Updates in Hospital Medicine: 2022

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Assistant Professor of Medicine
OHSU Division of Hospital Medicine

DATE: September 23, 2022

Updates in Hospital Medicine 2022

No Conflicts of Interest

Updates in Hospital Medicine 2022

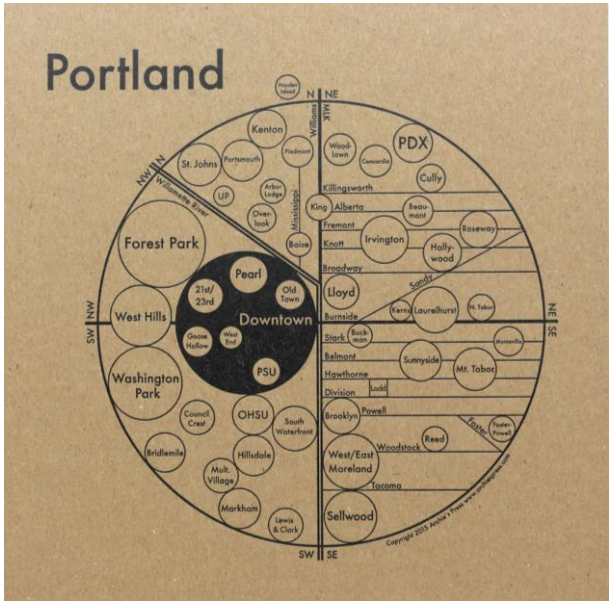
Objectives

- Review and evaluate recent impactful literature in the practice of Hospital Medicine
- Discuss how this data may: confirm, inform, or perhaps change your practice

Updates in Hospital Medicine 2022

Road Map

- New literature from late 2021 through 2022
- No COVID-19 studies
- High level review (Not full EBM session)
  - Case based approach
  - Quick Take vs Modest Depth

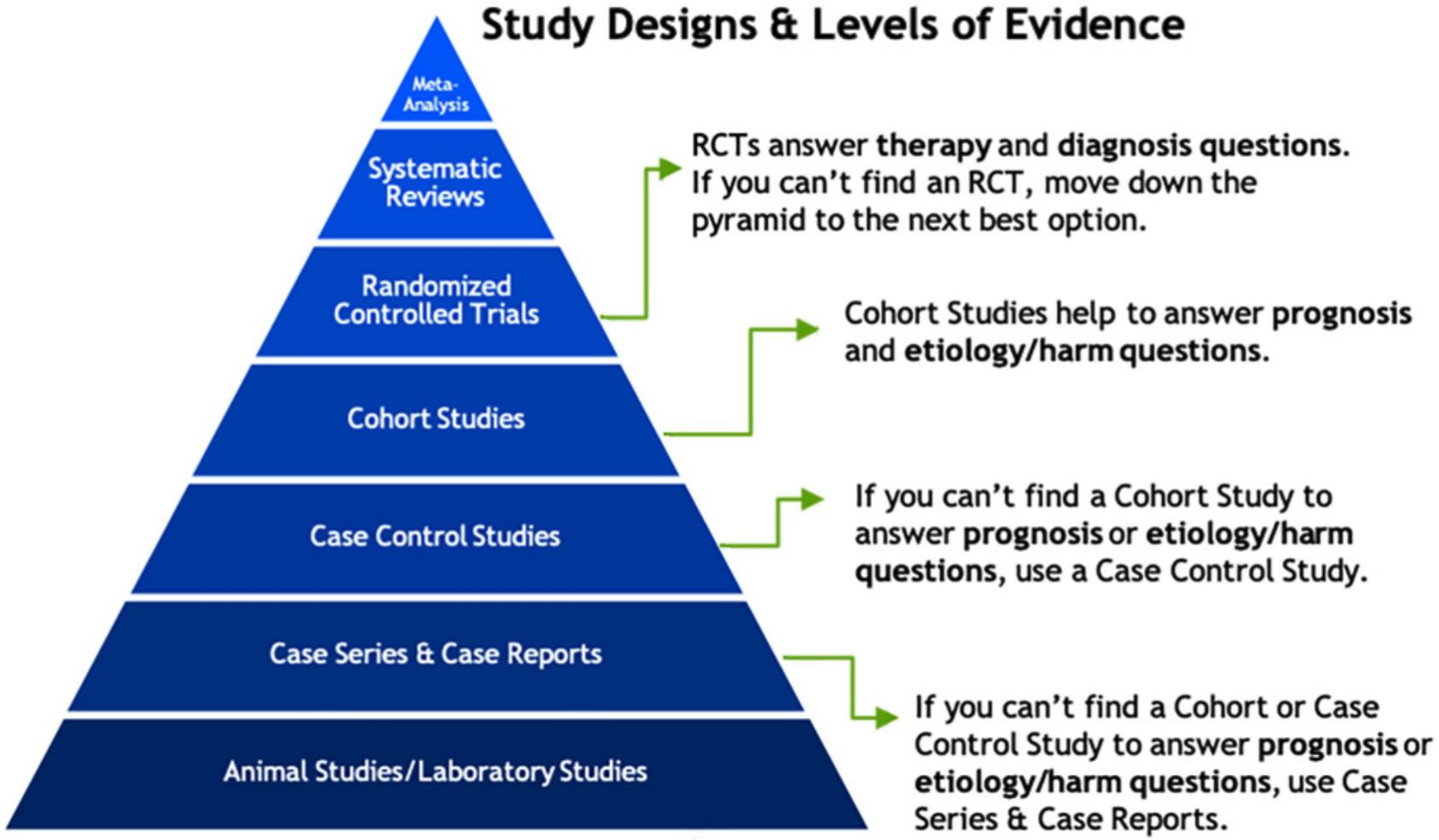


- Articles selected based on likelihood to:
  - ✓Change practice
  - ✓Inform/Modify practice
  - ✓Confirm practice

