AF’nin Ekonomik Yükü ve Türkiye

Dr. Yücel BALBAY, *FACC, FESC*

AF ekonomik yükünün bileşenleri

- AF sıklığı
- AF sıklığındaki değişim
- AF’de tanı konulmasındaki zorluklar
- AF tedavisi
- AF’nin tedavi edilmemesi

Atrial Fibrillation

A Substantial Threat to the Brain

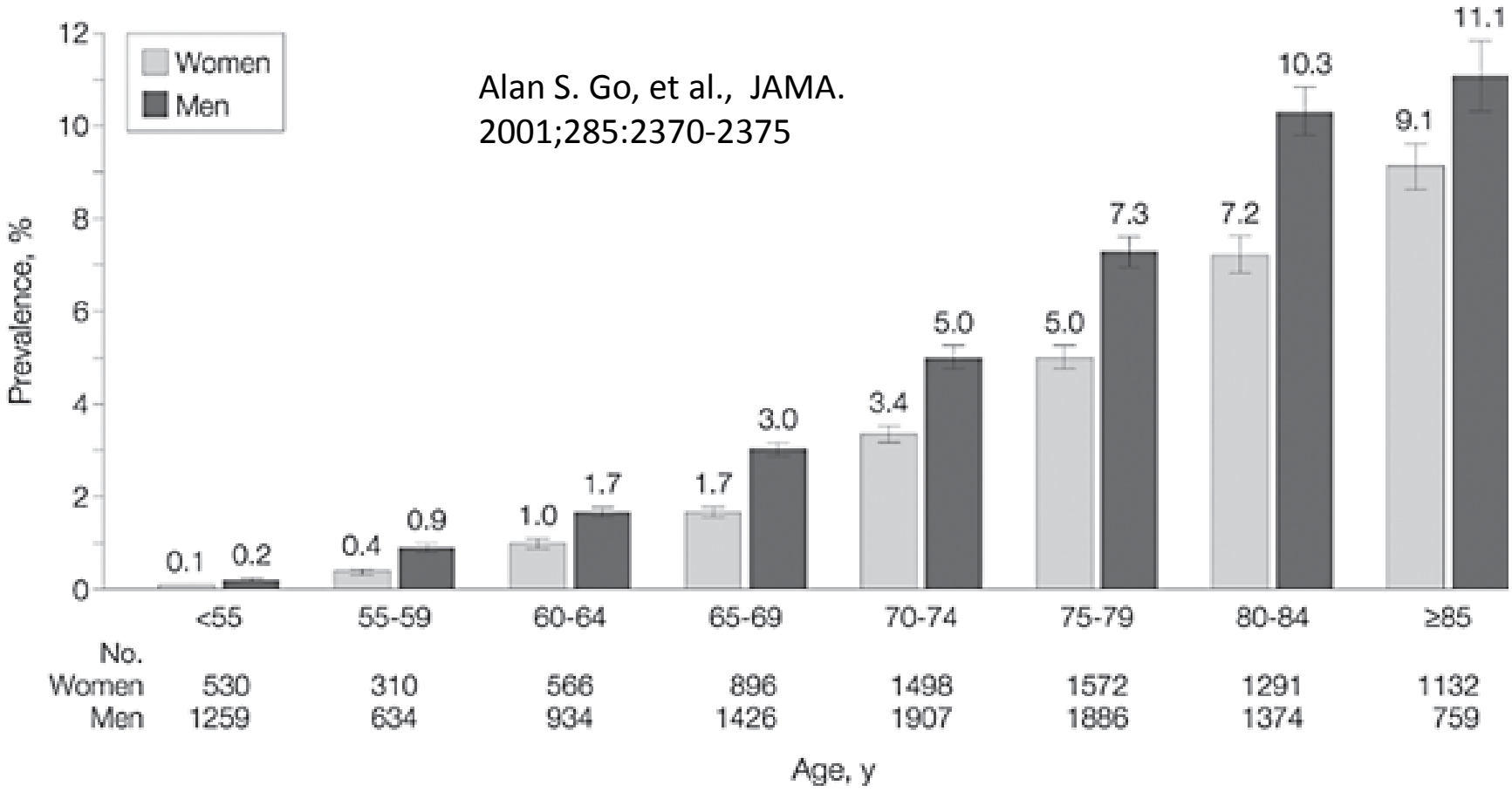
- Affects
  - ~4% of people aged ≥60 years
  - ~9% of those aged ≥80 years
- 5%/year stroke rate
- 12%/year for those with prior stroke
- $ billions annual cost for stroke care
- AF-related strokes have worse outcomes

AF identifies millions of people with a five-fold increased risk of stroke

Prevalence of diagnosed Afib in adults

National Implications for Rhythm Management and Stroke Prevention: the AnTicoagulation and Risk Factors In Atrial Fibrillation **(ATRIA) Study**

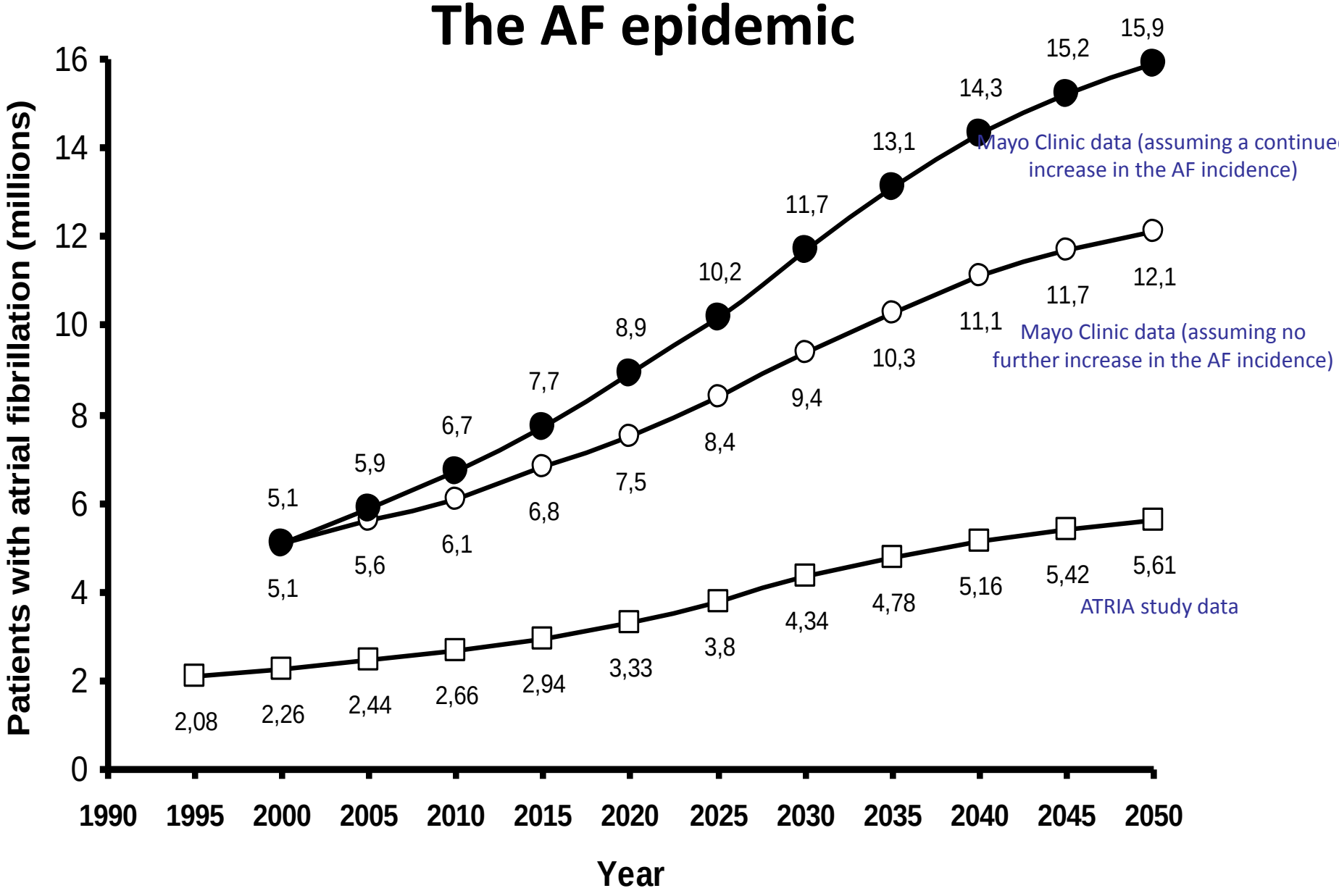
WWU Münster



Alan S. Go, et al., JAMA. 2001;285:2370-2375

Prevalence of Diagnosed Atrial Fibrillation Stratified by Age and Sex

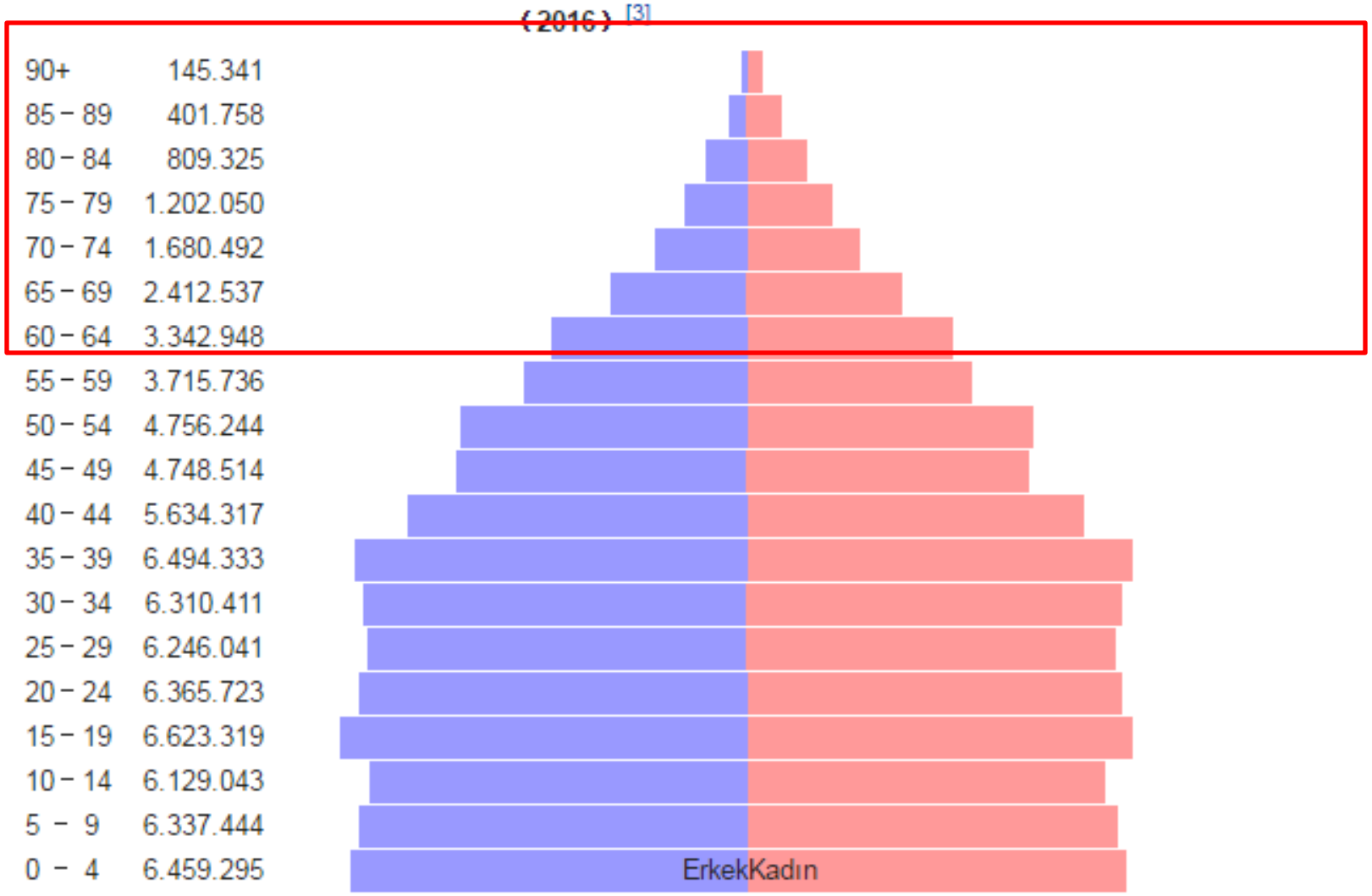
The AF epidemic



slide by J Camm

Nüfus Piramidi [değiştir | kaynağı değiştir]

