

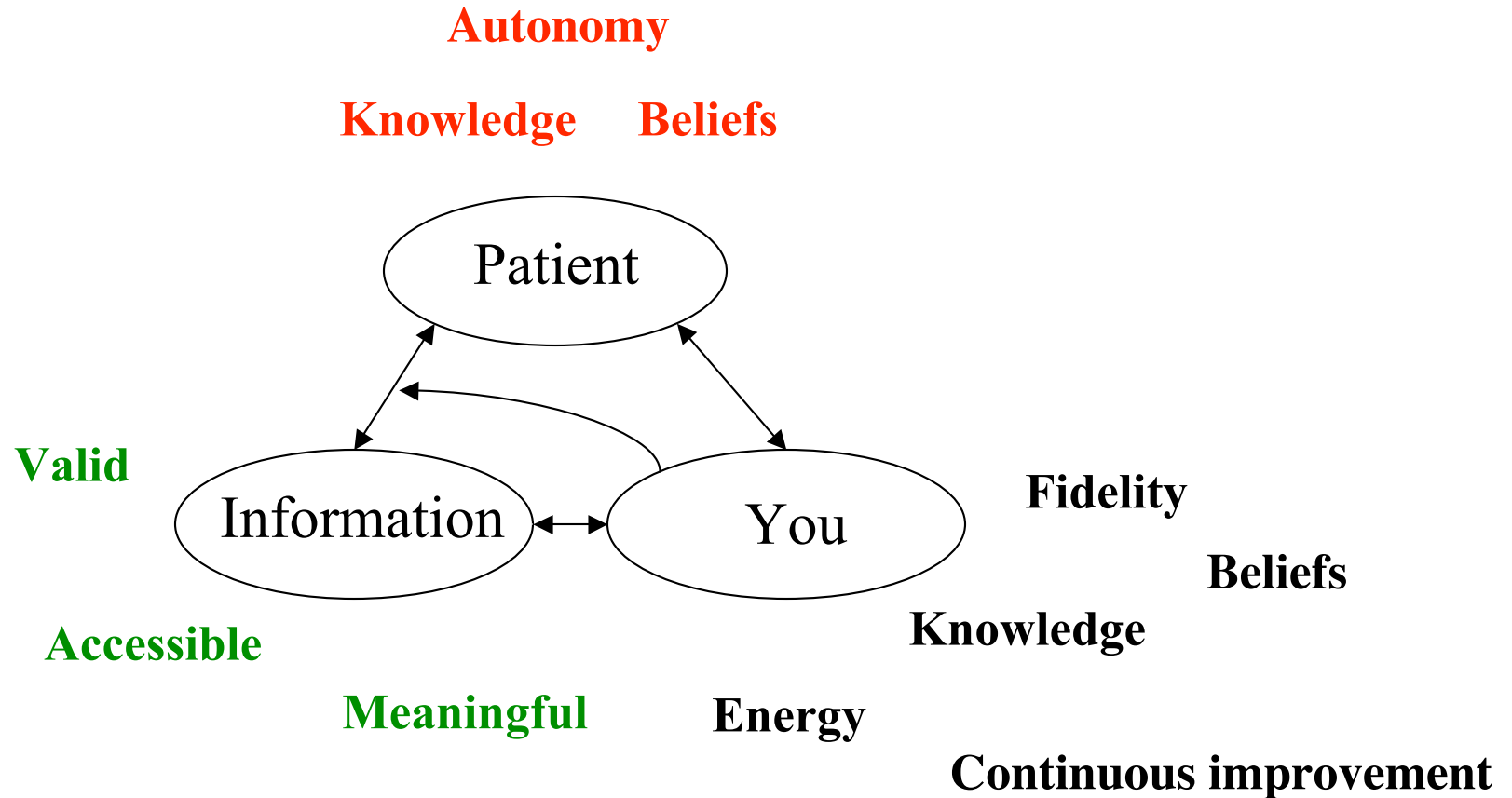
Evidence Based Medicine- and the Dartmouth EBM Website

Jonathan M. Ross, MD
October 7, 2005

Learning objectives

- Review some basics of EBM
- Discuss methods of communication of risk and risk reduction
- Explore the challenges of applying results of high quality clinical studies to patient care

The Encounter Paradigm



Evidence Based Medicine

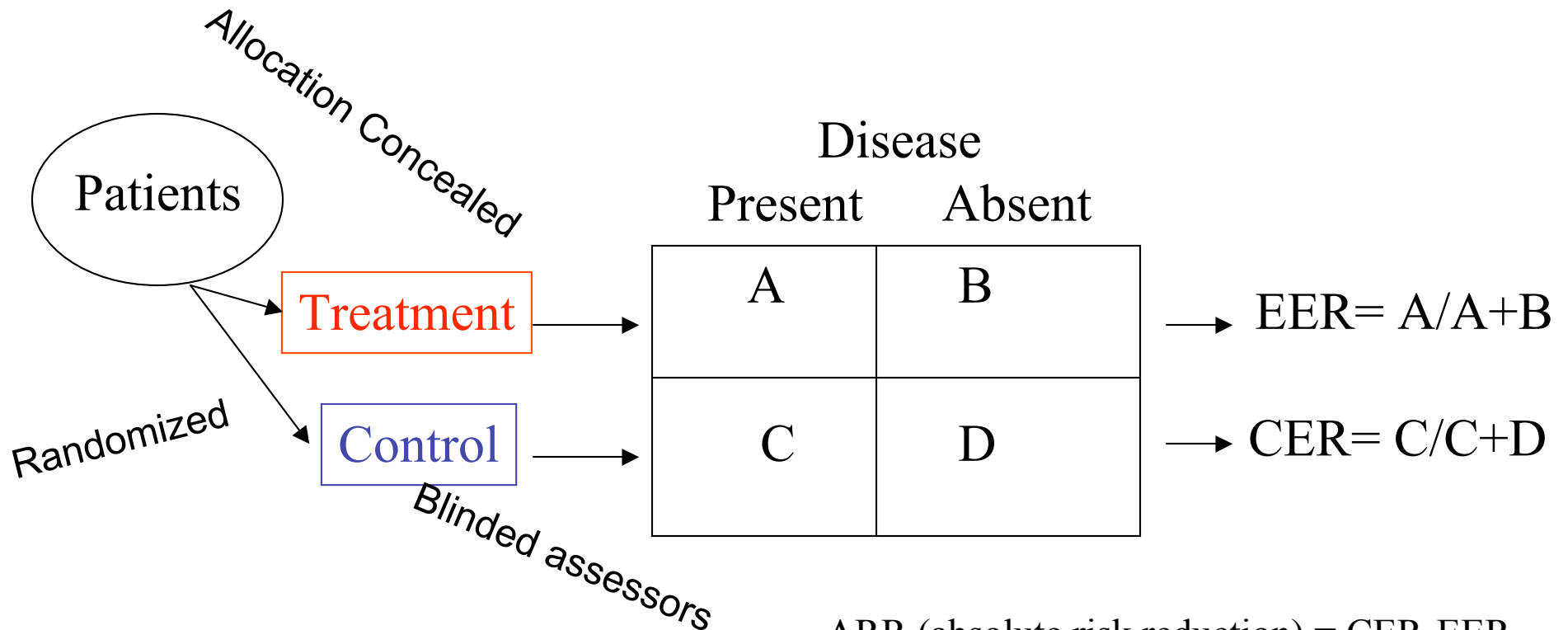
- "conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett, DL. BMJ. 1996 Jan 13;312(7023):71-2).
- An intriguing irony- as most RCT's are based on *average* efficacy in large populations