Adapted from 2021 Literature Update by Dr. Anstey and Dr. Jacobs

Updates in Hospital Medicine 2022

A Brief Comment on Level of Evidence to Guide Decision Making

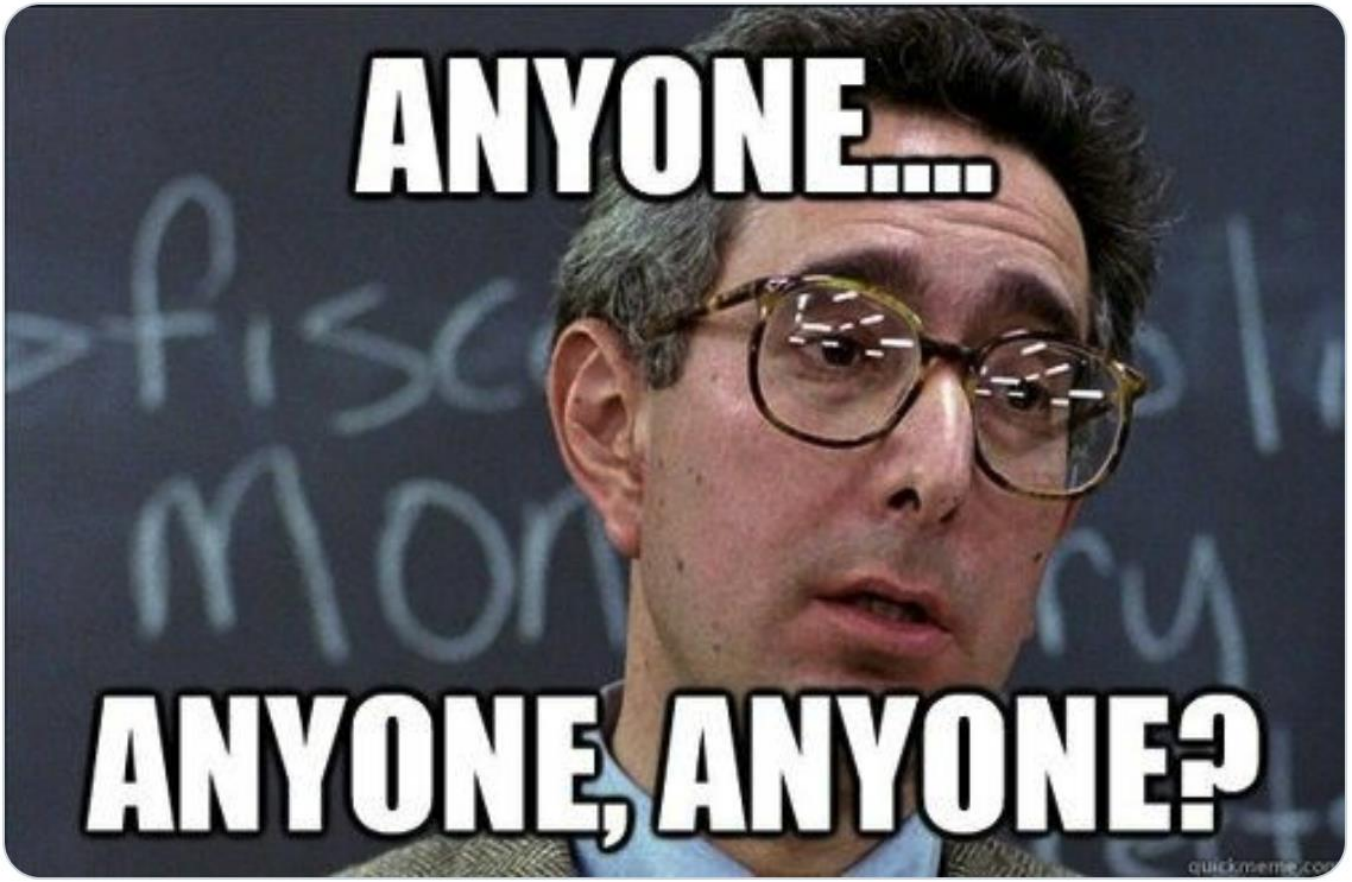


https://guides.dml.georgetown.edu/ebm/ebmclinicalquestions

Updates in Hospital Medicine 2022

Raise Your Hand if the Majority of Your Clinical Decisions are Supported by High Quality RCTs or Better…

Updates in Hospital Medicine 2022



https://twitter.com/kermodemovie/status/1231997699853049856

Updates in Hospital Medicine 2022

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D. Start the patient on digoxin, because who doesn't love foxgloves and it seems like he could use a little extra "squeeze"

Updates in Hospital Medicine 2022: AF and HFrEF

ESC European Society of Cardiology

European Heart Journal (2021) **42**, 4731–4739
doi:10.1093/eurheartj/ehab569

FASTTRACK CLINICAL RESEARCH
Arrhythmias

AV junction ablation and cardiac resynchronization for patients with permanent atrial fibrillation and narrow QRS: the APAF-CRT mortality trial

Michele Brignole [1,2]*, Francesco Pentimalli [3], Pietro Palmisano [4], Maurizio Landolina[5], Fabio Quartieri[6], Eraldo Occhetta[7], Leonardo Calò [8], Giuseppe Mascia [9], Lluis Mont[10], Kevin Vernooy [11], Vincent van Dijk[12], Cor Allaart[13], Laurent Fauchier [14], Maurizio Gasparini [15], Gianfranco Parati [2,16], Davide Soranna[17], Michiel Rienstra [18], and Isabelle C. Van Gelder[18]; for the APAF-CRT Trial Investigators†

[1]Department of Cardiology, Ospedali del Tigullio, Lavagna, Italy; [2]Department of Cardiology, IRCCS Istituto Auxologico Italiano, Ospedale San Luca, Piazzale Brescia 20, 20149 Milan, Italy; [3]Department of Cardiology, Ospedale S. Paolo, Savona, Italy; [4]Department of Cardiology, Ospedale Panico, Tricase, Italy; [5]Department of Cardiology, Ospedale Maggiore, Crema, Italy; [6]Department of Cardiology, Ospedale S. Maria Nuova, Reggio Emilia, Italy; [7]Department of Cardiology, Ospedale Maggiore della Carità, Novara, Italy; [8]Department of Cardiology, Policlinico Casilino, Roma, Italy; [9]Department of Cardiology, Ospedale San Giovanni di Dio, Firenze, Italy; [10]Department of Cardiology, Hospital Clinic, Barcelona, Spain; [11]Department of Cardiology, University Medical Center, Maastricht, The Netherlands; [12]Department of Cardiology, University Medical Center, Nieuwegein, The Netherlands; [13]Department of Cardiology, University Medical Center, Amsterdam, The Netherlands; [14]Department of Cardiology, Centre Hospitalier Universitaire Trousseau, Université François Rabelais, Tours, France; [15]Department of Cardiology, Istituto Clinico Humanitas, Rozzano, Italy; [16]Department of Cardiology, University of Milano Bicocca, Milan, Italy; [17]Department of Cardiology, IRCCS Istituto Auxologico Italiano, Biostatistic Unit, Milan, Italy; and [18]Department of Cardiology, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands

Received 28 June 2021; revised 21 July 2021; editorial decision 3 August 2021; accepted 4 August 2021; online publish-ahead-of-print 28 August 2021

See page 4740 for the editorial comment for this article 'Pace and ablate better than drugs in patients with heart failure and atrial fibrillation: lessons from the APAF-CRT mortality trial', by C. Linde, https://doi.org/10.1093/eurheartj/ehab695.

Updates in Hospital Medicine 2022: AF and HFrEF

Inclusion Criteria:

- Severely" Symptomatic Permanent AF>6 months
- Unsuitable for AF ablation or failed AF Ablation
- QRS <110msec
- At least 1 HF Hospitalization in last year

Endpoints:

- Primary
- All-cause mortality
- Secondary
- Composite all-cause mortality or HF hospitalization

Brignole M, Pentimalli F, Palmisano P, Landolina M, Quartieri F, Occhetta E, Calò L, Mascia G, Mont L, Vernooy K, van Dijk V, Allaart C, Fauchier L, Gasparini M, Parati G, Soranna D, Rienstra M, Van Gelder IC; APAF-CRT Trial Investigators. AV junction ablation and cardiac resynchronization for patients with permanent atrial fibrillation and narrow QRS: the APAF-CRT mortality trial. Eur Heart J. 2021 Dec 7;42(46):4731-4739. doi: 10.1093/eurheartj/ehab569. Erratum in: Eur Heart J. 2021 Oct 16;: Erratum in: Eur Heart J. 2021 Dec 08;: PMID: 34453840.

