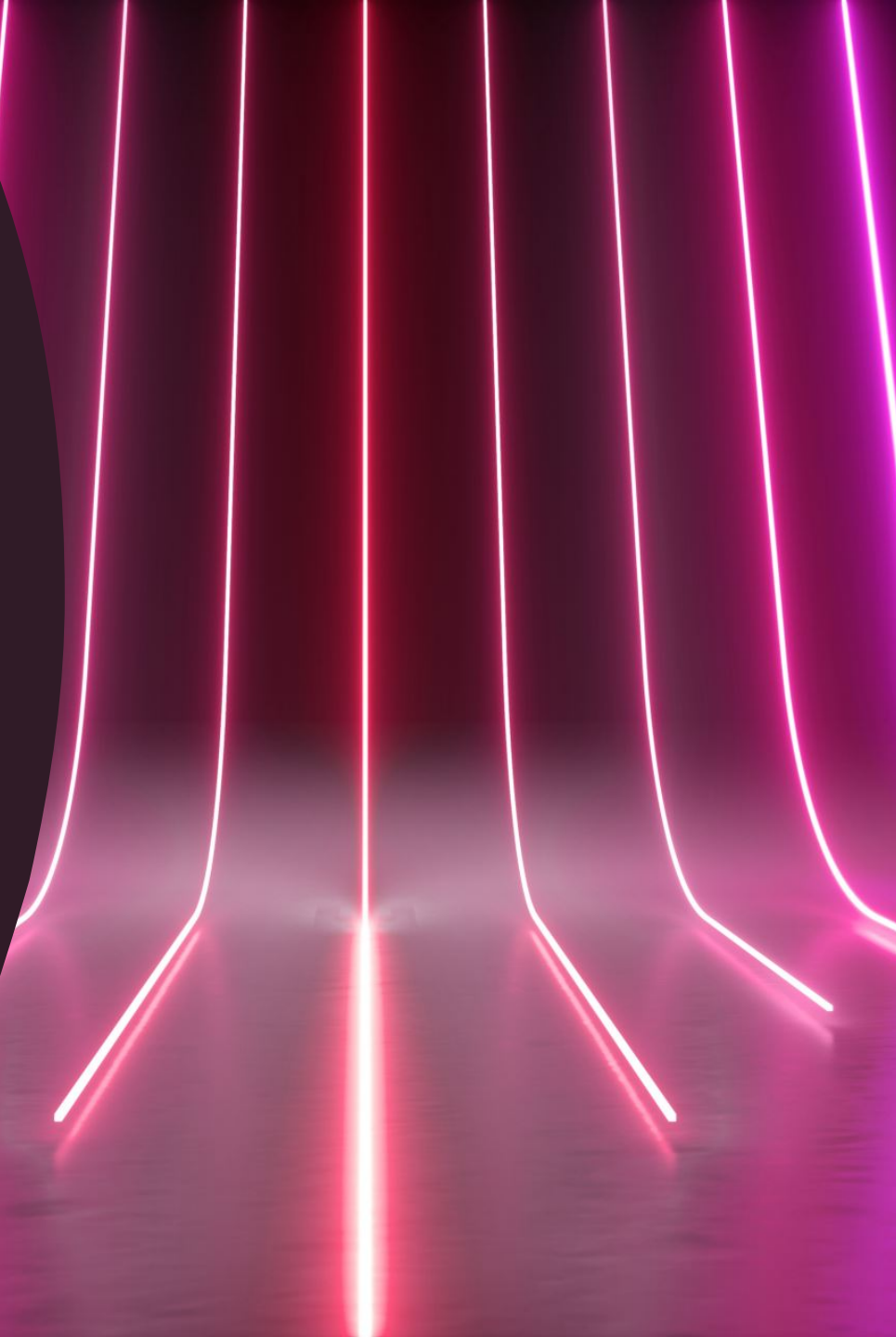
Updates in Cardiology Happening in 2020

Andrew Rauh MD

January 16th, 2021



Disclosure

- None

Colchicine in CAD

- Colcot NEJM 2019
- LoDoCo2 NEJM 2020

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 DECEMBER 26, 2019 VOL. 381 NO. 26