Adrese Dayalı Nüfus Kayıt Sistemi'ne göre 2016 yılı itibarıyla Türkiye nüfusunun yaş gruplarına göre dağılımı;



Türkiye nüfusu 31 Aralık 2016 tarihi itibarıyla 79 milyon 814 bin 871 kişi oldu

TÜRKİYEDE AF SIKLIĞI

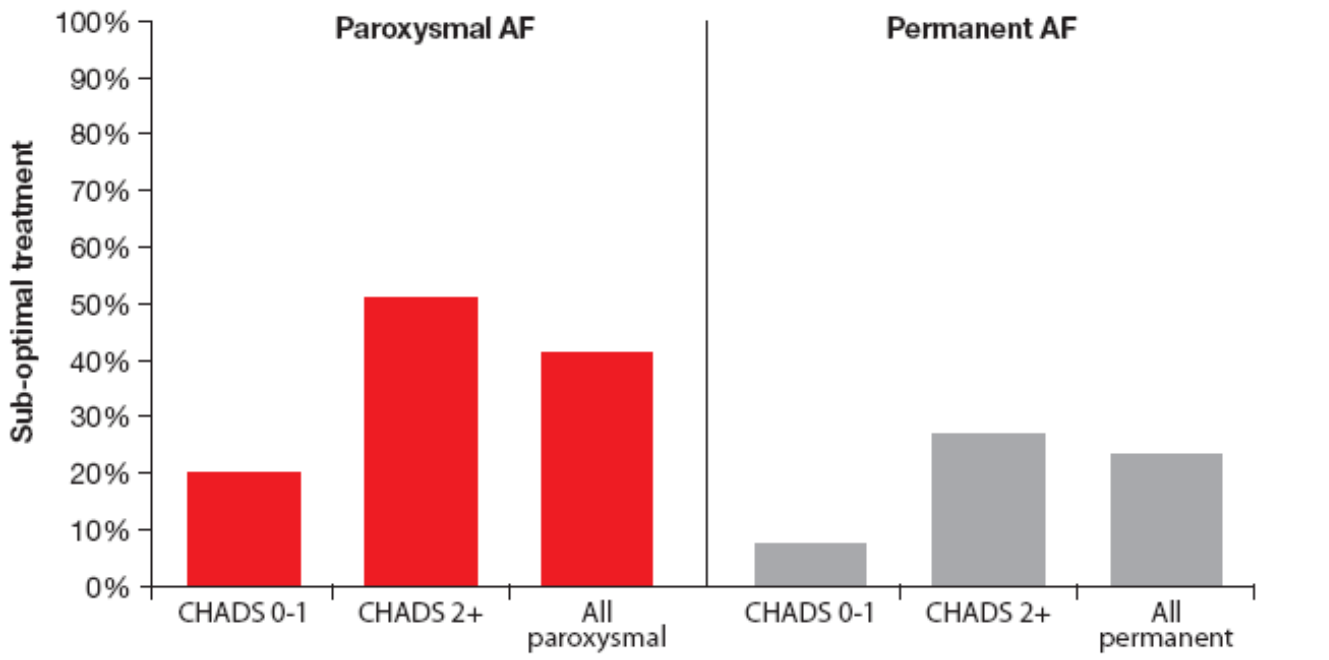
- 2016: >60 yaş 9.994.451 kişi
- %4: ~400.000
- %1.2-2 genel populasyon: 960.000-1.600.000

Türkiye 2013

Tani Kodu	Adi	Basvuru Sayisi	Hasta Sayisi
I48	**Atrial fibrilasyon ve flutter**	1047639	329994
I49	**Kardiyak aritmiler, diğer**	238019	159027
I49.0	Ventriküler fibrilasyon ve flutter	3053	2025
I49.1	Atrial prematür depolarizasyon	21174	16972
I49.2	Junctional prematür depolarizasyon	146	127
I49.3	Ventriküler prematür depolarizasyon	35291	25302
I49.4	Prematür depolarizasyon, diğer ve tanımlanmamış	1544	764
I49.5	Hasta sinüs sendromu	5226	3164
I49.8	Kardiyak aritmiler diğer, tanımlanmış	86611	58543
I49.9	Kardiyak aritmi, tanımlanmamış	269209	178442
I50	**Kalp yetmezliği**	555354	258932
	Evde Bakim	284516	78880

AF’da tanı konulmasındaki zorluklar

Suboptimal tedavi



European Heart Journal (2016) **37**, 2893–2962
doi:10.1093/eurheartj/ehw210

ESC GUIDELINES

2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS

The Task Force for the management of atrial fibrillation of the European Society of Cardiology (ESC)

Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC

Endorsed by the European Stroke Organisation (ESO)

Authors/Task Force Members: Paulus Kirchhof* (Chairperson) (UK/Germany), Stefano Benussi*[1] (Co-Chairperson) (Switzerland), Dipak Kotecha (UK), Anders Ahlsson[1] (Sweden), Dan Atar (Norway), Barbara Casadei (UK), Manuel Castella[1] (Spain), Hans-Christoph Diener[2] (Germany), Hein Heidbuchel (Belgium), Jeroen Hendriks (The Netherlands), Gerhard Hindricks (Germany), Antonis S. Manolis (Greece), Jonas Oldgren (Sweden), Bogdan Alexandru Popescu (Romania), Ulrich Schotten (The Netherlands), Bart Van Putte[1] (The Netherlands), and Panagiotis Vardas (Greece)

5.2.2 Prolonged monitoring for paroxysmal atrial fibrillation

Paroxysmal AF is often missed.[120] Repeated daily ECG recordings increased the detection of silent, asymptomatic paroxysmal AF in an unselected Swedish population aged >75 years.[120,135] Several patient-operated devices[136,137] and extended continuous ECG monitoring using skin patch recorders[138] have been validated for the detection of paroxysmal AF (*Web Figure 1*).[139] The detection of asymptomatic AF by new technologies, such as smartphone cases with ECG electrodes, smart watches, and blood pressure machines with AF detection algorithms, has not yet been formally evaluated against an established arrhythmia detection method.[140]

Medical Devices: Evidence and Research

Dovepress
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Open Access Full Text Article

ORIGINAL RESEARCH

Benefits of monitoring patients with mobile cardiac telemetry (MCT) compared with the Event or Holter monitors

This article was published in the following Dove Press journal:
Medical Devices: Evidence and Research
6 December 2013
Number of times this article has been viewed

Jean-Patrick Tsang
Shunmugam Mohan

Bayser Consulting, Skokie, IL, USA

Introduction: This research is meant to establish if a patient monitored with mobile cardiac telemetry (MCT) sees different outcomes regarding diagnostic yield of arrhythmia, therapeutic management through the use of antiarrhythmic drugs, and cardiovascular costs incurred in the hospital setting when compared with more traditional monitoring devices, such as the Holter or the Event monitor.

Table 2 Patients diagnosed with arrhythmia when using MCT, Event, and Holter monitors

	n	Diagnosed	Difference	*P*-value
MCT	5,129	61.3%		
Event	24,023	23.0%	36%	0.0006
Holter	57,143	24.2%	35%	0.0006

Abbreviation: MCT, mobile cardiac telemetry.

Table 5 Savings (US$) when using MCT – ablation

	Device	Pre-	Post-	Difference	P-value
MCT vs Event (n=54)					
Test	MCT	16,132	10,376	(5,756)	
Control	Event	6,043	35,400	29,358	
Impact				(35,114)	<0.0001
MCT vs Holter (n=45)					
Test	MCT	17,996	8,485	(9,511)	
Control	Holter	2,759	29,362	26,604	
Impact				(36,115)	<0.0001

Abbreviations: MCT, mobile cardiac telemetry; vs, versus.

Cardiac telemetry identifies AF in cryptogenic stroke

FEBRUARY 2, 2012 Caroline Helwick

New Orleans, LA - Outpatient cardiac telemetry over 21 days detects occult paroxysmal atrial fibrillation (AF) in almost 20% of patients with cryptogenic cerebral ischemia, a new study shows [1].

Investigators reported their results here at the **International Stroke Conference 2012**.

In one-third of patients discharged with stroke or transient ischemic attack (TIA), the etiology of the event remains undetermined, the researchers note. While paroxysmal AF is known to be a possible cause, factors predicting paroxysmal AF have not been defined.

"Potentially, one in three stroke patients could be monitored with this technology," said lead author **Dr Daniel J Miller** (Henry Ford Hospital, Detroit, MI) at a press briefing. "The reason it is important to identify paroxysmal AF is that it may change treatment."

He explained that standard antiplatelet treatment would not be sufficient for this population, which would benefit instead from anticoagulation.

Monitoring for 21 days detected paroxysmal AF in 17%

MCT 3L Olay Raporu

Doktor Bilgileri

Yücel Balbay
Türkiye Yüksek İhtisas Hastane
Atatürk Bulvarı Kolay Sokak No:4 Sihhiye / Ankar
Ankara, Türkiye

Hasta Bilgileri

Ad Soyad: MAHMUT SADIÇ
Doğum Tarihi: 02/02/1949, 68 years old
Telefon: 00905357218094
Hizmet Türü: MCT 3L 7
ICD: R000 Taşikardi,tanımlanmamış, R002 Çarpıntı

Kayıt No : 10603
Cinsiyeti: Erkek

Hizmet Dönemi: 28/03/2017 - 04/04/2017

Son 3 Olay:

TARİH	SAAT	BELİRTİLER	BULGULAR	TETİKLEYİCİ TÜRÜ
03/04/2017	08:43:00		Sinüs Ritmi, Atrial Premature Atım	Oto
01/04/2017	14:58:47		Sinüs Bradikardisi, Atrial Premature Atım	Manuel
31/03/2017	22:13:08		Sinüs Ritmi, Sinüs Bradikardisi	Oto

MCT 3L OLAY 03/04/2017 12:59

BELİRTİLER:

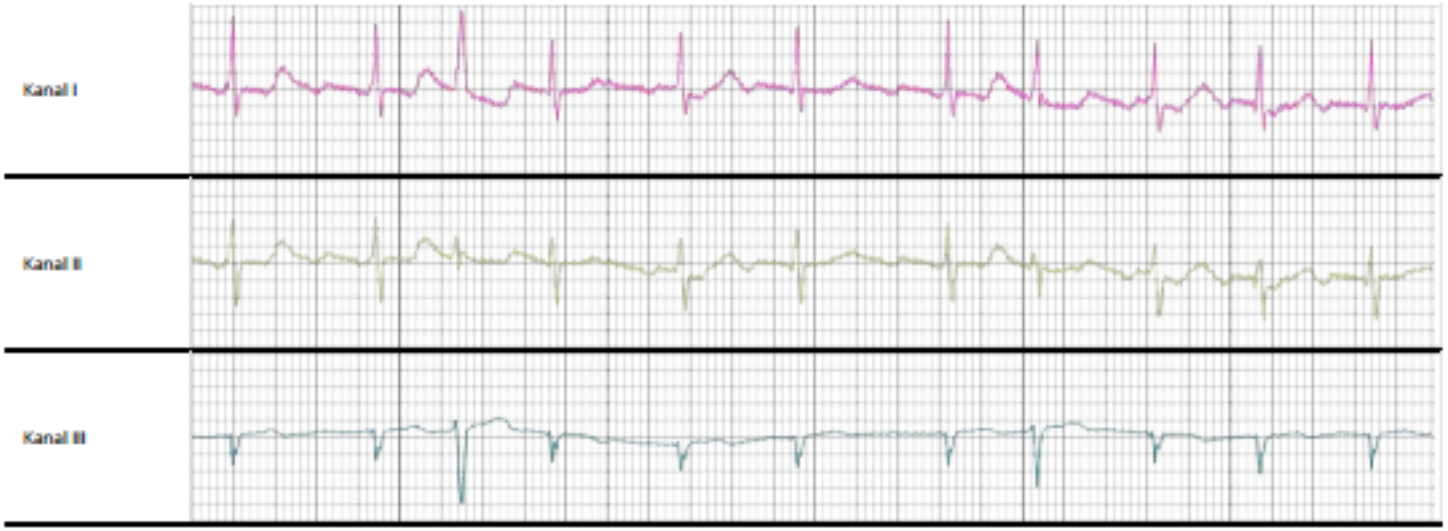
AKTİVİTELER:

ÖN BULGULAR: Atrial Fibrilasyon, Geniş Kompleks Atımı

YORUMLAR:

OLAY KAYIT VERİSİ: Olay Öncesi Süre: 60 sn — Olay Sonrası Süre: 30 sn

Örnek 1 **Kayıt Tarihi: 03/04/2017 13:00** 25 mm/sn, 35 mm/mV KH: 110 atım/dak Oto



AF’nin ekonomik yükü

TÜRKİYE'DE İNMENİN DOĞRUDAN TEDAVİ MALİYETLERİ

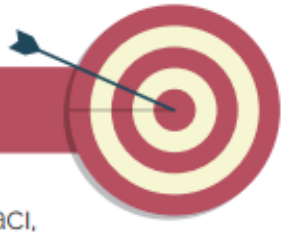
2.

