undergoing non-cardiac surgery during a three-year period at the two hospitals were included in the analysis. Our main outcome measure was the percentage of patients with episodes of hypoxemia ( $SpO_2 < 90$ ) or severe hypoxemia ( $SpO_2 \leq 85$ ) for two minutes or longer during the intraoperative period (induction of anesthesia, surgery, and emergence).

#### Results

We evaluated **95,407 electronic anesthesia records** at the two hospitals. During the intraoperative period, 6.8% of patients had a hypoxemic event, and 3.5% of patients had a severely hypoxemic event of two consecutive minutes or longer. Seventy percent of the hypoxemic episodes occurred during either induction or emergence—time periods that represent 21% of the total intraoperative time. From induction to emergence, one episode of hypoxemia occurred every 28.9 hr, and one episode of severe hypoxemia occurred every 55.7 hr of intraoperative time.

#### Conclusion

Despite advances in monitoring technology, hypoxemia continues to occur commonly in the operating room and may be a serious safety concern because of its potential impact on end organ function and long-term outcomes. Further studies are needed to improve our understanding of the clinical impact of intraoperative hypoxemia and the strategies that will be most useful in minimizing its occurrence.

## Anesthesiologist staffing considerations consequent to the temporal distribution of hypoxemic episodes in the postanesthesia care unit.

Epstein RH<sup>1</sup>, Dexter F, Lopez MG, Ehrenfeld JM.

### + Author information

#### Abstract

**BACKGROUND:** Hypoxemia, as measured by pulse oximetry (SpO<sub>2</sub>), is common in postanesthesia care unit (PACU) patients. The temporal distribution of desaturation has managerial implications because treatment may necessitate the presence of an anesthesiologist.

**METHODS:** We retrieved SpO<sub>2</sub> values recorded electronically every 30 to 60 seconds from 137,757 PACU patients over n = 80 four-week periods at an academic medical center. Batch mean methods of analysis were used. Onset times of hypoxemic episodes (defined, on the basis of previous studies, as SpO<sub>2</sub> <90% lasting at least 2 minutes) were determined and resolution at 3, 5, and 10 minutes was assessed. Episodes beginning <30 minutes and ≥30 minutes after PACU admission were compared. Patients undergoing intubation in the PACU were identified by doing a free text search of electronically recorded nursing notes for phrases suggesting intubation, followed by a confirmatory manual chart review. Intervals from PACU admission to intubation were determined.

**RESULTS:** Fewer than half (31.2% ± 0.05%) of episodes of PACU hypoxemia lasting ≥2 minutes occurred <30 minutes after PACU admission. Most (i.e., >50%) occurred ≥30 minutes after admission (P < 0.0001). Few (<1%) anesthesia providers transporting patients to the PACU were still present in the PACU 30 minutes after arrival in the PACU. Fewer than half (37%; 95% confidence interval, 27.4% to 48.8%) of PACU intubations occurred <30 minutes after PACU admission. Most (i.e., >50%) occurred ≥30 minutes after admission (P = 0.029). Hypoxemic episodes in the PACU resolved more slowly than episodes in operating rooms (P < 0.0001). After 3 minutes, 40.9% ± 0.6% were unresolved in the PACU versus 23% (99% upper confidence limit) in operating rooms, and 32.6% ± 0.5% vs 9% (99% upper confidence limit) after 5 minutes.

**CONCLUSIONS:** Because most (68.8%) hypoxemic episodes in the PACU occur ≥30 minutes after admission, a time by which the anesthesia provider who transported the patient usually would no longer be present (>99% of cases), the PACU needs to be considered when anesthesiologist operating room staffing and assignment decisions are made.

## Information Needs for the OR and PACU Electronic Medical Record

[V. Herasevich](#),<sup>1,2</sup> [M.A. Ellsworth](#),<sup>3</sup> [J.R. Hebl](#),<sup>1</sup> [M.J. Brown](#),<sup>1</sup> and [B.W. Pickering](#)<sup>1,2</sup>

### Objective

The amount of clinical information that anesthesia providers encounter creates an environment for information overload and medical error. In an effort to create more efficient OR and PACU EMR viewer platforms, we aimed to better understand the intraoperative and post-anesthesia clinical information needs among anesthesia providers.

### 3.1 Study Design

A web-based survey was conducted at [Mayo Clinic, Rochester](#), MN, an academic tertiary health care center, equipped with a comprehensive EMR [26]. The Mayo Clinic has 112 ORs and 120 post-anesthesia care unit (PACU) beds distributed throughout its Rochester campus. The survey was conducted among anesthesia providers of varying clinical roles. The Institutional Review Board waived the requirement for written consent for the study.

### Conclusion

Anesthesia providers demonstrate a [larger need for EMR](#) data to help guide clinical decision making in the OR as compared to the PACU. When creating EMR platforms for these settings it is important to understand and include data items providers deem the most clinically useful. Minimizing the less relevant data items helps prevent information overload and reduces the risk for medical error.

## Lack of utility of a decision support system to mitigate delays in admission from the operating room to the postanesthesia care unit.