Efficacy and Safety of Low-Dose Colchicine after Myocardial Infarction

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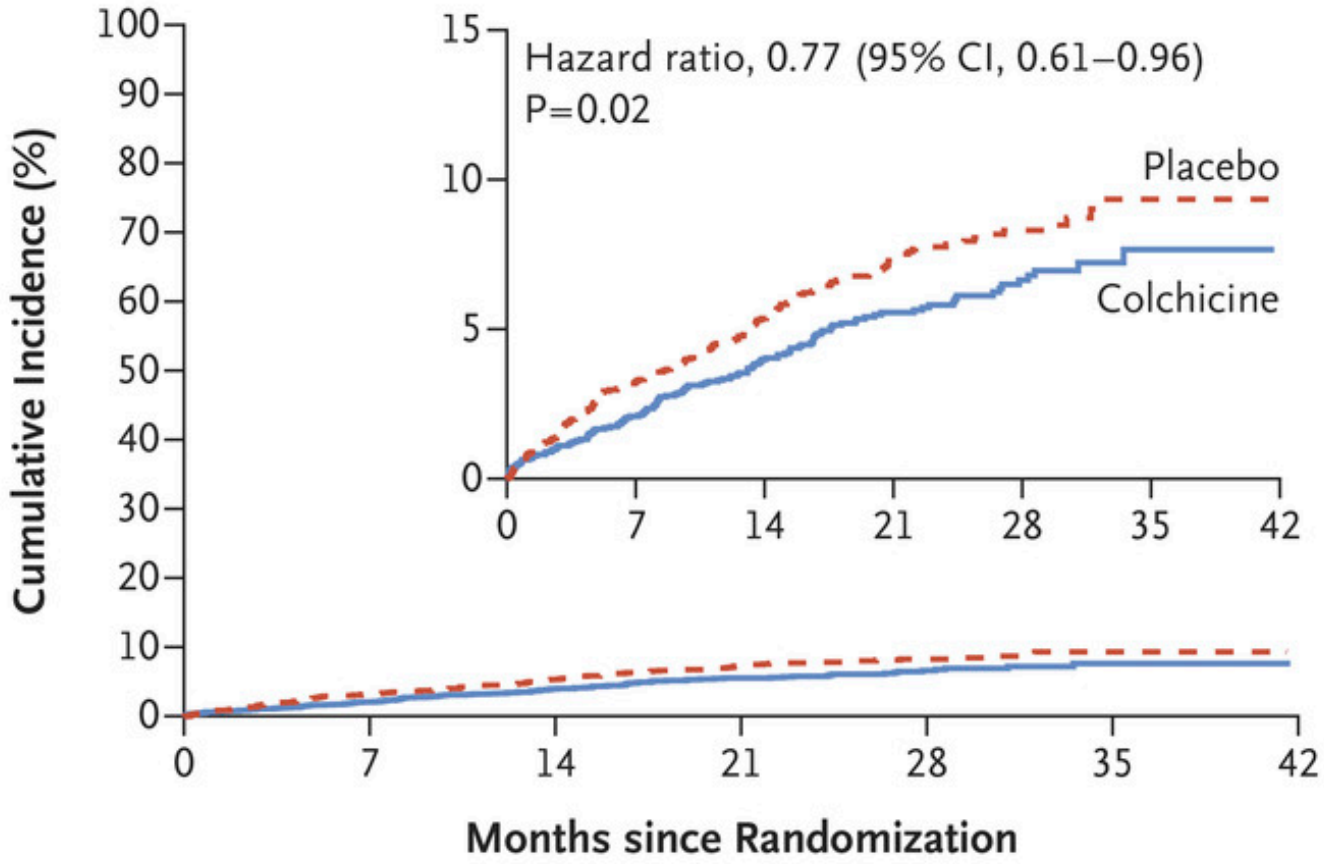
ABSTRACT



No. at Risk							
Placebo	2379	2261	1854	1224	622	144	0
Colchicine	2366	2284	1868	1230	628	153	0

Table 2. Major Clinical End Points (Intention-to-Treat Population).*

End Point	Colchicine (N = 2366)	Placebo (N = 2379)	Hazard Ratio (95% CI)	P Value
	number (percent)			
Primary composite end point	131 (5.5)	170 (7.1)	0.77 (0.61–0.96)	0.02†
Components of primary end point				
Death from cardiovascular causes	20 (0.8)	24 (1.0)	0.84 (0.46–1.52)	
Resuscitated cardiac arrest	5 (0.2)	6 (0.3)	0.83 (0.25–2.73)	
Myocardial infarction	89 (3.8)	98 (4.1)	0.91 (0.68–1.21)	
Stroke	5 (0.2)	19 (0.8)	0.26 (0.10–0.70)	
Urgent hospitalization for angina leading to revascularization	25 (1.1)	50 (2.1)	0.50 (0.31–0.81)	
Secondary composite end point‡	111 (4.7)	130 (5.5)	0.85 (0.66–1.10)	
Death	43 (1.8)	44 (1.8)	0.98 (0.64–1.49)	
Deep venous thrombosis or pulmonary embolus	10 (0.4)	7 (0.3)	1.43 (0.54–3.75)	
Atrial fibrillation	36 (1.5)	40 (1.7)	0.93 (0.59–1.46)	

Colchicine in Patients with Chronic Coronary Disease

Stefan M. Nidorf, M.D., Aernoud T.L. Fiolet, M.D., Arend Mosterd, M.D., John W. Eikelboom, M.D., Astrid Schut, M.Sc., Tjerk S.J. Opstal, M.D., Salem H.K. The, M.D., Xiao-Fang Xu, M.D., Mark A. Ireland, M.D., Timo Lenderink, M.D., Donald Latchem, M.D., Pieter Hoogslag, M.D., et al., for the LoDoCo2 Trial Investigators*

November 5, 2020
N Engl J Med 2020; 383:1838-1847
DOI: 10.1056/NEJMoa2021372

Abstract

BACKGROUND Evidence from a recent trial has shown that the antiinflammatory effects of colchicine reduce the risk of cardiovascular events in patients with recent myocardial infarction, but evidence of such a risk reduction in patients with chronic coronary disease is limited.