İnme tüm dünyada en önemli ikinci ölüm sebebidir ve inme ile mücadele eden insanlar kalıcı engellilikle yaşamak zorunda kalabilir.

İnmenin Ana Nedenleri

- Yaşlanan nüfus
- Hipertansiyon
- Yaşam tarzıyla ilgili faktörler
- Atriyal fibrilasyon

AMAÇ



Bu çalışmanın amacı, Türkiye'deki ödeyici açısından doğrudan inme maliyetini belirlemektir.

KAPSAM

4 YIL
1.921
HASTA

Bu çalışma için bir üniversite hastanesinin nöroloji bölümündeki 1.921 yatan hasta için 4 yılı kapsayan büyük bir veri grubu incelenmiştir.

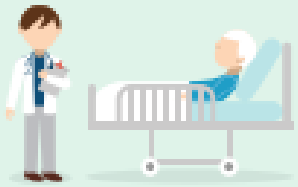
BULGULAR

UZMAN GÖRÜŞÜ

AYAKTA HASTA TEDAVİ MALİYETİ

1.807 TL

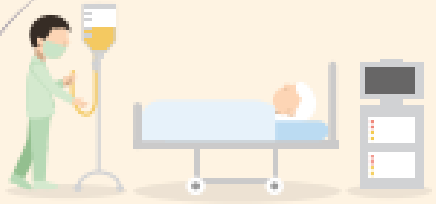
YATAN HASTA TEDAVİ MALİYETİ



5.636 TL

GERİYE DÖNÜK VERİ ANALİZİ

YOĞUN BAKIM ORTALAMA TEDAVİ MALİYETİ



12.564 TL

YATAN HASTA TEDAVİ MALİYETİ

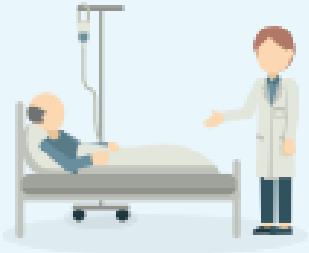
5.561 TL

ATRİYAL FİBRİLASYONU OLANLARDA HASTA BAŞINA MALİYET

12.675 TL

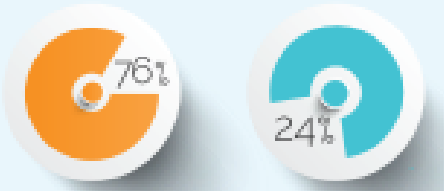
Geriye Dönük Veri Analizi, atriyal fibrilasyonun dikkate alınması gereken önemli bir faktör olduğunu göstermiştir.

SONUÇ



Bu çalışma, inme için doğrudan tıbbi maliyetin sağlık bütçesi üzerinde önemli ekonomik yükü olduğunu göstermiştir.

Ayakta tedavi ve izleme maliyetleri toplam maliyetin %x'ünü oluştururken, yatan hasta maliyeti %y'lik bir oluşturmaktadır.



Yatan Hasta Maliyeti

Ayakta Tedavi ve İzleme Maliyeti

Bu çalışmanın sponsoru Boehringer Ingelheim'dır.

Boehringer Ingelheim

DIRECT TREATMENT COSTS OF STROKE IN TURKEY

Tatar M.[1], Senturk A.[2], Tuna E.[2], Karabulut E.[3] Caliskan Z.[4], Arsava E.M.[5], Topcuoglu M.A.[5],
[1]Hacettepe Universtiy, Ankara, Turkey, [2]PolarSağlık Health Economics& Policy, Ankara, Turkey, [3]Hacettepe Universtiy School of Medicine Biostatistics, Ankara, Turkey,
[4]Hacettepe University School of Economics and Administrative Sciences, Ankara, Turkey, [5]Hacettepe University Hospital, Ankara, Turkey

Table 1. Outpatient and Monitoring Cost of Stroke – Expert Opinion (annual cost per patient)

	Cost (TL)*
Outpatient Visits and Costs	515,04
Drug Cost	1.292,55
Total	**1.807,58**

* TL: Turkish Lira

Table 2. Inpatient Costs – Expert Opinion (annual cost per patient)

	Cost (TL)
Intensive Care Cost	4.002,75
Hospitalization and Test Cost	1.143,03
Drug Cost	490,74
Total	**5.636,52**

Table 3. Total Cost of Stroke Per Patient – Expert Opinion (annual cost per patient)

	Cost (TL)
Outpatient and Monitoring Cost	1.807,58
Inpatient Cost	5.636,52
Total Cost	**7.444,11**

Table 4 . Total Cost of Stroke Per Patient – Retrospective Data Analysis (annual cost per patient)

	Average (TL)	Standard Deviation	Median	Min	Max
Emergency	442	620,4	328,2	4,80	4.442,5
Service	3.790	9.187,5	1.533,0	11,94	70.000,4
Intensive Care	12.564	20.167,1	3.847,0	15,50	100.838,9
Other	2.942	5.815,6	63,9	15,50	20.052,9
Total	5.561	13.575,6	1.222,4	4,80	100.838,9

Atrial fibrillation and Stroke – costs and benefits

Context

- Around **600,000** people in England have AF – **1.2%** of the population
- The annual risk of stroke is 5-6 times greater in AF patients than in people with normal heart rhythm
- Approximately **12,500 strokes a year are attributable to AF. These strokes could be avoided if AF were eliminated**
- When AF patients have strokes, they tend to be more severe than those in people without AF. Mortality and morbidity rates are higher
- **Around 8,500 deaths in England** per annum within a year of first stroke can be attributed to AF

Atrial fibrillation and Stroke – costs and benefits

Costs

- The annual cost to the NHS and personal social services budget of strokes **attributable to AF is estimated to be around £148 million (680 milyon TI)**:
  - Hospital costs around £103 million
  - Post discharge care around £45 million
- **The cost per stroke is estimated at £11,900 (54750) in the first year after stroke occurrence**

Atrial fibrillation and Stroke – costs and benefits

Averting stroke by anticoagulation

- It has been estimated that 5,000 to 8,000 strokes a year could be averted by conforming with NICE guidelines on the prescribing of anticoagulants for AF
- **Annual unit cost for anti-coagulation is £383 (x4,62)(1770TL)**
- **The cost of each stroke averted is estimated at £10,000 to £14,000 per annum (46200-64680 Tl)**

Atrial fibrillation and Stroke – costs and benefits

Conclusion

- There can be no argument against appropriate **anticoagulation treatment for those with AF at risk of stroke:**
  - **it is undoubtedly cost-effective**
  - **more importantly, it saves lives!**
- **The overall figures here are very probably an underestimation of what the true savings and benefits might be**

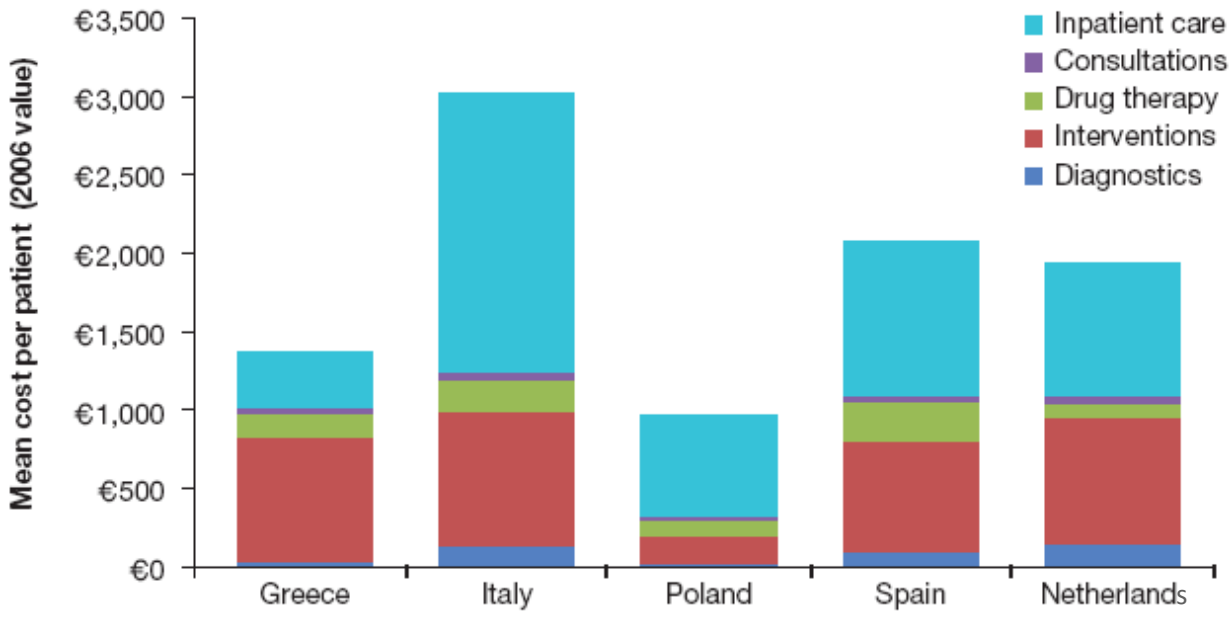
Atrial Fibrillation in Europe: How AWARE are you? Research Findings

Leela Barham & James Beeby

Leela Barham
Independent health economist
Contact: leels@btinternet.com

Economic burden

Types of health care costs



Source: Ringborg et al (2008)