Ehrenfeld JM<sup>1</sup>, Dexter F, Rothman BS, Minton BS, Johnson D, Sandberg WS, Epstein RH.

### Author information

### Abstract

**BACKGROUND:** When the phase I postanesthesia care unit (PACU) is at capacity, completed cases need to be held in the operating room (OR), causing a "PACU delay." Statistical methods based on historical data can optimize PACU staffing to achieve the least possible labor cost at a given service level. A decision support process to alert PACU charge nurses that the PACU is at or near maximum census might be effective in lessening the incidence of delays and reducing over-utilized OR time, but only if alerts are timely (i.e., neither too late nor too early to act upon) and the PACU slot can be cleared quickly. We evaluated the maximum potential benefit of such a system, using assumptions deliberately biased toward showing utility.

**METHODS:** We extracted 3 years of electronic PACU data from a tertiary care medical center. At this hospital, PACU admissions were limited by neither inadequate PACU staffing nor insufficient PACU beds. We developed a model decision support system that simulated alerts to the PACU charge nurse. PACU census levels were reconstructed from the data at a 1-minute level of resolution and used to evaluate if subsequent delays would have been prevented by such alerts. The model assumed there was always a patient ready for discharge and an available hospital bed. The time from each alert until the maximum census was exceeded ("alert lead time") was determined. Alerts were judged to have utility if the alert lead time fell between various intervals from 15 or 30 minutes to 60, 75, or 90 minutes after triggering. In addition, utility for reducing over-utilized OR time was assessed using the model by determining if 2 patients arrived from 5 to 15 minutes of each other when the PACU census was at 1 patient less than the maximum census.

**RESULTS:** At most, 23% of alerts arrived 30 to 60 minutes prior to the admission that resulted in the PACU exceeding the specified maximum capacity. When the notification window was extended to 15 to 90 minutes, the maximum utility was <50%. At most, 45% of alerts potentially would have resulted in reassigning the last available PACU slot to 1 OR versus another within 15 minutes of the original assignment.

**CONCLUSIONS:** Despite multiple biases that favored effectiveness, the maximum potential benefit of a decision support system to mitigate PACU delays on the day on the surgery was below the 70% minimum threshold for utility of automated decision support messages, previously established via meta-analysis. Neither reduction in PACU delays nor reassigning promised PACU slots based on reducing over-utilized OR time were realized sufficiently to warrant further development of the system. Based on these results, the only evidence-based method of reducing PACU delays is to adjust PACU staffing and staff scheduling using computational algorithms to match the historical workload (e.g., as developed in 2001).

[Automatic Notifications Mediated by Anesthesia Information Management Systems Reduce the Frequency of Prolonged Gaps in Blood Pressure Documentation](#)

Jesse M. Ehrenfeld, Richard H. Epstein, Stephen Bader, Sachin Kheterpal, Warren S. Sandberg

Anesth Analg. Author manuscript; available in PMC 2012 August 1.

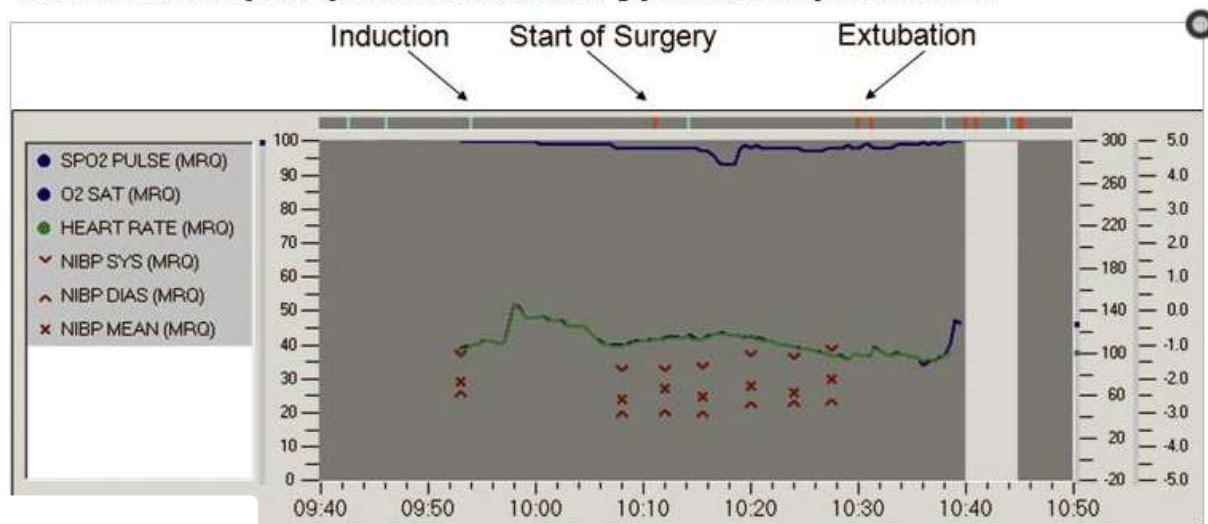
Published in final edited form as: Anesth Analg. 2011 August; 113(2): 356–363. Published online 2011 March 17. doi: 10.1213/ANE.0b013e31820d95e7

**Background**

Arterial blood pressure (BP) measurement at least every five minutes is part of the American Society of Anesthesiologists' (ASA) monitoring standard, but prolonged BP gaps in electronic anesthesia records have been noted. We undertook multicenter studies to determine the frequency of cases with at least one interval  $\geq 10$  minutes between successive BP measurements and then to ascertain if educational feedback via an electronic, near real-time notification system alerting providers to the presence of such gaps would reduce their incidence.