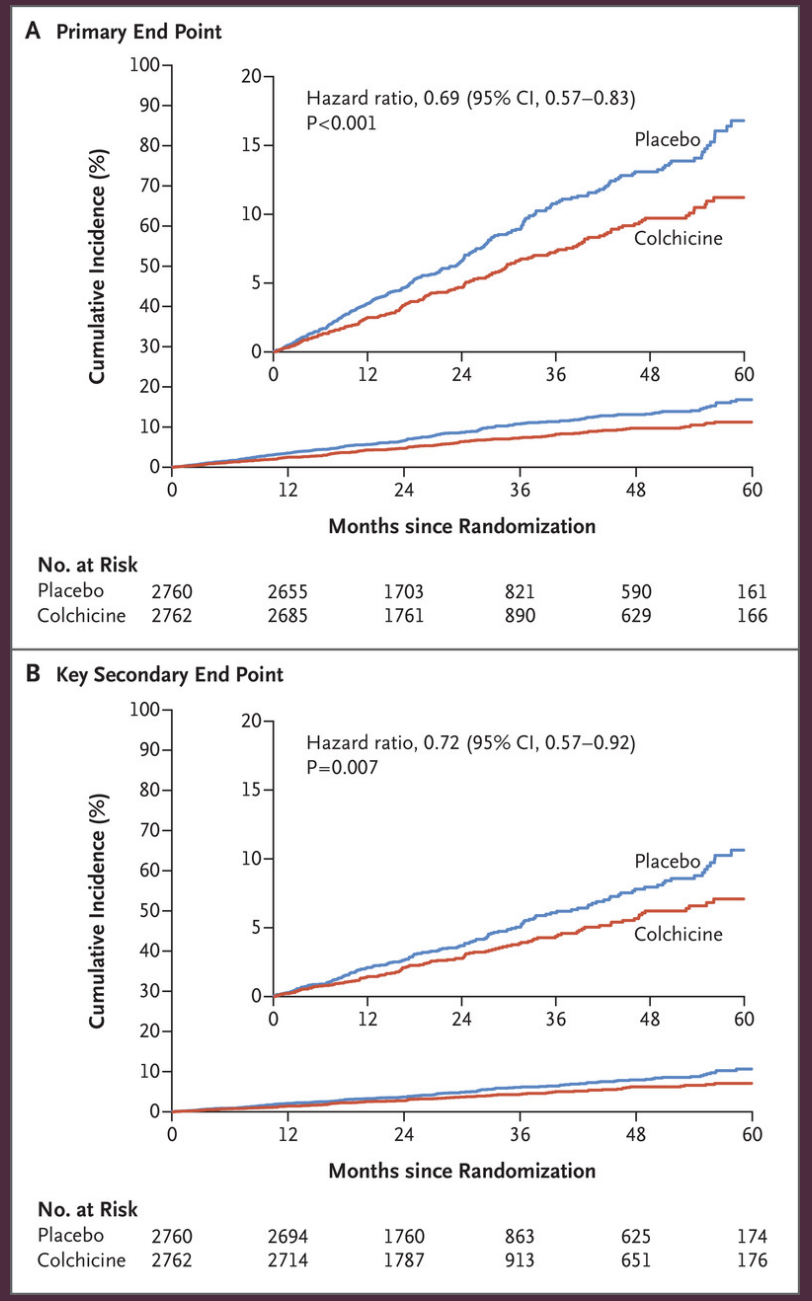

A Primary End Point
Cumulative Incidence (%)
Hazard ratio, 0.69 (95% CI, 0.57–0.83)
P<0.001
Placebo
Colchicine
Months since Randomization
No. at Risk
Placebo 2760 2655 1703 821 590 161
Colchicine 2762 2685 1761 890 629 166
B Key Secondary End Point
Cumulative Incidence (%)
Hazard ratio, 0.72 (95% CI, 0.57–0.92)
P=0.007
Placebo
Colchicine
Months since Randomization
No. at Risk
Placebo 2760 2694 1760 863 625 174
Colchicine 2762 2714 1787 913 651 176

Table 2. Adverse Events in the Intention-to-Treat Population.*

Event	Colchicine (N=2762)		Placebo (N=2760)		Hazard Ratio or Cumulative Incidence Ratio (95% CI)
	no. of patients/ total no. (%)	*no. of events/100 person-yrs*	*no. of patients/ total no. (%)*	*no. of events/100 person-yrs*	
Noncardiovascular death	53/2762 (1.9)	0.7	35/2760 (1.3)	0.5	1.51 (0.99–2.31)
Diagnosis of cancer	120/2762 (4.3)	1.6	122/2760 (4.4)	1.6	0.98 (0.76–1.26)
Hospitalization for infection	137/2762 (5.0)	1.8	144/2760 (5.2)	1.9	0.95 (0.75–1.20)
Hospitalization for pneumonia	46/2762 (1.7)	0.6	55/2760 (2.0)	0.7	0.84 (0.56–1.24)
Hospitalization for gastrointestinal reason	53/2762 (1.9)	0.7	50/2760 (1.8)	0.7	1.06 (0.72–1.56)
Gout	38/2762 (1.4)	—	95/2760 (3.4)	—	0.40 (0.28–0.58)
Neutropenia	4/2762 (0.1)	—	3/2760 (0.1)	—	NR
Myotoxic effects†	3/2762 (0.1)	—	3/2760 (0.1)	—	NR
Myalgia‡	384/1811 (21.2)	—	334/1807 (18.5)	—	1.15 (1.01–1.31)
Dysesthesia: numbness or tingling‡	143/1811 (7.9)	—	150/1807 (8.3)	—	0.95 (0.76–1.18)

* Hazard ratios are reported for noncardiovascular death, diagnosis of cancer, hospitalization for infection, hospitalization for pneumonia, and hospitalization for gastrointestinal reason; cumulative incidence ratios are reported for gout, myalgia, and dysesthesia because time-to-event data were not collected for these end points. Cumulative incidence ratios are not reported (NR) for neutropenia and myotoxic effects because of the low numbers of events.