Economic burden – health care costs

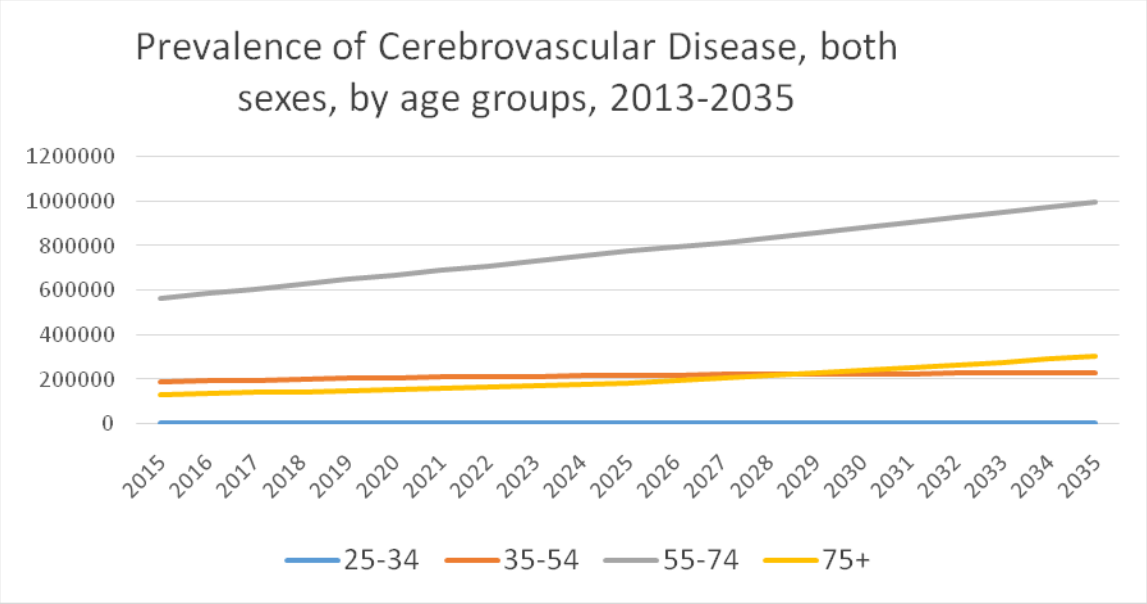
Country	Direct health care cost	Source
France	€3,027 average per patient per year	Le Heuzey et al 2004
Germany	AF related strokes cost more than non-AF related strokes; on average €11,799 vs €8,817per patient	Brüggenjürgen, Rossnagel, Roll et al 2007
Germany	€680m in total in 2006	Survey respondent[1]
Greece	€1,373 average per patient per year	Ringborg et al (2008)
Italy	€3,019 average per patient per year	Ringborg et al (2008)
Netherlands	€1,936 average per patient per year	Ringborg et al (2008)
Poland	€971 average per patient per year	Ringborg et al (2008)
Spain	€2,073 average per patient per year	Ringborg et al (2008)
Sweden	AF patients had on average €818 higher inpatient costs over 3 years than non-AF patients (€10,192 vs. €9,374)	Ghatnekar and Glader 2008
UK	AF has been estimated to cost the UK to be £459 million (~€655 million) in 2000	Stewart et al 2004

Economic burden – indirect cost

Country	Indirect cost	Source
Germany	€3,125 average per patient per year	Brüggenjürgen, Rossnagel, Roll et al 2007
Greece	€135 average per patient per year	Ringborg et al (2008)
Italy	€3,225 average per patient per year	Ringborg et al (2008)
Netherlands	€391 average per patient per year	Ringborg et al (2008)
Poland	€39 average per patient per year	Ringborg et al (2008)
Spain	€242 average per patient per year	Ringborg et al (2008)

Preliminary Results – CeVD Prevalence

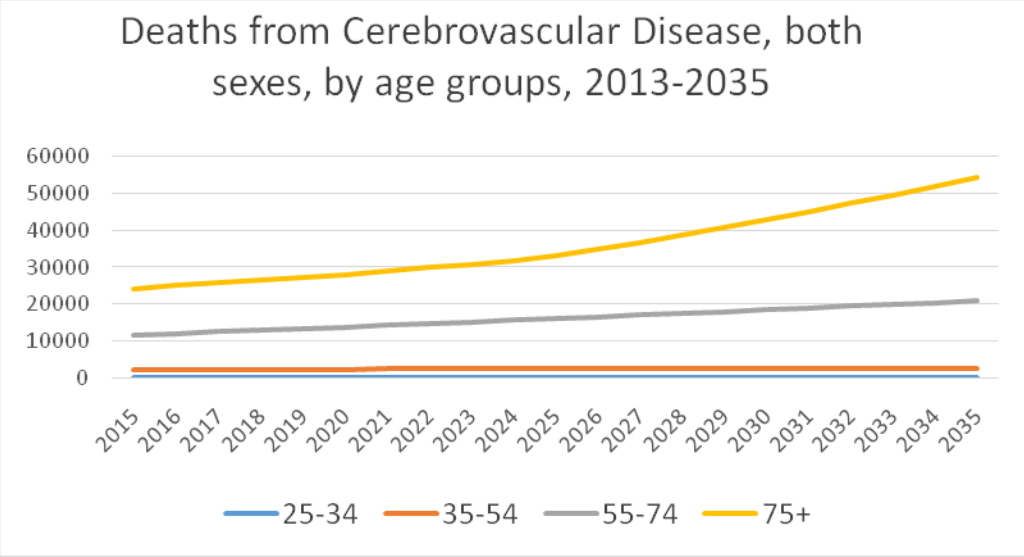
Using the minimum **updated data**, we obtain the following results (subject to change if new data is provided):



Age Groups	2013	2035	Δ 2013 to 2035
25-34	4,394	4,410	16
35-54	179,856	230,562	50,706
55-74	519,963	998,437	478,474
75+	125,522	304,067	178,545
Total	**829,736**	**1,537,476**	**707,741**

- **Increased from 0.82M cases in 2013 to 1.53M cases in 2035.**

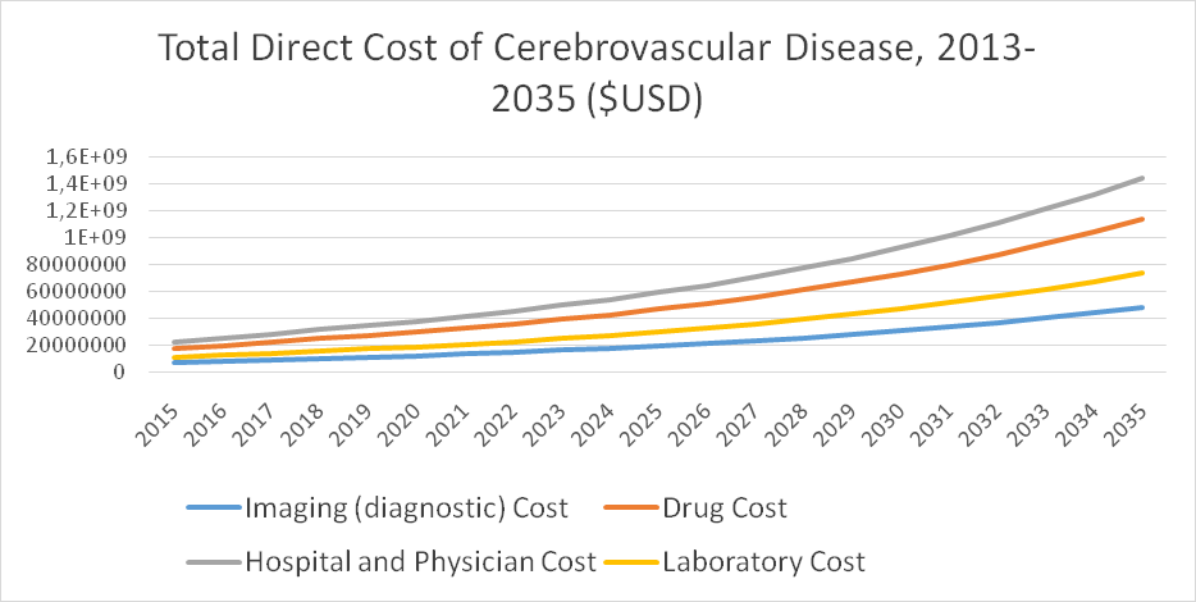
Preliminary Results – CeVD Mortality



Age Groups	2013	2035	Δ 2013 to 2035
25-34	187	188	1
35-54	2,118	2,729	611
55-74	10,791	20,919	10,128
75+	22,652	54,295	31,643
Total	**35,871**	**78,131**	**42,260**

- **Increased from 35,871 in 2013 to 78,131 in 2035.**

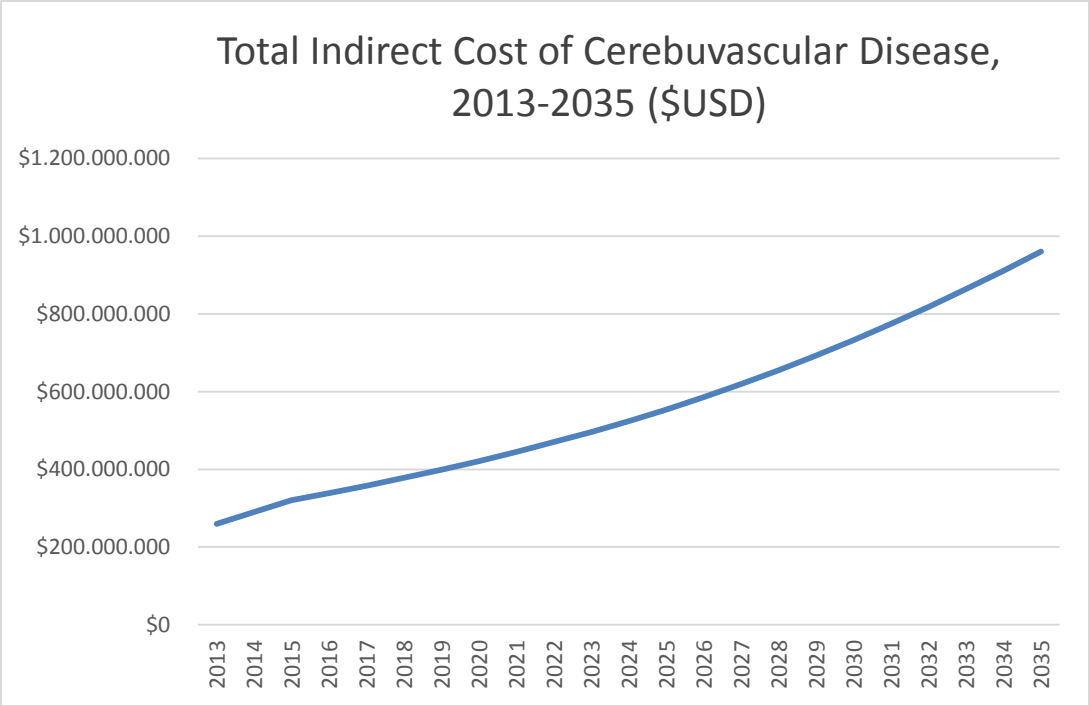
Preliminary Results – CeVD Direct Costs



Cost Break-Down	2013	2035	Δ 2013 to 2035
Imaging (diagnostic)	$ 59,275,927	$ 483,666,153	$ 424,390,226
Drug	$ 139,980,240	$1,142,178,755	$ 1,002,198,515
Hospital and Physician	$ 176,714,617	$1,441,915,526	$ 1,265,200,909
Laboratory	$ 91,001,070	$ 742,529,727	$ 651,528,657
Total	**$ 466,971,854**	**$3,810,290,161**	**$ 3,343,318,307**

- **Increased from $466M in 2013 to $3.8B in 2035.**

Preliminary Results – CeVD Indirect Costs



- **Increased from $260M in 2013 to $961M in 2035.**

ANTİKOAGÜLASYON

The National Collaborating Centre

for Chronic Conditions

Funded to produce guidelines for the NHS by NICE

ATRIAL FIBRILLATION

National clinical guideline for management in primary and secondary care

Table 16 Strokes avoided with proposed treatment

	High Risk	Moderate Risk	Low Risk	
Number of strokes occuring if all patients untreated	18,544	13,246	1,159	32,949
Number of strokes occuring if all patients treated with aspirin	14,888	10,042	773	25,703
Number of strokes occuring if all patients treated with warfarin	7,444	5,021	386	12,852

11.8.3 Evidence to recommendations

The health economic analysis suggested that the studies comparing warfarin with no anticoagulation and warfarin with aspirin were of good quality and summarised the evidence as follows:

- In patients with AF, anticoagulation treatment is cost effective compared with no anticoagulation.
- In patients at high risk of stroke, anticoagulation is cost effective, but not for those with a low risk of stroke.
- Aspirin is cost effective in low-risk patients compared with warfarin, but not in higher risk patients.

It was agreed that the health economics evidence was consistent with the stroke risk stratification algorithm (Figure 11.1).

-Genel olarak antikoagülasyon maliyet etkindir.
-İnme riski yüksek olanlarda antikoagülasyon maliyet etkindir.
-Aspirin düşük risk grubunda maliyet etkindir.

Malzeme Kaynakları Yönetim Sistemi verilerine göre

Malzeme Fiyat Sorgulaması

MKYS FİYAT SORGU

23.07.2012 tarih ve 352 sayılı "Mal Alımlarında Yaklaşık Maliyet Tespiti" konulu genel yazıda belirtilen hususlarla birlikte, dikkat edilmesi gerekenler;

1- Özet fiyat tablosunda ortalama fiyat sütunundaki veri; sorgulama sonucu gelen tüm verilerin fiyatlarının ortalaması alınarak hesaplanmaktadır.
Ortalama fiyatı hesaplamak için; kullanılan tüm veriler ürününüzü temsil etmiyorsa (teknik özellik, fiyat vb.), özet tablonun altında yer alan, kurumların detaylı alım verilerini içeren tablodan, ürününüzü temsil eden veriler seçilerek, ortalama fiyat hesaplanabilir.