**Methods**

We evaluated 212,706 electronic anesthesia records from three large academic centers. We determined the fraction of cases with  $\geq 10$  minute BP monitoring gaps at baseline and did a root cause analysis to determine common causes for these lapses. We then designed and implemented automated systems at two of the hospitals to notify point-of-care providers immediately after such 10-minute gaps occurred and determined the subsequent impact of this feedback on BP gap incidence, compared to baseline.



## Conclusions

BP gaps of  $\geq 10$  minutes were common in electronic anesthesia records, and their incidence was reduced but not eliminated by near real-time feedback to providers. The ASA standard for every 5 min BP documentation may not be achievable with current practices and technology. Anesthesia information management systems users need to be cognizant of the potential for gaps in BP measurement, take steps to minimize their occurrence, and document an explanation when such failures occur.

## ABYS; satın alma öncesi yanıtlanması gereken sorular

Sistem hangi aktivitelere sahip olacak; preop muayene, perop kayıt, postop kontroller?

Bölümün mevcut çalışma düzenini nasıl etkileyecek?

Sistem hangi çalışma alanlarına kurulacak (OR, L&D, SDS)?

Tek başına mı çalışacak, HIS ile arayüz?

Ek altyapı gereksinimleri (network, server, diğer donanımlar)?

Sistemin kurulum ve bakım planı?

Yazılım yüklenmesi ve test aşaması?

İlk ve daha sonraki eğitimlerin planlanması?

Backup sistemleri?

Mevcut sistemin bakımı ve upgrade?





## ANADOLU SAĞLIK MERKEZİ : Anestezi Dosyası

Soyad : [ ] Ad : [ ] Kızlık soyadı : [ ]  
 Protokol No : 29509 Müdahale No : [ ]  
 d. tarihi : 10/10/73 Yaş : 42 yıl Cinsiyet : K Boy (cm) : 159 Ağırlık (Kg) : 60  
 ameliyat tarihi : 20/04/16 08:13  
 Müdahale : Kadın Doğum / Laparoskopik total histerektomi Anestezi : Genel Anestezi  
 ASA Sınıfı : [ ] Nedeni : [ ]  
 Hedef servis : [ ]

## Diğer müdahaleler :

## Sağlık ekibi

Anestezi : YETKİN ÖZER, DOÇ.DR.  
 Cerrah : FATİH GÜÇER, DOÇ.DR.

Anestezi teknisyeni	SEMRA ÖZGÜR	08:00	08:54	Salon 6
Anestezi	YETKİN ÖZER, DOÇ.DR.	08:00	08:54	Salon 6
Kadın Hastalıkları ve Doğum	FATİH GÜÇER, DOÇ.DR.	08:00	09:54	Salon 6
Kadın Hastalıkları ve Doğum	NİLFER SARUHAN, OP.DR.	08:10	09:54	Salon 6

## Ameliyat süreleri

Tanım	Süre	Başlangıç tarihi	Bitiş tarihi
Ameliyat odası Giriş-Çıkış	1 saat41 Dakika	20/04/2016 08:13:00	20/04/2016 08:54:00
Anestezi süresi	1 saat33 Dakika	20/04/2016 08:21:00	20/04/2016 08:54:00
Kapama	1 saat21 Dakika	20/04/2016 08:27:00	20/04/2016 09:48:00

## Anestezi özeti

## Ürünler

Ürünler	Miktar
setazolol 1 gr im-iv flk(setsolol)	1000 mg
rokuronyum 50 mg/5 ml amp(esameron)	50 mg
lidokain simplex amp	40 mg
propofol 200mg/20ml iv amp-fles	110 mg
fentanyl 0,5 mg/10 ml(balmal)	100 mcg
rocuronyum 2 mg flk(jullivis)	331,87 mcg
ondansetron 8 mg/4 ml amp(zophralam)	8 mg
ranitidin 50mg/2ml amp(julcuran)	50 mg
tenoksikam 20 mg flk (oksamen)	20 mg
parasetamol 1000 mg/100ml flk(perfalgan)	1000 mg
propofol 100mg/2ml ml/iv amp (zaritarnal)	100 mg
lidokain 100mg/2ml im-so-iv amp(lidokain)	100 mg
sugammadex 200 mg/2 ml iv flk(bridion)	200 mg