Updates in Hospital Medicine 2022: AF and HFrEF

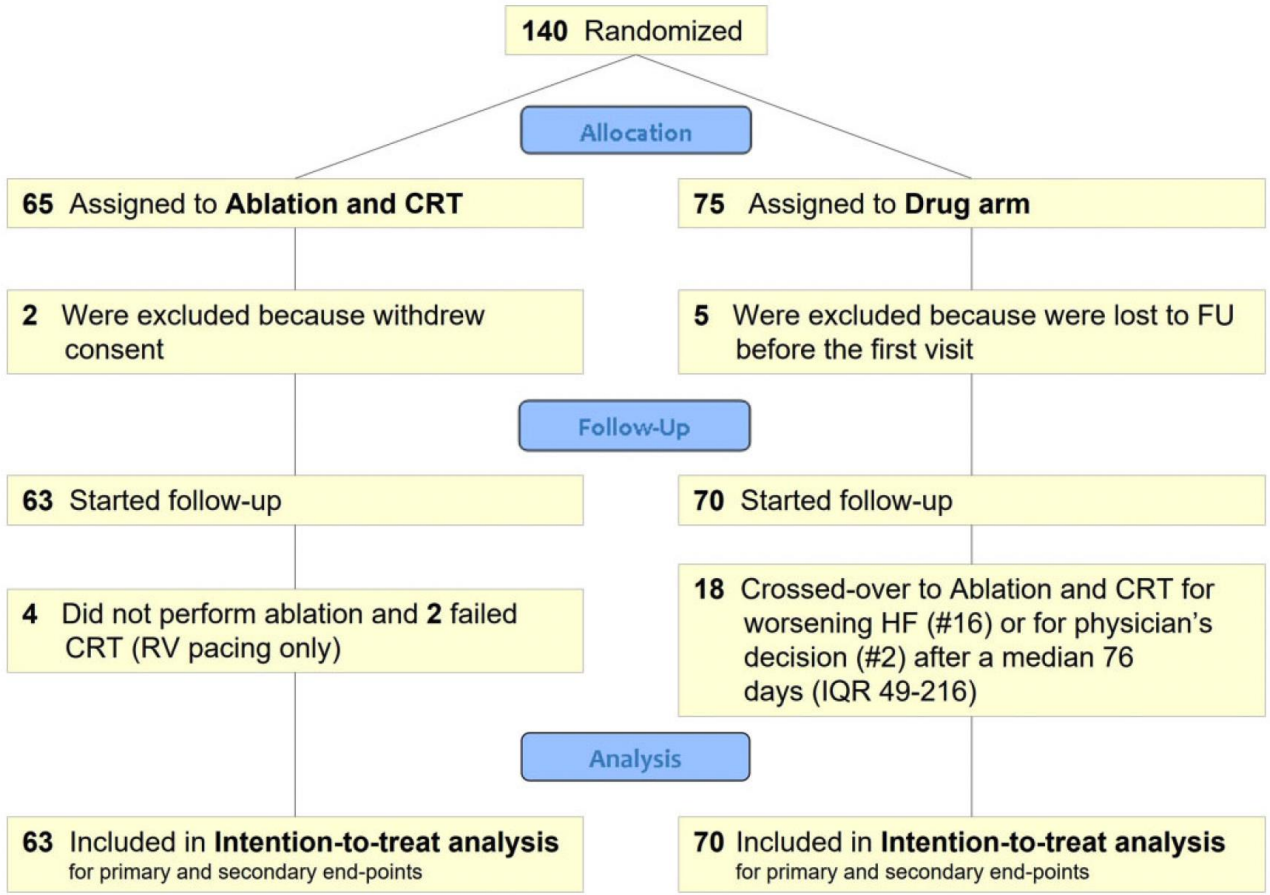

Figure 1 Trial flow chart. CRT, cardiac resynchronization therapy; HF, heart failure; IQR, interquartile range; RV, right ventricular.

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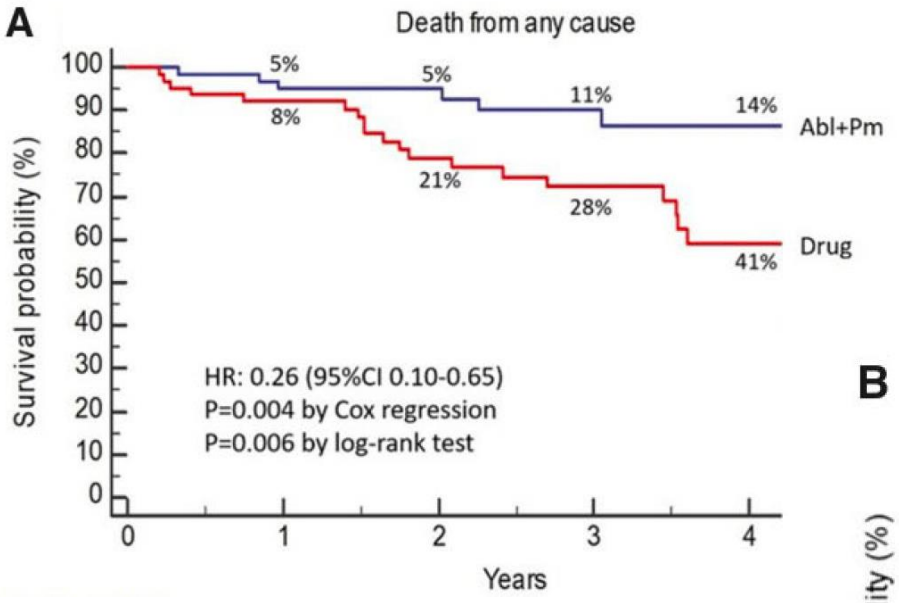

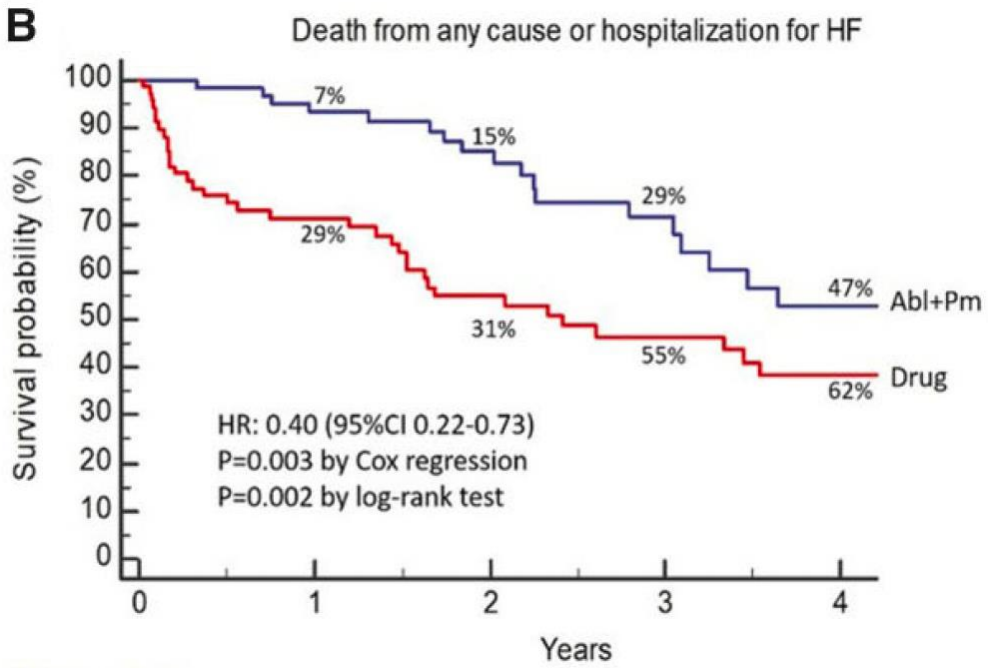

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Updates 2022 Quick Take

Case: 72 y/o with PMH of Gout, BPH, HTN, HFrecEF (LVEF 45%) 2/2 Idiopathic Cardiomyopathy admitted for treatment of sepsis 2/2 CAP. Patient on full GDMT but diuretics, SGLT2, ARNI held and Beta Blocker decreased at time of admission. As he recovers from CAP you discuss resuming his full GDMT package and he asks, “how much are all these medications really doing for me?” You respond:

A. GDMT will prevent you from being readmitted for heart failure in the next year

B. That’s a great question, your Cardiologist would be the best person to discuss that question with

C. I think it will help you but estimating exactly how much is hard to say

D. The full medication package you were on is estimated to cut your risk of HF hospitalization or Cardiovascular Death by ~1/2