Hypothetic Examples of RRR, ARR & NNT Measures in 4 Studies

<u>Group</u>	<u>Pts</u>	<u># Events</u>		<u>RR</u>	<u>ARR</u>	<u>NNT</u>
Placebo	1000	1	CER	50%	0.05%	2000
Treated	1000	0.5	EER			
Placebo	1000	10	CER	50%	0.5%	200
Treated	1000	5	EER			
Placebo	1000	100	CER	50%	5%	20
Treated	1000	50	EER			
Placebo	1000	1000	CER	50%	50%	2
Treated	1000	500	EER			

As the control event rate increases, the NNT decreases- populations with higher rates of events are more likely to benefit from interventions

The Randomised Control Trial



EER= experimental event rate
CER= control event rate

ARR (absolute risk reduction) = CER-EER
RRR (relative risk reduction) = ARR/CER
NNT (number needed to treat) = $1/ARR$

Disclaimer

- “The application of randomized trials has brought...splendid progress in the science of evaluating average therapeutic efficacy, but the basic statistical strategies are not designed or intended to address the basic scientific challenges in clinical taxonomy and data. Randomization is not a scientific method; it is an invaluable statistical strategy for the mathematical exploitation of uncertainty.”
- “Thus, despite their magnificent general contributions, randomized trials have encouraged and allowed clinicians to evade the basic scientific challenges of appropriate data and clinical taxonomy.”

Feinstein, Alvin. Clinical Judgment Revisited: The distraction of Quantitative models. Ann Intern Med. 1994;120:799-805.

Number needed to....

- **NNS**- number needed to **screen** to prevent a particular outcome
 - (e.g. mammography/breast Ca)
- **NNT**- number needed to **treat** to prevent a particular adverse outcome
 - (e.g. warfarin/atrial fibrillation)
- **NNH**- number needed to **harm** to cause an additional particular harmful outcome
 - (e.g. ASA/bleeding)

Desirable metrics?

- $NNS < 1000$ for a screening test?
- $NNT < 100$ for a treatment effect?
- $NNH > 200$ for a harmful effect?

What is significant?

- Statistical significance
 - Epidemiologists, policy makers, population care advocates
- Clinical significance
 - Clinicians
- Personal significance
 - Patients

What is significant?

- RRR?
- ARR?
- NNT?
- P value < 0.05?
- Narrow Confidence Interval?

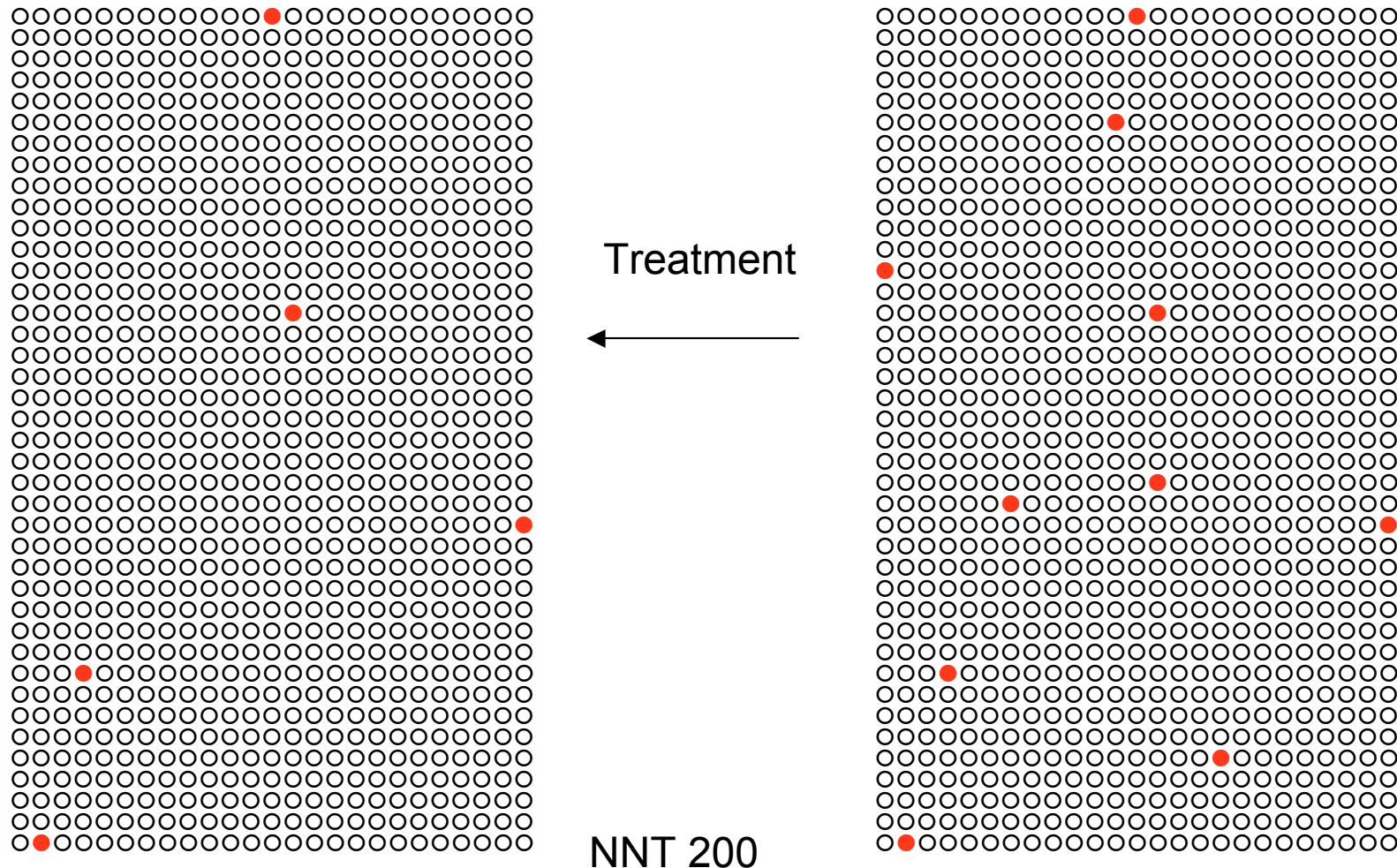
P values or confidence intervals?

