Secondary Data Analysis

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Disclosures

NIH (R01HL144541, U01NS095869, U01NS106513)

BMS (in-kind study drug for ARCADIA trial)

Roche (ancillary study support for ARCADIA trial)

Medtronic (clinical trial steering committee)

Janssen (clinical trial executive committee)

Javelin Medical (clinical trial steering committee)

Boehringer-Ingelheim (clinical trial adjudication committee)

NovoNordisk (clinical trial adjudication committee)

Deputy Editor, *JAMA Neurology*

What is secondary data analysis?

Use of existing data for an analysis that is distinct from the primary reason the data were collected

Why do secondary data analysis?

Feasibility

Efficiency

Training

Why do secondary data analysis?

Trainees usually lack time, resources, and research skills

2° analysis lets you do in days what would take years

Allows skill acquisition and apprenticeship

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Methods

Design

We retrospectively studied the rate, timing, and predictors of delayed detection of AF in a cohort of patients with ischemic stroke. To take advantage of the close monitoring and follow-up required in randomized clinical trials, we examined data from patients in the placebo arms of 4 trials: Clomethiazole Acute Stroke Study in Ischemic Stroke (CLASS-I), NXY-059 for Acute Ischemic Stroke (SAINT-I), NXY-059 for the Treatment of Acute Ischemic Stroke (SAINT-II), and Effects of Repinotan in Patients with Acute Ischemic Stroke (mRECT). Data from these trials were obtained from the Virtual International Stroke Trials Archive. Details of CLASS-I, SAINT-I, SAINT-II, and Virtual International Stroke Trials Archive have been published elsewhere.[18-21] The design and results of mRECT were presented in abstract form at the XIV European Stroke Conference.[22] Briefly, all 4 studies were randomized, double-blinded, placebo-controlled trials of neuroprotective agents in acute ischemic stroke. All trials were approved by the institutional review boards at the participating institutions. Our analysis was certified as exempt from review by our institutional review board because the data had been collected for other purposes and lacked patient identifying information.

Delayed Detection of Atrial Fibrillation after Ischemic Stroke

Hooman Kamel, MD,* Kennedy R. Lees, MD,† Patrick D. Lyden, MD,‡§
Philip A. Teal, MD,// Ashfaq Shuaib, MD,¶ Myzoon Ali, MRes,† and
S. Claiborne Johnston, MD, PhD,* on behalf of the Virtual International Stroke Trials Archive Investigators

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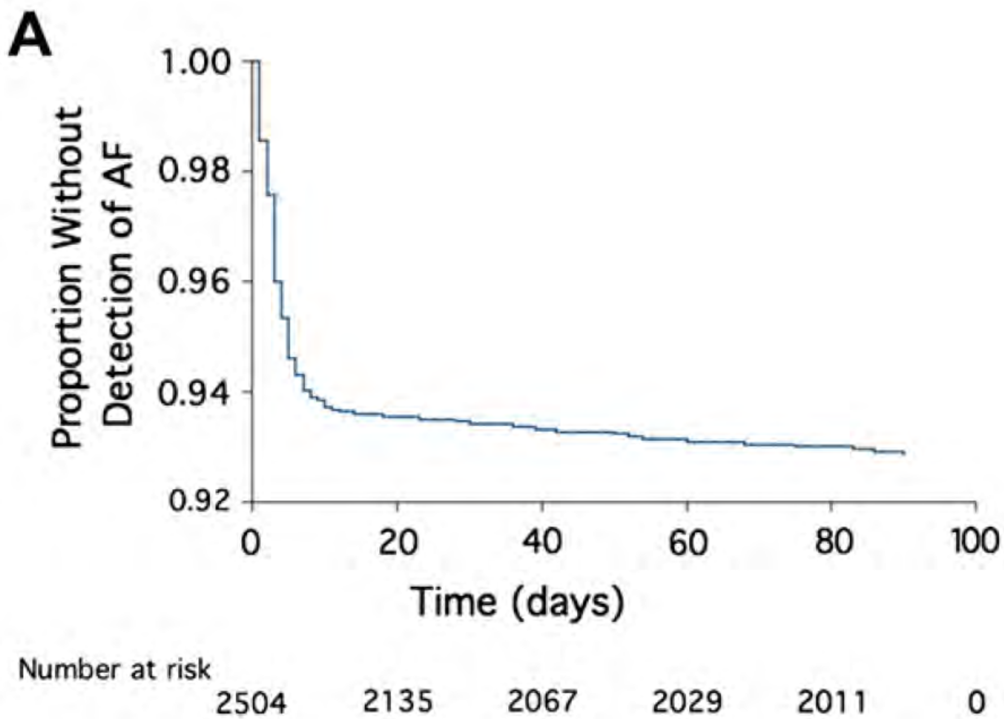

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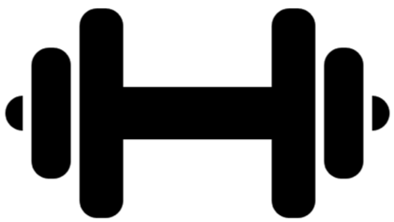
Why do secondary data analysis?

Some projects are not feasible without 2° data analysis



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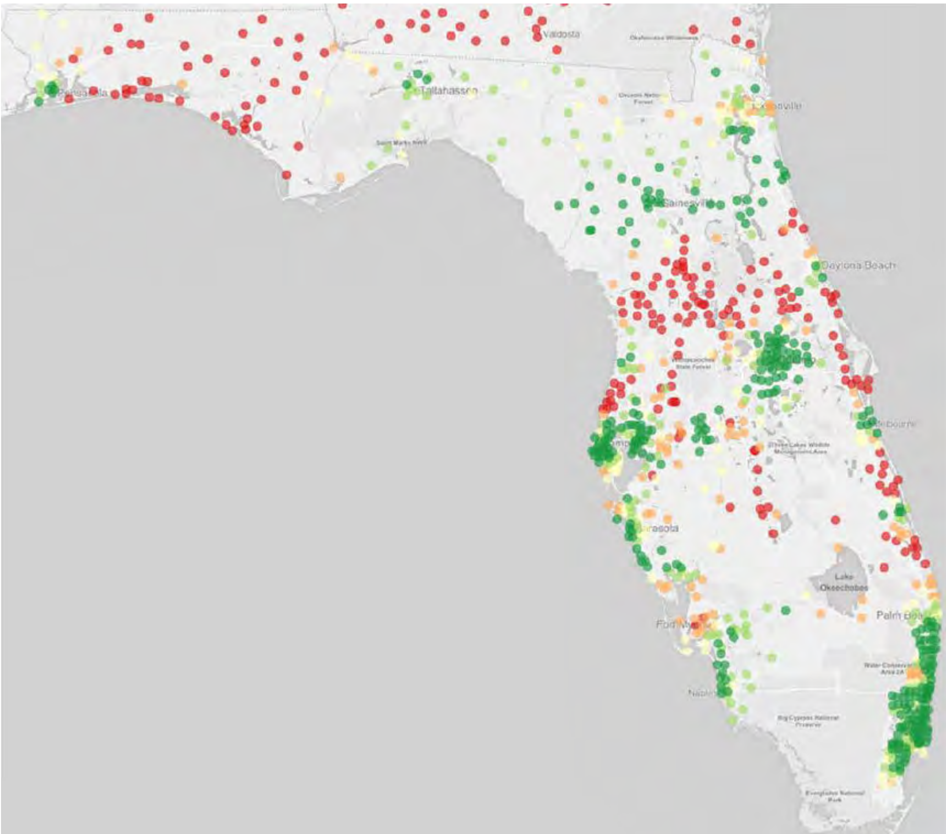

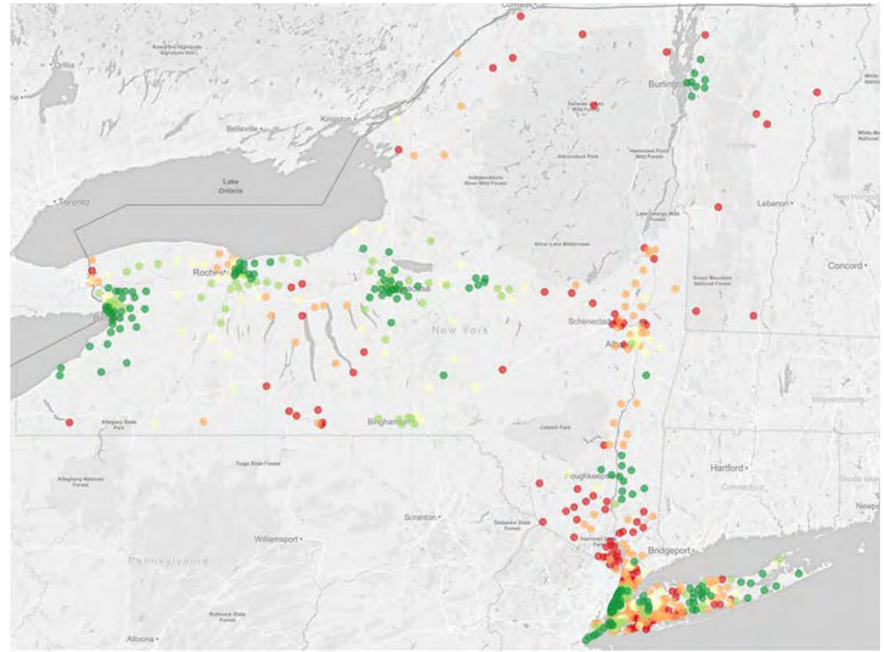

Stroke

ORIGINAL CONTRIBUTION

Access to Mechanical Thrombectomy for Ischemic Stroke in the United States

Hooman Kamel, MD, MS; Neal S. Parikh, MD, MS; Abhinaba Chatterjee, BS; Luke K. Kim, MD; Jeffrey L. Saver, MD; Lee H. Schwamm, MD; Kori S. Zachrison, MD, MSc; Raul G. Nogueira, MD; Opeolu Adeoye, MD; Iván Díaz, PhD; Andrew M. Ryan, PhD; Ankur Pandya, PhD; Babak B. Navi, MD, MS

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Our study should be considered in light of its limitations. First, we lacked data from the entire United States, particularly from Western states. However, we had comprehensive data from 11 heterogeneous, geographically dispersed states encompassing 80 million residents. Second, we analyzed administrative data rather than review medical records or prospectively ascertain events. However, a comprehensive, population-based analysis across the United States is not possible without administrative data. To mitigate misclassification, we used validated codes to define key variables. Third, we lacked data on the availability of certain important clinical services such as telestroke consultation, and we lacked data on the numbers of interventionalists and the times during the week when interventional treatments were available at each hospital. Fourth, our latest data were from the end of 2018 and thrombectomy access may have improved in the last 2 years. The all-payer claims data we used are released with a lag time of several years, and we used the latest available data, so periodic analyses will be required to assess trends in thrombectomy access.

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How to do secondary data analysis?

Randomized clinical trials

Observational research studies

Registries

Surveys

Administrative data

Randomized clinical trials

Advantages

- Relatively large populations with a specific disease
- Rigorous ascertainment of outcomes
- Can explore effects of intervention

Disadvantages

- Not population based
- Need to account for intervention effect
- Usually modest sample sizes

Randomized clinical trials

NINDS repository

https://www.ninds.nih.gov/Current-Research/Research-Funded-NINDS/Clinical-Research/Archived-Clinical-Research-Datasets

Archived datasets are available for the following studies:

Show 10 entries   Quick Search:

Trial Acronym	Official Trial Title	Principal Investigator	Primary Disease Category - All -	Secondary Disease Focus (if applicable)
ALIAS 1	A Phase III Randomized Multicenter Clinical Trial Of High-Dose Human Albumin Therapy For Neuroprotection In Acute Ischemic Stroke Part 1 Trial	Myron Ginsberg, MD	Stroke, Ischemic	
ALIAS 2	A Phase III Randomized Multicenter Clinical Trial Of High-Dose Human Albumin Therapy For Neuroprotection In Acute Ischemic Stroke Part 2 Trial	Myron Ginsberg, MD	Stroke, Ischemic	
ARUBA	A Randomized Trial of Unruptured Brain Arteriovenous Malformations	J.P. Mohr, MD	Cerebral Arteriovenous Malformation	Stroke
ATACH-II	Antihypertensive Treatment of Acute Cerebral Hemorrhage-II : A Phase III Randomized Multicenter Clinical Trial of Blood Pressure	Adnan I. Qureshi, MD	Hemorrhage, Intracerebral	Acute Hypertensive Response

Methods

Study Design

We performed an individual patient-level analysis of patients with ICH enrolled in the Minimally Invasive Surgery Plus Alteplase for Intracerebral Hemorrhage Evacuation phase 3 trial (MISTIE III),[10] Antihypertensive Treatment of Acute Cerebral Hemorrhage (ATACH-2) trial,[11] Intracerebral Hemorrhage Deferoxamine (i-DEF) phase 2 trial,[12] and the multicenter prospective ERICH study.[13] The study and trial protocols were approved by an ethics committee at each enrolling site, and written informed consent was obtained from each participant or their legal surrogate. This study was approved by the institutional review board of Weill Cornell Medicine, New York, New York, and followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline (eAppendix in the Supplement).