Updates 2022 Quick Take: Estimating GDMT Benefit

Circulation

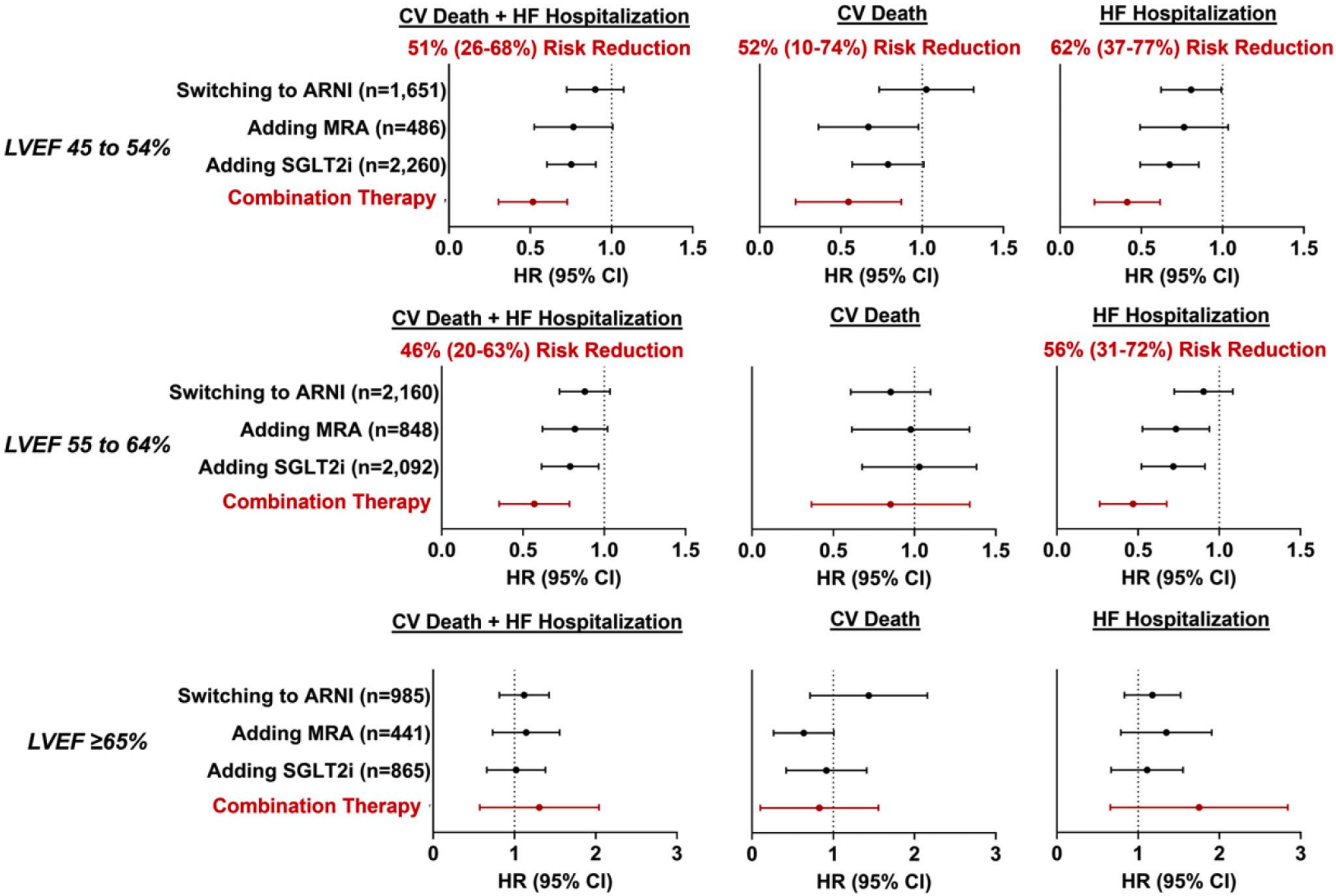
RESEARCH LETTER

Estimating the Benefits of Combination Medical Therapy in Heart Failure With Mildly Reduced and Preserved Ejection Fraction

Muthiah Vaduganathan, MD; Brian L. Claggett, PhD; Riccardo M. Inciardi, MD; Gregg C. Fonarow, MD; John J.V. McMurray, MD; Scott D. Solomon, MD

Circulation. 2022;145:1741–1743. DOI: 10.1161/CIRCULATIONAHA.121.058929

Updates 2022 Quick Take: Estimating GDMT Benefit



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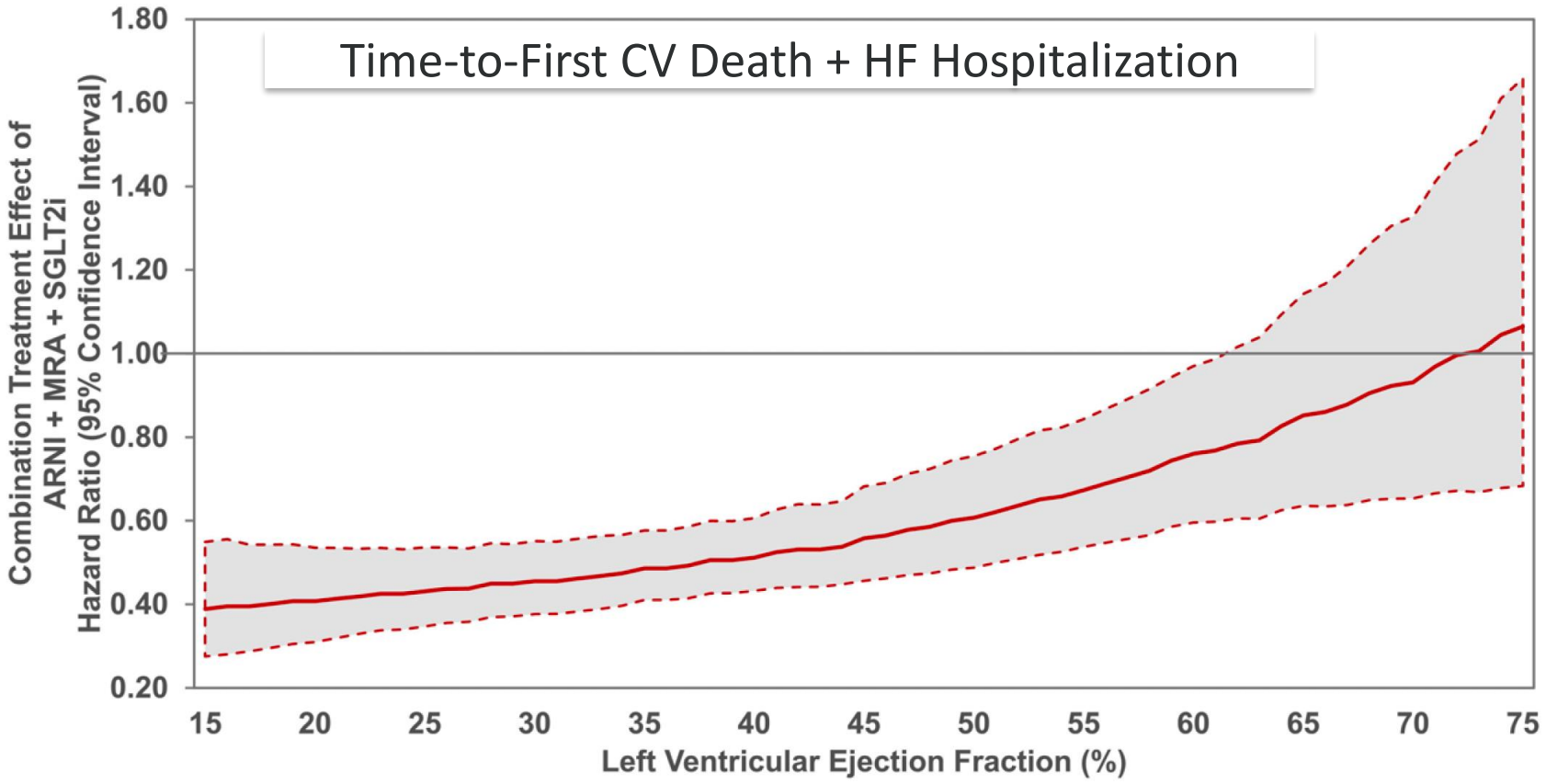
Updates 2022 Quick Take: Estimating GDMT Benefit



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Updates in Hospital Medicine 2022

Case: 57 y/o with PMH of HTN (not adherent to previously prescribed antihypertensives) and DM2 admitted for management of DM foot infection. As they recover from operative debridement blood pressure remains consistently elevated with SBP in 160s, consistent with previously documented clinic visits. Despite reticence to initiate new antihypertensive in the hospital for moderate HTN, the patient is interested in getting back on treatment ("this infection has been a wake up call") and is unable to get a PCP visit for 3 weeks. You decide to:

A. Start Amlodipine 5mg daily

B. Defer to PCP f/u, counseling the patient that benefit from anti-hypertensives requires months to years of treatment

C. Start Lisinopril 10mg daily

D. Start Olmesartan 20mg daily

E. Start HCTZ 25mg daily

F. Start combo BP pill du jour

Updates in Hospital Medicine 2022: ACE-I vs ARB

Hypertension

ANTIHYPERTENSIVE TREATMENT

Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers

A Multinational Cohort Study

RuiJun Chen, Marc A. Suchard, Harlan M. Krumholz, Martijn J. Schuemie, Steven Shea, Jon Duke, Nicole Pratt, Christian G. Reich, David Madigan, Seng Chan You, Patrick B. Ryan, George Hripcsak

(*Hypertension*. 2021;78:591–603. DOI: 10.1161/HYPERTENSIONAHA.120.16667.)