- P values test the evidence against a null hypothesis- e.g. $p=0.05$ or we can be sure that the hypothesis tested is *likely to be true 95% of the time*.
- Confidence intervals tell us about the *strength of evidence*- e.g. a 95% CI is the range of values *within which we can be 95% sure that the true value lies*.

Risk reduction- relative (50%) or absolute (0.5%)?

5/1000 Frequency
0.05% EER

Frequency 10/1000
CER 0.10%



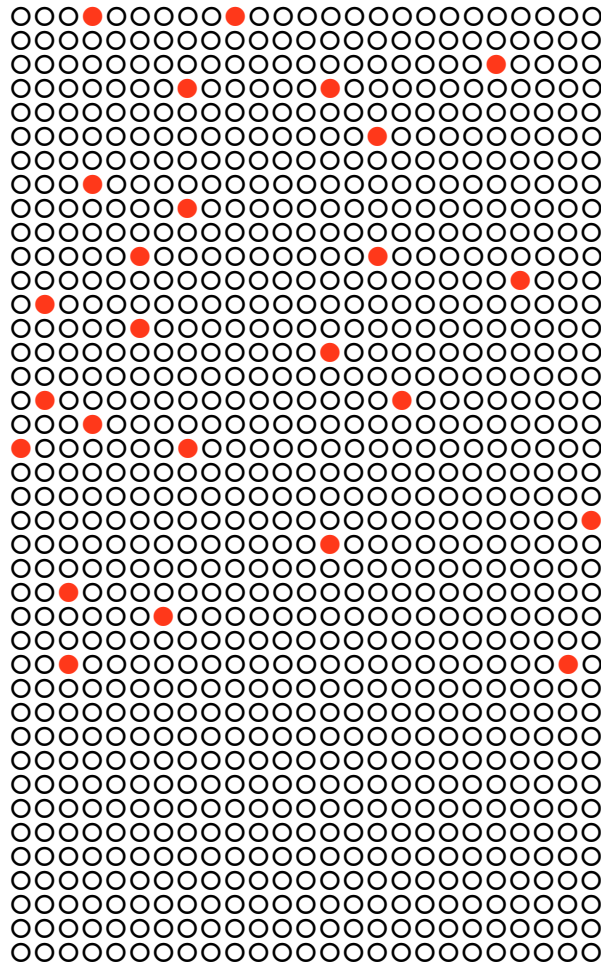
Risk reduction- relative (50%) or absolute (2.5%)?

25/1000

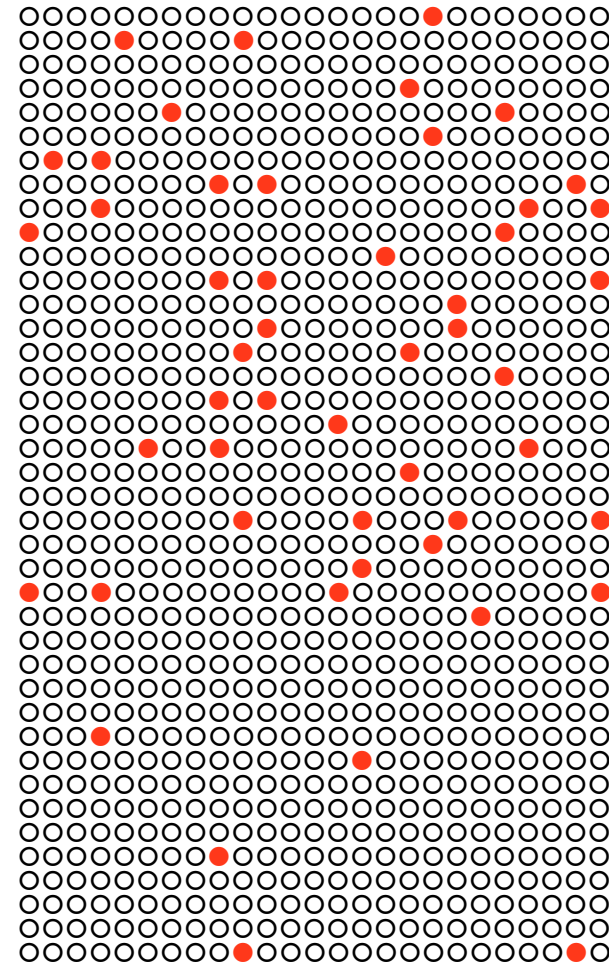
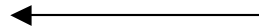
2.5%