JAMA Neurology | Original Investigation

A Pooled Analysis of Diffusion-Weighted Imaging Lesions in Patients With Acute Intracerebral Hemorrhage

Santosh B. Murthy, MD, MPH; Sung-Min Cho, DO; Ajay Gupta, MD, MS; Ashkan Shoamanesh, MD; Babak B. Navi, MD, MS; Radhika Avadhani, MS; Joshua Gruber, MSPH; Yunke Li, MD; Tatiana Greige, MD; Vasileios-Arsenios Lioutas, MD; Casey Norton, BS; Cenai Zhang, MS; Pitchaiah Mandava, MD, PhD, MSEE; Costantino Iadecola, MD; Guido J. Falcone, MD, ScD, MPH; Kevin N. Sheth, MD; Alessandro Biffi, MD; Jonathan Rosand, MD; Adnan I. Qureshi, MD; Joshua N. Goldstein, MD; Chelsea Kidwell, MD; Issam Awad, MD; Magdy Selim, MD; Daniel F. Hanley, MD; Daniel Woo, MD; Hooman Kamel, MD; Wendy C. Ziai, MD, MPH

Table 3. Multivariable Logistic Regression of Factors Associated With DWI Lesions[a]

Characteristic	OR (95% CI)	*P* value
Age, per y	0.98 (0.97-0.99)	.004
Male sex	1.33 (1.01-1.74)	.04
Race/ethnicity		
White	1 [Reference]	NA
Black	1.64 (1.17-2.30)	.004
Hispanic	0.89 (0.62-1.28)	.54
Other	0.64 (0.22-1.13)	.42
Prior anticoagulant therapy	0.63 (0.35-1.13)	.12
Hematoma volume, baseline (per 10-mL increase)	1.12 (1.02-1.22)	.01
Presence of IVH	1.07 (0.79-1.43)	.66
Hematoma location		
Lobar	1 [Reference]	NA
Deep	0.81 (0.58-1.11)	.19
Infratentorial	1.09 (0.65-1.82)	.73
Baseline SBP (per 10-mm Hg increase)	1.13 (1.08-1.18)	<.001
Delta SBP	1.00 (0.98-1.04)	.49
Presence of cerebral microbleeds	1.85 (1.39 -2.46)	<.001
Leukoaraiosis, moderate to severe	1.59 (1.67-2.17)	.003

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Methods

Data Source and Study Design

We performed a retrospective cohort study using data from the Virtual International Stroke Trials Archive ICH (VISTA-ICH).[12] The VISTA database (www.vistacollaboration.org) houses anonymized, individual patient-level data from completed trials. Trials are eligible for inclusion in VISTA-ICH if they meet the following requirements: (1) documented entry criteria into a trial with a minimum of 50 randomized patients with ICH; (2) documented consent or waiver of consent from a local ethics board; (3) baseline assessment within 24 hours of ICH; (4) baseline assessment of neurological deficit at the time of admission; (5) confirmation of ICH by cerebral imaging within 7 days; (6) outcome assessment between 1 and 6 months with a validated stroke scale; and (7) data validation through monitoring.[13] The VISTA cohort used in this study consisted of only patients in the placebo arm of all trials and intervention arms of negative nonsurgical trials. Individual trials that contributed to the dataset used for this analysis were performed with institutional review board or regulatory approval. Individual trials obtained informed consent. Our analysis was approved by the Weill Cornell Medicine institutional review board. The data used in this analysis are restricted per the terms of VISTA-ICH's data use agreement and, therefore, cannot be shared directly with other investigators. However, investigators can obtain access to these data by submitting a formal application to VISTA-ICH.

Liver Fibrosis Indices and Outcomes After Primary Intracerebral Hemorrhage

Neal S. Parikh, MD, MS; Hooman Kamel, MD; Babak B. Navi, MD, MS;
Costantino Iadecola, MD; Alexander E. Merkler, MD; Arun Jesudian, MD; Jesse Dawson, MD;
Guido J. Falcone, MD, ScD, MPH; Kevin N. Sheth, MD; David J. Roh, MD;
Mitchell S.V. Elkind, MD, MS; Daniel F. Hanley, MD; Wendy C. Ziai, MD, MPH;
Santosh B. Murthy, MD, MPH; on behalf of the VISTA-ICH Collaborators*

Table 2. Associations Between Liver Fibrosis Indices and Admission Hematoma Volume, Hematoma Expansion, and Outcomes After ICH

	APRI*		FIB-4*		NFS*	
Outcome	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value	OR (95% CI)	*P* Value
Hematoma expansion	1.6 (1.1–2.3)	0.01	1.9 (1.2–3.0)	0.01	1.2 (0.9–1.5)	0.22
All-cause mortality	1.8 (1.1–2.7)	0.01	2.0 (1.1–3.6)	0.02	1.2 (0.9–1.8)	0.22
Death or major disability	1.3 (0.9–1.8)	0.19	1.3 (0.8–2.1)	0.31	0.9 (0.8–1.2)	0.71
	Beta (SE)	*P* Value	Beta (SE)	*P* Value	Beta (SE)	*P* Value
Admission hematoma volume*†	0.20 (0.08)	0.01	0.27 (0.11)	0.01	0.03 (0.05)	0.53

APRI indicates Aspartate Aminotransferase–Platelet Ratio Index; FIB-4, Fibrosis-4; ICH, intracerebral hemorrhage; NFS, Nonalcoholic Fatty Liver Disease Fibrosis Score; and OR, odds ratio.

*Logarithmic transformation was performed to minimize skewness.

†Linear regression was used.

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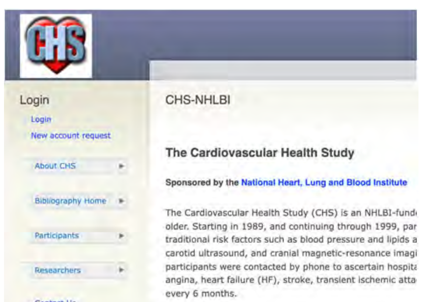
Observational research studies

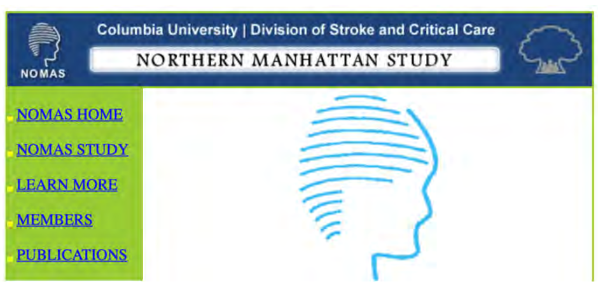
Advantages

- Prospective enrollment, ascertainment, and follow-up
- Wealth of detailed assessments
- Often population based

Disadvantages

- Small numbers of patients with diseases not of 1° interest
- Incomplete ascertainment of non-study related endpoints
- Trade-off b/w modern diagnostics vs length of follow-up





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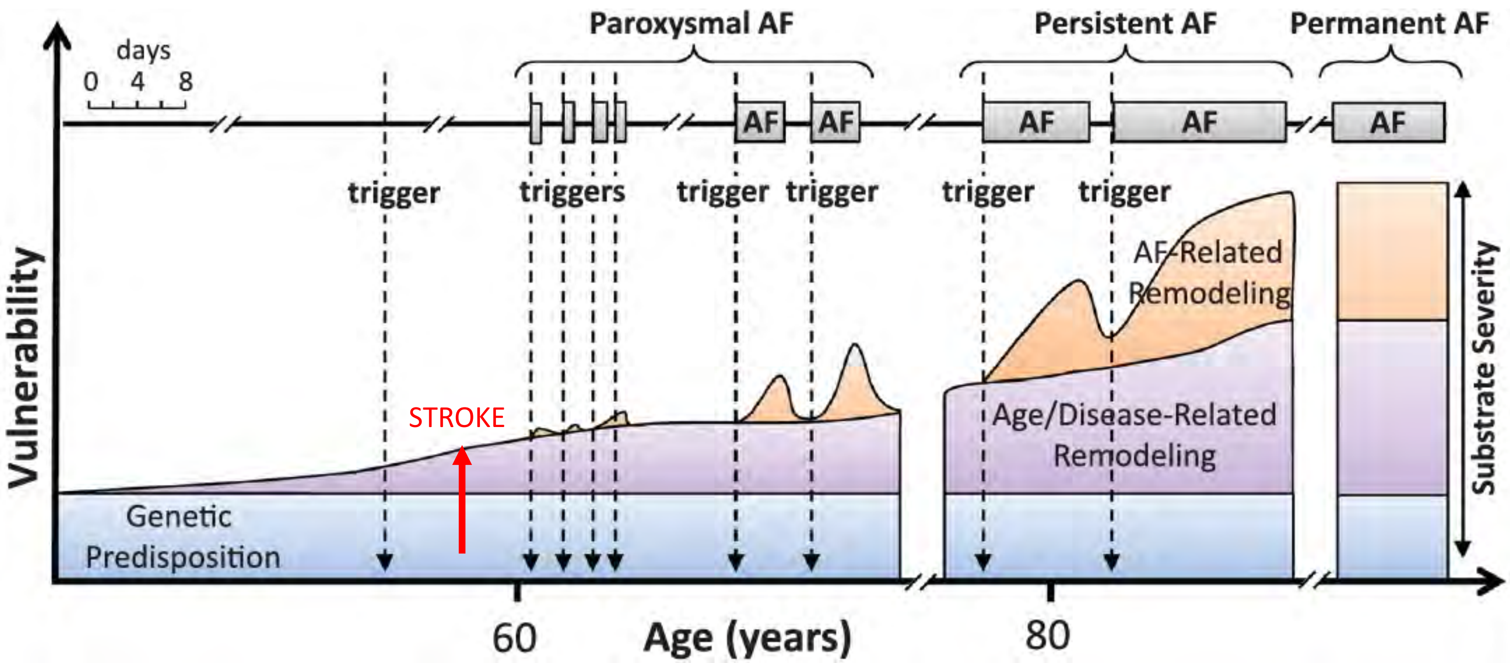


Cellular and Molecular Electrophysiology of Atrial Fibrillation Initiation, Maintenance, and Progression

Jordi Heijman,* Niels Voigt,* Stanley Nattel, Dobromir Dobrev
Circ Res. 2014;114:1483-1499

Table 2. Associations Between P-Wave Morphology and Incident Ischemic Stroke

Characteristic	HR Per 1 SD Increase (95% CI)
P-wave terminal force in lead V_1, μV*ms	1.21 (1.02–1.44)
P-wave mean area, μV*ms	1.16 (0.98–1.39)
P-wave maximum area, μV*ms	1.16 (0.99–1.37)
P-wave mean duration, ms	1.11 (0.92–1.34)
P-wave maximum duration, ms	1.12 (0.93–1.35)

CI indicates confidence interval; and HR, hazard ratio.

Brief Reports

P-Wave Morphology and the Risk of Incident Ischemic Stroke in the Multi-Ethnic Study of Atherosclerosis

Hooman Kamel, MD; Elsayed Z. Soliman, MD, MS; Susan R. Heckbert, MD, PhD; Richard A. Kronmal, PhD; W.T. Longstreth Jr, MD, MPH; Saman Nazarian, MD, PhD; Peter M. Okin, MD

(*Stroke*. 2014;45:2786-2788.)