2- Özet fiyat tablosunda en düşük uygun fiyat ve en yüksek uygun fiyat sütunlarındaki veri; gerçekleşen fiyatlar üzerinden istatistiksel yöntemlerle belirlenen aralıktır. (referans fiyat aralığı) Bu fiyat aralığı verileri, yoğun alımların olduğu ürünlerde daha etkin kullanılabilir. Daha değerlendirilerek kullanılabilir.

3- Özet tablonun altında yer alan veriler kullanılırken; bu ürünlerin ortalama fiyatı hesaplamasında, makbuz tarihinin yanında alımın yapıldığı tarih olan ihale tarihi de dikkate alınmalıdır.

4- Ortalama fiyatın yanı sıra en düşük fiyatın gerçekleştiği hastane verileri de dikkate alınabilir.

Yaklaşık Maliyet Tablosu

(KDV Hariç Fiyata Göre Hazırlanmıştır)

Barkod	Malzeme Açıklaması	Alım Miktarı	Kdv Hariç Toplam Tutar	Kdv Dahil Toplam Tutar	Örneklem Sayısı	En Düşük Fiyat	En Yüksek Fiyat	Ortalama Fiyat	Referans Fiyat En Düşük Uygun Fiyat	Referans Fiyat En Yüksek Uygun Fiyat
8699502013384	COUMADIN 5 MG 28 TABLET	123.864	16.866,6375	18.185,0026	360	0,1100	0,1900	0,1363	0,1347	0,1379
8699502013391	COUMADIN 10 MG 28 TABLET	884	147,5480	159,3518	4	0,1470	0,1970	0,1700	0,1470	0,1970
8699502010222	COUMADIN 5 MG 25 TABLET	596	83,0930	89,7404	4	0,1130	0,1580	0,1397	0,1130	0,1580
Genel Toplam		**125.344**	**17.097,2785**	**18.434,0949**	**368**	**0,1100**	**0,1970**	**0,1367**	**0,1351**	**0,1383**

En Düşük Fiyat	En Yüksek Fiyat	Ortalama Fiyat	Referans Fiyat En Düşük Uygun Fiyat	Referans Fiyat En Yüksek Uygun Fiyat
0,1100	0,1900	0,1363	0,1347	0,1379
0,1470	0,1970	0,1700	0,1470	0,1970
0,1130	0,1580	0,1397	0,1130	0,1580
0,1100	**0,1970**	**0,1367**	**0,1351**	**0,1383**

HİZMET BAŞI İŞLEM PUAN LİSTESİ					
SIRA NO	KODU	İŞLEM ADI	AÇIKLAMA	İŞLEM PUANI	TUTAR
4497	905.195	PRA(anti-HLA antikoru) High Resolution	Doku Tiplendirme Laboratuvar Merkezleri tarafından çalışılabilir.Sonuç belgesi istendiği takdirde Kuruma ibraz etmek üzere saklanmak kaydıyla, yapılan işlemlere ait ayrıntılı teknik açıklamayı içeren ayrıntılı raporla faturalandırılır. İşlem Basamakları olarak Moleküler kodlar ile faturalanamaz. (Preimplantasyon genetik tetkikler, hematolojik maligniteler için moleküler test çalışmaları yapıldığında moleküler kodlarla faturalandırılır.)	150,00	
4498	905.200	Pıhtı retraksiyonu		2,87	
4499	905.210	Pıhtılaşma zamanı		2,87	
4500	905.220	Piruvat kinaz		5,73	
4501	905.230	Platelet F4		71,50	
4502	905.240	Plazminojen		28,67	
4503	905.250	Plazminojen Aktivatör (PA)		24,45	
4504	905.260	Protein C		64,42	
4505	905.270	Protein C antijeni		43,00	
4506	905.280	Protein S		64,42	
4507	905.290	Protein S antijeni		43,00	
4508	905.300	Protrombin fragman 1+2		10,12	
4509	905.310	Protrombin kompleksi		34,40	
4510	905.320	Protrombin zamanı (Koagülometre)		10,12	6,00
4511	905.330	Rekalsifikasyon zamanı		2,87	
4512	905.340	Reptilaz zamanı		28,67	
4513	905.350	Retikülosit sayımı		5,73	
4514	905.360	Retikülosit sayımı (Otomatik sistem)		14,33	
4515	905.370	Serum opsonik aktivite		10,12	

Cost-Effectiveness of Apixaban, Dabigatran, Rivaroxaban, and Warfarin for Stroke Prevention in Atrial Fibrillation

Amanda R. Harrington, MS; Edward P. Armstrong, PharmD; Paul E. Nolan Jr, PharmD; Daniel C. Malone, PhD

Background and Purpose—To estimate the cost-effectiveness of stroke prevention in patients with nonvalvular atrial fibrillation by using novel oral anticoagulants apixaban 5 mg, dabigatran 150 mg, and rivaroxaban 20 mg compared with warfarin.

Methods—A Markov decision-analysis model was constructed using data from clinical trials to evaluate lifetime costs and quality-adjusted life-years of novel oral anticoagulants compared with warfarin. The modeled population was a hypothetical cohort of 70-year-old patients with nonvalvular atrial fibrillation, increased risk for stroke ($CHADS_2$ ≥1), renal creatinine clearance ≥50 mL/min, and no previous contraindications to anticoagulation. The willingness-to-pay threshold was $50 000/quality-adjusted life-years gained.

Results—In the base case, warfarin had the lowest cost of $77 813 (SD, $2223), followed by rivaroxaban 20 mg ($78 738±$1852), dabigatran 150 mg ($82 719±$1959), and apixaban 5 mg ($85 326±$1512). Apixaban 5 mg had the highest quality-adjusted life-years estimate at 8.47 (SD, 0.06), followed by dabigatran 150 mg (8.41±0.07), rivaroxaban 20 mg (8.26±0.06), and warfarin (7.97±0.04). In a Monte Carlo probabilistic sensitivity analysis, apixaban 5 mg, dabigatran 150 mg, rivaroxaban 20 mg, and warfarin were cost-effective in 45.1%, 40%, 14.9%, 0% of the simulations, respectively.

Conclusions—In patients with nonvalvular atrial fibrillation and an increased risk of stroke prophylaxis, apixaban 5 mg, dabigatran 150 mg, and rivaroxaban 20 mg were all cost-effective alternatives to warfarin. The cost-effectiveness of novel oral anticoagulantss was dependent on therapy pricing in the United States and neurological events associated with rivaroxaban 20 mg. **(*Stroke*. 2013;44:1676-1681.)**

Key Words: anticoagulation ■ atrial fibrillation ■ cost-effectiveness ■ intracranial hemorrhage ■ Markov model ■ stroke

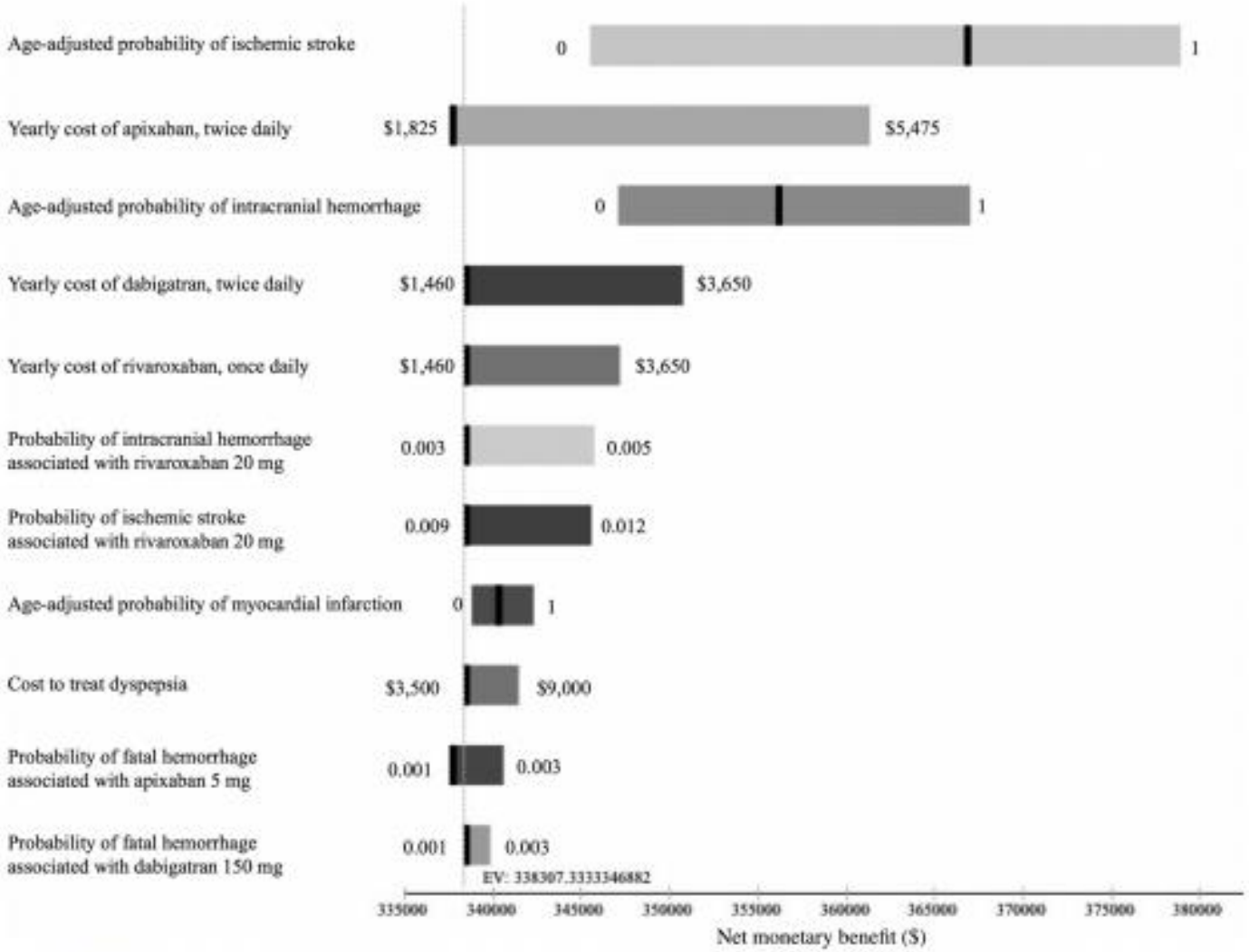


Figure 2. Each horizontal bar in the tornado diagram represents net monetary benefit values expected from a range of values evaluated for each variable. The vertical black line represents a change in the preferred treatment for a given variable being analyzed.

Table 1 – Summary of AF-related direct medical health system costs by treatment.