50/1000

5%

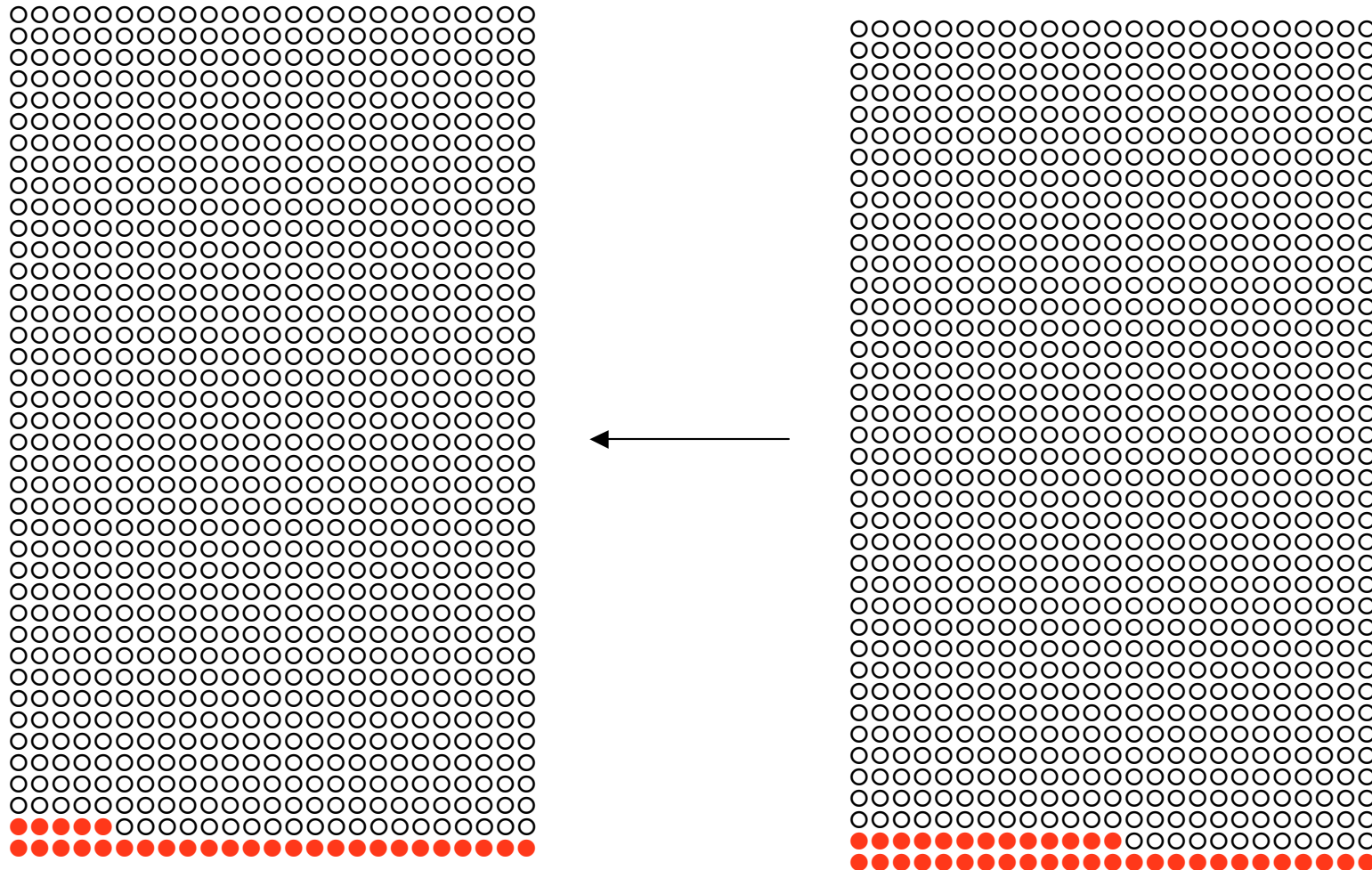


Treatment



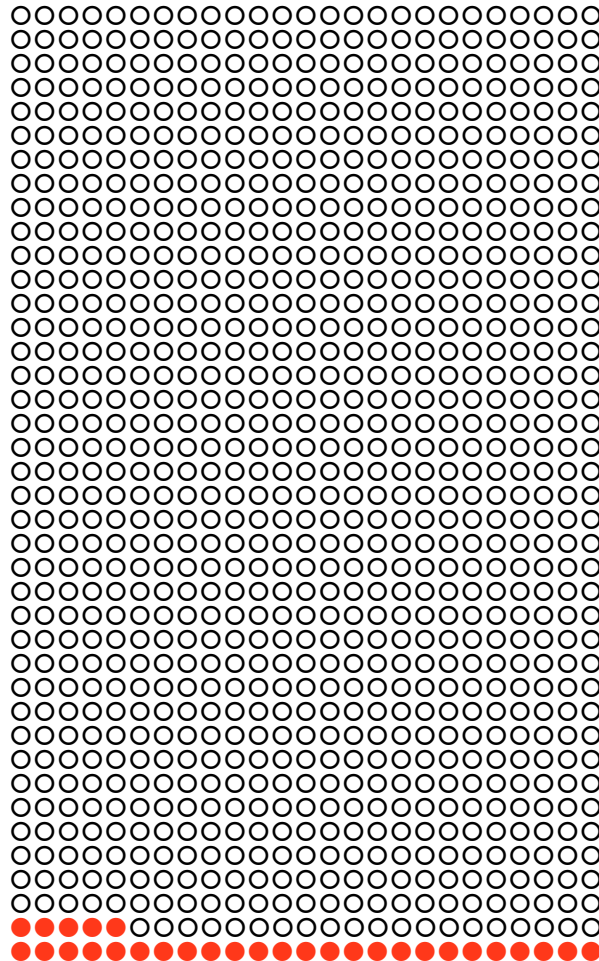
NNT 40

Risk reduction- relative (26%) or absolute (0.8%)?

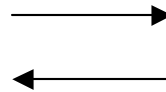


What is the benefit of not taking HRT for 10 years regarding breast cancer incidence risk?

30/1000
3%

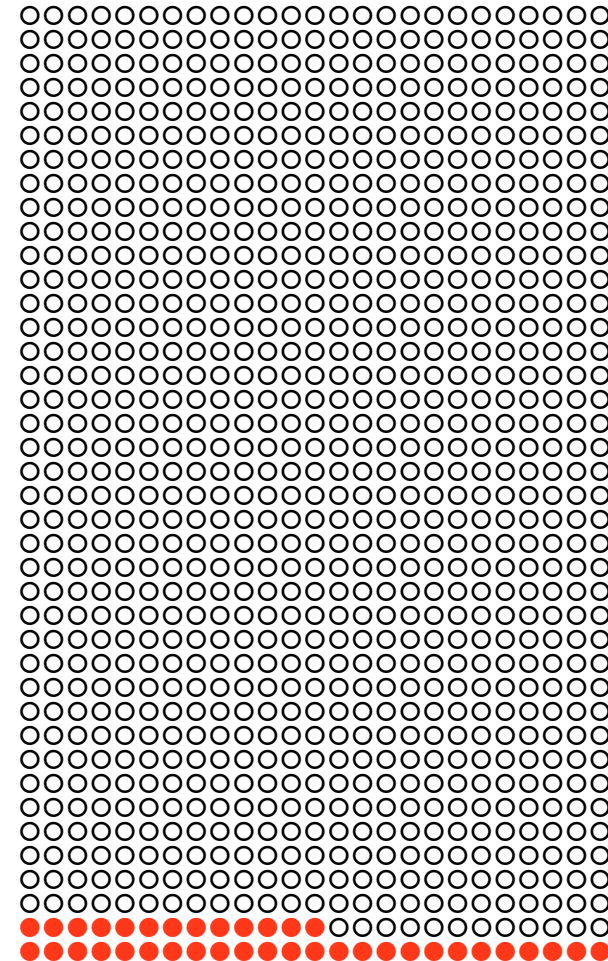


No HRT



RRR 26%
ARR 0.8%
NNT 125

38/1000
3.8%



HRT for 10 years

Accessing the Evidence

The Dartmouth EBM Website
Via Biomedical Libraries

<http://domwebserver.hitchcock.org/EBM/>

What is it?