Association Between Left Atrial Abnormality on ECG and Vascular Brain Injury on MRI in the Cardiovascular Health Study

Hooman Kamel, MD; Traci M. Bartz, MS; W.T. Longstreth Jr, MD, MPH; Peter M. Okin, MD; Evan L. Thacker, PhD; Kristen K. Patton, MD; Phyllis K. Stein, PhD; Rebecca F. Gottesman, MD, PhD; Susan R. Heckbert, MD, PhD; Richard A. Kronmal, PhD; Mitchell S.V. Elkind, MD, MS; Elsayed Z. Soliman, MD, MS

***Stroke*. 2015;46:711-716**

Electrocardiographic Left Atrial Abnormality and Risk of Stroke
Northern Manhattan Study

Hooman Kamel, MD; Madeleine Hunter; Yeseon P. Moon, MS; Shadi Yaghi, MD; Ken Cheung, PhD; Marco R. Di Tullio, MD; Peter M. Okin, MD; Ralph L. Sacco, MD; Elsayed Z. Soliman, MD, MSc, MS; Mitchell S.V. Elkind, MD, MS

***Stroke*. 2015;46:00-00**

Electrocardiographic Left Atrial Abnormality and Stroke Subtype in the Atherosclerosis Risk in Communities Study

Hooman Kamel, MD,[1] Wesley T. O'Neal, MD, MPH,[2] Peter M. Okin, MD,[3] Laura R. Loehr, PhD,[4] Alvaro Alonso, MD, PhD,[5] and Elsayed Z. Soliman, MD, MS[6]

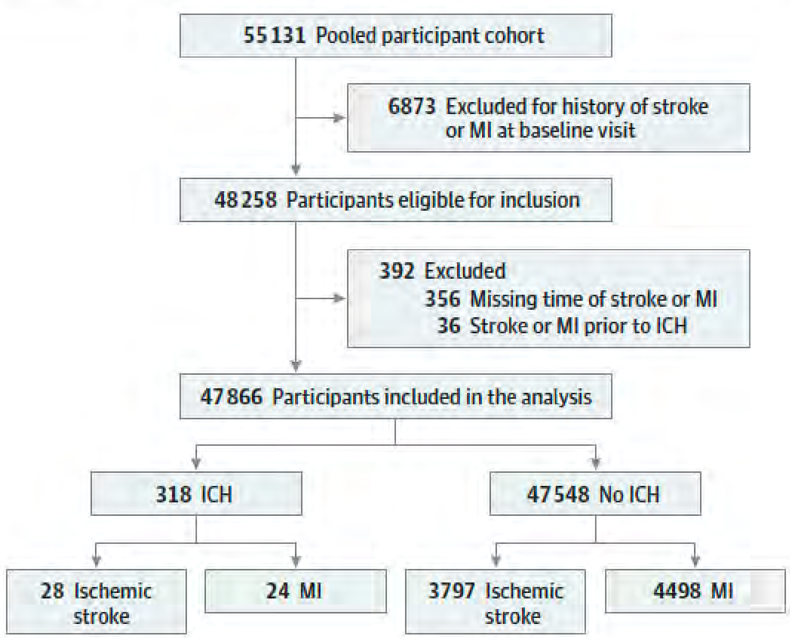
ANN NEUROL 2015;78:670–678

Atrial Cardiopathy and the Risk of Ischemic Stroke in the CHS (Cardiovascular Health Study)

Hooman Kamel, MD; Traci M. Bartz, MS; Mitchell S.V. Elkind, MD, MS; Peter M. Okin, MD; Evan L. Thacker, PhD; Kristen K. Patton, MD; Phyllis K. Stein, PhD; Christopher R. deFilippi, MD; Rebecca F. Gottesman, MD, PhD; Susan R. Heckbert, MD, PhD; Richard A. Kronmal, PhD; Elsayed Z. Soliman, MD, MS; W.T. Longstreth Jr, MD, MPH

***Stroke*. 2018;49:00-00**

Figure 1. Flowchart Showing Inclusion Criteria for Analysis of Intracerebral Hemorrhage (ICH) and Subsequent Arterial Ischemic Events



JAMA Neurology | Original Investigation

Association Between Intracerebral Hemorrhage and Subsequent Arterial Ischemic Events in Participants From 4 Population-Based Cohort Studies

Santosh B. Murthy, MD, MPH; Cenai Zhang, MS; Ivan Diaz, PhD; Emily B. Levitan, ScD; Silvia Koton, PhD; Traci M. Bartz, MS; Janet T. DeRosa, MS; Kevin Strobino, MS; Lisandro D. Colantonio, MD, PhD; Costantino Iadecola, MD; Monika M. Safford, MD; Virginia J. Howard, PhD; W. T. Longstreth Jr, MD; Rebecca F. Gottesman, MD, PhD; Ralph L. Sacco, MD, MS; Mitchell S. V. Elkind, MD, MS; George Howard, DrPH; Hooman Kamel, MD

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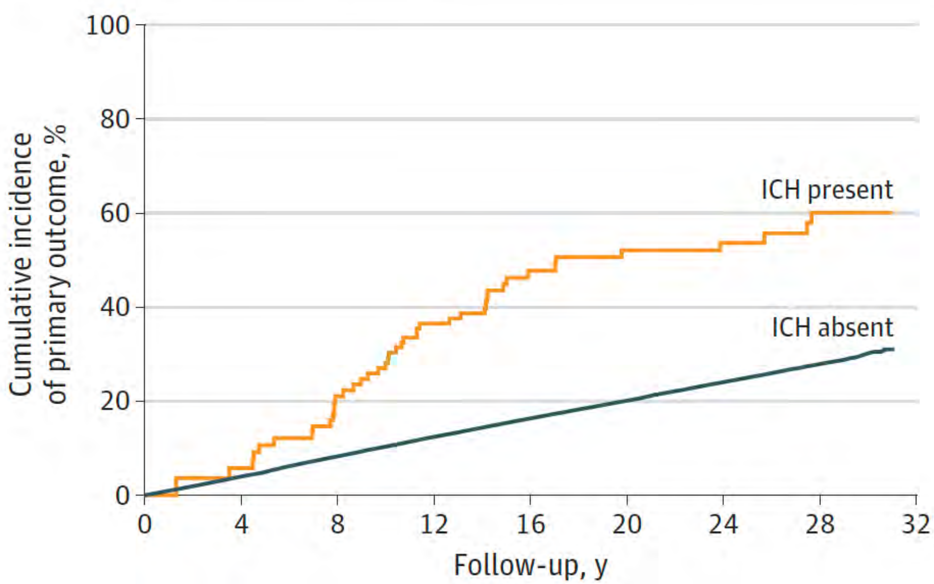
Figure 2. Kaplan-Meier Analysis of the Risk of an Arterial Ischemic Event After Intracerebral Hemorrhage (ICH)



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Registries

Advantages:

- Relatively granular data
- Often prospectively collected
- Standardized definitions

Disadvantages:

- Not population based
- Most diseases lack registries
- Variable availability of follow-up

Registries

Get With The Guidelines

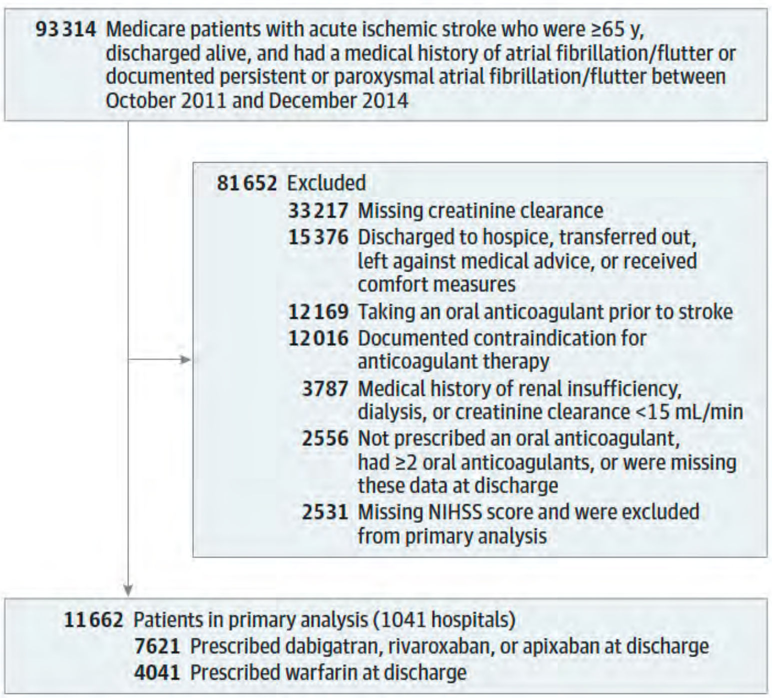
National Surgical Quality Improvement Program

National Cardiovascular Data Registry

Cornell Acute Stroke Academic Registry (CAESAR)

Athens Stroke Registry

Figure 1. Study Population



JAMA Neurology | Original Investigation

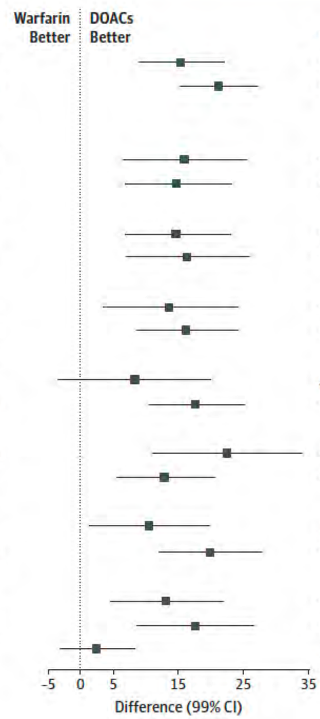
Clinical Effectiveness of Direct Oral Anticoagulants vs Warfarin in Older Patients With Atrial Fibrillation and Ischemic Stroke

Findings From the Patient-Centered Research Into Outcomes Stroke Patients Prefer and Effectiveness Research (PROSPER) Study

Ying Xian, MD, PhD; Haolin Xu, MS; Emily C. O'Brien, PhD; Shreyansh Shah, MD; Laine Thomas, PhD; Michael J. Pencina, PhD; Gregg C. Fonarow, MD; DaiWai M. Olson, RN, PhD; Lee H. Schwamm, MD; Deepak L. Bhatt, MD, MPH; Eric E. Smith, MD, MPH; Deidre Hannah, MSN, RN; Lesley Maisch, BA; Barbara L. Lytle, MS; Eric D. Peterson, MD, MPH; Adrian F. Hernandez, MD, MHS

Figure 2. Association Between Direct Oral Anticoagulants (DOACs) at Discharge and Home Time During the First Year Postdischarge

Source	DOACs Patients, No.	DOACs Mean (SD)	Warfarin Patients, No.	Warfarin Mean (SD)	Adjusted Analysis, Difference (99% CI)	P Value	P for Interaction
Primary analysis	4041	287.2 (114.7)	7621	263.0 (127.3)	15.6 (9.0-22.1)	<.001	
Sensitivity analysis	4773	287.1 (114.4)	9420	262.4 (127.4)	21.4 (15.3-27.4)	<.001	
Subgroup analyses							
Age, y							
65-80	2100	308.5 (100.6)	3847	284.7 (115.6)	16.2 (6.8-25.5)	<.001	.74
>80	1941	264.3 (124.3)	3774	241.0 (134.6)	15.0 (6.9-23.1)	<.001	
Sex							
Female	2277	281.4 (116.9)	4292	257.0 (127.9)	14.9 (6.8-22.9)	<.001	.86
Male	1764	294.8 (111.5)	3329	270.8 (126.1)	16.5 (7.0-26.0)	<.001	
Prior coronary artery disease or myocardial infarction							
Yes	1217	277.7 (118.7)	2412	253.2 (131.9)	13.6 (3.1-24.1)	<.001	.68
No	2824	291.4 (112.8)	5209	267.6 (124.8)	16.4 (8.7-24.0)	<.001	
Prior stroke/transient ischemic attack							
Yes	949	272.9 (123.8)	1749	255.6 (129.3)	8.3 (-3.6-20.1)	.07	.09
No	3092	291.7 (111.5)	5872	265.3 (126.6)	17.8 (10.4-25.1)	<.001	
Diabetes mellitus							
Yes	1012	281.2 (116.4)	1994	248.7 (131.3)	22.6 (11.1-34.1)	<.001	.04
No	3029	289.3 (114.2)	5627	268.1 (125.4)	13.2 (5.7-20.6)	<.001	
NIHSS score							
0-4	2295	311.5 (98.6)	3629	300.0 (105.7)	10.6 (1.3-19.8)	.003	.003
>4	1746	255.4 (126.1)	3992	229.5 (135.6)	20.0 (12.0-27.9)	<.001	
Concomitant antiplatelet therapy							
Yes	1732	285.2 (116.4)	4629	263.3 (127.5)	13.2 (4.5-21.8)	<.001	.32
No	2309	288.8 (113.5)	2992	262.7 (126.9)	17.7 (8.6-26.7)	<.001	
Discharged home	2066	330.5 (81.5)	2957	326.4 (85.9)	2.6 (-3.2-8.3)	.25	



JAMA Neurology | Original Investigation

Clinical Effectiveness of Direct Oral Anticoagulants vs Warfarin in Older Patients With Atrial Fibrillation and Ischemic Stroke

Findings From the Patient-Centered Research Into Outcomes Stroke Patients Prefer and Effectiveness Research (PROSPER) Study

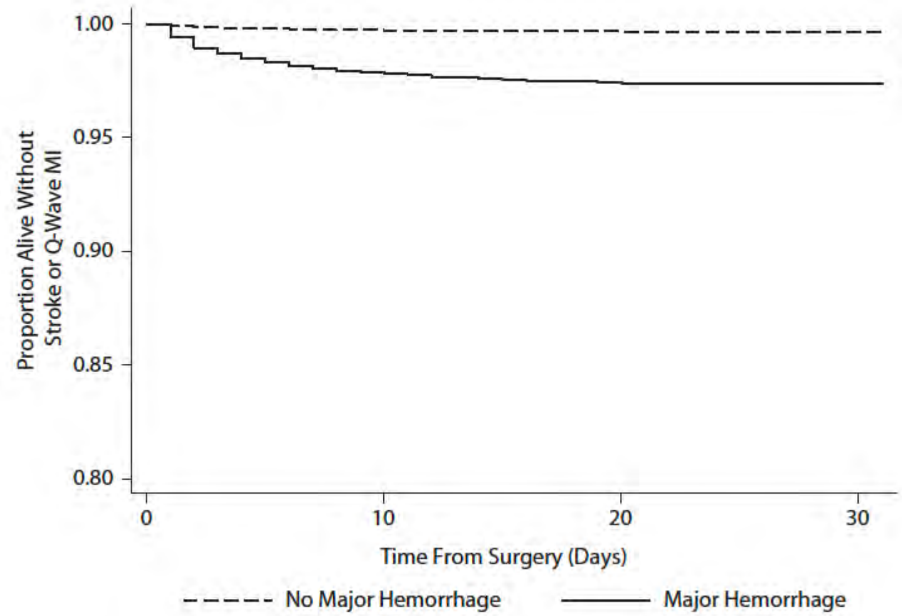
Ying Xian, MD, PhD; Haolin Xu, MS; Emily C. O'Brien, PhD; Shreyansh Shah, MD; Laine Thomas, PhD; Michael J. Pencina, PhD; Gregg C. Fonarow, MD; DaiWai M. Olson, RN, PhD; Lee H. Schwamm, MD; Deepak L. Bhatt, MD, MPH; Eric E. Smith, MD, MPH; Deidre Hannah, MSN, RN; Lesley Maisch, BA; Barbara L. Lytle, MS; Eric D. Peterson, MD, MPH; Adrian F. Hernandez, MD, MHS