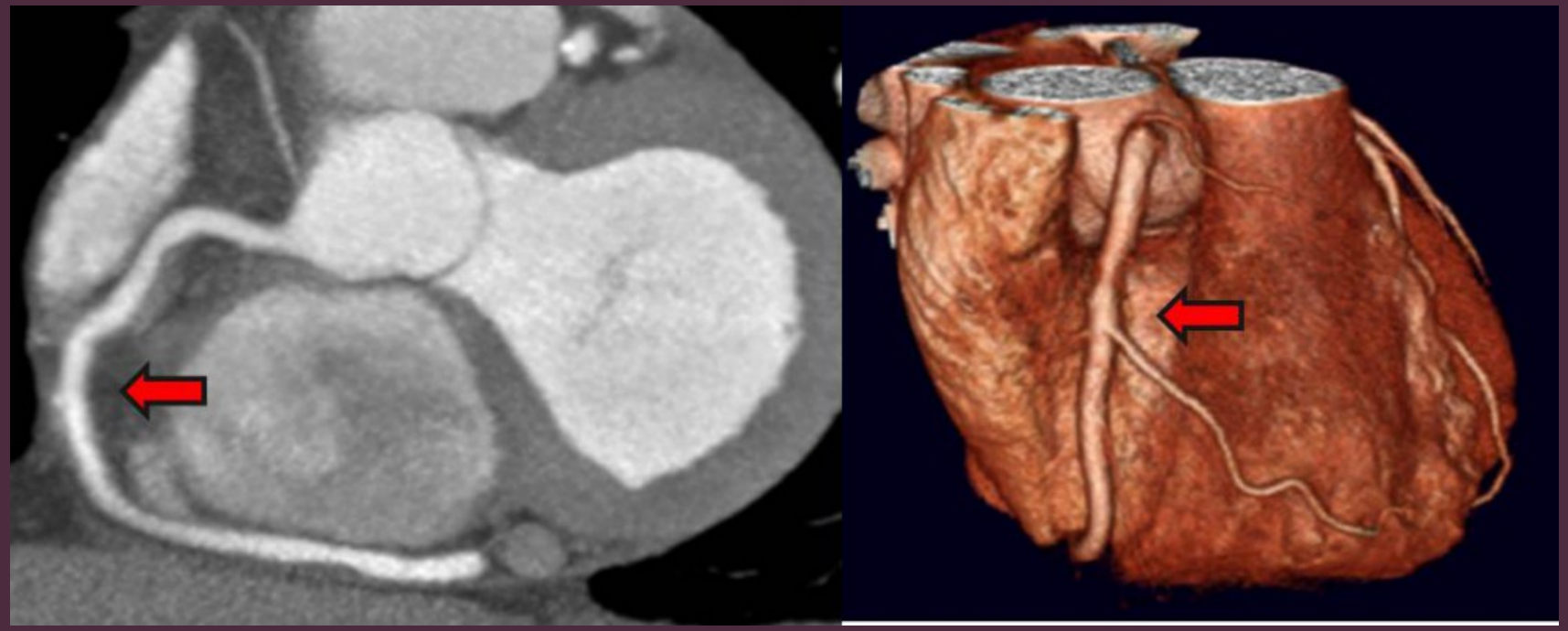
† Rhabdomyolysis occurred in one patient in the colchicine group, who had a full recovery.

‡ Data were collected for the Netherlands cohort only. Reporting of these adverse events was requested by the Medicines Evaluation Board in the Netherlands when the trial was expanded to include patients from that country.

Colchicine in CAD

- Jury still out
- Cost $124/month
  - Varies $136-$224/month
  - Good Rx $33.54-$72.58/month
- Patients with uncontrolled CAD and intolerant of other meds

CT Angiogram with the Coronary Arteries



Coronary CTA

- “…This has culminated with United HealthCare (UHC) now making coronary CTA and CT-FFR the first-line test (over stress testing) for the evaluation of chest pain in low and intermediate risk patients.
- https://www.uhcprovider.com/en/resource-library/news/2020-network-bulletin-features-articles/0520-coronary-cta-reimbursement.html
- Summary: When a provider goes to prior-authorize a stress test for a UHC patient, they will be prompted to instead utilize coronary CTA. If the provider accepts the suggestion, they will receive automatic approval and an authorization number for the coronary CTA and CT FFR. If the provider insists on the stress test, they must go through the normal prior-authorization process. For this new policy, the following tests are considered stress tests: SPECT, PET and echo.
- Also, BCBS IL also recently lifted pre-authorization for coronary CTA and DT FFR. More insurance companies will inevitably follow what UHC has done.”