Ref.	Author	Publication year	Study type	Cost year	Country	Average cost	Medical management			Surgical ablation
							Rhythm	Rate	Combined*	
1	Stewart et al.	2004	Population	2000	UK	6422			6422	
17	Wolf et al.	1998	Cohort— Admin (Medicare)	1991	USA	3888			3888	
18	Wu et al.	2005	Cohort— Admin	2002	USA	21,099			21,099	
19	Kim et al.	2009	Cohort— Admin	2007	USA	8354			8354	
20	Rohrbacker et al.	2010	Cohort— Admin	2008	USA	4979			4979	
21	Weerasooriya et al.	2003	Cohort— COCAF (Model)	2001	France	3340			4178	2502
22	Le Heuzy et al.	2004	Cohort— COCAF	2001	France	6469			6469	
23	Reynolds et al.	2007	Cohort— FRACTAL	2002	USA	7358			7358	
24	Bruggenjurgen et al.	2007	Cohort— Berlin Acute Stroke Study	2005	Germany	5060			5060	
25	Jonsson et al.	2010	Cohort— Primary data	2005	Sweden	3059			3059	
25	Jonsson et al.	2010	Cohort— Primary data	2005	Germany	3936			3936	
26	Ringborg et al.	2008	Cohort—Euro Heart Study	2006	Greece	2308			2308	
26	Ringborg et al.	2008	Cohort— Euro Heart Study	2006	Italy	5075			5075	
26	Ringborg et al.	2008	Cohort— Euro Heart Study	2006	Poland	1632			1632	
26	Ringborg et al.	2008	Cohort— Euro Heart Study	2006	Spain	3485			3485	
26	Ringborg et al.	2008	Cohort— Euro Heart Study	2006	Netherlands	3255			3255	
27	Lumer et al.	2002	Trial—CTAF	1995	Canada	2336	2336			
28	Hagens et al.	2004	Trial— RACE	2000	Netherlands	4109	3731	4487		
29	Pietrasik et al.	2007	Trial—HOT CAFÉ	2002	Poland	3575	4815	2335		
16	Marshall et al.	2004	Trial— AFFIRM	2003	USA	8644	9654	7663		
30	Goldberg et al.	2003	Single center	2001	USA	6320				6320
21	Weerasooriya et al.	2003	Single center— Model	2001	France	2669			2929	2409
21	Weerasooriya et al.	2003	Cohort— COCAF— Model	2001	France	3340			4178	2502
31	Moeremans et al.	2000	Model	1998	France	4932			4932	
32	Chan et al.	2006	Model	2004	USA	6697	6819	5621		7651
33	Khaykin et al.	2007	Model (CARAF Trial)	2005	Canada	6175			5812	6537
34	Khaykin et al.	2009	Model (RAAFT Trial)	2005	Canada	5674			5656	5691
35	McKenna et al.	2009	Model	2005	UK	4299			3486	5111

All figures represent average per-patient per-year annualized costs in 2010 Canadian dollars.

AF, atrial fibrillation; AFFIRM, Atrial Fibrillation Follow-up Investigation of Rhythm Management; CARAF, Canadian Registry of Atrial Fibrillation; CTAF, Canadian Trial of Atrial Fibrillation; COCAF, Cost of Care in Atrial Fibrillation; FRACTAL, Fibrillation Registry Assessing Costs, Therapies Adverse events and Lifestyle; HOT CAFÉ, How to Treat Chronic Atrial Fibrillation; RAAFT, Radiofrequency Ablation versus Antiarrythmic Drug Therapy as First-line Treatment; RACE, RAte Control versus Electrical cardioversion.

* Combined costs reported for unspecified treatment in study; all costs specific to AF except Stewart et al. [1], Le Heuzey et al. [22], Ringborg et al. [26], Lumer et al. [27], and Hagens et al. [28] who used patient reports that may have included non-AF treatment costs.

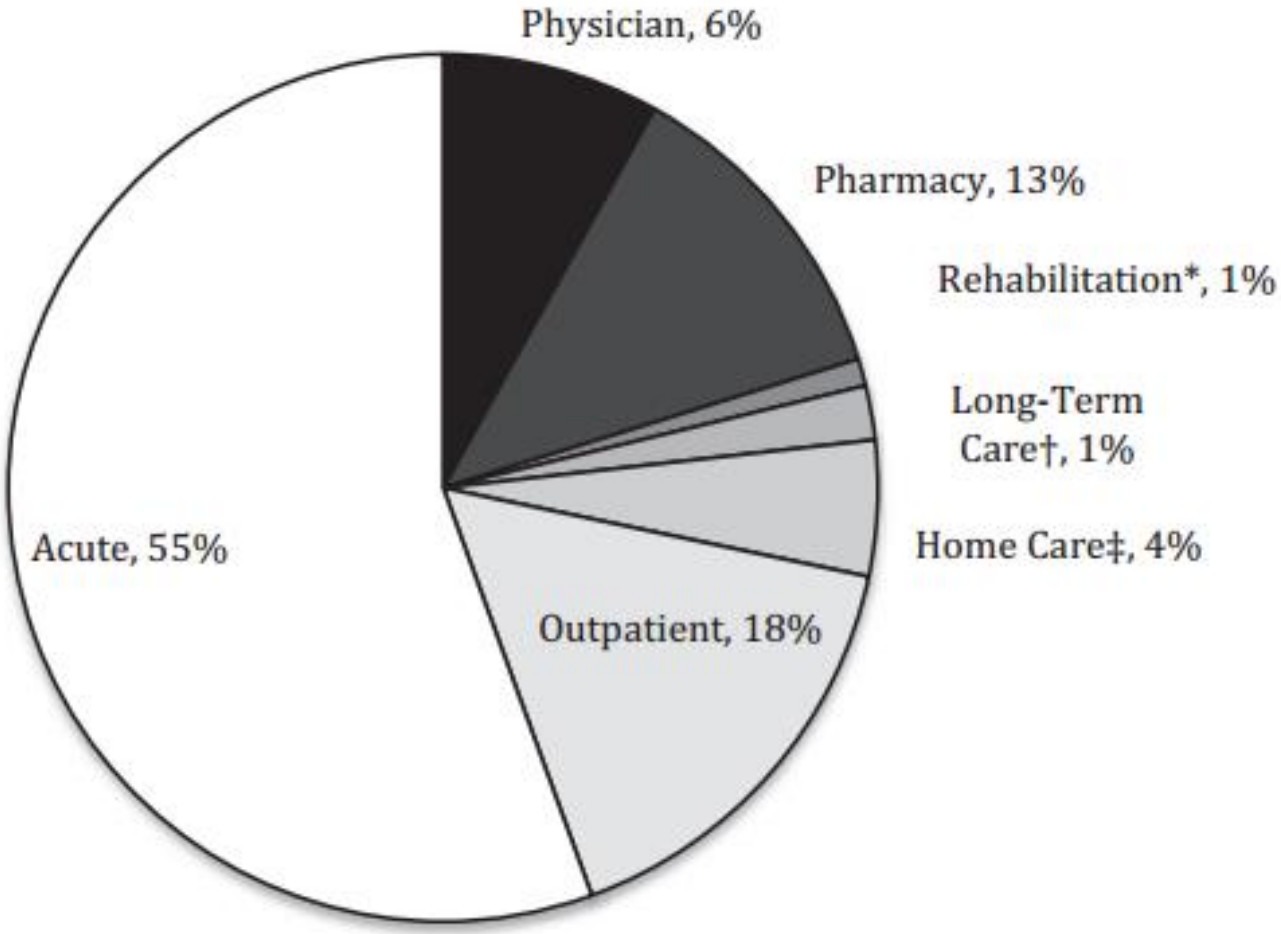


Fig. 1 – Distribution of total system costs for patients with atrial fibrillation. Note: Percentage figures represent average of costs based on studies. *Rehabilitation included in only one study and amounted to 13%; †Long-term care included in three studies averaging 7% in those studies; ‡Home care included in three studies averaging 16%. Other cost centers were based on 11 reported results. See Table 2 for full details.

Novel Anticoagulants for Stroke Prevention in Atrial Fibrillation: A Systematic Review of Cost-Effectiveness Models

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Abstract

Objective: To conduct a systematic review of economic models of newer anticoagulants for stroke prevention in atrial fibrillation (SPAF).

Patients and Methods: We searched Medline, Embase, NHSEED and HTA databases and the Tuft's Registry from January 1, 2008 through October 10, 2012 to identify economic (Markov or discrete event simulation) models of newer agents for SPAF.

Results: Eighteen models were identified. Each was based on a lone randomized trial/new agent, and these trials were clinically and methodologically heterogeneous. Dabigatran 150 mg, 110 mg and sequentially-dosed were assessed in 9, 8, and 9 models, rivaroxaban in 4 and apixaban in 4. Warfarin was a first-line comparator in 94% of models. Models were conducted from United States (44%), European (39%) and Canadian (17%) perspectives. Models typically assumed patients between 65–73 years old at moderate-risk of stroke initiated anticoagulation for/near a lifetime. All models reported cost/quality-adjusted life-year, 22% reported using a societal perspective, but none included indirect costs. Four models reported an incremental cost-effectiveness ratio (ICER) for a newer anticoagulant (dabigatran 110 mg (n = 4)/150 mg (n = 2); rivaroxaban (n = 1)) vs. warfarin above commonly reported willingness-to-pay thresholds. ICERs vs. warfarin ranged from $3,547–$86,000 for dabigatran 150 mg, $20,713–$150,000 for dabigatran 110 mg, $4,084–$21,466 for sequentially-dosed dabigatran and $23,065–$57,470 for rivaroxaban. Apixaban was found economically-dominant to aspirin, and dominant or cost-effective ($11,400–$25,059) vs. warfarin. Indirect comparisons from 3 models suggested conflicting comparative cost-effectiveness results.

Conclusions: Cost-effectiveness models frequently found newer anticoagulants cost-effective, but the lack of head-to-head trials and the heterogeneous characteristics of underlying trials and modeling methods make it difficult to determine the most cost-effective agent.

Yeni antikoagülanların maliyet etkin olduğu fakat çalışmaların heterojen oluşundan hangi ajanın daha çok maliyet etkin olduğunu söylemenin zor olduğu ifade edilmiştir

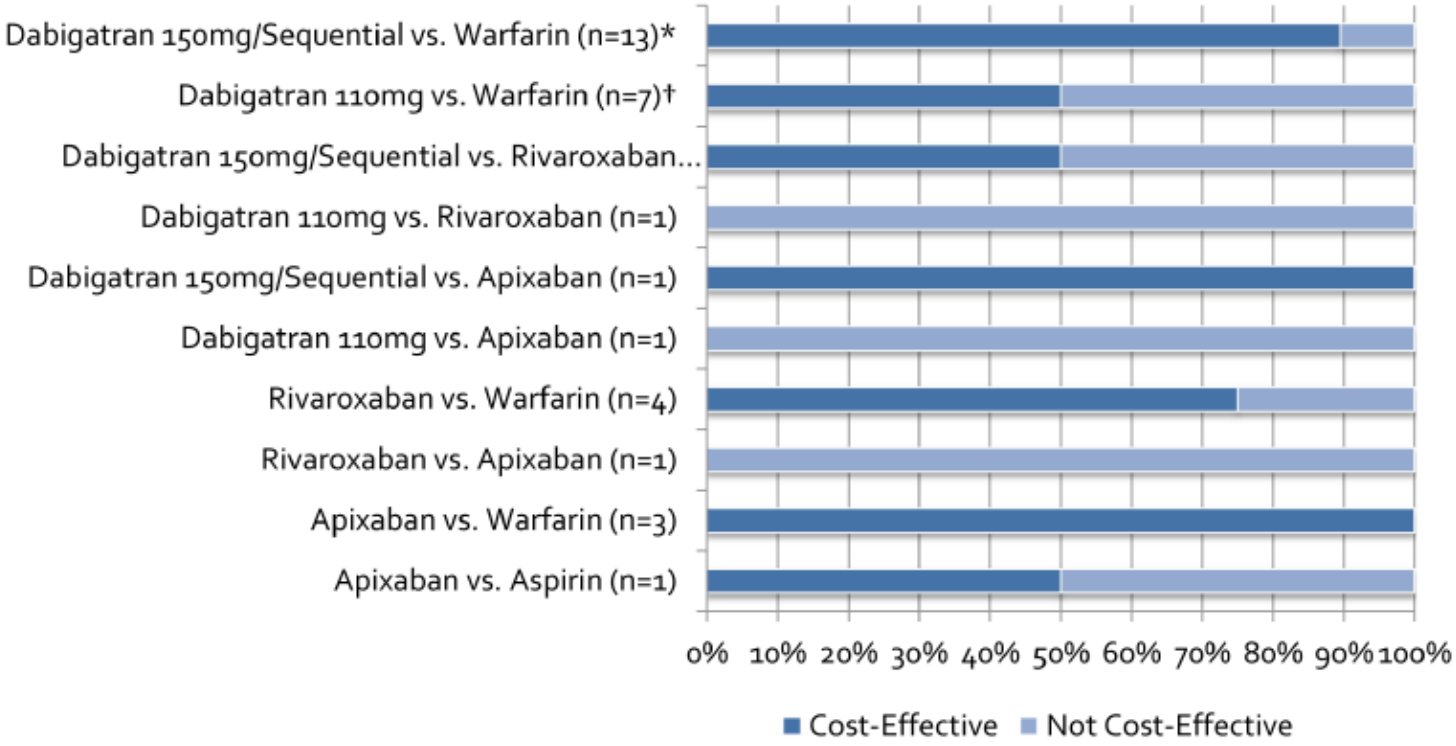

Figure 2. Proportion of Reported Incremental Cost-Effectiveness Ratios Below Reported Willingness-to-Pay Threshold. *Includes results of dabigatran compared to "real-world prescribing", "trial-like" warfarin control and genotype-guided warfarin †Includes results of dabigatran compared to "trial-like" warfarin control and genotype-guided warfarin.
doi:10.1371/journal.pone.0062183.g002

The Cost–Effectiveness of Rivaroxaban for the Prevention of Stroke in Patients with Atrial Fibrillation (AF) in Turkey

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Parali E[1], Sumer F[1], Tuna E[1], Yilmaz ZS[1]

The ICER value was sensitive to the cost and frequency of monitoring in warfarin patients.