Weill Cornell Medicine

NewYork-Presbyterian

Table 2. Results of Proportional Hazards Analysis and Sensitivity Analyses of the Association Between Major Perioperative Hemorrhage and Subsequent Stroke or Q-Wave Myocardial Infarction

	HR for Subsequent Stroke or Q-Wave MI (95% CI)
Major perioperative hemorrhage	
Unadjusted analysis*	4.1 (3.4–4.9)
Primary adjusted analysis†	2.6 (2.2–3.1)
Sensitivity analysis of possible misclassification of major hemorrhage‡	4.2 (3.0–5.7)
Sensitivity analysis of missing preoperative creatinine values§	2.6 (2.2–3.1)
Sensitivity analysis of missing preoperative hematocrit values‖	2.6 (2.2–3.2)
Sensitivity analysis of surgical classifications¶	2.4 (2.0–2.8)



Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION
American Heart Association

Association Between Major Perioperative Hemorrhage and Stroke or Q-Wave Myocardial Infarction

Hooman Kamel, S. Claiborne Johnston, John C. Kirkham, Christopher G. Turner, Jorge R. Kizer, Richard B. Devereux and Costantino Iadecola

CAESAR piggybacks onto GWTG—Stroke

Data quality in the American Heart Association Get With The Guidelines-Stroke (GWTG-Stroke): Results from a National Data Validation Audit

Ying Xian, MD, PhD,[a] Gregg C. Fonarow, MD,[b] Mathew J. Reeves, PhD,[c] Laura E. Webb, CCRP,[a] Jason Blevins, MPH,[a] Vladimir S. Demyanenko, MS,[a] Xin Zhao, MS,[a] DaiWai M. Olson, PhD, RN,[a] Adrian F. Hernandez, MD, MHS,[a] Eric D. Peterson, MD, MPH,[a] Lee H. Schwamm, MD,[d] and Eric E. Smith, MD, MPH[e] *Durham, NC; Los Angeles, CA; East Lansing, MI; Boston, MA; and Alberta, Canada*

Table II. Overall data accuracy among GWTG-Stroke hospitals

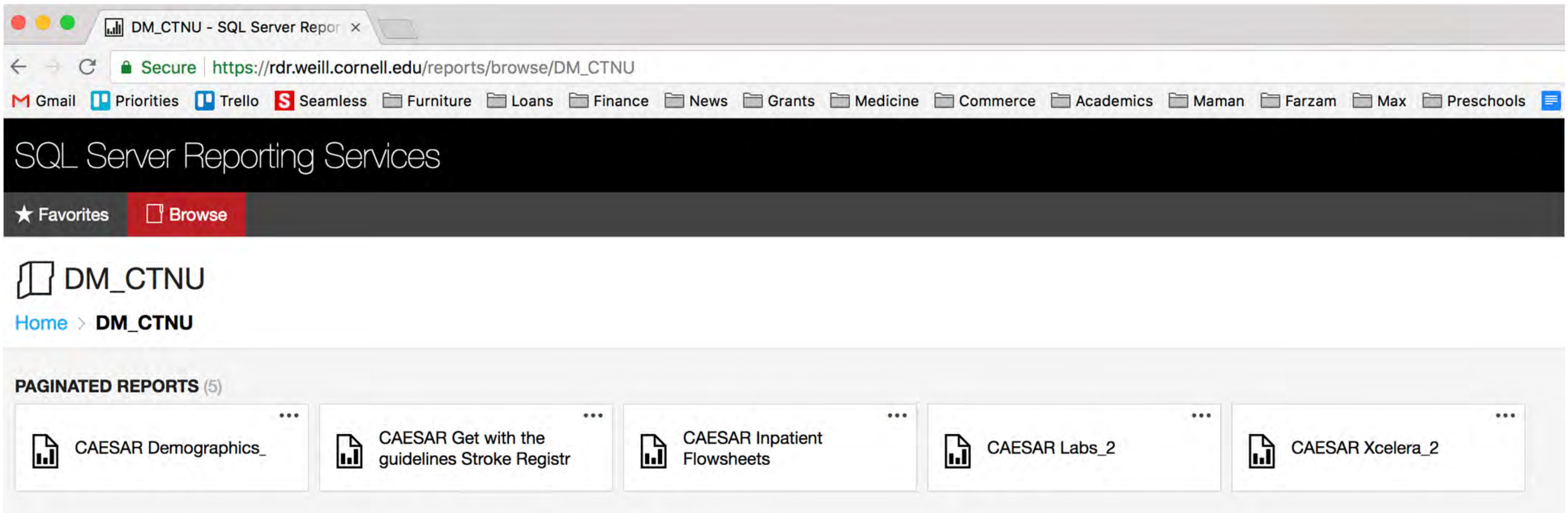
Hospital type	Level	Composite accuracy	P
Overall	–	96.1	–
No. of ischemic stroke discharges	0-100	96.2	.87
	101-300	96.0	
	301+	96.0	
No. of beds	0-100	96.2	.19
	101-200	96.1	
	201-300	96.3	
	301-500	96.1	
	501+	95.3	
Region	West	96.1	<.001
	South	95.5	
	Midwest	96.6	
	Northeast	96.5	
Teaching status	Academic	96.4	.01
	Nonacademic	95.8	
Primary stroke center	Yes	96.2	.67
	No	96.1	
Paul Coverdell hospital	Yes	96.5	.12
	No	96.1	

JAMA | Original Investigation

Association of Preceding Antithrombotic Treatment With Acute Ischemic Stroke Severity and In-Hospital Outcomes Among Patients With Atrial Fibrillation

Ying Xian, MD, PhD; Emily C. O'Brien, PhD; Li Liang, PhD; Haolin Xu, MS; Lee H. Schwamm, MD; Gregg C. Fonarow, MD; Deepak L. Bhatt, MD, MPH; Eric E. Smith, MD, MPH; DaiWai M. Olson, PhD, RN; Lesley Maisch, BA; Deidre Hannah, MSN, RN; Brianna Lindholm, BA; Barbara L. Lytle, MS; Michael J. Pencina, PhD; Adrian F. Hernandez, MD, MHS; Eric D. Peterson, MD, MPH

Research Data Repository



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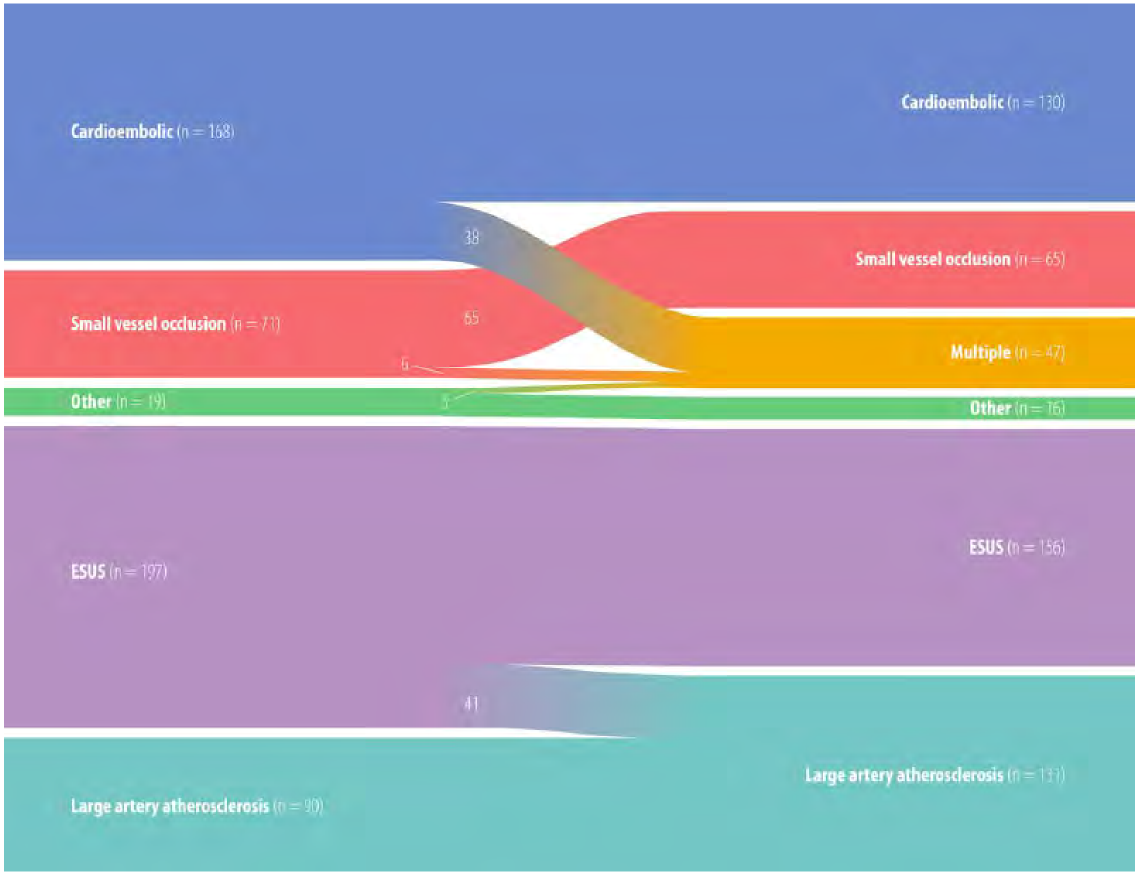


Original Contribution

Reclassification of Ischemic Stroke Etiological Subtypes on the Basis of High-Risk Nonstenosing Carotid Plaque

Hooman Kamel, MD; Babak B. Navi, MD, MS; Alexander E. Merkler, MD;
Hediyeh Baradaran, MD; Iván Díaz, PhD; Neal S. Parikh, MD, MS; Scott E. Kasner, MD;
David J. Gladstone, MD, PhD; Costantino Iadecola, MD; Ajay Gupta, MD, MS

Weill Cornell Medicine

NewYork-Presbyterian

Plans to link CAESAR to NY SPARCS


NEW YORK STATE

Services News Government Local

Location Translate

Department of Health Individuals/Families Providers/Professionals Health Facilities Search

SPARCS

- Overview
- Data Submission
- Data Access
- Forms
- Reports
- Training/Support
- Newsletters

You are Here: Home Page > Statistics and Data > Statewide Planning and Research Cooperative System (SPARCS)

Statewide Planning and Research Cooperative System (SPARCS)

Overview

SPARCS is a comprehensive all payer data reporting system established in 1979 as a result of cooperation between the healthcare industry and government. The system was initially created to collect information on discharges from hospitals. SPARCS currently collects patient level detail on patient characteristics, diagnoses and treatments, services, and charges for each hospital inpatient stay and outpatient (ambulatory surgery, emergency department, and outpatient services) visit; and each ambulatory surgery and outpatient services visit to a hospital extension clinic and diagnostic and treatment center licensed to provide ambulatory surgery services.

The enabling legislation for SPARCS is located under Section 28.16 of the Public Health Law (PHL). The regulations pertaining to SPARCS are under Section 400.18 of Title 10 (Health) of the Official Compilation of Codes, Rules, and Regulations of the State of New York (NYCRR).

Further Reading

- Data Governance Policy and Procedure Manual (PDF, 527 KB)

Surveys

Advantages:

- Nationally representative
- Outpatient data available in some surveys
- Longer time span of available data

Disadvantages:

- No longitudinal follow-up
- Cannot account for multiple visits by same patient
- Often mostly limited to administrative data

RESEARCH LETTER

National Trends in Ambulance Use by Patients With Stroke, 1997-2008

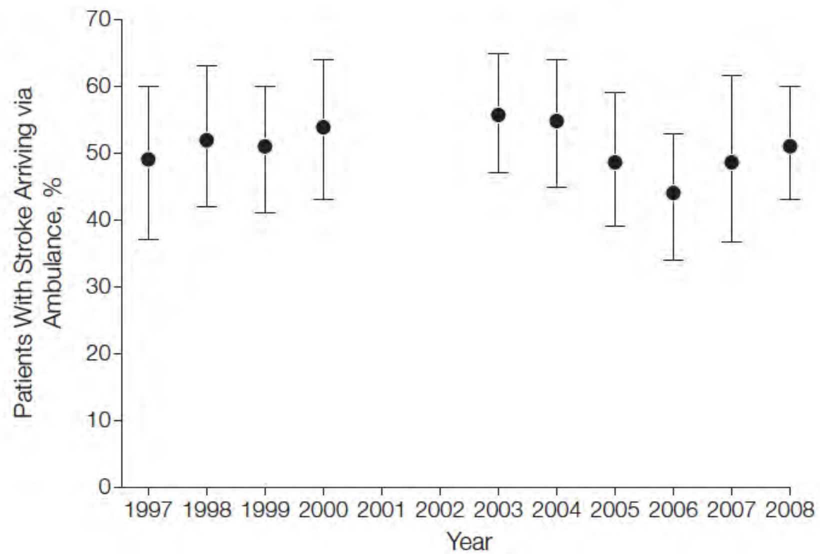
To the Editor: Thrombolytic therapy improves outcomes after ischemic stroke, but most patients are ineligible because they do not present in time.[1] This has prompted efforts to educate people to call 911 for signs of stroke because ambulance transportation results in faster arrival at the emergency department (ED).[2] Regional studies have suggested suboptimal ambulance use among patients with stroke,[3] but none has examined a nationally representative population or temporal trends since the approval of thrombolysis.