Updates in Hospital Medicine 2022: ACE-I vs ARB

-LEGEND-HTN (Large-scale Evidence Generation and Evaluation across a Network of Databases for Hypertension) study, large-scale propensity-matched network study representing the largest head-to-head comparison of ACE (angiotensin-converting enzyme) inhibitors with angiotensin receptor blockers (ARBs) for the first-line treatment of hypertension across a global network of 8 large observational databases.

-Retrospective new-user comparative cohort design and included all patients initiating antihypertensive treatment with a single agent

-1 year of prior observation in the database before treatment initiation and a recorded diagnosis of hypertension at the time of initiation or during the 1 year prior

-Antihypertensive medication and patients who initiated another antihypertensive in the 7 days after index exposure to an ACE inhibitor or ARB to prevent the potential inclusion of patients starting combination therapy

Chen R, Suchard MA, Krumholz HM, Schuemie MJ, Shea S, Duke J, Pratt N, Reich CG, Madigan D, You SC, Ryan PB, Hripcsak G. Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers: A Multinational Cohort Study. Hypertension. 2021 Sep;78(3):591-603. doi: 10.1161/HYPERTENSIONAHA.120.16667. Epub 2021 Jul 26. PMID: 34304580; PMCID: PMC8363588.

Updates in Hospital Medicine 2022: ACE-I vs ARB

Primary Outcomes:

- Acute Myocardial Infarction
- Hospitalization for Heart Failure
- Ischemic or Hemorrhagic Stroke
- Composite Cardiovascular Outcome

Secondary Outcomes

- 51 safety/adverse event related

Evaluated both Intention to Treat and Time on Treatment

Utilized Propensity Scoring to try to minimize confounding

Chen R, Suchard MA, Krumholz HM, Schuemie MJ, Shea S, Duke J, Pratt N, Reich CG, Madigan D, You SC, Ryan PB, Hripcsak G. Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers: A Multinational Cohort Study. Hypertension. 2021 Sep;78(3):591-603. doi: 10.1161/HYPERTENSIONAHA.120.16667. Epub 2021 Jul 26. PMID: 34304580; PMCID: PMC8363588.

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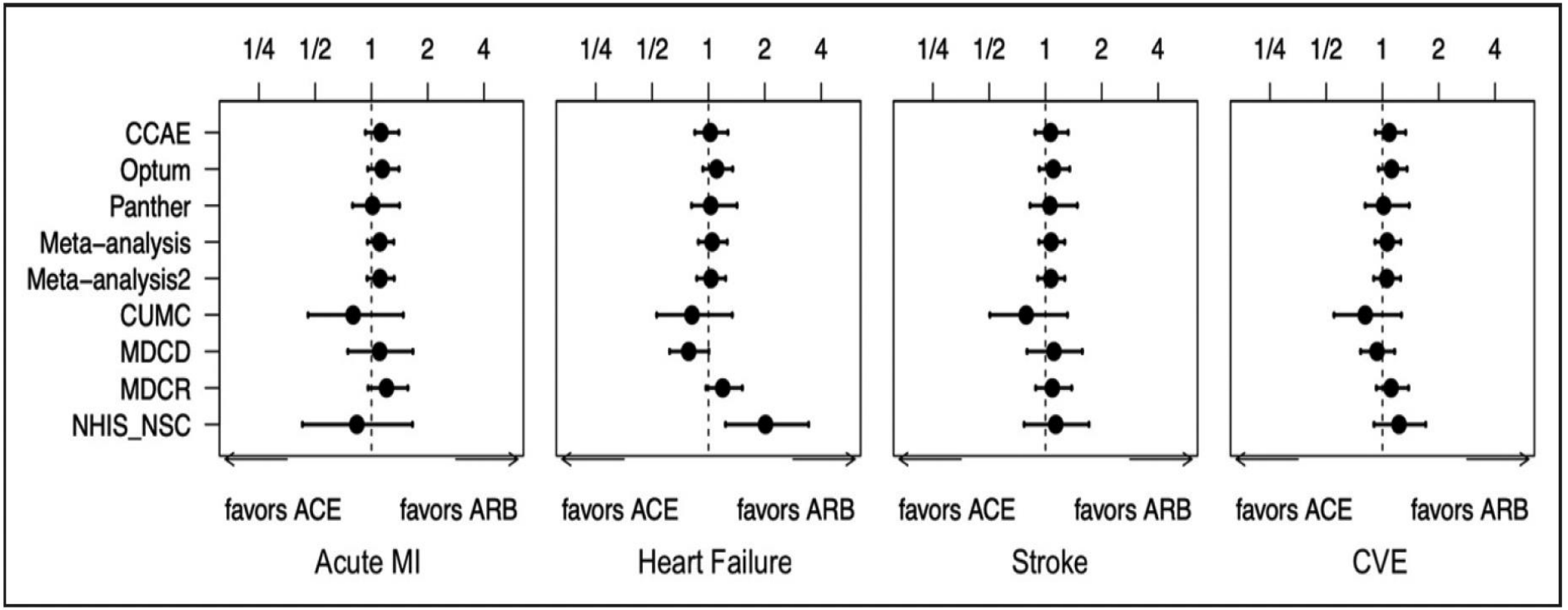

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Updates in Hospital Medicine 2022: ACE-I vs ARB

Secondary Outcomes on ACE-I:

- Higher risk of Angioedema and Cough
- Higher risk of Pancreatitis
- Higher risk of GI Bleed

Chen R, Suchard MA, Krumholz HM, Schuemie MJ, Shea S, Duke J, Pratt N, Reich CG, Madigan D, You SC, Ryan PB, Hripcsak G. Comparative First-Line Effectiveness and Safety of ACE (Angiotensin-Converting Enzyme) Inhibitors and Angiotensin Receptor Blockers: A Multinational Cohort Study. Hypertension. 2021 Sep;78(3):591-603. doi: 10.1161/HYPERTENSIONAHA.120.16667. Epub 2021 Jul 26. PMID: 34304580; PMCID: PMC8363588.

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Updates in Hospital Medicine 2022

Case: 77 y/o with PMH notable for DM2 on metformin and glargine, HLD, prior tobacco use who was admitted under observation after being found to have acute diverticulitis in the ED and poor tolerance of oral intake. The next day they appeared able to transition home, but you notice that were notably hyperglycemic overnight. Coincidentally, an A1C obtained last week (PCP ordered) was elevated at 8.7%. The patient reports having had stable A1C for the last couple years but noticed elevated fingersticks over the last 2 months, since starting on Atorvastatin. He asks if the statin could be making his diabetes control worse. You reply:

A. I have no idea

B. Seems unlikely

C. That's a great question for your PCP

D. It's possible but you seem to have a good indication for statin therapy (10yr ASCVD risk 34%)

E. Hmmm, let me look into that

Updates in Hospital Medicine 2022

Research

JAMA Internal Medicine | Original Investigation

Association of Statin Therapy Initiation With Diabetes Progression
A Retrospective Matched-Cohort Study

Ishak A. Mansi, MD; Matthieu Chansard; Ildiko Lingvay, MD, MPH, MSCS; Song Zhang, PhD; Ethan A. Halm, MD, MPH, MBA; Carlos A. Alvarez, PharmD, MSc, MSCS

JAMA Intern Med. 2021;181(12):1562-1574. doi:10.1001/jamainternmed.2021.5714
Published online October 4, 2021.