## Perfüzyon

Ürünler	Miktar
isolyt 1000 ml mx	753,33 mL

## Kayıplar ve mesane irrigasyonu

Kayıplar	Çıkan (ml)	Giriş (ml)
idrar sondası	70	
Kanamalar miktarı	100	

## Giriş/Çıkış dengesi

Sıvı dengesi	Gerçek giriş (ml)	Gerçek çıkan (ml)
583	753	170

## Anestezi Raporu

Cormack skoru:1

**SAGLIK MERKEZİ: Anestezi Dosyası**Protokol No : 29509 / I İşlem tarihi: 10/10/1973  
Müdahale Tarihi: 20/04/2016 08:13**Hasta ekipmanı**

Ekipman	Giriş konumu	Yol	Lot numarası / Ref.
Emülsiyon kapı 7.0			
IV ağızlı 200	Sol brasiyal vein	Demar yolu 1	
Üstler scale: 10			

**Hasta pozisyonu**

Tarih	Saat	Pozisyon
20/04/2016	08:23	Litotomi

**Materiyal ve cihazlar**

Bağlantı	Son	Cihaz	Oda / İş istasyonu
20/04/2016 08:13	20/04/2016 09:54	Receve-02	Salon 6
20/04/2016 08:13	20/04/2016 09:54	Prensus 04	Salon 6

Tarih: 20 Nisan 2016 09:55

Sayfa: 2

**ANADOLU** In Affiliation with  
JOHNS HOPKINS MEDICINE

AGLIK MERKEZİ: Anestezi Dosyası

Form No: 2909/71 logum tarihi: 10/10/1973  
 Başlatma Tarihi: 20/04/2016 08:13

**İlaçlar**

Başlangıç	Son	Özellik	Miktar	NOT
20/04/2016 08:21		Selçuk 1 gr 84/75 (Soluşon)	1 gr	
20/04/2016 08:21		Rokunetin 50 mg/10 ml ampul/serum	30 mg	
20/04/2016 08:21		Lidokain simplex amp	40 mg	
20/04/2016 08:21		Propofol 200mg/20ML N amp/serum	150 mg	
20/04/2016 08:21		Fentanyl 0.5 MG/10 ML (Tutkal)	100 mg	
20/04/2016 08:27	20/04/2016 08:37	Ramifenalar 2 mg (Soluşon) (30-30 mg/ml)	200 mg/10	Her 2 mL Dose: 2.333 mg/kg/h
20/04/2016 08:27		Ondansetron 8 mg/1 ml ampul/serum	8 mg	
20/04/2016 08:27		Ranitidin 30mg/1ml ampul/serum	30 mg	
20/04/2016 08:27	20/04/2016 08:35	Ramifenalar 2 mg (Soluşon) (30-30 mg/ml)	200 mg/10	Her 2 mL Dose: 2.333 mg/kg/h
20/04/2016 08:43		Tetracain 20 mg/5 (Gözetim)	20 mg	
20/04/2016 08:54		Rokunetin 50 mg/10 ml ampul/serum	15 mg	
20/04/2016 09:28		Propofol 200 mg/20ml (Soluşon)	100 mg	
20/04/2016 09:06		Tramadol 100mg/100 ml IMV amp (Gözetim)	100 mg	PERFALGAN İÇİNE
20/04/2016 09:28		Rokunetin 50 mg/10 ml ampul/serum	5 mg	
20/04/2016 09:33	20/04/2016 09:44	Ramifenalar 2 mg (Soluşon) (30-30 mg/ml)	100 mg/10	Her 2 mL Dose: 1.667 mg/kg/h
20/04/2016 09:41		Pelidin 100mg/100 ml (M-3G-N ampul/serum)	50 mg	100 ML GÖZÜNE İÇİNE İP
20/04/2016 09:43		Pelidin 100mg/100 ml (M-3G-N ampul/serum)	50 mg	S.C
20/04/2016 09:42		Sigammaxin 200 mg/2 ml N (Soluşon)	200 mg	

**Perfüzyon**

Başlangıç	Son	Özellik	Miktar	NOT
20/04/2016 09:20	20/04/2016 09:58	ISOLAYT 1000 ML MK	200 mL	
20/04/2016 09:42		ISOLAYT 500 ML MK	300 mL	
20/04/2016 09:58	20/04/2016 09:54	ISOLAYT 1000 ML MK	300 mL	

**Etkinlikler listesi**

Tarih	Saat	Etkinlikler	NOT	Değer
20/04/16	08:30	Check List Açıl	Tamam	
20/04/16	08:15	Anelstetiyon başlangıç		Saton 5
20/04/16	08:21	Anelstet başlangıç		Genel Anelstet
20/04/16	08:25	Enfözyon		Ondansetron Comrack (Koru 11) Eupimar Entubasyon 500 T.3
20/04/16	08:23	Verilasyon		Kontrol (V)
20/04/16	08:25	Hastaya pozisyon verilmesi		L.İstam
20/04/16	08:24	Skor ölçül		ASA skoru(Toplam=2) ASA = ASA(2)
20/04/16	08:27	Genel başlangıç		
20/04/16	08:46	PCA hazırlanması	Comrack 1ml 10mg-Bilce bmg-kilb-100	
20/04/16	08:48	Genel Bilgi		
20/04/16	08:50	Kayp		Kanama miktar 100 mL
20/04/16	08:50	Ekstüzyon		
20/04/16	08:54	Anelstet bitiş		
20/04/16	09:34	Kayp		İdrar sondası 70 mL
20/04/16	09:54	Anelstetiyon bitiş	Per-anelstetik olaylar : HAYIR	