Methods. We analyzed data collected by the National Hospital Ambulatory Medical Care Survey (NHAMCS) between 1997 and 2008.[4] A nationally representative random sample of 340 to 408 EDs was surveyed annually, reflecting a participation rate of 87% to 98% and constituting approximately 10% of US EDs. Staff used structured forms to collect data about a systematic random sample of patients over a random 4-week period. Analysis of this publicly available deidentified data set was exempt from evaluation by our institutional review boards.

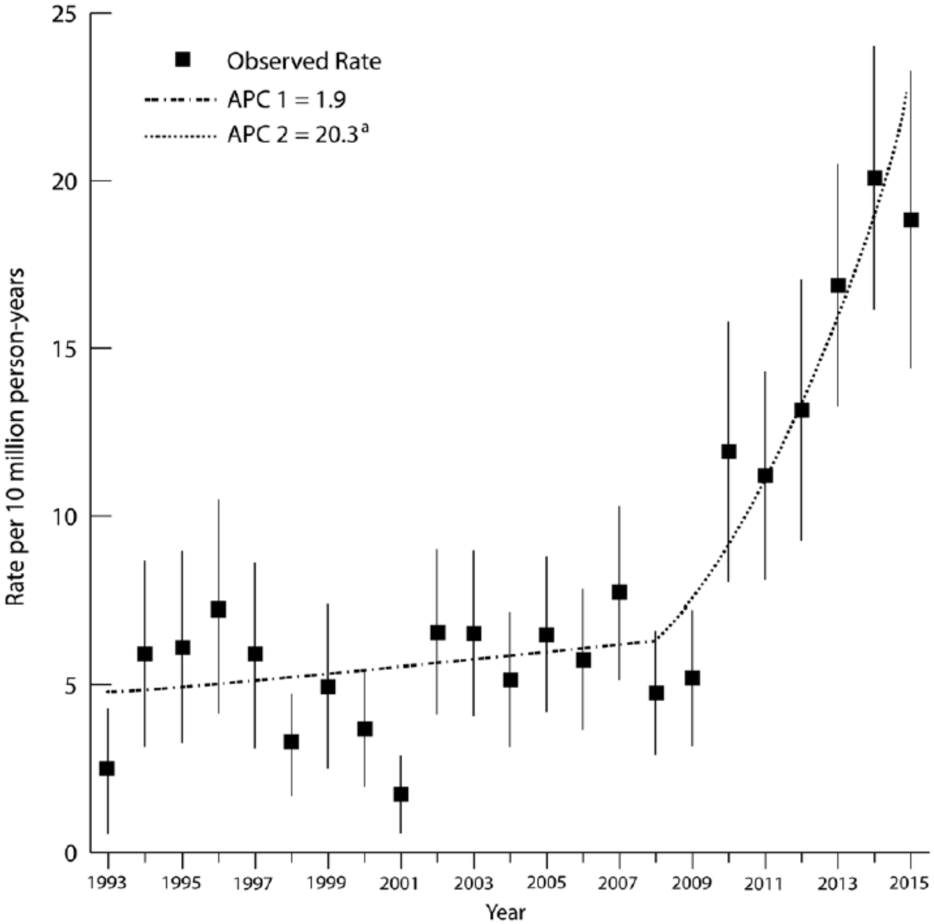
We included patients with a primary diagnosis of ischemic stroke, defined by *International Classification of Diseases, Ninth Revision* codes that have been validated for identifying patients with acute stroke and used in other studies.[5] Additionally, we included patients with subarachnoid hemorrhage, intracerebral hemorrhage, and transient ischemic attack because these can present similarly to ischemic stroke. Our outcome was arrival at the ED via ambulance. We used survey visit weights provided by the NHAMCS to estimate the national proportion of patients diagnosed with stroke in the ED each year who arrived by ambulance. We examined trends within subgroups defined by characteristics associated with ambulance use: age, sex, race, payment source, geographic region, and stroke subtype.[6] We performed sensitivity analyses limited to ischemic stroke and excluding patients not admitted to the hospital or with additional ED diagnoses besides stroke.

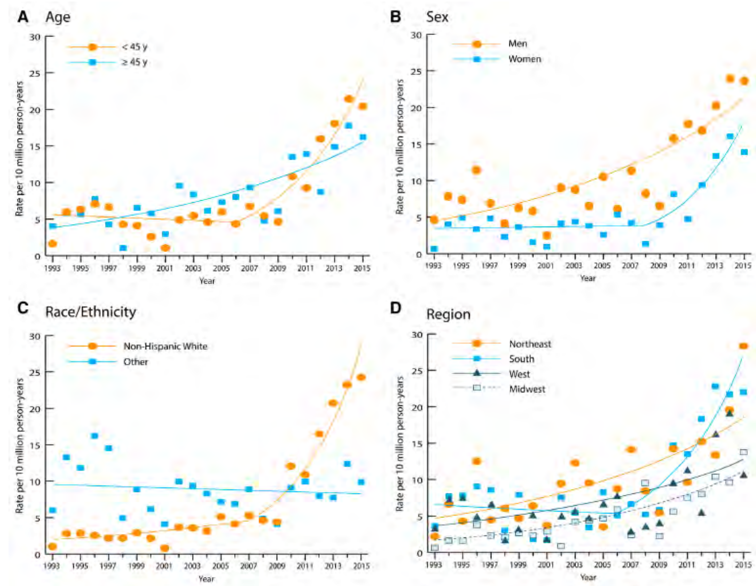
A survey-weighted χ^2 test for trend was used to examine the statistical significance of changes in ambulance use over time. We used multiple logistic regression to analyze yearly trends in ambulance use for stroke while controlling for covariates. The threshold of statistical significance was a 2-sided α level of .05. Statistical analysis was performed with Stata SE version 11 (StataCorp).

Figure. Proportion of Patients With Stroke Presenting to the Emergency Department via Ambulance From 1997 Through 2008



Hooman Kamel, MD
Babak B. Navi, MD
Jahan Fahimi, MD, MPH





National Trends in Hospitalizations for Stroke Associated With Infective Endocarditis and Opioid Use Between 1993 and 2015

Setareh Salehi Omran, MD; Abhinaba Chatterjee, BS; Monica L. Chen, BA; Michael P. Lerario, MD; Alexander E. Merkler, MD; Hooman Kamel, MD

Stroke March 2019

Weill Cornell Medicine

NewYork-Presbyterian

Administrative data

Advantages:

- Extensive longitudinal follow-up
- Adequate power even for rare diseases
- Can be population based

Disadvantages:

- Data limited to ICD codes
- No medication data
- No lab or imaging data

What are administrative data?

In using the term administrative data, we refer broadly to information generated during routine encounters between patients and the healthcare system. Such data may arise from hospitalizations, emergency department visits, clinic appointments, encounters for diagnostic testing, or pharmacy dispensing. Although the data may be collected primarily for administrative, regulatory, or billing purposes, the information can also be used for research. Administrative data can be obtained from many sources, including state governments that collect data from hospitals and emergency departments; payers such as Medicare, Medicaid, and commercial insurers; quality improvement registries; and federal surveys such as the Nationwide Inpatient Sample.

InterSECT

International Section for Early Career and Training

Jump Starting Your Clinical Research Career Using Administrative Data Sets for Stroke Research
Part 1

Alexander E. Merkler, MD; Neal S. Parikh, MD; Hooman Kamel, MD

Stroke **October 2018**

Very useful for health services research

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Readmissions, Observation, and the Hospital Readmissions Reduction Program

Rachael B. Zuckerman, M.P.H., Steven H. Sheingold, Ph.D., E. John Orav, Ph.D., Joel Ruhter, M.P.P., M.H.S.A., and Arnold M. Epstein, M.D.

JAMA | Original Investigation

Association of Changing Hospital Readmission Rates With Mortality Rates After Hospital Discharge

Kumar Dharmarajan, MD, MBA; Yongfei Wang, MS; Zhenqiu Lin, PhD; Sharon-Lise T. Normand, PhD; Joseph S. Ross, MD, MHS; Leora I. Horwitz, MD, MHS; Nihar R. Desai, MD, MPH; Lisa G. Suter, MD; Elizabeth E. Drye, MD, SM; Susannah M. Bernheim, MD, MHS; Harlan M. Krumholz, MD, SM

Also useful for clinical research

CARING FOR THE CRITICALLY ILL PATIENT

Incident Stroke and Mortality Associated With New-Onset Atrial Fibrillation in Patients Hospitalized With Severe Sepsis

Allan J. Walkey, MD, MSc
Renda Soylemez Wiener, MD, MPH
Joanna M. Ghobrial, MD
Lesley H. Curtis, PhD
Emelia J. Benjamin, MD, ScM

JAMA, November 23/30, 2011—Vol 306, No. 20

But high potential for MIS-use

Table 1. Required Research Practices for Studies Using the NIS

Research Practice No. by Domain	Required Research Practices for Conducting Studies Using the NIS
Data interpretation	
1	Identifying observations as hospitalization events rather than unique patients[4,12]
Research design	
2	Not performing state-level analyses[11]
3	Limiting hospital-level analyses to data from years 1988-2011[10,14]
4	Not performing physician-level analyses[13,15]
5	Avoiding use of nonspecific secondary diagnosis codes to infer in-hospital events[16-20]
Data analysis	
6	Using survey-specific analysis methods that account for clustering, stratification, and weighting[6]
7	Accounting for data changes in trend analyses spanning major transition periods in the data set (1997-1998 and 2011-2012)[14,21]

Table 2. Total Number of Instances of Nonadherence to Required Research Practices per Study for Publications in 2015-2016 Using the National Inpatient Sample (NIS)

No. of Instances of Nonadherence to Required Practices	Nonadherence, No. (%) of Studies			Estimates of Nonadherence for the Universe of NIS Studies (N = 1082)[a]	
	Overall (N = 120)	Journal Impact Factor <10 (n = 96)[b]	Journal Impact Factor ≥10 (n = 24)[b]	No. (95% CI)	% (95% CI)
0	18 (15.0)	10 (10.4)	8 (33.3)	114 (50-177)	10.5 (4.7-16.4)
1	28 (23.3)	21 (21.9)	7 (29.2)	229 (143-315)	21.2 (13.2-29.1)
2	36 (30.0)	32 (33.3)	4 (16.7)	342 (244-440)	31.6 (22.6-40.7)
3	30 (25.0)	25 (26.0)	5 (20.8)	269 (178-360)	24.9 (16.5-33.3)
≥4	8 (6.7)	8 (8.3)	0	85 (28-142)	7.8 (2.5-13.1)

Research

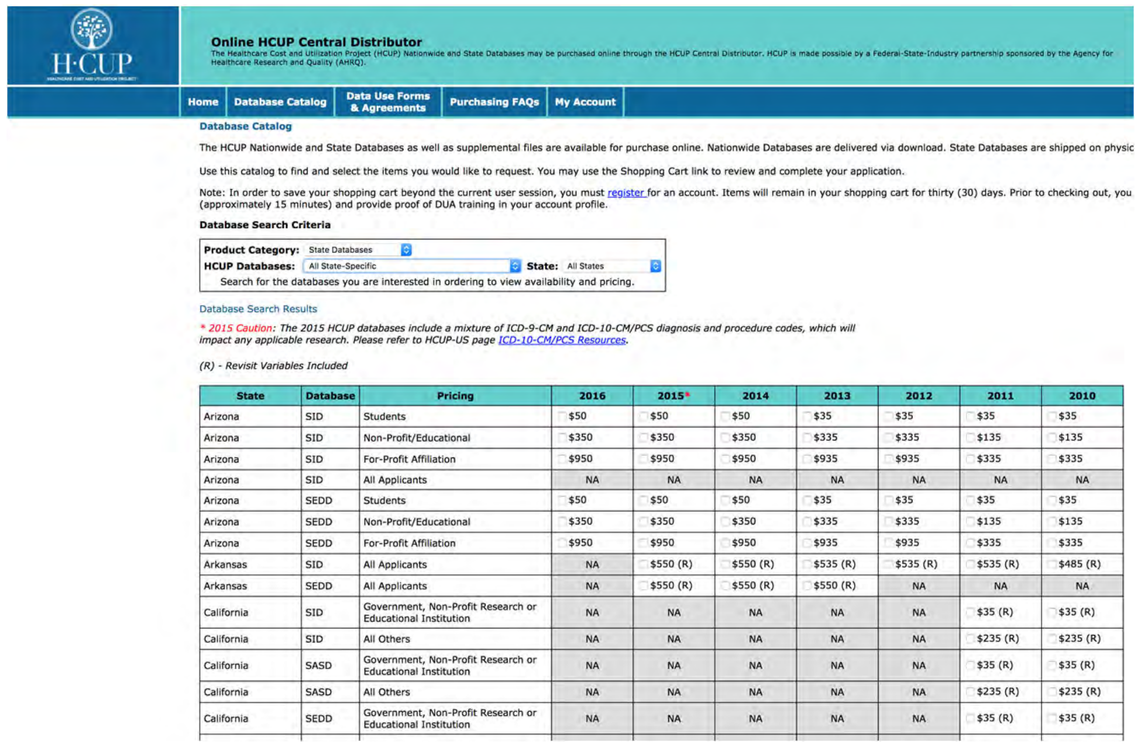
JAMA | Original Investigation

Adherence to Methodological Standards in Research Using the National Inpatient Sample

Rohan Khera, MD; Suveen Angraal, MBBS; Tyler Couch, BS; John W. Welsh, BS; Brahmajee K. Nallamothu, MD, MPH; Saket Girotra, MD, SM; Paul S. Chan, MD, MSc; Harlan M. Krumholz, MD, SM

Statewide all-payer claims data

- FL, NY, GA, MA, …
- Deidentified
- Longitudinal tracking
- 25% US population
- No outpatient data
- No medication data



H·CUP

Online HCUP Central Distributor

The Healthcare Cost and Utilization Project (HCUP) Nationwide and State Databases may be purchased online through the HCUP Central Distributor. HCUP is made possible by a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ).