Updates in Hospital Medicine 2022: Statin Effect on Diabetes

Retrospective matched-cohort study to assess associations between statin initiation and diabetes progression among a national cohort of patients covered by the VA from fiscal year (FY) 2003-FY 2015

Inclusion Criteria

- 30 years or older at the index date and were regular VA health system users.

Exclusion Criteria

- Fewer than 60 days of follow up

- Active comparator being initiation of H2 Blocker or PPI
- Baseline Propensity Score Matching (93 variables)

Mansi IA, Chansard M, Lingvay I, Zhang S, Halm EA, Alvarez CA. Association of Statin Therapy Initiation With Diabetes Progression: A Retrospective Matched-Cohort Study. *JAMA Intern Med.* 2021;181(12):1562–1574. doi:10.1001/jamainternmed.2021.5714

Updates in Hospital Medicine 2022: Statin Effect on Diabetes

Primary Outcomes

- Therapy intensification, including new insulin initiation during the follow-up period or
an increased number of glucose-lowering medication classes that were ever used during follow-up in comparison with the baseline

- New persistent hyperglycemia or acute glycemic complications, including:

-the presence of 5 or more measurements with blood glucose levels of 200mg/dL or greater during the follow up period

- Receiving a new diagnosis of diabetes with ketoacidosis or uncontrolled diabetes during the follow-up period

Mansi IA, Chansard M, Lingvay I, Zhang S, Halm EA, Alvarez CA. Association of Statin Therapy Initiation With Diabetes Progression: A Retrospective Matched-Cohort Study. *JAMA Intern Med.* 2021;181(12):1562–1574. doi:10.1001/jamainternmed.2021.5714

Updates in Hospital Medicine 2022: Statin Effect on Diabetes

Table 2. Odds of Outcomes During Follow-up Period Between Statin Users and Active Comparators in Propensity Score–Matched Cohorts

Outcomes	Overall cohort				Diabetes-prevalent cohort			
	No. (%)				No. (%)			
	Statin users (n = 83 022)	Active comparators (n = 83 022)	OR (95% CI)	*P* value	Statin users (n = 51 467)	Active comparators (n = 51 467)	OR (95% CI)	*P* value
Primary								
Diabetes progression	46 434 (55.9)	39 868 (48.0)	1.37 (1.35 to 1.40)	<.001	30 494 (59.3)	27 189 (52.8)	1.30 (1.27 to 1.33)	<.001
Secondary								
Components of diabetes progression outcome								
New insulin starts during follow-up	11 947 (14.4)	10 540 (12.7)	1.16 (1.12 to 1.19)	<.001	9081 (17.6)	8215 (16.0)	1.13 (1.09 to 1.17)	<.001
Increased No. of glucose-lowering classes	42 579 (51.3)	35 533 (42.8)	1.41 (1.38 to 1.43)	<.001	27 299 (53.0)	23 443 (45.6)	1.35 (1.32 to 1.38)	<.001
Incident ≥5 measurements with blood glucose ≥200 mg/dL[a]	13 963 (16.8)	12 601 (15.2)	1.13 (1.10 to 1.16)	<.001	9858 (19.2)	9167 (17.8)	1.09 (1.06 to 1.13)	<.001
Incident diabetes with ketoacidosis/uncontrolled diabetes	4468 (5.4)	3635 (4.4)	1.24 (1.19 to 1.30)	<.001	2837 (5.5)	2427 (4.7)	1.18 (1.12 to 1.25)	<.001
Difference in No. of glucose-lowering classes during follow-up vs baseline								
Mean (SD)	0.77 (0.99)	0.59 (0.89)	−0.19 to −0.17[b]	<.001	0.78 (1.0)	0.62 (0.94)	−0.18 to −0.15[b]	<.001
Median (IQR)	1 (0 to 1)	0 (0 to 1)	NA	<.001[c]	1 (0 to 1)	0 (0 to 1)	NA	<.001
Decreased No. of glucose-lowering medication classes	2132 (2.6)	2276 (2.7)	0.94 (0.88 to 0.99)	.03	2116 (4.1)	2272 (4.4)	0.93 (0.87 to 0.99)	.02
Change in mean blood glucose during follow-up vs baseline, mg/dL[a]								
Mean (SD)	6.3 (45.4)	5.5 (46.1)	−1.24 to −0.36[b]	<.001	0.32 (52.8)	−0.60 (52.8)	−1.6 to −0.28[b]	.005
Median (IQR)	6.1 (−8.5 to 24.2)	5.7 (−8.8 to 23.0)	NA	<.001[c]	2.8 (−17.7 to 23.8)	2.1 (−18.5 to 22.6)	NA	<.001

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Updates in Hospital Medicine 2022: Statin Effect on Diabetes

- “There was a dose response association between intensity of lowering LDL cholesterol and risk of the study outcomes, with higher intensity of LDL cholesterol-lowering associated with higher odds of diabetes progression. For example, the odds of diabetes progression among statin users vs nonusers were 1.83, 1.55, and 1.45 for high-, moderate-, and low-intensity cholesterol lowering, respectively”

- “the number needed to be exposed to statins for 1 additional person to experience diabetes progression outcome was 13”

- “the mean difference between blood glucose during follow-up and baseline among statin users in contrast with nonusers was modest, there was significant escalation in diabetes therapy thatwasnot associated with better clinical outcomes… From 2009 to 2015, annual emergency department visits for hyperglycemic crisis almost doubled, hospitalization increased by 73%, and related deaths increased by 55%.”

Mansi IA, Chansard M, Lingvay I, Zhang S, Halm EA, Alvarez CA. Association of Statin Therapy Initiation With Diabetes Progression: A Retrospective Matched-Cohort Study. *JAMA Intern Med.* 2021;181(12):1562–1574. doi:10.1001/jamainternmed.2021.5714

Updates in Hospital Medicine 2022

Case: 77 y/o with PMH notable for DM2 on metformin and glargine, HLD, prior tobacco use who was admitted under observation after being found to have acute diverticulitis in the ED and poor tolerance of oral intake. The next day they appeared able to transition home, but you notice that were notably hyperglycemic overnight. Coincidentally, an A1C obtained last week (PCP ordered) was elevated at 8.7%. The patient reports having had stable A1C for the last couple years but noticed elevated fingersticks over the last 2 months, since starting on Atorvastatin. He asks if the statin could be making his diabetes control worse. You reply:

A. I have no idea

B. Seems unlikely

C. That's a great question for your PCP

D. It's possible but you seem to have a good indication for statin therapy (10yr ASCVD risk 34%)

E. Hmmm, let me look into that

Updates Quick Take 2022

Case: 66 y/o with PMH of HTN, HLD and COPD admitted for COPD exacerbation. Symptomatically nearing discharge, but description of baseline sxs suggests they may benefit from chronic O2. However, during a “road test” done by RT has the patient hovers at 92% while on room air. The patient still reports significant dyspnea, consistent with what they experience at baseline. Their chronic bronchodilator regimen appears maximized. The patient self identifies as black and has notably dark skin. You decide to:

A. Proceed with discharge without supplemental oxygen
B. Add scheduled daily azithromycin 250mg
C. Extend Prednisone 40mg daily from 5 to 10 days
D. Obtain ABG
E. Obtain TTE, wondering if the patient may have undiagnosed pulmonary hypertension

Updates Quick Take 2022: Pulse Ox Bias

RESEARCH

Racial bias and reproducibility in pulse oximetry among medical and surgical inpatients in general care in the Veterans Health Administration 2013-19: multicenter, retrospective cohort study