- A focused resource
- Easily searched
- A clinical curriculum of EBM

What is it more specifically?

- A compilation of clinically relevant studies
 - High quality, RCTs or meta-analyses
 - *Likely to be useful in the clinical practice of medicine*
- Organized concisely
- Easily searched
- Quantitatively informative
- Palatable and digestible
- Backbone of an essential library for the clinician

What is it not?

- Not a competitor to Biomedical Library, UpToDate, Ovid, Harrison's, Center for Evidence Based Medicine, EBM reviews, Cochrane...
- Not pathophysiology
- Not ethics, etc.
- It is simply bringing us a step closer to clinical evidence

Why do we need it?

- We are chronically overwhelmed with information and information resources
- The effort to search and filter remains considerable
- We need point of care access to information
 - To inform choice discussions
 - To inform our patients
 - To teach ourselves, residents and students

Stroke Reduction in Atrial
Fibrillation- how effective is
Anticoagulation?

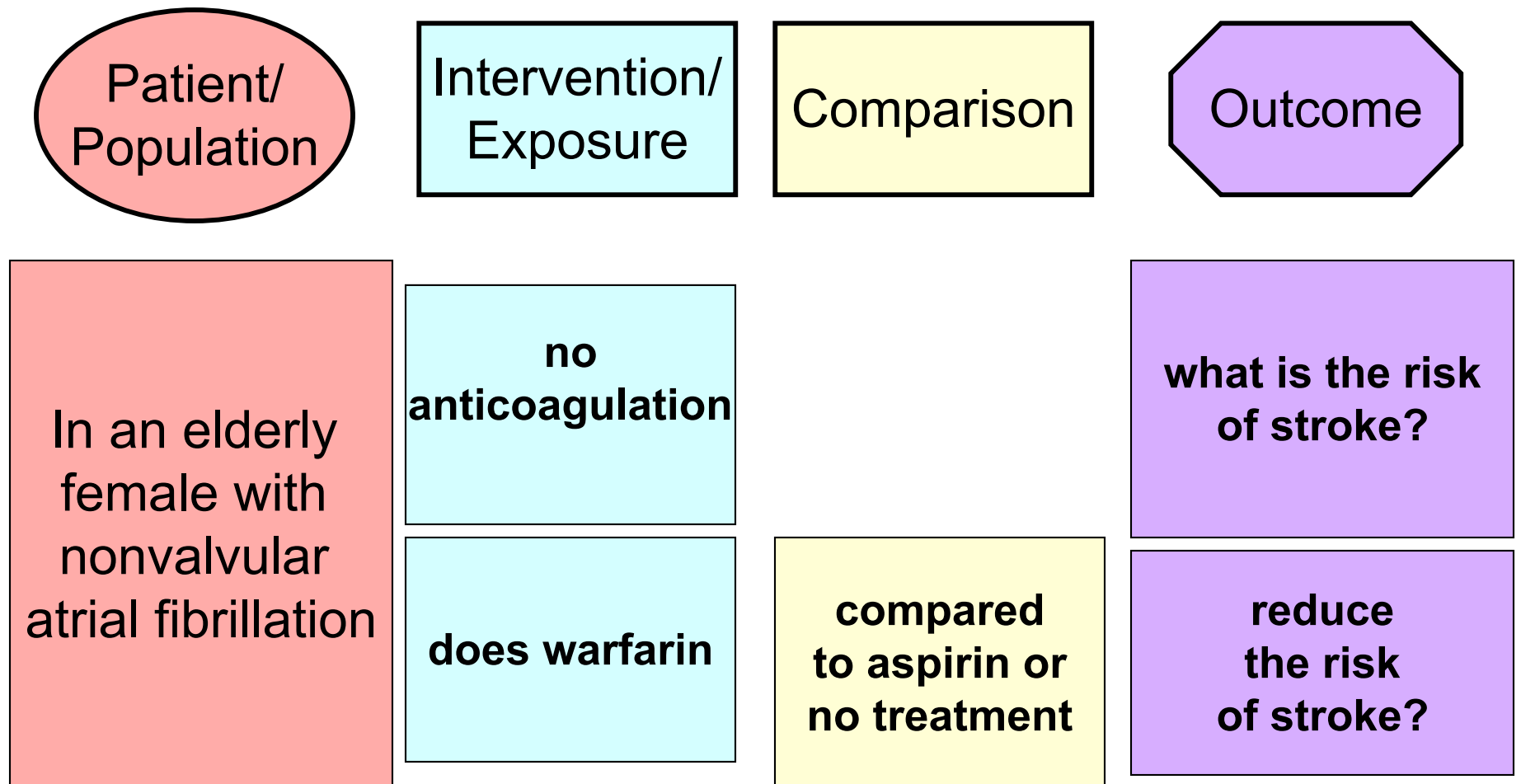
Assess Your Patient

- Mrs. Jones is a 78 year old woman with nonvalvular AF diagnosed 2 months ago, hypertension, and diabetes. An ECHO showed normal LV function and left atrial size.
- No complaints
- Medications:
 - Metoprolol XL 50 mg, Digoxin 0.125 mg, Glipizide 10 mg, ASA 325 mg

Assess Your Patient

- PE: BP - 120/70, pulse - 65
 - Cardiac: irregularly irregular, no murmurs
+1 pedal pulses
 - Lungs: clear
 - Extremities: no edema
- Labs are normal
- ECG shows atrial fibrillation

Ask Clinical Questions



PubMed	Nucleotide	Protein	Genome	Structure	PapSet	Taxonomy	OMIM
Search PubMed	for atrial fibrillation and anticoagulation			Go	Clear		
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☐ 1. [Howard PA, Ellerbeck EF, Engelman KK, Dunn MI.](#)

Related Articles

Warfarin for stroke prevention in octogenarians with atrial fibrillation.

Am J Geriatr Cardiol. 2001 May-Jun;10(3):139-44.

PMID: 11360838 [PubMed - in process]

☐ 2. [Nozawa T, Asanoi H, Inoue H.](#)

Related Articles

Instability of anticoagulation intensity contributes to occurrence of ischemic stroke in patients with non-rheumatic atrial fibrillation.

Jpn Circ J. 2001 May;65(5):404-8.