Home | Database Catalog | Data Use Forms & Agreements | Purchasing FAQs | My Account

Database Catalog

The HCUP Nationwide and State Databases as well as supplemental files are available for purchase online. Nationwide Databases are delivered via download. State Databases are shipped on physic

Use this catalog to find and select the items you would like to request. You may use the Shopping Cart link to review and complete your application.

Note: In order to save your shopping cart beyond the current user session, you must register for an account. Items will remain in your shopping cart for thirty (30) days. Prior to checking out, you (approximately 15 minutes) and provide proof of DUA training in your account profile.

Database Search Criteria

Product Category: State Databases
HCUP Databases: All State-Specific **State:** All States
Search for the databases you are interested in ordering to view availability and pricing.

Database Search Results

** 2015 Caution: The 2015 HCUP databases include a mixture of ICD-9-CM and ICD-10-CM/PCS diagnosis and procedure codes, which will impact any applicable research. Please refer to HCUP-US page ICD-10-CM/PCS Resources.*

(R) - Revisit Variables Included

State	Database	Pricing	2016	2015*	2014	2013	2012	2011	2010
Arizona	SID	Students	$50	$50	$50	$35	$35	$35	$35
Arizona	SID	Non-Profit/Educational	$350	$350	$350	$335	$335	$135	$135
Arizona	SID	For-Profit Affiliation	$950	$950	$950	$935	$935	$335	$335
Arizona	SID	All Applicants	NA	NA	NA	NA	NA	NA	NA
Arizona	SEDD	Students	$50	$50	$50	$35	$35	$35	$35
Arizona	SEDD	Non-Profit/Educational	$350	$350	$350	$335	$335	$135	$135
Arizona	SEDD	For-Profit Affiliation	$950	$950	$950	$935	$935	$335	$335
Arkansas	SID	All Applicants	NA	$550 (R)	$550 (R)	$535 (R)	$535 (R)	$535 (R)	$485 (R)
Arkansas	SEDD	All Applicants	NA	$550 (R)	$550 (R)	$550 (R)	NA	NA	NA
California	SID	Government, Non-Profit Research or Educational Institution	NA	NA	NA	NA	NA	$35 (R)	$35 (R)
California	SID	All Others	NA	NA	NA	NA	NA	$235 (R)	$235 (R)
California	SASD	Government, Non-Profit Research or Educational Institution	NA	NA	NA	NA	NA	$35 (R)	$35 (R)
California	SASD	All Others	NA	NA	NA	NA	NA	$235 (R)	$235 (R)
California	SEDD	Government, Non-Profit Research or Educational Institution	NA	NA	NA	NA	NA	$35 (R)	$35 (R)

Different possible designs

Descriptive – simple, robust

Associations – more difficult, more interesting

Table 2. Risk of Adverse Outcomes During Hospitalization for Patent Foramen Ovale Closure

Characteristic*	Rate of Adverse Outcomes (95% CI)
Total adverse outcomes	7.0% (5.9%–8.2%)
Individual adverse outcomes†	
Atrial fibrillation/flutter	3.7% (2.9%–4.6%)
Vascular complication	3.0% (2.3%–3.9%)
Hematoma/hemorrhage only	2.7% (2.0%–3.5%)
Cardiac tamponade/perforation	0.5% (0.2%–0.9%)
Death	0.3% (0.1%–0.6%)
Pneumothorax/hemothorax	0.1% (0%–0.3%)

Table 3. Risk of Adverse Outcomes After PFO Closure, Stratified by Subgroup

Characteristic*	No Adverse Outcome	Adverse Outcome	*P* Value
Age			<0.001
≤60 y	1176 (95.1)	61 (4.9)	
>60 y	579 (89.1)	71 (10.9)	
Sex			0.15
Female	844 (92.1)	72 (7.9)	
Male	911 (93.8)	60 (6.2)	
Race†			0.49
White	1212 (93.2)	88 (6.8)	
Other	505 (92.3)	42 (7.7)	
Indication for PFO closure			0.002
Ischemic stroke	463 (90.1)	51 (9.9)	
Transient ischemic attack	1292 (94.1)	81 (5.9)	
Medical comorbidities‡			<0.001
0	580 (94.9)	31 (5.1)	
1	536 (94.2)	33 (5.8)	
2	327 (94.2)	20 (5.8)	
≥3	312 (86.7)	48 (13.3)	

Safety Outcomes After Percutaneous Transcatheter Closure of Patent Foramen Ovale

Alexander E. Merkler, MD*; Gino Gialdini, MD*; Shadi Yaghi, MD; Peter M. Okin, MD; Costantino Iadecola, MD; Babak B. Navi, MD, MS; Hooman Kamel, MD

- The role of empirical oral anticoagulation in patients with cardiomyopathy, reduced EF, and a history of stroke/TIA should also be investigated further in future studies because these patients were largely underrepresented in RCTs of prophylactic oral anticoagulation in patients with cardiomyopathies and reduced EF.

5.4.5. Patent Foramen Ovale

Recommendations for PFO
Referenced studies that support recommendations are summarized in online Data Supplements 38 and 39.

COR	LOE	Recommendations
1	C-EO	1. In patients with a nonlacunar ischemic stroke of undetermined cause and a PFO, recommendations for PFO closure versus medical management should be made jointly by the patient, a cardiologist, and a neurologist, taking into account the probability of a causal role for the PFO.

the number needed to treat with device closure to prevent 1 recurrent stroke was 131 during 1 person-year of follow-up or 13 during 10 person-years of follow-up, which may be clinically important in this generally young population. Analysis of administrative claims data showed a 4.9% rate of serious periprocedural complication, including AF, in patients ≤60 years of age.[562] RCT data of PFO closure in patients >60 years of age are extremely limited,[553] and the rate of serious periprocedural complications in this older age group is significantly higher (10.9%).[562]

Recommendation-Specific Supportive Text

1. Recommendations for secondary stroke prevention in a patient with a PFO should be based on joint input from a neurologist with expertise in vascular neurology and a cardiologist with expertise in PFO closure (Figure 5).[563,564] Although 1 small trial with 120 patients did include some patients

562. Merkler AE, Gialdini G, Yaghi S, Okin PM, Iadecola C, Navi BB, Kamel H. Safety outcomes after percutaneous transcatheter closure of patent foramen ovale. *Stroke.* 2017;48:3073–3077. doi: 10.1161/STROKEAHA.117.018501

Stroke

AHA/ASA GUIDELINE

2021 Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack

A Guideline From the American Heart Association/American Stroke Association

Reviewed for evidence-based integrity and endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons.

Endorsed by the Society of Vascular and Interventional Neurology

The American Academy of Neurology affirms the value of this statement as an educational tool for neurologists.

Dawn O. Kleindorfer, MD, FAHA, Chair; Amytis Towfighi, MD, FAHA, Vice Chair; Seemant Chaturvedi, MD, FAHA; Kevin M. Cockroft, MD, MSc, FAHA; Jose Gutierrez, MD, MPH; Debbie Lombardi-Hill, BS, FAHA; Hooman Kamel, MD; Walter N. Kernan, MD*; Steven J. Kittner, MD, MPH, FAHA; Enrique C. Leira, MD, MS, FAHA; Olive Lennon, PhD; James F. Meschia, MD, FAHA; Thanh N. Nguyen, MD, FAHA; Peter M. Pollak, MD; Pasquale Santangeli, MD, PhD; Anjail Z. Sharrief, MD, MPH, FAHA; Sidney C. Smith Jr, MD, FAHA; Tanya N. Turan, MD, MS, FAHA†; Linda S. Williams, MD, FAHA

Original Investigation

Perioperative Atrial Fibrillation and the Long-term Risk of Ischemic Stroke

Gino Gialdini, MD; Katherine Nearing, MD; Prashant D. Bhave, MD; Ubaldo Bonuccelli, MD; Costantino Iadecola, MD; Jeff S. Healey, MD; Hooman Kamel, MD

JAMA August 13, 2014 Volume 312, Number 6

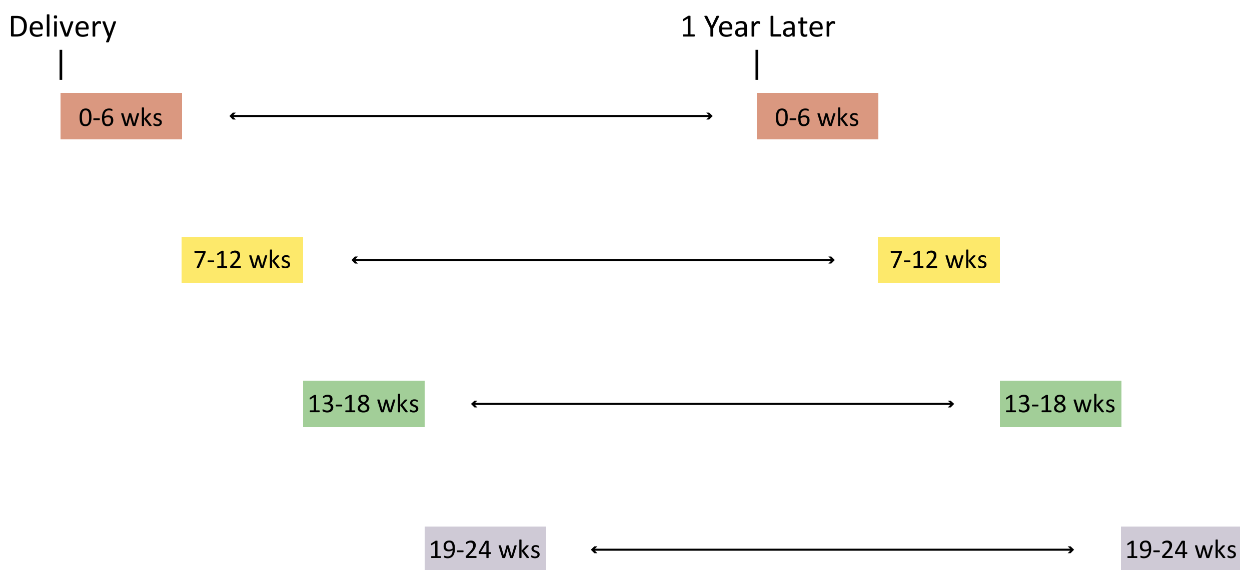
RESULTS Of 1 729 360 eligible patients, 24 711 (1.43%; 95% CI, 1.41%-1.45%) had new-onset perioperative atrial fibrillation during the index hospitalization and 13 952 (0.81%; 95% CI, 0.79%-0.82%) experienced a stroke after discharge. In a Cox proportional hazards analysis accounting for potential confounders, perioperative atrial fibrillation was associated with subsequent stroke both after noncardiac and cardiac surgery.

Type of Surgery	Cumulative Rate of Stroke 1 Year After Hospitalization, % (95% CI)		Hazard Ratio (95% CI)
	Perioperative Atrial Fibrillation	No Perioperative Atrial Fibrillation	
Noncardiac	1.47 (1.24-1.75)	0.36 (0.35-0.37)	2.0 (1.7-2.3)
Cardiac	0.99 (0.81-1.20)	0.83 (0.76-0.91)	1.3 (1.1-1.6)

The association with stroke was significantly stronger for perioperative atrial fibrillation after noncardiac vs cardiac surgery ($P < .001$ for interaction).

CONCLUSIONS AND RELEVANCE Among patients hospitalized for surgery, perioperative atrial fibrillation was associated with an increased long-term risk of ischemic stroke, especially following noncardiac surgery.