Coronary Computed Tomography Angiography and the Future Risk of Myocardial Infarction

5-Year Follow-up of the SCOT-HEART Trial
on behalf of the SCOT-HEART Investigators

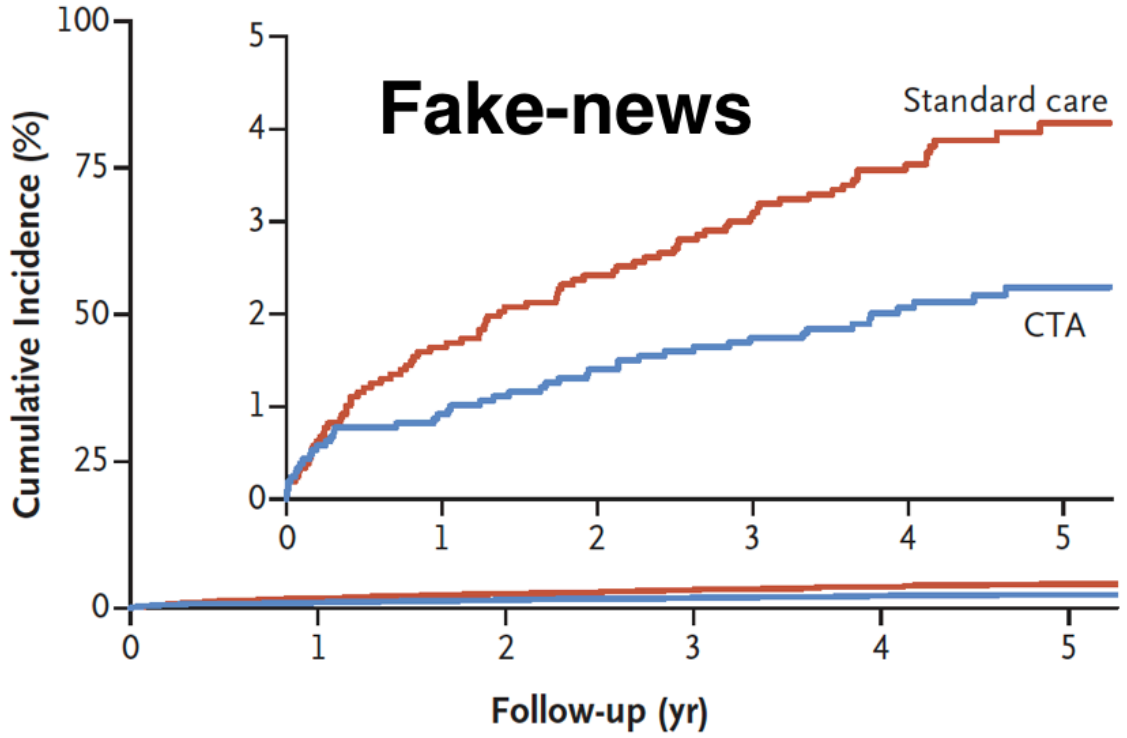
CHIEF SCIENTIST OFFICE

Edinburgh & Lothians Health Foundation

NHS Lothian

ESC Congress Munich 2018

A Death from Coronary Heart Disease or Nonfatal Myocardial Infarction

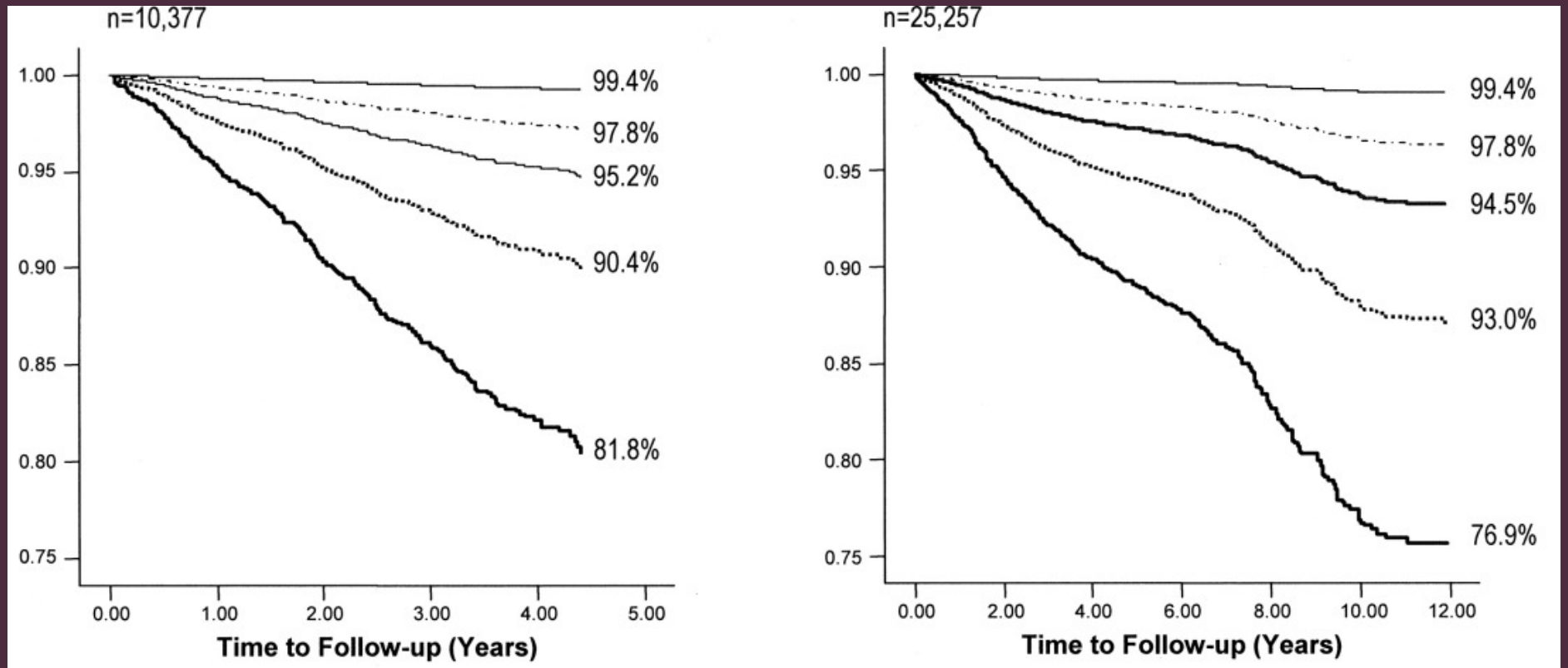


No. at Risk

Standard care	2073	2033	2008	1994	1572	856
CTA	2073	2051	2029	2015	1588	872

Why?

- Technological Advances = fractional flow reserve
- More accurate identification of obstructive CAD
- Better medical management of non-obstructive CAD



CAC Score	(5 Yr Mortality = 1.2%)	(12-Yr Mortality = 2.1%)	Difference