PMID: 11357868 [PubMed - in process]

☐ 3. [Robinson A, Thomson R, Parkin D, Sudlow M, Eccles M.](#)

Related Articles

How patients with atrial fibrillation value different health outcomes: a standard gamble study.

J Health Serv Res Policy. 2001 Apr;6(2):92-8.

PMID: 11357250 [PubMed - in process]

☐ 4. [Klein AL, Grimm RA, Murray RD, Apperson-Hansen C, Asinger RW, Black IW, Davidoff R, Erbel R, Halperin JL, Orsinelli DA, Porter TR, Stoddard MF.](#)

Related Articles

Use of transesophageal echocardiography to guide cardioversion in patients with atrial fibrillation.

N Engl J Med. 2001 May 10;344(19):1411-20.

PMID: 11346805 [PubMed - indexed for MEDLINE]

Abstracts of Cochrane Reviews

The Cochrane Library Issue 2, 2001

Cochrane Library

The full text of these reviews and protocols is available in [\[The Cochrane Library\]](#)

New indicates the review is new in the current release of the Library.

Update indicates the review has been substantially amended since the last issue of the Library.

Note: 'Protocols' are the introduction, objectives, materials and methods for reviews currently being prepared.

Reviews

- [Anticoagulants for acute ischaemic stroke \(Cochrane Review\)](#)
- [Anticoagulants for preventing recurrence following ischaemic stroke or transient ischaemic attack \(Cochrane Review\)](#)
- [Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attacks \(Cochrane Review\)](#)
- [Anticoagulants versus antiplatelet therapy for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attacks \(Cochrane Review\)](#)
- [Antifibrinolytic therapy for aneurysmal subarachnoid haemorrhage \(Cochrane Review\)](#)
- [Antiplatelet therapy for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attacks \(Cochrane Review\)](#)
- [Antiplatelet therapy for acute ischaemic stroke \(Cochrane Review\)](#)
- [Antiplatelet therapy for preventing stroke in patients with non-valvular atrial fibrillation and no previous history of stroke or transient ischemic attacks \(Cochrane Review\)](#)
- [Antithrombotic drugs for carotid artery dissection \(Cochrane Review\)](#)
- [Calcium antagonists for aneurysmal subarachnoid haemorrhage \(Cochrane Review\)](#)
- [Calcium antagonists for acute ischemic stroke \(Cochrane Review\)](#)
- [Carotid endarterectomy for symptomatic carotid stenosis \(Cochrane Review\)](#)
- [Carotid endarterectomy for asymptomatic carotid stenosis \(Cochrane Review\)](#)
- [Circulatory volume expansion for aneurysmal subarachnoid hemorrhage \(Cochrane Review\)](#)
- [Cognitive rehabilitation for memory deficits following stroke \(Cochrane Review\)](#)
- [Cognitive rehabilitation for attention deficits following stroke \(Cochrane Review\)](#)
- [Cooling therapy for acute stroke \(Cochrane Review\)](#)
- [Corticosteroids for acute ischaemic stroke \(Cochrane Review\)](#)
- [Electrical stimulation for preventing and treating post-stroke shoulder pain \(Cochrane Review\)](#)
- [Eversion versus conventional carotid endarterectomy for preventing stroke \(Cochrane Review\)](#)
- [Fibrinogen depleting agents for acute ischaemic stroke \(Cochrane Review\)](#)
- [Gangliosides for acute ischaemic stroke \(Cochrane Review\)](#)
- [Glycerol for acute stroke \(Cochrane Review\)](#)
- [Haemodilution for acute ischaemic stroke \(Cochrane Review\)](#)
- [Interventions for deliberately altering blood pressure in acute stroke \(Cochrane Review\)](#)

Main results: Of 2313 participants without prior cerebral ischemia from five trials, about half ($n = 1154$) were randomized to adjusted-dose OAC with an estimated mean INRs ranging between 2.0-2.6 during 1.5 years/participant average follow-up. Participant features and study quality were similar between trials. **OAC was associated with large, highly statistically significant reductions in ischemic stroke ($OR = 0.34$, 95% CI 0.23 - 0.52), all stroke ($OR = 0.39$, 95% CI 0.26 - 0.59), all disabling or fatal stroke ($OR = 0.47$, 95% CI 0.28 - 0.80), and the combined endpoint of all stroke, MI or vascular death ($OR = 0.56$, 95% CI 0.42 - 0.76).** The observed rates of intracranial and extracranial hemorrhage not significantly increased by OAC therapy, but confidence intervals were wide.

Reviewers' conclusions: Adjusted-dose OAC (achieved INRs between 2-3) reduces stroke as well as disabling/fatal stroke for patients with nonvalvular AF, and these benefits were not substantially offset by increased bleeding among participants in randomized clinical trials. Limitations include relatively short

$OR = 0.34$, 95% CI 0.23 - 0.52

- Odds Ratio $< 1 \rightarrow$ decreased risk
- Confidence Interval does not cross 1 \rightarrow statistically significant



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Title



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4	2 and 3	12	Display

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Abstract

Question:

atrial fibrillation

Data source

Collaboration

Study selection

AF. The exclusion

Risk of Stroke

Warfarin vs. placebo	RRR 62%, 95% CI 48% - 72%
Aspirin vs. placebo	RRR 21%, 95% CI 2% - 38%
Warfarin vs. aspirin	RRR 36%, 95% CI 14% - 52%

Date
second

Number needed to treat (NNT) for one year:

Warfarin vs. placebo

Aspirin vs. placebo

Primary prevention:

NNT = 37

NNT = 67

Secondary prevention:

NNT = 12

NNT = 40

approximately 5%
adjusted-dose
to 38%), and
or reducing
%/y). Similar

For every 37 patients with AF treated for one year with warfarin for primary prevention, one stroke will be prevented.

Conclusion

balance of benefit and risk between warfarin and aspirin depends on the underlying risk for stroke and hemorrhage in each patient.

on the baseline risk of certain groups (e.g.,
te at 1 year for warfarin compared with placebo
primary prevention and 40 for secondary
e underlying risk for stroke, and 21 for

warfarin is more effective than aspirin. The

[Anticoagulation to prevent embolization in chronic atrial fibrillation: Recommendations](#)

[RISK FACTORS](#)

[Mortality after stroke](#)

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[Possible limitations to clinical practice](#)

[Utilization of warfarin](#)

[RECOMMENDATIONS](#)

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[Goal INR](#)

[Initiation of therapy](#)

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[Anticoag AF age risk factors](#)

[Events in AF according to INR](#)

[Low dose warfarin in AF](#)

[Anticoagulation nonvalvular AF](#)

Anticoagulation to prevent embolization in chronic atrial fibrillation: Recommendations

Morton F Arnsdorf, MD

Gregory YH Lip, MD, FRCPE, FESC, FACC

UpToDate

UpToDate performs a continuous review of over 270 journals and other resources. Updates are added as important new information is published. The literature review for version 9.1 is current through December 2000; this topic was last changed on April 18, 2000.