Duration of postpartum thrombosis

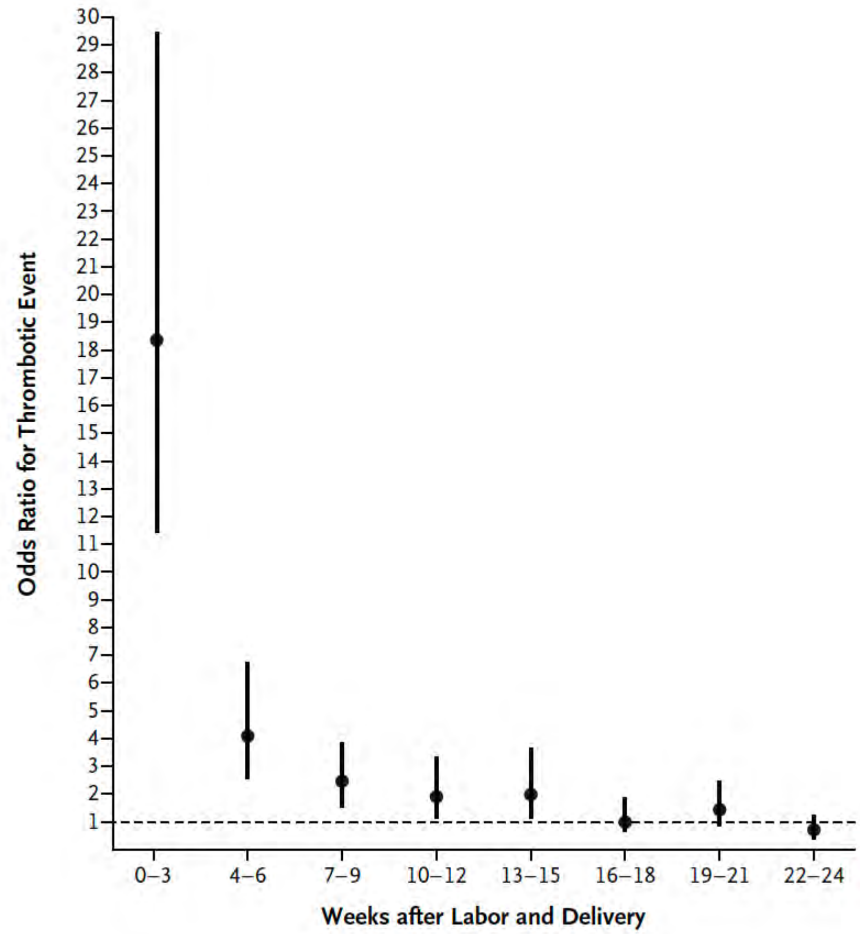


The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Risk of a Thrombotic Event after the 6-Week Postpartum Period

Hooman Kamel, M.D., Babak B. Navi, M.D., Nandita Sriram, B.S.,
Dominic A. Hovsepian, B.S., Richard B. Devereux, M.D.,
and Mitchell S.V. Elkind, M.D.



Weill Cornell Medicine

NewYork-Presbyterian

Medicare data includes outpatient visits

Byproduct of claims submitted by providers

Key clinical information:

- Basic demographic information
- *ICD* diagnosis codes (in- and out-patient)
- *ICD* procedure codes (from hospital)
- *CPT* procedure codes (in- and out-patient)
- Date of death
- Date of insurance start/stop

Medicare data

Advantages:

- Includes ambulatory diagnoses
- *CPT* procedure codes more granular
- More accurate censoring
- Potentially linkable to medication data

Disadvantages:

- 65 years of age and older only
- Population-based?
- Expensive/cumbersome

Medicare Limited Datasets are attractive

Traditional Medicare datasets:

- Identifiable
- Need IRB approval
- More cumbersome DUA

Limited datasets:

- Essentially deidentified
- Much less expensive
- Straightforward DUA

JAMA Neurology | Original Investigation

Association Between Cirrhosis and Stroke in a Nationally Representative Cohort

Neal S. Parikh, MD; Babak B. Navi, MD, MS; Yecheskel Schneider, MD; Arun Jesudian, MD; Hooman Kamel, MD

JAMA Neurology Published online June 5, 2017

Figure. Cumulative Incidence of Stroke Stratified by Presence or Absence of Cirrhosis

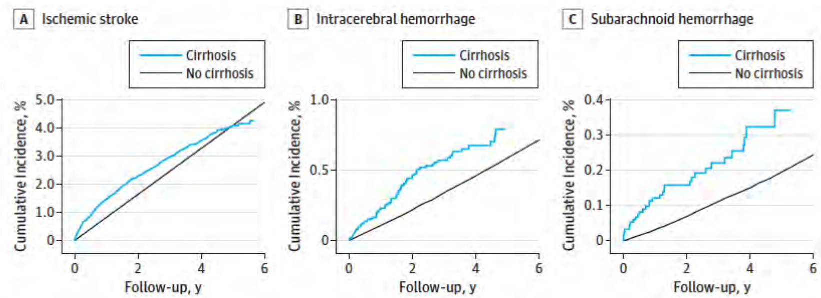


Table 3. Association Between Cirrhosis and Stroke in Medicare Beneficiaries by Type of Cirrhosis and Type of Stroke

		HR (95% CI)			
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Cirrhosis	15 586	1.4 (1.3-1.5)	1.3 (1.2-1.5)	1.9 (1.5-2.4)	2.4 (1.7-3.5)
Alcohol-related cirrhosis	3255	1.5 (1.2-1.8)	1.4 (1.2-1.7)	2.3 (1.5-3.7)	1.6 (0.7-4.0)
Non-alcohol-related cirrhosis	11 164	1.5 (1.3-1.6)	1.4 (1.2-1.5)	2.1 (1.6-2.7)	2.8 (1.9-4.1)
Decompensated cirrhosis	6043	1.7 (1.5-2.0)	1.6 (1.4-1.9)	2.5 (1.8-3.5)	2.8 (1.7-5.0)
Cirrhosis diagnosed by GI	5542	1.5 (1.3-1.7)	1.3 (1.1-1.5)	2.5 (1.8-3.5)	3.1 (1.9-5.2)
Cirrhosis with imaging or biopsy[a]	13 384	1.4 (1.3-1.6)	1.3 (1.2-1.5)	2.1 (1.6-2.6)	2.4 (1.6-3.5)

Merging in external data can add value

Medicare datasets include county codes and physician NPI numbers

Possible to merge in:

- County demographics and socioeconomic indices
- Physician board-certification, etc

RESEARCH LETTER

Medical Specialties of Clinicians Providing Mechanical Thrombectomy to Patients With Acute Ischemic Stroke in the United States

JAMA Neurology Published online January 25, 2018

Hooman Kamel, MD
Caroline D. Chung, BA
Gbambele J. Kone, BS
Ajay Gupta, MD
Nicholas A. Morris, MD
Matthew E. Fink, MD
Babak B. Navi, MD, MS

Table. Clinician Specialty Among Cases of Mechanical Thrombectomy for Ischemic Stroke in a 5% Sample of Medicare Beneficiaries

	No. (%)		
Clinician Specialty	CMS[a]	NPI[b]	Google[c]
Radiology	341 (61.4)	328 (59.2)	316 (56.9)
Neurosurgery	110 (19.8)	99 (17.9)	95 (17.1)
Neurology	91 (16.4)	108 (19.5)	131 (23.6)
Other	13 (2.4)	20 (3.4)	13 (2.4)

Abbreviations: CMS, Centers for Medicare and Medicaid Services; NPI, National Provider Identifier.

[a] Provider specialty as self-designated at the time of enrollment in Medicare.

[b] Provider specialty as self-designated on the NPI application.

[c] Provider specialty as ascertained from review of publicly available online records.

Weill Cornell Medicine

NewYork-Presbyterian

RESEARCH LETTER

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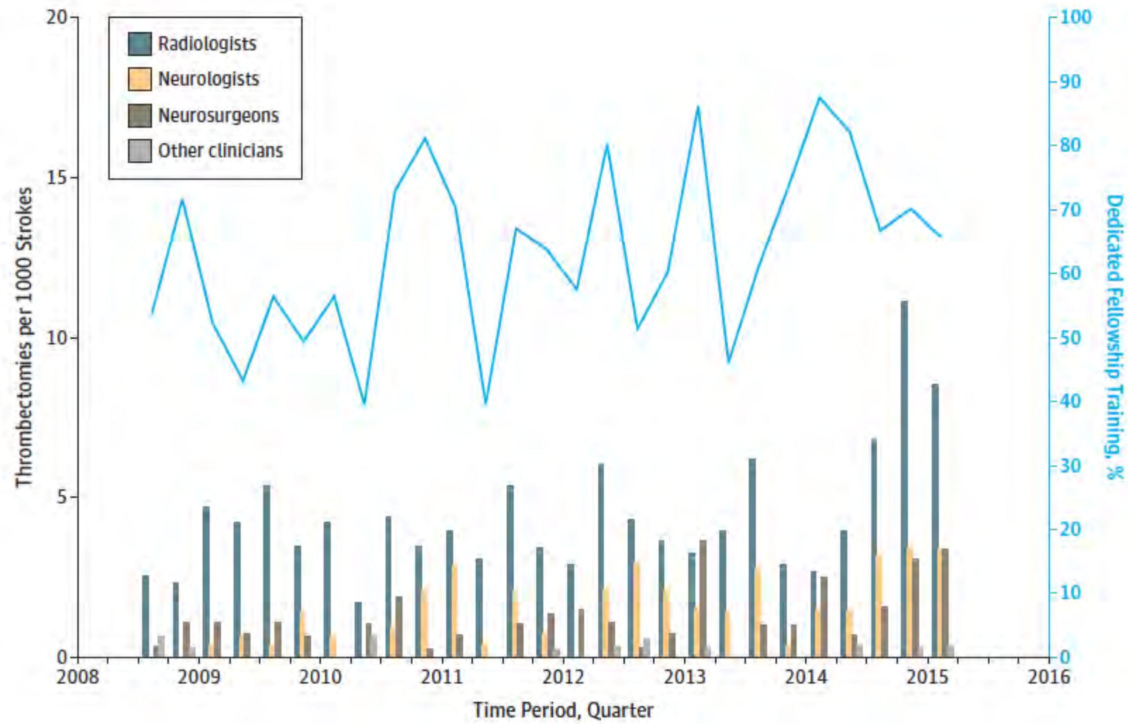
Figure. Temporal Changes in Stroke-Related Mechanical Thrombectomy Rates and Backgrounds of Performing Physicians



Weill Cornell Medicine

NewYork-Presbyterian

Commercial claims data

Essentially same as Medicare but <65 years of age

Can include medications, lab results

Optum, Thomson Reuters, Premier, etc

Extremely expensive

Population-based?

Original Investigation

Population-Level Evidence for an Autoimmune Etiology of Epilepsy

Mei-Sing Ong, PhD; Isaac S. Kohane, MD, PhD; Tianxi Cai, PhD; Mark P. Gorman, MD; Kenneth D. Mandl, MD, MPH

IMPORTANCE Epilepsy is a debilitating condition, often with neither a known etiology nor an effective treatment. Autoimmune mechanisms have been increasingly identified.

OBJECTIVE To conduct a population-level study investigating the relationship between epilepsy and several common autoimmune diseases.

DESIGN, SETTING, AND PARTICIPANTS A retrospective population-based study using claims from a nationwide employer-provided health insurance plan in the United States. Participants were beneficiaries enrolled between 1999 and 2006 (N = 2 518 034).

MAIN OUTCOMES AND MEASURES We examined the relationship between epilepsy and 12 autoimmune diseases: type 1 diabetes mellitus, psoriasis, rheumatoid arthritis, Graves disease, Hashimoto thyroiditis, Crohn disease, ulcerative colitis, systemic lupus erythematosus, antiphospholipid syndrome, Sjögren syndrome, myasthenia gravis, and celiac disease.

RESULTS The risk of epilepsy was significantly heightened among patients with autoimmune diseases (odds ratio, 3.8; 95% CI, 3.6-4.0; $P < .001$) and was especially pronounced in children (5.2; 4.1-6.5; $P < .001$). Elevated risk was consistently observed across all 12 autoimmune diseases.

CONCLUSIONS AND RELEVANCE Epilepsy and autoimmune disease frequently co-occur; patients with either condition should undergo surveillance for the other. The potential role of autoimmunity must be given due consideration in epilepsy so that we are not overlooking a treatable cause.

JAMA Neurol. 2014;71(5):569-574. doi:10.1001/jamaneurol.2014.188
Published online March 31, 2014.