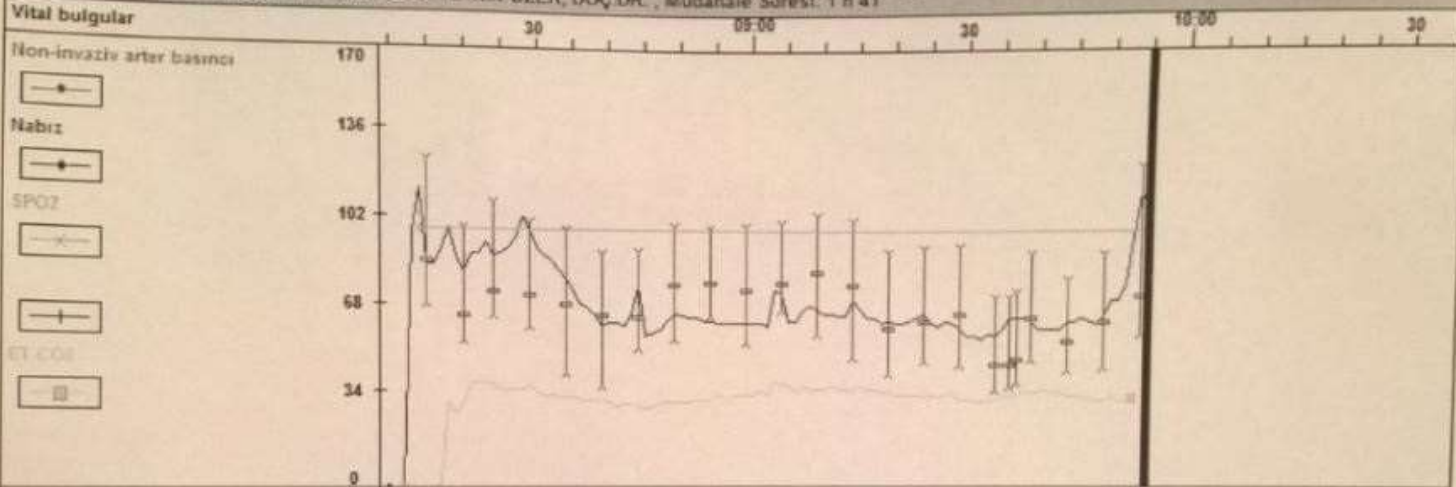
Tarih: 20 Nisan 2016 09:58

Sayfa

Ameliyat izlem sayfası [ ] Protokol no:29509 / Müdahale No: [ ] doğum tarihi: 10/10/1973 (42 yıl) ameliyat tarihi: 20/04/2016 08:13  
 Laparoskopik total histerektomi, Genel Anest., Cerrah: FATİH GÜÇER, DOÇ.DR., Anesteziist: YE. KIN OZER, DOÇ.DR., Müdahale Süresi: 1 h 41

Ameliyat izlem takibi	30	09:00	30	10:00	30
Ameliyat odası Anestezi Müdahale Uyanma					
Orun. / Perf. / Etk.	30	09:00	30	10:00	30
sefazolin 1 gr im-iv flk/ 1000 mg	1				
rokuronyum 50 mg/5 ml amp 50 mg	35				
lidokain simplex amp 40 mg	40		10		5
propofol 200mg/20ml iv am 110 mg	110				
fentanyl 0,5 mg/10 ml(tal) 100 mcg	100				
remifentanyl 2 mg flk/ult 331.67 mcg	100				
ondansetron 8 mg/4 ml amp 8 mg	8				
ranitidin 50mg/2ml amp/ul 50 mg	50				
tenoksikam 20 mg flk (oks) 20 mg	20				
parasetamol 1000 mg/100ml 1000 mg				1000	
tramadol 100mg/2ml im/iv 100 mg				100	
pethidin 100mg/2ml im-so 100 mg					100
sugammadex 200 mg/2 ml i 200 mg					200
isolyt 1000 ml mx 753.33 mL	200		1000	1000	100
Entübasyon Ventilasyon					