0-10	99.4%	99.4%	0.0%
11-100	97.8%	97.8%	0.0%
101-400	95.2%	94.5%	0.7%
401-1,000	90.4%	93.0%	0.6%
>1,000	81.8%	76.9%	4.9%

Caveats

- Not usable in revascularized patients (PCI or CABG)
- Heart Rate < 65BPM

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Dapagliflozin in Patients with Heart Failure and Reduced Ejection Fraction

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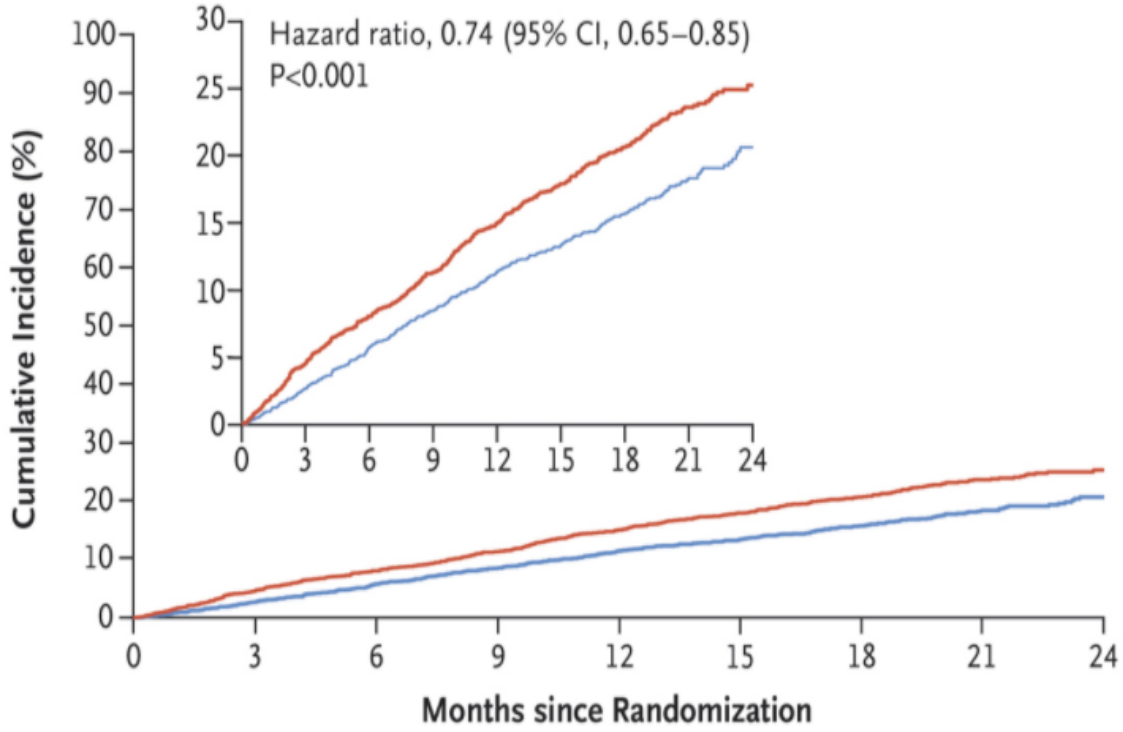
ABSTRACT

BACKGROUND

In patients with type 2 diabetes, inhibitors of sodium–glucose cotransporter 2 (SGLT2) The authors' full names, academic de

A Primary Outcome



No. at Risk

Placebo	2371	2258	2163	2075	1917	1478	1096	593	210
Dapagliflozin	2373	2305	2221	2147	2002	1560	1146	612	210