Valeria S M Valbuena,[1,2,3] Sarah Seelye,[2] Michael W Sjoding,[4] Thomas S Valley,[2,4] Robert P Dickson,[4] Steven E Gay,[4] Dru Claar,[4] Hallie C Prescott,[2,4] Theodore J Iwashyna[2,3,4]

thebmj | *BMJ* 2022;378:e069775 | doi: 10.1136/bmj-2021-069775

Updates Quick Take 2022: Pulse Ox Bias

- Multicenter Reptrospective Cohort, Study Period 2013-19
- Extraction of SpO2 and SaO2 data from the Veterans Affairs Patient Database(VAPD)
- Defined occult hypoxemia as a low saturation of arterial oxygen (SaO2 <88%) with a pulse oximetry reading of SpO2 ≥92% recorded within 10 minutes
- Excluded ICU measurements or days when patients were transferred in or out of ICU
- Six categories by race and ethnic origin were used: non-Hispanic black, non-Hispanic white, Hispanic or Latino, Asian or Pacific Islander, American Indian, and other
- Cohort included 30,039 SpO2-SaO2 pairs

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Updates Quick Take 2022: Pulse Ox Bias

Table 1 | Characteristics of SpO_2-SaO_2 pairs recorded in study population, by race and ethnic origin

Characteristics	Non-Hispanic white	Non-Hispanic black	Hispanic/ Latino	P value of difference	
				White *v* black	White *v* Hispanic
Paired SpO_2-SaO_2 readings					
Total No	21 918	6498	1623	—	—
Median (IQR) pulse oximetry (SpO_2, %)	95 (93-97)	97 (94-99)	97 (94-99)	<0.001	<0.001
Median (IQR) arterial oxygen saturation (SaO_2, %)	94 (89.9-96.6)	94.3 (89-97.1)	95 (90.2-98)	0.31	<0.001
Supplemental oxygen (L/min)					
Median (IQR)	0	0	0	<0.001	0.14
Mean (SD)	0.9 (2.5)	0.6 (2.0)	0.8 (2.7)	<0.001	0.14
Potential occult hypoxemia					
All SpO_2 (92-100%)	18 157 (82.8)	5852 (90.1)	1466 (90.3)	<0.001	<0.001
SaO_2 <88% if SpO_2 is 92-100%	2823 (15.6)	1144 (19.6)	237 (16.2)	<0.001	0.53
Patient day characteristics					
Total No	20 822	6190	1519		
Median (IQR) age (years)	69 (64-77)	66 (60-72)	68 (62-76)	<0.001	<0.001
Male sex (No (%))	20 099 (96.5)	5852 (94.5)	1479 (97.4)	<0.001	0.082
Primary diagnoses (No (%))					
Chronic obstructive pulmonary disease	2984 (14.3)	681 (11.0)	97 (6.4)	<0.001	<0.001
Respiratory failure	2766 (13.3)	633 (10.2)	162 (10.7)	<0.001	0.003
Septicemia	1622 (7.8)	466 (7.5)	118 (7.8)	0.50	0.98
Pneumonia	1608 (7.72)	291 (4.7)	59 (3.9)	<0.001	<0.001
Congestive heart failure	1336 (6.4)	464 (7.5)	84 (5.5)	0.003	0.17
Coronary atherosclerosis	391 (1.9)	108 (1.7)	184 (12.1)	0.50	<0.001
Diabetes with complication	309 (1.5)	204 (3.3)	30 (2.0)	<0.001	0.13
Cardiac dysrhythmia	361 (1.7)	94 (1.5)	18 (1.2)	0.25	0.11
Renal failure	316 (1.5)	115 (1.9)	23 (1.5)	0.06	0.99
Acute myocardial infarction	223 (1.1)	58 (0.9)	71 (4.7)	0.36	<0.001
Other	8906 (42.8)	3076 (49.7)	673 (44.3)	<0.001	0.24
Comorbidities* (No (%))					
Congestive heart failure	7304 (35.1)	2202 (35.6)	486 (32.0)	0.47	0.02
Neurological disease	2436 (11.7)	896 (14.5)	175 (11.5)	<0.001	0.834
Chronic pulmonary disease	11 911 (57.2)	2642 (42.7)	495 (32.6)	<0.001	<0.001
Liver disease	1746 (8.4)	694 (11.2)	213 (14.0)	<0.001	<0.001
Diabetes without complication	5099 (24.5)	1732 (28.0)	448 (29.5)	<0.001	<0.001
Diabetes with complication	3480 (16.7)	1171 (18.9)	359 (23.6)	<0.001	<0.001
Non-metastatic cancer	2176 (10.5)	711 (11.5)	146 (9.6)	0.02	0.30
Metastatic cancer	782 (3.8)	266 (4.3)	38 (2.5)	0.05	0.01
Renal disease	4935 (23.7)	2004 (32.4)	447 (29.4)	<0.001	<0.001
Median (IQR) length of hospital stay (days)	6 (4-10)	6 (3-11)	9 (4-17)	<0.001	<0.001
Mortality (No (%))					
In hospital	1118 (5.4)	350 (5.7)	91 (6.0)	0.39	0.30
At 30 days	2240 (10.8)	553 (8.9)	142 (9.4)	<0.001	0.086

SaO_2=arterial blood gas reading; SpO_2=pulse oximetry reading; IQR=interquartile range; SD=standard deviation.

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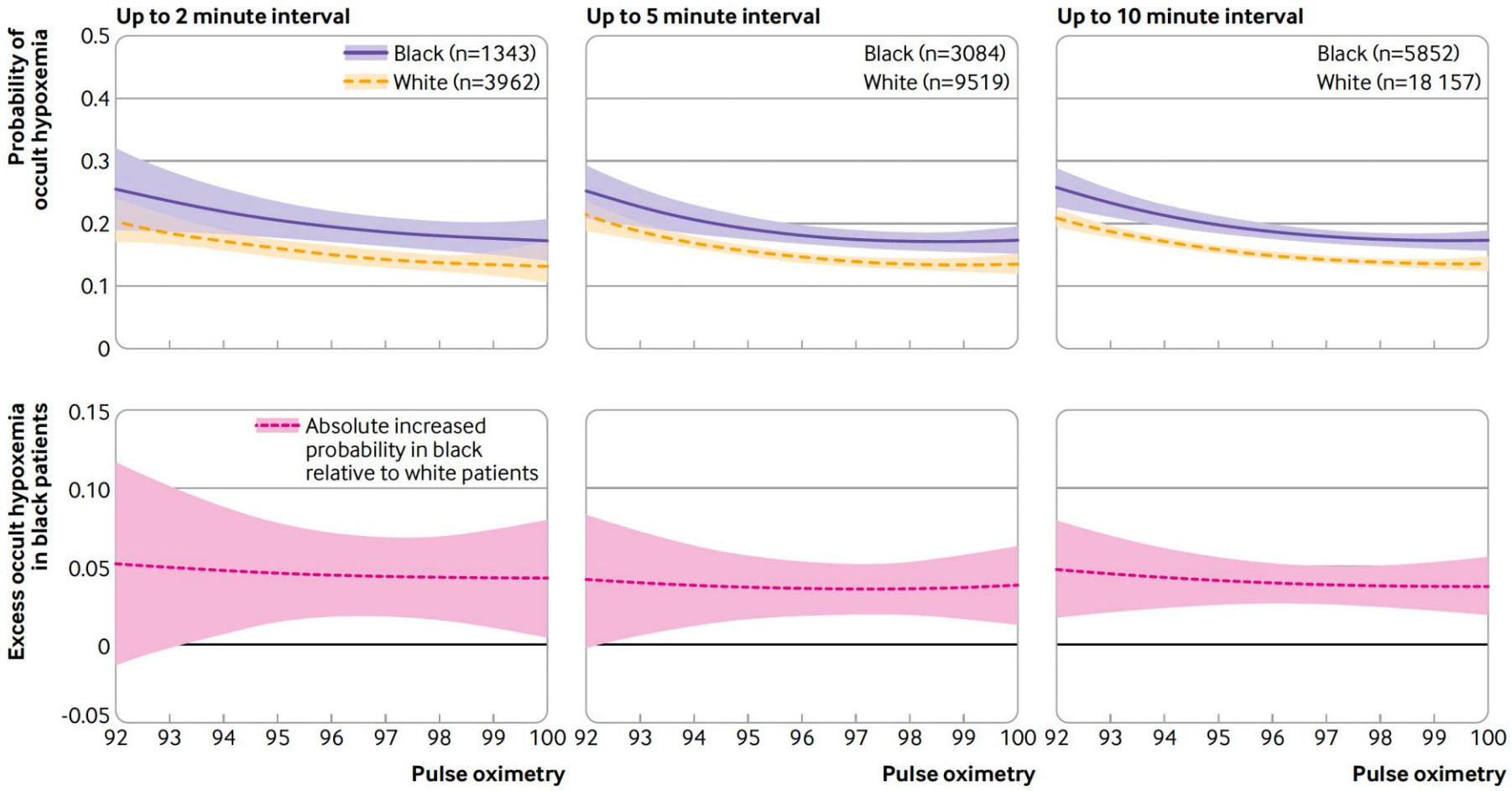
Updates Quick Take 2022: Pulse Ox Bias