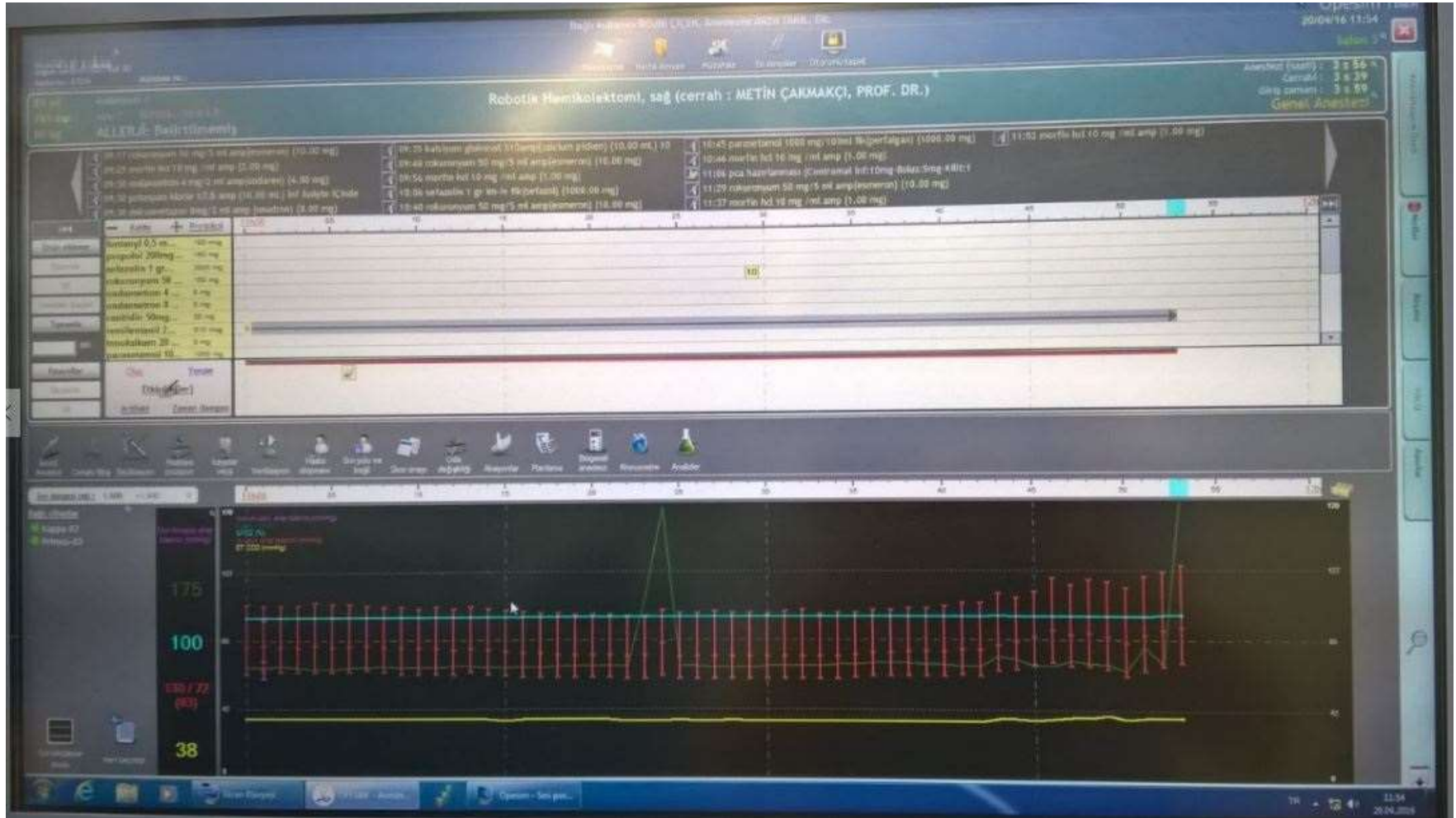
Ameliyat izlem sayfası: [Redacted] Protokol no: 29509 / Müdahale No: [Redacted] doğum tarihi: 10/10/1973 (42 yıl) ameliyat tarihi: 20/04/2016 , 08:13  
 Laparoskopik total histerektomi, Genel Anestezi  
 Cerrah: FATİH GÜÇER, DOÇ.DR., Anestezist: YETKİN ÖZER, DOÇ.DR., Müdahale Süresi: 1 h 41



Nabız	0	87	84	91	93	77	64	59	67	64	64	65	68	70	64	64	53	62	62	65	71	100
Non-invasiv sistolik arter basıncı		127	101	103	100	91	82	102	101	102	103	106	104	92	93	94	74	74	81	91	125	
Non-invasiv ortalam arter basıncı		88	75	75	71	67	66	72	80	77	80	84	79	92	85	88	68	68	68	67	83	77
Non-invasiv diastolik arter basıncı		71	57	63	44	39	54	58	67	56	69	60	51	44	45	49	38	39	46	47	66	
SPO2	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Solunum hızı/ dk	0	0	0	25	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12
Oksijen fresh gaz flow	0	2980	2980	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973	1973
air fresh gaz flow	0	0	0	32	30	37	35	33	31	35	36	36	39	38	39	36	34	35	37	36	36	
ET CO2	0	0	0	5.7	4.8	4.8	4.9	5.4	5.1	5	5	5	6.5	6.3	6.3	6.3	6.2	6.2	6.2	6.1	6.1	6.7
Minute volüm	0	0	28	50	10	10	10	10	10	10	10	10	12	12	12	12	12	12	12	12	12	12
IRV	30	30	13	18	17	17	24	28	28	28	28	24	21	20	23	26	28	21	21	18	18	
PERK	12	11	14	14	14	20	24	24	23	24	20	19	17	19	22	23	18	19	14	15		
PLAT	1	2	5	5	5	5	6	6	6	6	6	5	5	5	5	6	5	6	5	5	5	
PEEP	169	234	472	468	209	374	212	303	304	306	364	341	233	236	233	227	136	142	220	241		
Tidal Volüm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N2O	0	0	0	7	14	18	20	22	24	26	27	29	31	33	34	36	39	41	41	42		
Desofflurane tüketimi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sevofflurane tüketimi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
İns anestezi ajanı	0	0	0	7.9	6.8	6.4	6.7	6.7	6.5	6.6	6.6	6.6	6.5	6.3	6.4	6.3	6.3	6.5	6.7	6.3	6.5	
ET anestezi ajanı	0	0	0	5.8	5.4	5.5	5.9	6	6	6	6	6	5.9	5.9	5.7	5.7	5.8	6	5.4	5.5	1.2	
Fexp. O2	37	45	70	54	52	51	49	49	48	47	47	46	46	46	46	46	47	47	47	48	90	
Finsp. O2	27	45	73	58	57	55	53	53	52	52	51	51	51	50	50	50	51	51	51	53	96	