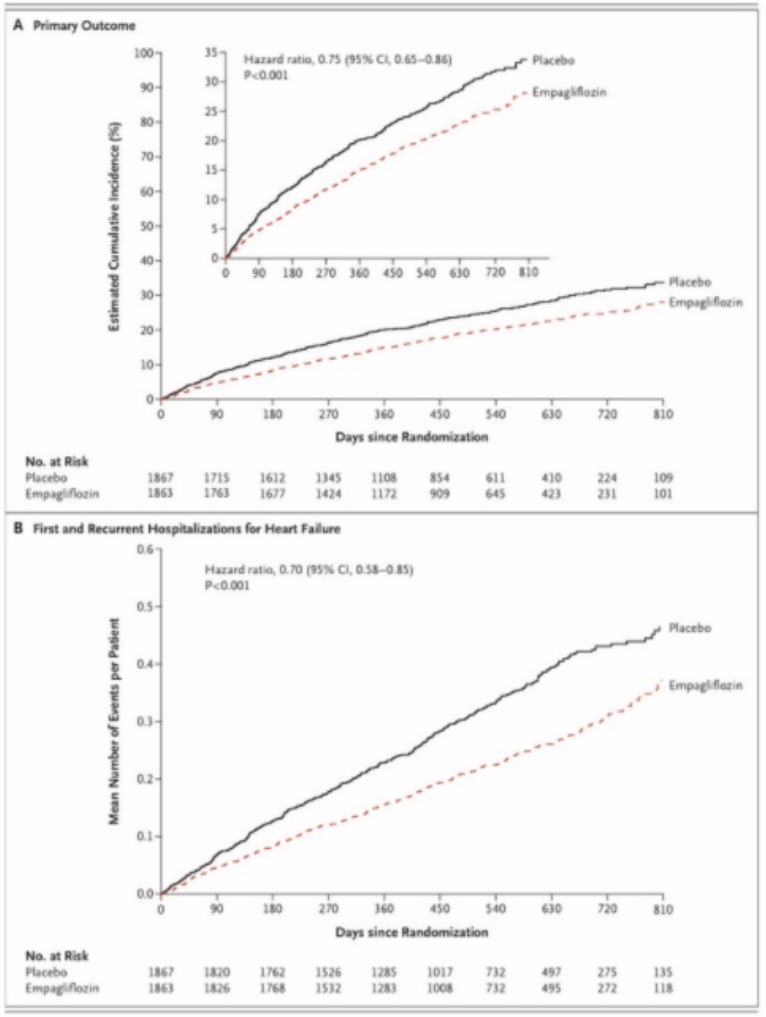
Cardiovascular and Renal Outcomes with Empagliflozin in Heart Failure

Milton Packer, M.D., Stefan D. Anker, M.D., Ph.D., Javed Butler, M.D., Gerasimos Filippatos, M.D., Stuart J. Pocock, Ph.D., Peter Carson, M.D., James Januzzi, M.D., Subodh Verma, M.D., Ph.D., Hiroyuki Tsutsui, M.D., Martina Brueckmann, M.D., Waheed Jamal, M.D., Karen Kimura, Ph.D., et al., for the EMPEROR-Reduced Trial Investigators*

October 8, 2020
N Engl J Med 2020; 383:1413-1424
DOI: 10.1056/NEJMoa2022190

Abstract

BACKGROUND Sodium–glucose cotransporter 2 (SGLT2) inhibitors reduce the risk of hospitalization for heart failure in patients regardless of the presence or absence of diabetes. More evidence is needed regarding the effects of these drugs in patients across the broad spectrum of heart failure, including those with a markedly reduced ejection fraction.



two groups are shown in Table 2. The 4 patients in the placebo group who did not receive placebo were excluded from the safety analyses. Uncomplicated genital tract infection was reported more frequently with empagliflozin than with placebo. Adverse events of interest are listed in Table S2.

Several sensitivity analyses were performed to account for missing follow-up data in 42 patients

JAMA Cardiology | Original Investigation

Outcomes of Cardiovascular Magnetic Resonance Imaging in Patients Recently Recovered From Coronavirus Disease 2019 (COVID-19)

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IMPORTANCE Coronavirus disease 2019 (COVID-19) continues to cause considerable morbidity and mortality worldwide. Case reports of hospitalized patients suggest that COVID-19 prominently affects the cardiovascular system, but the overall impact remains unknown.

OBJECTIVE To evaluate the presence of myocardial injury in unselected patients recently recovered from COVID-19 illness.

DESIGN, SETTING, AND PARTICIPANTS In this prospective observational cohort study, 100 patients recently recovered from COVID-19 illness were identified from the University Hospital Frankfurt COVID-19 Registry between April and June 2020.

EXPOSURE Recent recovery from severe acute respiratory syndrome coronavirus 2 infection, as determined by reverse transcription–polymerase chain reaction on swab test of the upper respiratory tract.

MAIN OUTCOMES AND MEASURES Demographic characteristics, cardiac blood markers, and cardiovascular magnetic resonance (CMR) imaging were obtained. Comparisons were made with age-matched and sex-matched control groups of healthy volunteers (n = 50) and risk factor–matched patients (n = 57).