Systemic embolization from atrial thrombi can occur with either paroxysmal or chronic atrial fibrillation (AF), spontaneously or in association with cardioversion. As a result, anticoagulation is often considered in these patients. This decision is best made with an appreciation both of the risk of embolic events and of the results of controlled trials that have been published in the past few years.

Among patients with chronic AF, the Framingham Heart Study found that the incidence of clinically evident embolization was about 5 percent per year; in addition, the overall incidence of cerebrovascular embolization was 28 percent as compared to 7 percent in patients in sinus rhythm [1]. The prevalence of stroke associated with AF increases strikingly with age. As an example, one study evaluated 27,202 men and women, aged 50 to 89, with a hospital diagnosis of AF and without a prior diagnosis of stroke [2]. The stroke rate (percent per patient per year) was:

- 1.3 in those aged 50 to 59
- 2.2 in those aged 60 to 69
- 4.2 for those aged 70 to 79
- 5.1 for those aged 80 to 89

Compared to the general population, AF increased the risk of stroke in men (relative risk 2.4) and women (relative risk 3.0).

Autopsy studies, however, have revealed a much higher frequency of embolization: 40 percent or more of patients with chronic AF had peripheral emboli and 40 to 70 percent had cerebral emboli [1,3]. In comparison, it has been assumed that the risk of embolization is small and that anticoagulation may not be necessary if cardioversion is performed within 72 hours of the onset of AF. However, this assumption may be erroneous. (See "[Anticoagulation during restoration of sinus rhythm in atrial fibrillation](#)").

RISK FACTORS — The risk of embolization is not uniform among patients with chronic AF. Features

- REFERENCES**
1. Wolf, PA, Kannel, WB, McGee, DL, et al. Duration of atrial fibrillation and imminence of stroke: The Framingham study. *Stroke* 1983; 14:664.
 2. Frost, L, Engholm, G, Johnsen, S, et al. Incident stroke after discharge from hospital with a diagnosis of atrial fibrillation. *Am J Med* 2000; 108:36.
 3. Hinton, RC, Kistler, JP, Fallon, JT, et al. Influence of etiology of atrial fibrillation on incidence of systemic embolism. *Am J Cardiol* 1977; 40:509.

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Anticoagulation to prevent embolization in atrial fibrillation

INTRODUCTION
INCIDENCE OF EMBOLISM
Type of AF
Rhythm versus rate control
MECHANISM OF THROMBOEMBOLISM IN VALVULAR AF
Fibrinolytic therapy in the LAA
Spontaneous echo contrast
Hypercoagulable state
RISK STRATIFICATION
Clinical parameters from randomized trials
Clinical parameters from community cohorts
Echocardiographic parameters
Trans thoracic echocardiography
Transesophageal echocardiography
Summary of risk models
ANTITHROMBOTIC THERAPY
Warfarin
Aspirin
Low-dose warfarin plus aspirin
Risk of bleeding
Hyperthyroidism
Rivaroxaban
Nonpharmacologic options
Prevention of AF
LAA ligation, amputation, or occlusion
STROKE IN THE SETTING OF AF
Risk of recurrent embolism
Evaluation
Echocardiography
Acute antithrombotic therapy
Thrombolysis
Heparin
Aspirin

discussed separately. (See "Anticoagulation prior to and after restoration of sinus rhythm in atrial fibrillation").

INCIDENCE OF EMBOLISM — Atrial fibrillation occurs in 2 to 4 percent of the population aged 60 years and older [3-5]. The prevalence of AF increases with age, affecting more than 10 percent of people older than age 80 years (show figure 1) [3,6]. AF is thought to be responsible for approximately one-sixth of all ischemic strokes in people over age 60 years [7].

The incidence of stroke associated with AF increases with age [7,8]. This was illustrated in a study that evaluated 27,202 men and women, ages 50 to 89, with a hospital diagnosis of AF and without a prior diagnosis of stroke [8]. The stroke rate (percent per patient per year) was:

- 1.3 in those aged 50 to 59 years
- 2.2 in those aged 60 to 69 years
- 4.2 for those aged 70 to 79 years
- 5.1 for those aged 80 to 89 years

Compared with the general population, AF increased the risk of stroke in men (relative risk 2.4) and women (relative risk 3.0).

Most embolic events are ischemic strokes; in one review, peripheral embolization accounted for only 6.3 percent of events [9]. AF is associated with more severe strokes and "longer" transient ischemic attacks than emboli from carotid disease, presumably due to embolization of larger particles in AF [10,11]. This relationship was illustrated in a report comparing ischemic brain events in patients with AF and those with carotid disease in two major trials; the ratio of hemispheric events to retinal events was 25:1 with AF compared to 2:1 with carotid disease [10].

In addition to causing clinical stroke with major deficits, AF is also associated with silent cerebral infarctions [12-14]. The frequency with which this occurs was evaluated in a report of 516 patients with nonrheumatic AF in the SPINAF trial; CT scanning was performed initially and, in the absence of neurologic symptoms, at the end of follow-up [12]. One or more silent cerebral infarctions were seen at presentation in 15 percent; the estimated rate of new silent cerebral infarcts was about 1.3 percent per year at up to three years follow-up.

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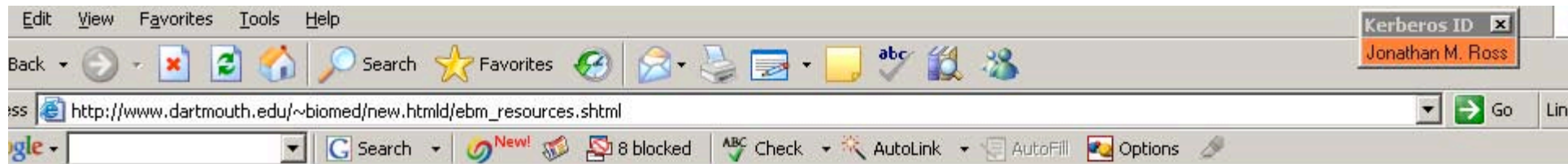
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Evidence-Based Medicine (EBM) Resources

Evidence-based medicine is the "conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett, DL. BMJ. 1996 Jan 13;312(7023):71-2).