Cost Effectiveness Table

	Rivaroxaban	Warfarin	Difference
Drug Cost	3,286.6	203.5	3,083.1
Drug Administration and Follow-up Cost	572.9	2,474.9	-1,902.0
Cost Related with Complications and Other Clinical Events	1,605.7	1,721.4	-115.7
Total Cost	5,465.1	4,399.8	1,065.3
Life Years	7.94	7.88	0.065
ICER	-	-	16,362 USD/year

All costs are calculated in USD

Conclusion

Rivaroxaban, with its cost-saving effect on monitoring, reducing the frequencies of clinical events, improvement in LYs and QALYs, and ICER values below WTP threshold, is suggested to be a cost-effective alternative for the prevention of stroke in AF.

Ekonomik yük

- **Sağlık sistemlerinde AF için yapılan toplam harcamaları «tam» olarak belirlemek çok zordur**
- **Veriler INR'yi etkili aralıkta tutmak inmeleri azaltacağından sağlık harcamalarını azaltacaktır.**
- **AF yönünden yapılacak bir tarama başlangıçta sağlık sistemine yük getirse de ileride gelişecek inmeler için yapılacak harcamaları azaltacağından net bir fayda sağlayacaktır.**


T.C. Sağlık Bakanlığı
Türkiye İlaç ve
Tıbbi Cihaz Kurumu
Türkiye İlaç ve Tıbbi
Cihaz Kurumu

Arama Seçenekleri İLAÇ ADI (PRODUCT) xarelto

Ara

İLAÇ ADI (PRODUCT)	FİRMA ADI (COMPANY NAME)	GERÇEK REFERANS FİYATI (REAL REFER
XARELTO 10 MG 10 TABLET	BAYER	19,40
XARELTO 10 MG 30 TABLET	BAYER	54,50
XARELTO 15 MG 28 FILM KAPLI TABLET	BAYER	54,32
XARELTO 20 MG 28 FILM KAPLI TABLET	BAYER	54,32

Xarelto
10 mg 10 tb 1tb fiyatı:1.94
10 mg 30 tb 1tb fiyatı:1.81
15 mg 28 tb 1tb fiyatı:1.94
20 mg 28 tb 1tb fiyatı:1.94

Arama Seçenekleri İLAÇ ADI (PRODUCT) pradaxa

Ara

İLAÇ ADI (PRODUCT)	FİRMA ADI (COMPANY NAME)	GERÇEK REFERANS FİYATI (REAL REFERI
PRADAXA 110 MG 10 SERT KAPSUL	BOEHRINGER INGELHEIM	9,70
PRADAXA 110 MG 60 SERT KAPSUL	BOEHRINGER INGELHEIM	56,43
PRADAXA 150 MG 60 SERT KAPSUL	BOEHRINGER INGELHEIM	58,20
PRADAXA 75 MG 10 SERT KAPSUL	BOEHRINGER INGELHEIM	9,70
PRADAXA 75 MG 60 SERT KAPSUL	BOEHRINGER INGELHEIM	53,68

Pradaxa

110 mg 10 tb 1tb fiyatı: 0.97x2=1.94

110 mg 60 tb 1tb fiyatı: 0.94x2=1.88

75 mg 10 tb 1tb fiyatı: 0.97x2=1.94

75 mg 60 tb 1tb fiyatı: 0.89x2=1.78

- Xarelto
- 10 mg 10 tb 1tb fiyatı:1.94
- 10 mg 30 tb 1tb fiyatı:1.81
- 15 mg 28 tb 1tb fiyatı:1.94
- 20 mg 28 tb 1tb fiyatı:1.94

- Pradaxa
- 110 mg 10 tb 1tb fiyatı: 0.97x2=1.94
- 110 mg 60 tb 1tb fiyatı: 0.94x2=1.88
- 75 mg 10 tb 1tb fiyatı: 0.97x2=1.94
- 75 mg 60 tb 1tb fiyatı: 0.89x2=1.78

Barkod	8681308096166
Firma	PFİZER PFE
Reçete Türü	**Beyaz Reçete**
Ruhsat Veren	Sağlık Bakanlığı onaylıdır
Fiyat	**172.15**
Fiyat Tarihi	22-02-2016
Kamu Fiyatı	**101.57**
Eczacı İndirimi	%1.00
İmalatçı İndirimi	%41.00
İmalatçı Fiyatı	120.64 +KDV
Depocu Fiyatı	129.06 +KDV
SGK Etkin Madde Kodu	**SGKG0H**
Kamu No	A14640
J/O	ORİJİNAL
KDV	%8.00
Ruhsat/İzin	05-11-2015, 2015/845
Raf Ömrü	36 Ay

1.69 x2=3.38 Tl

Barkod	8699693150127
Firma	BOEHRINGER INGELHEIM
Reçete Türü	**Beyaz Reçete**
Ruhsat Veren	Sağlık Bakanlığı onaylıdır
Fiyat	**170.56**
Fiyat Tarihi	18-10-2016
Kamu Fiyatı	**100.63**
Eczacı İndirimi	%1.00
İmalatçı İndirimi	%41.00
İmalatçı Fiyatı	119.42 +KDV
Depocu Fiyatı	127.79 +KDV
SGK Etkin Madde Kodu	**SGKFWS**
Kamu No	A13835
J/O	ORİJİNAL
KDV	%8.00
Ruhsat/İzin	30-12-2011, 132/55
Raf Ömrü	36 Ay

1.67x2= 3.35 Tl

Barkod	8699546090150
Firma	BAYER
Reçete Türü	**Beyaz Reçete**
Ruhsat Veren	Sağlık Bakanlığı onaylıdır
Fiyat	**160.10**
Fiyat Tarihi	26-06-2016
Kamu Fiyatı	**94.46**
Eczacı İndirimi	%1.00
İmalatçı İndirimi	%41.00
İmalatçı Fiyatı	111.39 +KDV
Depocu Fiyatı	119.44 +KDV
SGK Etkin Madde Kodu	**SGKFZM**
Kamu No	A14097
J/O	ORİJİNAL
KDV	%8.00
Ruhsat/İzin	05-07-2012, 133/48
Raf Ömrü	36 Ay

1 Tb= 3.37 Tl

ABLASYON

Circulation
Arrhythmia and Electrophysiology
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association
Learn and Live

Cost-Effectiveness of Radiofrequency Catheter Ablation Compared With Antiarrhythmic Drug Therapy for Paroxysmal Atrial Fibrillation

Matthew R. Reynolds, Peter Zimetbaum, Mark E. Josephson, Ethan Ellis, Tatyana Danilov and David J. Cohen

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 Print ISSN: 1941-3149. Online ISSN: 1941-3084

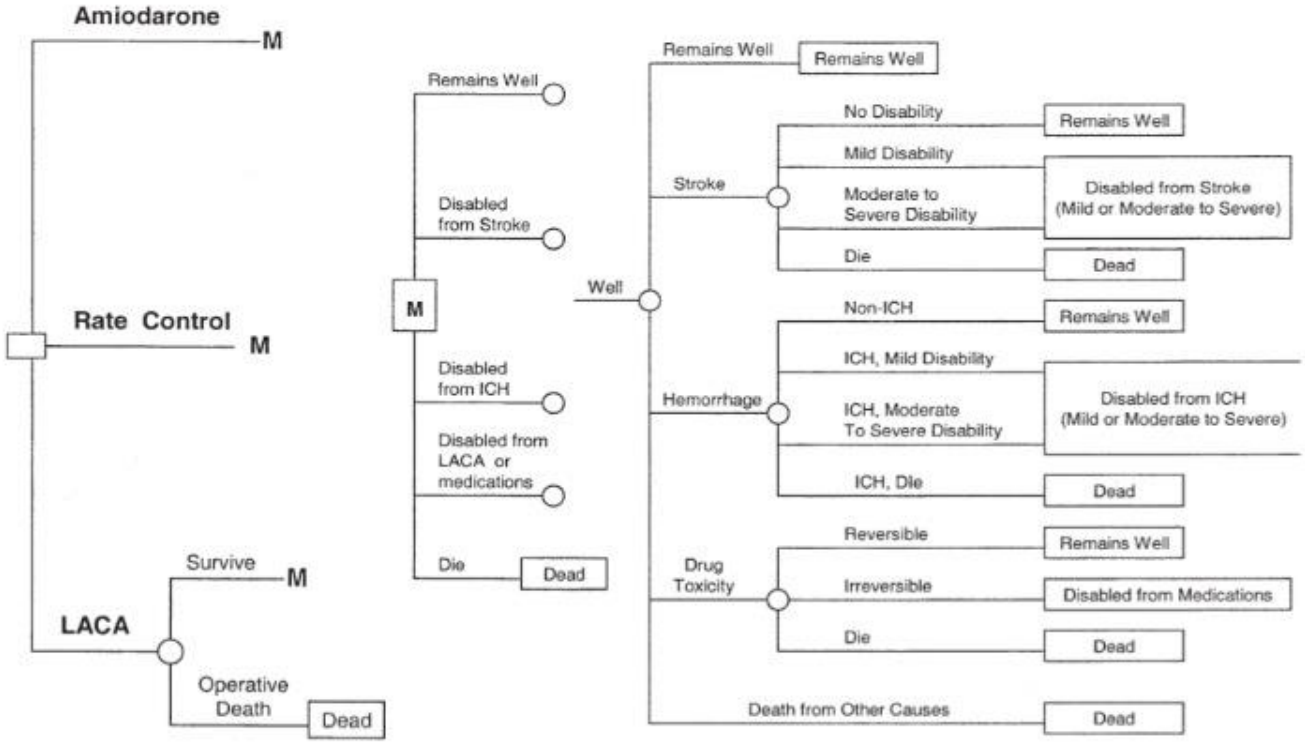

Figure 1. Simplified diagram of the Markov decision-analytic model. The **square at the left** represents the three treatment strategy choices. The **M** represents the Markov process, which leads to one of many health states. The **circles** represent chance events that may occur in each cycle (e.g., remain well, stroke, hemorrhage, drug toxicity, reversion to atrial fibrillation—not shown) and results in continued good health or one of several disabling states. The branch from **Well** illustrates these chance events. Health states in the figure are simplified, and each represents multiple states in the actual model (e.g., "disabled" includes separate health states in atrial fibrillation or sinus rhythm with mild or moderate-to-severe disability due to stroke, hemorrhage, left atrial catheter ablation [LACA] complications, or drug toxicity). ICH = intracranial hemorrhage.

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June 20, 2006:2513–20

Table 2. Incremental Cost-Effectiveness Ratios (ICER) in Base-Case Estimates, Stratified by Ischemic Stroke Risk

Stroke Risk	Strategy	Cost	Life-Years	QALYs	ICER ($/QALY)
Moderate (age = 65 yrs)	Rate control + warfarin	$39,391	11.47	10.81	Reference
	Amiodarone + warfarin	$43,358	11.45	10.75	Dominated
	LACA + warfarin	$52,369	11.55	11.06	$51,800/QALY
Moderate (age = 55 yrs)	Rate control + warfarin	$50,509	14.80	13.95	Reference
	Amiodarone + warfarin	$55,795	14.75	13.81	Dominated
	LACA + warfarin	$59,380	14.88	14.26	$28,700/QALY
Low	Rate control + ASA	$24,540	11.65	11.21	Reference
	Amiodarone + ASA	$38,425	11.60	11.02	Dominated
	LACA + ASA	$43,036	11.70	11.40	$98,900/QALY

Calculations for cost-effectiveness were performed by taking the incremental cost (difference between costs of compared strategies) divided by the incremental effectiveness (difference between quality-adjusted life-years [QALYs] of compared strategies). No calculations are needed for strategies that are dominated, as they are less effective and more costly than the reference strategy. All ICER results are measured in 2004 U.S. dollars and are rounded off to the nearest $100. Discrepancies in the ICER calculations are due to round-off error.