Dr. Yetkin Özer  
 Anestezist ve Anesteziyolog  
 Dişli Yolu No: 53777  
 Üsküdar, İstanbul No: 41900 / 52119  
 Çiğdemlik Sokak, İstanbul

Evluca 2004/2016 02





YETKİN ÖZER, DOÇ.DR. 2 4 6 8

**Salon 3** 00:51

kullanıcı: ROJBE ÇİÇEK  
 Hasta:   
 Hizmet: Laparoskopik Kolesistektomi  
 anestezi: MELTEM GÜL, DR.

- 14:20 rokuronyum 50 mg/5 ml amp(esmero)
- 14:10 tramadol 100mg/2ml im/iv amp (com)
- 14:10 parasetamol 1000 mg/100ml flk(perf)
- 14:02 yorum (ibuprofen ve maya alerjisi va
- 13:59 ranitidin 50mg/2ml amp(ulcuran) (50
- 13:59 ondansetron 4 mg/2 ml amp(ondane
- 13:59 deksametazon 8 mg/2 ml amp (B.00
- 13:54 cerrahi başlangıcı
- 13:51 skor onayı (ASA skoru)
- 13:51 ventilasyon (kontrol: V))

**Salon 4**

kullanıcı:   
 Hasta:   
 Hizmet:   
 anestezi:

**Salon 5**

kullanıcı:   
 Hasta:   
 Hizmet:   
 anestezi:

**Salon 6**

kullanıcı:   
 Hasta:   
 Hizmet:   
 anestezi:

**Salon 7** 02:12

kullanıcı: FATMA AYYILDIZ  
 Hasta:   
 Hizmet:   
 anestezi: MELTEM GÜL, DR.

- 13:56 rokuronyum 50 mg/5 ml amp(esmero)
- 13:55 flayyl 0.5 g/100 ml mx(metronidazo
- 13:48 furosemid 20 mg/2 ml amp (desal) (5
- 13:27 xloram 36 ml (500 g/l) (darnoc yon
- 13:27 frosart 1000 ml mx (1000 g/l) (darnoc
- 13:26 ranitidin 50mg/2ml amp(ulcuran) (50
- 13:26 deksametazon 8mg/2 ml amp (onad
- 13:25 remifentanil 2 mg flk(altiva) (250.00
- 13:24 rokuronyum 50 mg/5 ml amp(esmero)
- 13:20 valproilat 400 mg/200 ml amp(altiva)

51  
SP02  
100

**Salon 8**

kullanıcı:   
 Hasta:   
 Hizmet:   
 anestezi:



- **Veri güvenliđi!!**

**Articles:**

Monitoring of Neuromuscular Blockade

Large Anesthesia/Practice Management Groups

Expanding Our Influence

President's Report

Safety of Neuromuscular Blockade

History of Sugammadex

Emergency Manual Workshop

FDA Issues Drug Safety Communication

NMB Reversal and Outcomes

Q&A: OR Power Failure

Dear SIRS: Incorrect Network Connection

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Save the Date

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NBCRNA Support of Grant

Medtronic Support of APSF

APSF DVDs

APSF Awards 2016 Grant Recipients

Procedure for Submitting 2017 Grant Applications

**Letter to the Editor:**

PACU Handoff

**PRINTABLE PDF**

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**Dear SIRS**

**S**AFETY  
**I**NFORMATION  
**R**ESPONSE  
**S**YSTEM

Dear SIRS refers to the Safety Information Response System. The purpose of this column is to allow expeditious communication of technology-related safety concerns raised by our readers, with input and responses from manufacturers and industry representatives. This process was developed by Dr. Michael Olympio, former chair of the Committee on Technology, and Dr. Robert Morell, co-editor of this newsletter. Dear SIRS made its debut in the Spring 2004 issue. Dr. A William Paulsen, current chair of the Committee on Technology, is overseeing the column and coordinating the readers' inquiries and the responses from industry.

monitor returned to normal function. Word spread to all anesthesiologists to unplug the machines from the network and, within 15 to 20 minutes, everything was back in service, but disconnected from the network. Fortunately, there were no untoward sequela for the patients, but every patient had their anesthetic, monitoring, and mode of ventilation changed. Hospital information technology found the source of the excessive network traffic and broke the loop by unplugging the offending cable from the network.