[Finding Evidence-Based Answers to Clinical Questions- Quickly and Effectively \[Chart/Overview; PDF\]](#)

Resources for answering broad, general clinical questions:

- [Textbooks](#)
- [UpToDate](#)
- [eMedicine](#)
- [National Guideline Clearinghouse](#)

Resources for answering narrow, patient-focused clinical questions:

- [Cochrane Database of Systematic Reviews](#)
- [ACP Journal Club](#)
- [bmjupdates](#)
- [Database of Abstracts of Reviews of Effectiveness \(DARE\)](#)
- [Dartmouth EBM Database](#)- Maintained and updated by members of the Department of Medicine.





DARTMOUTH-HITCHCOCK MEDICAL CENTER

EBM DATABASE

Essential EBM for the Practicing Clinician

Please indicate how you would like to log into the system

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[Dartmouth Kerberos Ticket](#)

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DARTMOUTH-HITCHCOCK MEDICAL CENTER

EBM DATABASE

- ▶ EBM Database Home
- ▶ View Recent Additions
- ▶ Search
- ▶ Add New Study
- ▶ Review Pending
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Essential EBM for the Practicing Clinician

The Evidence Based Medicine database at Dartmouth Hitchcock Medical Center is designed to provide rapid access to clinically important trials likely to be of use in the practice of medicine. It is maintained and updated by members of the Department of Medicine.

Studies that are summarized have high quality and level of evidence (e.g. randomized control trial, meta-analysis, systematic review) and have been formatted to allow rapid retrieval. No summary can substitute for a careful exploration of the literature but presenting clinically relevant studies in this format may provide useful information in a timely manner. Although the medical literature is vast, certain studies have or should inform the everyday practice of medicine, and we are in the process of building an "Essential EBM for the Practicing Clinician". Suggestions for studies that should be included in the database are encouraged, and new submissions are welcome. The database provides direct links to the original articles for further reading.

Keywords:

- CER.....control event rate
- EER.....experimental event rate
- RRR.....relative risk reduction
- 95% CI.....confidence interval (the true value is likely to reside in this interval with 95% certainty)
- NNT.....number needed to treat (1/absolute risk reduction)
- ITT.....intention to treat



DARTMOUTH-HITCHCOCK MEDICAL CENTER

EBM DATABASE

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Latest additions to the EBM Database

- 9/27/2005 Do patients with heart disease but without LV dysfunction benefit from ACEI? (HOPE Trial)
- 9/27/2005 In patients with non-valvular atrial fibrillation, does the addition of coumadin reduce the risk of stroke?
- 9/27/2005 In patients with abdominal aortic aneurysm (AAA), is endovascular repair superior to open surgical repair? DREAM
- 9/27/2005 In patients with mild to moderate Alzheimer disease, does the addition of donepezil reduce subsequent hospitalization or disability?
- 9/20/2005 Does levodopa hasten neurodegeneration in Parkinson's disease as measured by a clinical scale (Unified Parkinson's Disease Rating Scale) and by a radiological measure of dopamine transporter density [123I]-beta-CIT SPECT.

Search the database for a study

Category: All Categories

Question / Keywords:

Search

- ▶EBM Database Home
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Category:	Neurology
Sub Category:	Stroke
Question:	In patients with non-valvular atrial fibrillation, does the addition of coumadin (warfarin) reduce the risk of stroke?
Type:	Meta-analysis
Quality:	Excellent quality, limited by some heterogeneity across trials. Published trials were from 1989-1993. All studies were analyzed by intention to treat.
Patients:	Sixteen trials included a total of 9874 participants (mean follow-up, 1.7 years) and 2239 assigned to placebo. Target INR for coumadin was 2-2.6.

Coumadin

Placebo

Outcome	EER	CER	RRR	NNT
Stroke, all patients:	3.6%	9.1%	60 (48-72)	18

Clinical Significance:

Absolute risk reductions were 2.7% (NNT 37) per year for primary prevention and 8.4% (NNT 12) per year for secondary prevention. Major extracranial bleeding was increased by warfarin therapy (absolute risk increase, 0.3% per year). Aspirin (six trials, 3119 participants) reduced stroke by 22% (CI, 2% to 38%); absolute risk reductions were 1.5% per year for primary prevention and 2.5% per year for secondary prevention. Adjusted-dose warfarin (five trials, 2837 participants) was more efficacious than aspirin (relative risk reduction, 36% [CI, 14% to 52%]).

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Reference:

[Ann Intern Med. 1999 Oct 5;131\(7\):492-501](#)

Date Prepared:

10/4/2005

Prepared By:

Jonathan M. Ross

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Antithrombotic Therapy To Prevent Stroke in Patients with Atrial Fibrillation: A Meta-Analysis

Robert G. Hart, MD; Oscar Benavente, MD; Ruth McBride, BS; and Lesly A. Pearce, MS

Purpose: To characterize the efficacy and safety of anti-coagulants and antiplatelet agents for prevention of stroke in patients with atrial fibrillation.

Data Sources: Randomized trials identified by using the search strategy developed by the Cochrane Collaboration Stroke Review Group.

Study Selection: All published randomized trials testing antithrombotic agents to prevent stroke in patients with atrial fibrillation.

Data Extraction: Data on interventions, number of participants, duration of exposure and occurrence of all stroke (ischemic and hemorrhagic), major extracranial bleeding, and death were extracted independently by two investigators.

Data Synthesis: Sixteen trials included a total of 9874 participants (mean follow-up, 1.7 years). Adjusted-dose

Nonvalvular atrial fibrillation is an important independent risk factor for stroke. Since 1989, 16 published clinical trials have conducted 36 separate randomized comparisons of antithrombotic agents in approximately 10 000 participants with atrial fibrillation (1–17). Previously published meta-analyses and pooled analyses of individual patient data (18–20) have considered, in various combinations, the first 6 clinical trials to be published. We present a meta-analysis of all currently available trials to further characterize the comparative efficacy and safety of antithrombotic therapy for the prevention of stroke in patients with atrial fibrillation.

Methods

Apply the Evidence

- Given her age and risk factors, Mrs. Jones has approximately an 8 to 12% yearly risk of stroke.
- Treatment with warfarin will reduce this risk to 2 - 4% each year, an absolute risk reduction of 6-8% (NNT 12-17)
- Maintaining an INR between 2 – 3 should minimize the increase in major bleeding.

Conclusions

- The encounter paradigm expects the physician to do a great deal
- Information access and dissemination remain challenging
- The Dartmouth EBM Website may be an aid in the quest for quantitative knowledge to inform the encounter
- <http://domwebserver.hitchcock.org/EBM/> or Biomedical Libraries Website