ASA = aspirin; LACA = left atrial catheter ablation.

- **Bu çalışma; antiaritmik tedaviye dirençli paroksismal AF'de ablasyon maliyet etkin olduğunu göstermektedir.**

- **İnme riski arttıkça işlem daha çok maliyet etkin olmaktadır.**

Cost Comparison of Catheter Ablation and Medical Therapy in Atrial Fibrillation

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ALLAN C. SKANES, M.D., F.R.C.P.C.,‡ AARON MCCRACKEN, M.B.A.,§
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Catheter Ablation and Medical Therapy. ***Introduction:*** **There is emerging evidence for clinical superiority of catheter ablation over rate and rhythm control strategies in paroxysmal atrial fibrillation (PAF). The objective of this study was to compare costs related to medical therapy versus catheter ablation for PAF in Ontario (Canada).**

Methods: **Costs related to medical therapy in the analysis included the cost of anticoagulation, rate and rhythm control medications, noninvasive testing, physician follow-up visits, and hospital admissions, as well as the cost of complications related to this management strategy. Costs related to catheter ablation were assumed to include the cost of the ablation tools (electroanatomic mapping or intracardiac echocardiography-guided pulmonary vein ablation), hospital and physician billings, and costs related to periprocedural medical care and complications. Costs related to these various elements were obtained from the Canadian Registry of Atrial Fibrillation (CARAF), government fee schedules, and published data. Sensitivity analyses looking at a range of initial success rates (50–75%) and late attrition rates (1–5%), prevalence of congestive heart failure (CHF) (20–60%), as well as discounting varying from 3% to 5% per year were performed.**

Results: **The cost of catheter ablation ranged from $16,278 to $21,294, with an annual cost of $1,597 to $2,132. The annual cost of medical therapy ranged from $4,176 to $5,060. Costs of ongoing medical therapy and catheter ablation for PAF equalized at 3.2–8.4 years of follow-up.**

Conclusion: **Catheter ablation is a fiscally sensible alternative to medical therapy in PAF with cost equivalence after 4 years.** *(J Cardiovasc Electrophysiol, Vol. 18, pp. 907-913, September 2007)*

TABLE 2
Annual Follow-Up Costs for Atrial Fibrillation[22,27]

	Rhythm Control		Rate Control		
	Warfarin	ASA	Warfarin	ASA	Total
Percentage of patients (in Ontario)	26.39	10.77	43.64	19.20	
Clinical tests (number/year)					
INR	14	0	14	0	
ECG	3.11	2.63	3.11	2.63	
Holter monitoring	1.06	0.69	0.15	0.3	
Echocardiography	0.67	0.73	0.67	0.73	
Exercise testing	0.05	0.1	0.05	0.1	
Thyroid function	0.03	0	0.03	0	
Digoxin levels	0	0	0.28	0.28	
Weighted annual cost	$176.95	$31.46	$254.18	$49.60	$512.18
Physician visits no CHF (per year, 45% patients without CHF)					
GP	6.6	5.56	7.44	5.67	
Specialist	2.6	2.11	2	1.67	
Hospital days	1.4	0.5	0.69	0.76	
Weighted cost	$123.02	$29.91	$146.54	$58.14	$357.61
Physician visits CHF (per year, 55% CHF prevalence)					
GP	11.22	10.14	10.89	8.13	
Specialist	3.89	3.5	3	2.75	
Hospital days	5	4.14	4.13	3.57	
Weighted cost	$388.79	$134.41	$530.59	$197.47	$1,251.26
Unscheduled visits (per year)					
Cardiologist	0.99	0.99	0.39	0.39	
Hospital days (assumed ICU)	2.01	2.01	0.49	0.49	
Weighted cost	$707.38	$288.69	$293.27	$129.03	$1,418.37
Annual weighted cost of clinical tests and visits					$3,539.42

Proportions of patients in each therapeutic strategy was derived from the CARAF registry.

TABLE 3
Catheter Cost Estimates

	Low	Medium	High
CARTO/3-D mapping case			
Diagnostic decapolar catheter	$636.00	$829.00	$897.00
Navistar catheters (8 mm)	$4,050.00	$4,324.00	$5,000.00
Thermocool catheters	$4,450.00	$5,050.00	$5,900.00
Average of above-listed catheters	$4,250.00	$4,687.00	$5,450.00
Reference patches	$764.00	$1,346.00	$2,000.00
Non-CARTO/non-3-D mapping case			
Diagnostic decapolar catheter	$636.00	$829.00	$897.00
Celsius catheter (8 mm)	$786.00	$916.00	$1,189.00
LASSO catheter	$1,837.00	$2,286.00	$2,657.00
ICE probe	NA	NA	$4,000.00
NAVx case			
Diagnostic decapolar catheter	$636.00	$829.00	$897.00
Celsius catheter (8 mm)	$786.00	$916.00	$1,189.00
LASSO catheter	$1,837.00	$2,286.00	$2,657.00
NAVx patch	$1,200.00	$1,200.00	$1,200.00
Total CARTO/3-D mapping case (33% of total volume)	$5,650.00	$6,862.00	$8,347.00
Total non-CARTO/non-3-D mapping case (33% of total volume)	$3,259.00	$4,031.00	$8,743.00
Total NAVx case (33% of total volume)	$4,459.00	$5,231.00	$5,943.00
Weighted average cost of catheters	$4,455.55	$5,374.13	$7,676.90

NA = not applicable.

TABLE 4

Prevalence and Cost of Procedural Complications[29,31]

Complication Type	Prevalence (%)	Cost
Tamponade	1.22	$5,382
Stroke	0.28	$13,700
Transient ischemic attack	0.66	$3,958
PV stenosis	1.62	$7,818
Total cost of complications		$256.91

TABLE 5

Total Pulmonary Vein Ablation Cost[27,30,32]

Item	Cost
Cost of anticoagulation for 1 month pre-procedure*	$57.92
Average cost of procedure (fixed costs, patient charges, EP lab staff costs, materials, and supplies)	$1,700.00
CT chest scan	$356.60
Physician fees	$1,276.00
3 months post-procedure follow-up	$1,566.65
Cost of procedure complications	$256.91
Catheters	$5,374.13
Total	10,588.21

*Cost of anticoagulation in 44% of the patients who would not otherwise be anticoagulated for 1 month pre-ablation.

TABLE 6

Sensitivity Analysis: Catheter Ablation Cost at Various Success Rates

Successful after 1st procedure (%)	50	60	65	70	75
Successful after 2nd procedure (%)	60	70	75	80	85
Successful after 3rd procedure (%)	70	75	80	85	90
Requiring a 2nd procedure (%)	50	40	35	30	25
Requiring a 3rd procedure (%)	40	30	25	20	15*
Unsuccessful (%)	30	25	20	15	10
Average # of procedures per patient	1.90	1.70	1.60	1.50	1.40
Cost of ablation—year 1 (per patient)	$20,118	$18,000	$16,941	$15,882	$14,823
Annual success attrition (%)	5	4	3	2	1
Annual follow-up cost					
Year 1	$1,462	$1,336	$1,210	$1,084	$958
Year 2	$2,346	$2,116	$1,886	$1,655	$1,425
Year 3	$2,538	$2,259	$1,981	$1,702	$1,423
Year 4	$2,730	$2,403	$2,076	$1,749	$1,422
Year 5	$2,922	$2,546	$2,171	$1,795	$1,420
Average annual follow-up cost over 5 years	$2,400	$2,132	$1,865	$1,597	$1,330
Catheter costs					
Low	$19,835	$17,775	$16,682	$15,589	$14,496
Low-medium	$20,707	$18,556	$17,417	$16,278	$15,139
Medium	$21,580	$19,336	$18,151	$16,967	$15,782
Medium-high	$23,768	$21,294	$19,994	$18,694	$17,394
High	$25,955	$23,251	$21,836	$20,421	$19,006

*Annual success attrition refers to the percentage of "successful" patients each year who become refractory to ablation after a successful procedure and thus "re-enter" the medical management stream.

Ablasyonda işlem başarısı arttıkça maliyet azalıyor,
Sinüs ritminde kalış süresi arttıkça maliyet azalıyor.

Türkiye’de SGK tarafından ablasyon işlem ödemeleri

SUT EK-2 B KAPSAMINDA ALINACAK İLAVE ÜCRETLER

KODU	İŞLEM ADI	AÇIKLAMA	İŞLEM PUANI	İşlem Tutarı	Hizmet başı veya Yatan hastalara İlave ücret alınması
	ELEKTROFİZYOLOJİK ÇALIŞMA (EFÇ) VE ABLASYON	12 yaş altında herhangi bir endikasyon sınırlaması olmaksızın, 12 yaş üstünde ise; septal kökenli supraventriküler taşikardilerde, frenik sinire yakın fokal atrial taşikardilerde, koroner sinüs bolgesi ile HİS bolgesine yakın ventriküler taşikardilerde, epikardiyal aksesuar yollarda yapılan Kriyoablasyon işlemleri faturalandırılır. 701031, 701041, 701062, 701063 işlemleri üçüncü basmak sağlık kurumlarınca faturalandırılır.		0,00	0
701.010	Temel tanısal elektrofizyolojik çalışma	Programlı stimulasyon dahil	400,17	237,30	İşlem Tutarı kadar
701.011	Transözefajiyal elektrofizyolojik çalışma		300,17	178,00	İşlem Tutarı kadar
701.030	Radyofrekans kateter ile ablasyon, supraventriküler	701.010, 701.011 ile birlikte faturalandırılmaz.	1.150,08	682,00	İşlem Tutarı kadar
701.031	Kriyoablasyon, supraventriküler	701.010, 701.011 ile birlikte faturalandırılmaz.	1.150,08	682,00	İşlem Tutarı kadar
701.040	Radyofrekans kateter ile ablasyon, ventriküler	701.010, 701.011 ile birlikte faturalandırılmaz.	1.000,51	593,30	İşlem Tutarı kadar
701.041	Kriyoablasyon, ventriküler	701.010, 701.011 ile birlikte faturalandırılmaz.	1.000,51	593,30	İşlem Tutarı kadar
701.050	AV nod ablasyonu	701.010, 701.011 ile birlikte faturalandırılmaz.	944,40	560,03	İşlem Tutarı kadar
701.060	Radyofrekans kateter ile ablasyon, atriyal fibrilasyon, pulmoner ven izolasyonu	701.010, 701.011 ile birlikte faturalandırılmaz.	1.200,51	711,90	İşlem Tutarı kadar
701.061	Kompleks haritalama yöntemiyle yapılan RF kateter ablasyonu	701010, 701011 ile birlikte faturalandırılmaz.	1.000,51	593,30	İşlem Tutarı kadar
701.062	Kriyobalon ile ablasyon, atriyal fibrilasyon, pulmoner ven izolasyonu	701.010, 701.011, 701.030, 701.040, 701.060, 701.061 ile birlikte faturalandırılmaz.	1.200,51	711,90	İşlem Tutarı kadar

FORMÜL

- İŞLEM ÜCRETİ+ KATETER+KATETER*%8 KDV+ %10 EĞİTİM ARAŞTIRMA HASTANESİ FARKI

RFKA

• P701060 RFKA, AF, PULMONER VEN İZOLASYONU	• 922,90 TL
• P701061 RFKA, AF, KOMPLEKS HARİTALAMA İLE	• 1384,38 TL
• P701062 KRIYOBALON İLE ABLASYON	• 922,90
• PULMONER VEN DONDURMALI ABLASYON	• 11070,00
• KATETER, PULMONER VEN DAİRESEL	• 4434,37
• KATETER , ABLASYON, KOMPLEKS HARİTALAMA	• 13239,78

TEŞEKKÜRLER