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Updates Quick Take 2022: Pulse Ox Bias

-”Pulse oximetry readings had greater bias and worse precision among black inpatients in general care than among white inpatients in general care. This greater bias and worse precision meant that on receiving a recent and well correlated pair of SpO2-SaO2 readings, white patients could have some reassurance that a later normal SpO2 reading was unlikely to be associated with a SaO2 reading of <88%; however, less reassurance was available for black patients.”

- “The overall prevalence of occult hypoxemia could be considerable and racially biased”

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A. Proceed with discharge without supplemental oxygen – current study suggests your odds may be ~80% of this being appropriate
B. Add scheduled daily azithromycin 250mg –only admit for COPD in last 3 years
C. Extend Prednisone 40mg daily from 5 to 10 days
D. Obtain ABG
E. Obtain TTE, wondering if the patient may have undiagnosed pulmonary hypertension—you later find a TTE in CareEverywhere from 6 months ago with normal LVEF, normal RVSP, no significant valvular abnormalities

Updates in Hospital Medicine 2022

Case: 71 y/o with PMH notable for HTN, HFpEF, and CKD III presents with AKI, tachycardia, 2L O2 requirement, leukocytosis and faint retrocardiac opacity. They are started on CTX and Azithromycin and admitted for CAP. HD#2 their O2 requirement remains unchanged. They note having twisted their Right knee hiking 10 days ago and spent several days in a recliner while recovering. They also mention their chest is feeling “tight”. Their creatinine is stable, but remains above baseline. You decide to:

A: Obtain a D-Dimer

B: Obtain a RLE Venous Duplex

C: Determine they are intermediate risk on Wells Score and Geneva Score and check a D-Dimer

D: Do the same Wells or Geneva Score and Order CTA PE Protocol

E: Double down and just keep treating CAP

F: Wells Score, CTA PE Protocol and Fluid for CIN prophylaxis

Updates in Hospital Medicine 2022

ORIGINAL RESEARCH • STATEMENTS AND GUIDELINES

Radiology

Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease: Consensus Statements from the American College of Radiology and the National Kidney Foundation

Matthew S. Davenport, MD • Mark A. Perazella, MD • Jerry Yee, MD • Jonathan R. Dillman, MD, MS • Derek Fine, MD • Robert J. McDonald, MD, PhD • Roger A. Rodby, MD • Carolyn L. Wang, MD • Jeffrey C. Weinreb, MD

Radiology 2020; 294:660–668 • https://doi.org/10.1148/radiol.2019192094 • Content codes: CT GU

Updates in Hospital Medicine 2022: IV Contrast and Kidney Dz

- Document Containing joint statements made by a multidisciplinary group of radiologists, and nephrologists. These statements were endorsed by the American College of Radiology, or ACR, and the National Kidney Foundation, or NKF, to improve and standardize the care of patients with impaired kidney function who have indication(s) to receive intravenous iodinated contrast media.

- “Recognize that in clinical practice, a multitude of factors are used to determine whether intravenous contrast media should be administered… Decisions are rarely based on a single consideration. Consequently, these statements should be considered in the context of the entire clinical scenario.”

Davenport MS, Perazella MA, Yee J, Dillman JR, Fine D, McDonald RJ, Rodby RA, Wang CL, Weinreb JC. Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease: Consensus Statements from the American College of Radiology and the National Kidney Foundation. Radiology. 2020 Mar;294(3):660-668. doi: 10.1148/radiol.2019192094. Epub 2020 Jan 21. PMID: 31961246.

Updates in Hospital Medicine 2022: IV Contrast and Kidney Dz

Useful Definitions/Risk Factors:

- Contrast-associated acute kidney injury (CA-AKI): Any AKI occurring within 48 hours after the administration of contrast media.

-*Multiple patient-related risk factors have been associated with CA-AKI. The primary risk factor is eGFR, with some studies finding an additive risk of CA-AKI from diabetes mellitus. Additional risk factors include nephrotoxic agents and exposures, hypotension, hypovolemia, albuminuria, and impaired kidney perfusion*

- Contrast-induced acute kidney injury (CI-AKI): CI-AKI is the subset of CA-AKI that can be causally linked to contrast media administration.

- Few studies have linked patient-related risk factors with CI-AKI. In studies that found evidence of CI-AKI, the primary risk factor was eGFR

Davenport MS, Perazella MA, Yee J, Dillman JR, Fine D, McDonald RJ, Rodby RA, Wang CL, Weinreb JC. Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease: Consensus Statements from the American College of Radiology and the National Kidney Foundation. Radiology. 2020 Mar;294(3):660-668. doi: 10.1148/radiol.2019192094. Epub 2020 Jan 21. PMID: 31961246.

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- The risk of CI-AKI has been estimated to be near 0% at eGFR greater than or equal to 45, 0%–2% at eGFR of 30–44, and 0%–17% at eGFR less than 30 mL/min/1.73 m2
- There are no randomized trials differentiating CA-AKI from CI-AKI in patients with eGFR less than 30 mL/min/1.73 m2.

At the Same Time…

- “Prophylaxis is indicated for patients who have AKI or an eGFR less than 30 mL/min/1.73 m2 and are not undergoing maintenance Dialysis” a
- “When prophylaxis is indicated, isotonic volume expansion with normal saline is the preferred method”
- “Typical volume expansion regimens begin 1 hour before and continue 3–12 hours after contrast media administration, with typical doses ranging from fixed (eg, 500 mL before and after) to weight-based volumes (1–3 mL/kg per hour). Longer regimens (approximately 12 hours) have been shown to lower the risk of CA-AKI compared with shorter regimens.”

Davenport MS, Perazella MA, Yee J, Dillman JR, Fine D, McDonald RJ, Rodby RA, Wang CL, Weinreb JC. Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease: Consensus Statements from the American College of Radiology and the National Kidney Foundation. Radiology. 2020 Mar;294(3):660-668. doi: 10.1148/radiol.2019192094. Epub 2020 Jan 21. PMID: 31961246.

Updates in Hospital Medicine 2022: IV Contrast and Kidney Dz

But what about patients on HD with residual kidney function…

- "Because of the inherent demonstrated lack of benefit, risks, and cost, neither acute dialysis nor continuous renal replacement therapy should be initiated or have the schedule changed solely based on iodinated contrast media administration, regardless of residual kidney function

What if they only have 1 kidney…

- "The presence of a solitary functioning kidney should not influence decision making regarding the risk of CA-AKI or CI-AKI"

Should we alter the amount of contrast used…

- "If lower doses of contrast media have been shown to be sufficiently diagnostic with specific protocols, then practices should consider lowering doses in all patients imaged with those protocols, not only patients with reduced kidney function"

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Updates in Hospital Medicine 2022

Acknowledgments:
Dr. Anstey, Dr. Atkin and Dr. Bains

I Look Forward to Questions/Comments Later!

Thank You!