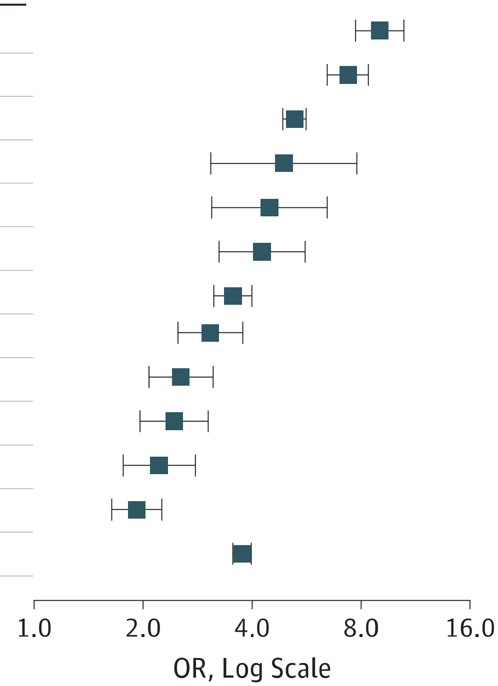
Supplemental content at jamaneurology.com

Author Affiliations: Australian Institute of Health Innovation, University of New South Wales, Sydney, Australia (Ong); Children's Hospital Informatics Program at Harvard–Massachusetts Institute of Technology Health Sciences and Technology, Boston Children's Hospital, Boston, Massachusetts (Ong, Kohane, Mandl); Center for Biomedical Informatics, Harvard Medical School, Boston, Massachusetts (Kohane, Gorman, Mandl); Department of Biostatics, Harvard School of Public Health, Boston, Massachusetts (Cai); Department of Neurology, Boston Children's Hospital, Boston, Massachusetts (Gorman).

Corresponding Author: Kenneth D. Mandl, MD, MPH, Intelligent Health Laboratory, Harvard Medical School, 300 Longwood Ave, Boston, MA 02115 (kenneth_mandl@harvard.edu).

Figure 1. Risk of Epilepsy in Children (<18 Years) and Nonelderly Adults (≤65 Years) With Autoimmune Disease Compared With Individuals Without Autoimmune Disease

Autoimmune Disease	No.	Epilepsy, %	OR (95% CI)
Antiphospholipid syndrome	5423	3.2	9.0 (7.7-10.5)
SLE	9696	2.5	7.4 (6.5-8.4)
Type 1 diabetes mellitus	43 704	1.8	5.2 (4.9-5.6)
Myasthenia gravis	1070	1.7	4.9 (3.1-7.8)
Celiac disease	1885	1.5	4.5 (3.1-6.5)
Sjögren syndrome	3614	1.5	4.3 (3.2-5.6)
Rheumatoid arthritis	22 890	1.2	3.5 (3.1-4.0)
Crohn disease	8774	1.1	3.1 (2.5-3.8)
Ulcerative colitis	10 690	0.9	2.5 (2.1-3.1)
Hashimoto thyroiditis	9830	0.8	2.4 (2.0-3.0)
Graves disease	9758	0.8	2.2 (1.8-2.8)
Psoriasis	23 542	0.7	1.9 (1.6-2.3)
Any of the above	135 394	1.3	3.8 (3.6-4.0)



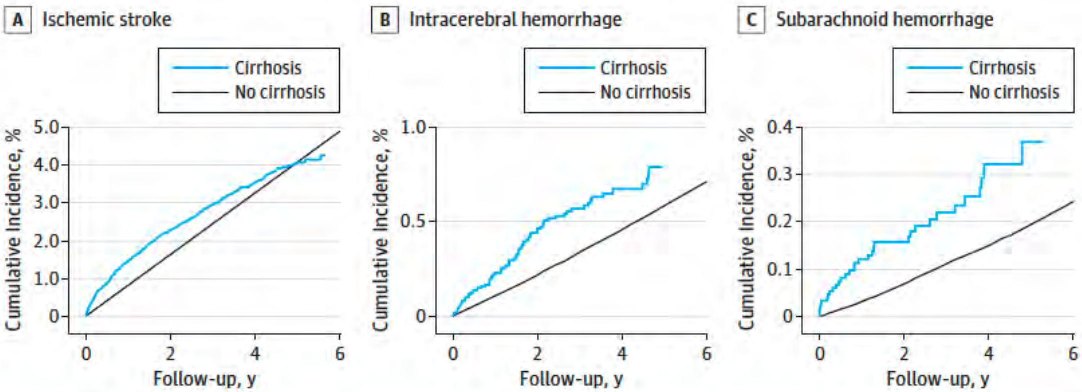
Admin data are a great resource for trainees

Publicly available

Not disease specific

Can be quickly certified as IRB exempt

Figure. Cumulative Incidence of Stroke Stratified by Presence or Absence of Cirrhosis



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JAMA Neurology | Original Investigation

Association Between Cirrhosis and Stroke in a Nationally Representative Cohort

Neal S. Parikh, MD; Babak B. Navi, MD, MS; Yecheskel Schneider, MD; Arun Jesudian, MD; Hooman Kamel, MD

ARTICLE

Prevalence of Cervical Artery Dissection Among Hospitalized Patients With Stroke by Age in a Nationally Representative Sample From the United States

Yahya B. Atalay, MD, Pirouz Piran, MD, Abhinaba Chatterjee, BS, Santosh Murthy, MD, MPH, Babak B. Navi, MD, MS, Ava L. Liberman, MD, Joseph Dardick, BS, Cenai Zhang, MS, Hooman Kamel, MD, MS, and Alexander E. Merkler, MD, MS

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Neurology® 2021;96:e1005-e1011. doi:10.1212/WNL.0000000000011420

Circulation

RESEARCH LETTER

Association Between Cervical Artery Dissection and Aortic Dissection

Jens Witsch, MD; Saad A. Mir, MD; Neal S. Parikh MD, MS; Santosh B. Murthy, MD, MPH; Hooman Kamel, MD, MS; Babak B. Navi, MD, MS; Alan Z. Segal, MD; Matthew E. Fink, MD; Stephanie B. Rutrick, MD; Monika M. Safford, MD; Nupoor Narula, MD; Parag Goyal, MD, MSc; Mario Gaudino, MD; Leonard N. Girardi, MD; Richard B. Devereux, MD; Mary J. Roman, MD; Cenai Zhang, MS; Alexander E. Merkler, MD, MS

Association between Pregnancy and Cervical Artery Dissection

Setareh Salehi Omran, MD,[1,2] Neal S. Parikh, MD, MS,[1] Sharon Poisson, MD,[2] Jennifer Armstrong, MD,[3] Alexander E. Merkler, MD,[1] Malavika Prabhu, MD,[4] Babak B. Navi, MD, MS,[1] Laura E. Riley, MD,[4] Matthew E. Fink, MD,[1] and Hooman Kamel, MD[1]

ANN NEUROL 2020;88:596–602

Weill Cornell Medicine

NewYork-Presbyterian

JAMA Neurology | Original Investigation

Distributional Validity and Prognostic Power of the National Institutes of Health Stroke Scale in US Administrative Claims Data

Hamidreza Saber, MD, MPH; Jeffrey L. Saver, MD

RESEARCH LETTER

Prehospital Treatment of Status Epilepticus in the United States

JAMA November 16, 2021 Volume 326, Number 19

Elan L. Guterman, MD, MAS
James F. Burke, MD, MS
Karl A. Sporer, MD

JAMA Neurology | Original Investigation

Risk of Pregnancy-Associated Stroke Across Age Groups in New York State

Eliza C. Miller, MD; Hajere J. Gatollari, MPH; Gloria Too, MD; Amelia K. Boehme, PhD, MSPH; Lisa Leffert, MD; Mitchell S. V. Elkind, MD, MS; Joshua Z. Willey, MD, MS

Circulation: Cardiovascular Quality and Outcomes

ORIGINAL ARTICLE

Utilization and Availability of Advanced Imaging in Patients With Acute Ischemic Stroke

Youngran Kim, PhD
Songmi Lee, MS
Rania Abdelkhaleq, BS
Victor Lopez-Rivera, MD
Babak Navi, MD
Hooman Kamel, MD
Sean I. Savitz, MD
Alexandra L. Czap, MD
James C. Grotta, MD
Louise D. McCullough, MD
Trudy Millard Krause, PhD
Luca Giancardo, PhD
Farhaan S. Vahidy, PhD
Sunil A. Sheth, MD

Weill Cornell Medicine

NewYork-Presbyterian

Methodological considerations

Understand source data

Beware of misclassification

Beware of nonrepresentative samples

Data management and ethics

Must understand nature of source data

Misunderstandings of source data

- Assuming longitudinal design when data are cross-sectional
- Effects of undocumented mortality
- Physician claims versus hospital diagnoses
- Secular trends in coding

Must understand nature of source data

Know your dataset inside and out

- Read documentation
- Attend training
- Read papers
- Speak with experts

Beware of misclassification

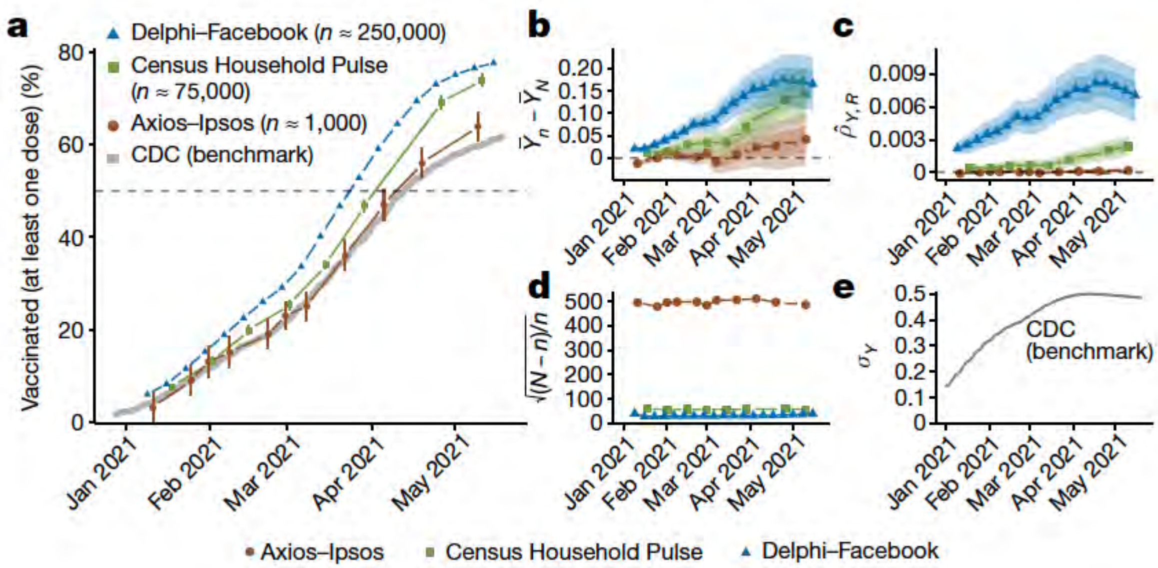
Power $\neq$ misclassification

Misclassification dilutes ability to detect differences

Cannot be fully overcome by increasing sample size

Thought experiment: what if you gave half your treatment group placebo instead?

Beware of nonrepresentative samples



Unrepresentative big surveys significantly overestimated US vaccine uptake

Nature | www.nature.com

https://doi.org/10.1038/s41586-021-04198-4

Received: 18 June 2021

Accepted: 29 October 2021

Valerie C. Bradley[1,6], Shiro Kuriwaki[2,6], Michael Isakov[3], Dino Sejdinovic[1], Xiao-Li Meng[4] & Seth Flaxman[5]

Weill Cornell Medicine

NewYork-Presbyterian

Key message

Include patients who reflect target population, in sufficient numbers

Measure the right things, and do it accurately

Key message

Include patients who reflect target population, in sufficient numbers

Measure the right things, and do it accurately

NO AMOUNT OF STATISTICAL WIZARDRY CAN HELP YOU IF YOU FAIL IN THESE TWO STEPS

Data management

Security

- Always use an encrypted, ITS-tagged computer
- Strict password hygiene
- Be aware of phishing
- Do not use unapproved cloud services for research data

Data management

Reproducibility

- Start with source data file
- Use a script to manipulate/analyze data
- Save resulting file as a different file
- Errors can be corrected without affecting the source data

Data management

Audit trail

- At all times, act as if FDA, DHHS, IRB, and Office of Research Compliance are about to come and audit your study
- Clearly organized and named folders and file names
- Detailed comments in your analysis script
- Readme files, notes, whatever you need to be able to remember and explain source of data and its analysis from start to finish

Ethics and regulatory approvals

Ensure all research activities have IRB approval

Request IRB exemption for analysis of deidentified data

Request expedited review and waiver of informed consent for:

- Minimal risk
- Research not practicable without exemption

Anything else will require full-board review and informed consent

Tips to get started

Make a win-win deal with your chair/chief/mentor:

- They provide modest start-up funding ($1,000-$5000)
- You provide the time/effort to acquire, learn, clean dataset
- Provides crucial career development for you and becomes lasting departmental resource

Tips to get started

Master the literature on a topic

Be alert to new ideas and techniques

Observe closely

Allow time for reflection and creativity

Find a good mentor

Be tenacious

Tips to get started

Remember: Initial projects are primarily to build skills

Rigorously assess feasibility before committing time

Know when to call off a project

Tips to get started

Think creatively about diagnoses, not clinical data

Think through biases and minimize them

Use validated codes or validate codes yourself

Lots of sensitivity analyses

Be careful about making strong claims

Remember Bayes, guard against p-hacking

Tips to get started

Form collaborations with researchers involved in prospective research studies in your area of interest

Reach out to investigators at your institution, network at meetings

Be enthusiastically persistent!

Tips to get started

Maintain a balanced research diet

- Chart reviews (limit your portions!)
- Administrative data
- Secondary analyses of prospective data
- Ancillary studies
- Prospective observational studies
- Clinical trials

We love to collaborate!

Please feel free to reach out anytime

hok9010@med.cornell.edu