**Incorrect Network Connection Simultaneously Crashes Multiple Anesthesia Machines**

Dear SIRS:

I work in Kalispell, Montana, as an anesthesiologist and head of our group of 20 anesthesiologists. We have two adjoining hospitals, one that functions as an outpatient surgery center, the other an acute care hospital and trauma center. We recently had an incident involving our Mindray anesthesia machines and monitors. Six (6) Mindray A5 anesthesia machines and eight (8) DPM 7 patient monitoring systems were in use delivering anesthesia care at the time of the incident. We have both Mindray anesthesia machines and a few Fabius Gas machines. All of our monitoring is Mindray.

While one of the Mindray machines was being moved from one anesthetizing location to another, a network connection was made incorrectly by an anesthesia technician, who plugged both ends of the network cable into the network receptacle rather than one end into the network receptacle and the other end to the anesthesia machine. This network was installed for the exclusive use of the Mindray equipment, thus no other equipment was affected. This misconnection resulted in a loop where the network traffic consumed 100% of the bandwidth. When the misconnection occurred, no other Mindray anesthesia machines or patient monitors were able to communicate with the network. As a result, every Mindray machine and patient monitor in both buildings simultaneously shut off and refused to turn back on as long as they were connected to the network. It was discovered that if the machine was disconnected from the network, the machine and monitor returned to normal function. Word spread to all anesthesiologists to unplug the machines from the network and, within 15 to 20 minutes, everything was back in service, but disconnected from the network. Fortunately, there were no untoward sequela for the patients, but every patient had their anesthetic, monitoring, and mode of ventilation changed. Hospital information technology found the source of the excessive network traffic and broke the loop by unplugging the offending cable from the network.



**ANADOLU** <sup>H</sup>

In Affiliation with  
JOHNS HOPKINS MEDICINE

Wed Sep 24, 2014 2:24pm EDT

# Your medical record is worth more to hackers than your credit card

NEW YORK/BOSTON | BY CAROLINE HUMER AND JIM FINKLE



A man types on a computer keyboard in this illustration picture taken in Warsaw February 28, 2013.  
REUTERS/KACPER PEMPEL

Your medical information is worth 10 times more than your credit card number on the black market.

Last month, the FBI warned healthcare providers to guard against cyber attacks after one of the largest U.S. hospital operators, Community Health Systems Inc, said Chinese hackers had broken into its computer network and stolen the personal information of 4.5

**ANADOLU** 

In Affiliation with  
JOHNS HOPKINS MEDICINE

## Are your personal medical records in danger of being hijacked?



Data hackers are the modern day Bonnie and Clyde.

Only instead of robbing banks and holding people at gunpoint, they're breaking into computers at doctors' offices and hospitals and stealing your health records.

In some cases, they're even holding the records for ransom – which could leave you unable to get the treatment or care you need.

It's a brewing medical catastrophe the likes of which were unimaginable just a few short years ago.

And it means that you have to take some simple steps to protect yourself now, before it's too late.

### **A gold mine for thieves**

"Electronic health records are 100 times more valuable than stolen credit cards," said data expert James Scott.

And unlike charges made on a stolen credit card, hacked health records can go on to have a life of their own for years to come.

They contain highly valuable information such as your Social Security number, your address, your job, *plus* your complete medical history.

Electronic health records are a like a gossip magazine that tells all – from the results of your last checkup to that CT scan of your ankle taken when you fell visiting Uncle Floyd.

For thieves, it's like hitting the information jackpot.

But for hospitals and doctors' offices, it's a little more like being sent back to the Stone Age.

When MedStar Health, a medical provider that operates 10 hospitals in Maryland and Washington, D.C., suffered a major data hack this week, it couldn't access any patient records.

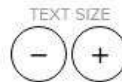
It was a potentially dangerous emergency that had doctors and nurses scribbling patient information and treatments down on paper.

"We can't do anything at all," one MedStar employee told a reporter.

And this is just one of many attacks that are going on all over the country that aren't getting as much media attention.

# Hospitals Aren't the Only Ones Bleeding Stolen Health Records

Organizations in nearly every industry are losing health data to theft, hacking, and carelessness.



KAVEH WADDELL | DEC 16, 2015 | TECHNOLOGY

When hackers possibly stole the personal-health data of 10 million people from Excellus, a health-insurance company, it was just the most recent incident in a string of recent cyberattacks that targeted health-care companies.\* This year, cyberattacks on Premera and UCLA Health Systems released millions more customers' health records into the wild.

But when it comes to losing health data, health-care companies are only a part of the picture. In fact, according to [research published Wednesday](#) by Verizon's business division, 90 percent of industries—from retail and finance to construction and mining—have experienced a breach of personal-health information.

While the organizations in these other sectors may not keep extensive databases of patient information the way a health-care facility or insurer might, businesses in every industry have data from employee benefits and wellness programs, and many deal with workers' compensation claims. Included in all three are troves of personal-health data.

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