RESULTS Of the 100 included patients, 53 (53%) were male, and the mean (SD) age was 49 (14) years. The median (IQR) time interval between COVID-19 diagnosis and CMR was 71 (64-92) days. Of the 100 patients recently recovered from COVID-19, 67 (67%) recovered at home, while 33 (33%) required hospitalization. At the time of CMR, high-sensitivity troponin T (hsTnT) was detectable (greater than 3 pg/mL) in 71 patients recently recovered from COVID-19 (71%) and significantly elevated (greater than 13.9 pg/mL) in 5 patients (5%). Compared with healthy controls and risk factor–matched controls, patients recently recovered from COVID-19 had lower left ventricular ejection fraction, higher left ventricle volumes, and raised native T1 and T2. A total of 78 patients recently recovered from COVID-19 (78%) had abnormal CMR findings, including raised myocardial native T1 (n = 73), raised myocardial native T2 (n = 60), myocardial late gadolinium enhancement (n = 32), or pericardial enhancement (n = 22). There was a small but significant difference between patients who recovered at home vs in the hospital for native T1 mapping (median [IQR], 1119 [1092-1150] ms vs 1141 [1121-1175] ms; $P = .008$) and hsTnT (4.2 [3.0-5.9] pg/dL vs 6.3 [3.4-7.9] pg/dL; $P = .002$) but not for native T2 mapping. None of these measures were correlated with time from COVID-19 diagnosis (native T1: $r = 0.07$; $P = .47$; native T2: $r = 0.14$; $P = .15$; hsTnT: $r = -0.07$; $P = .50$). High-sensitivity troponin T was significantly correlated with native T1 mapping ($r = 0.33$; $P < .001$) and native T2 mapping ($r = 0.18$; $P = .01$). Endomyocardial biopsy in patients with severe findings revealed active lymphocytic inflammation. Native T1 and T2 were the measures with the best discriminatory ability to detect COVID-19–related myocardial pathology.

CONCLUSIONS AND RELEVANCE In this study of a cohort of German patients recently recovered from COVID-19 infection, CMR revealed cardiac involvement in 78 patients (78%) and ongoing myocardial inflammation in 60 patients (60%), independent of preexisting conditions, severity and overall course of the acute illness, and time from the original diagnosis. These findings indicate the need for ongoing investigation of the long-term cardiovascular consequences of COVID-19.

JAMA Cardiol. doi:10.1001/jamacardio.2020.3557
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Editorial
Supplemental content

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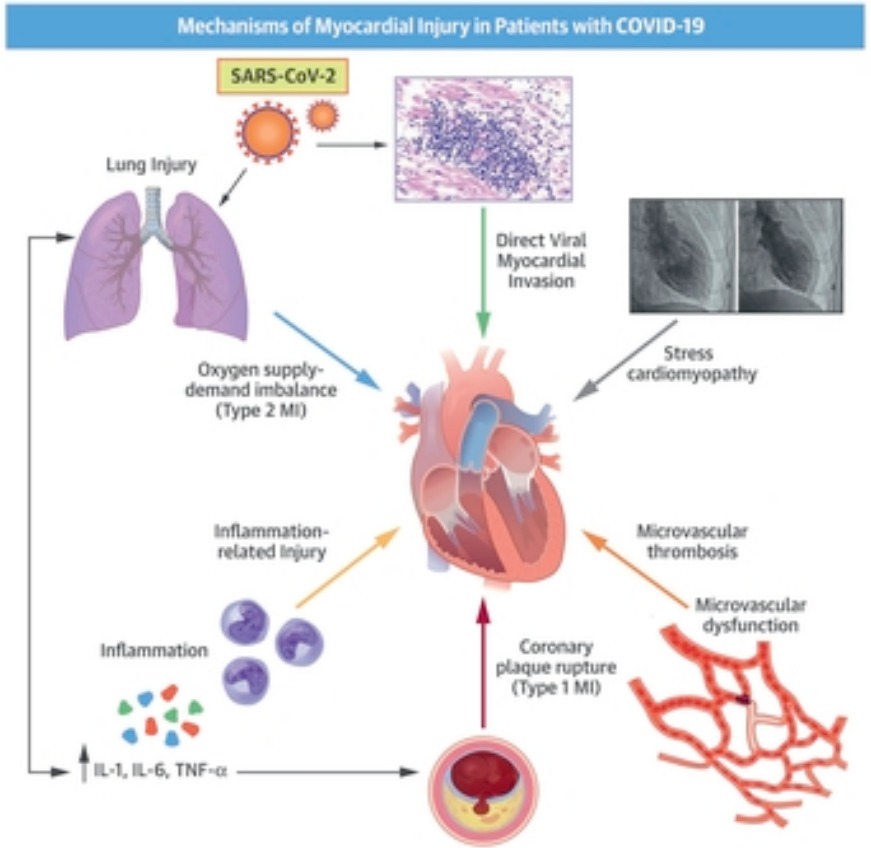
CENTRAL ILLUSTRATION: Overview of the Mechanisms of Myocardial Injury in Patients With Coronavirus Disease 2019



Giustino, G. et al. J Am Coll Cardiol. 2020;76(17):2011-23.

CV Manifestations

- Acute Coronary Syndrome (STEMI or NSTEMI)
- Acute Myocardial Injury without Obstructive CAD
- Arrhythmias
- Heart Failure +/- Cardiogenic Shock
- Pericardial Effusion +/- Tamponade
- Thromboembolic Complications

Covid-19 Mortality Rates

Comorbidity	Case Fatality Rate
Overall	2.3%
Re-existing CVD	10.5%
Diabetes	7.3%
Chronic resp. disease	6.3%
Hypertension	6.0%
Cancer	5.6%
No pre-existing conditions	0.9%

Males and especially underserved communities at higher risk

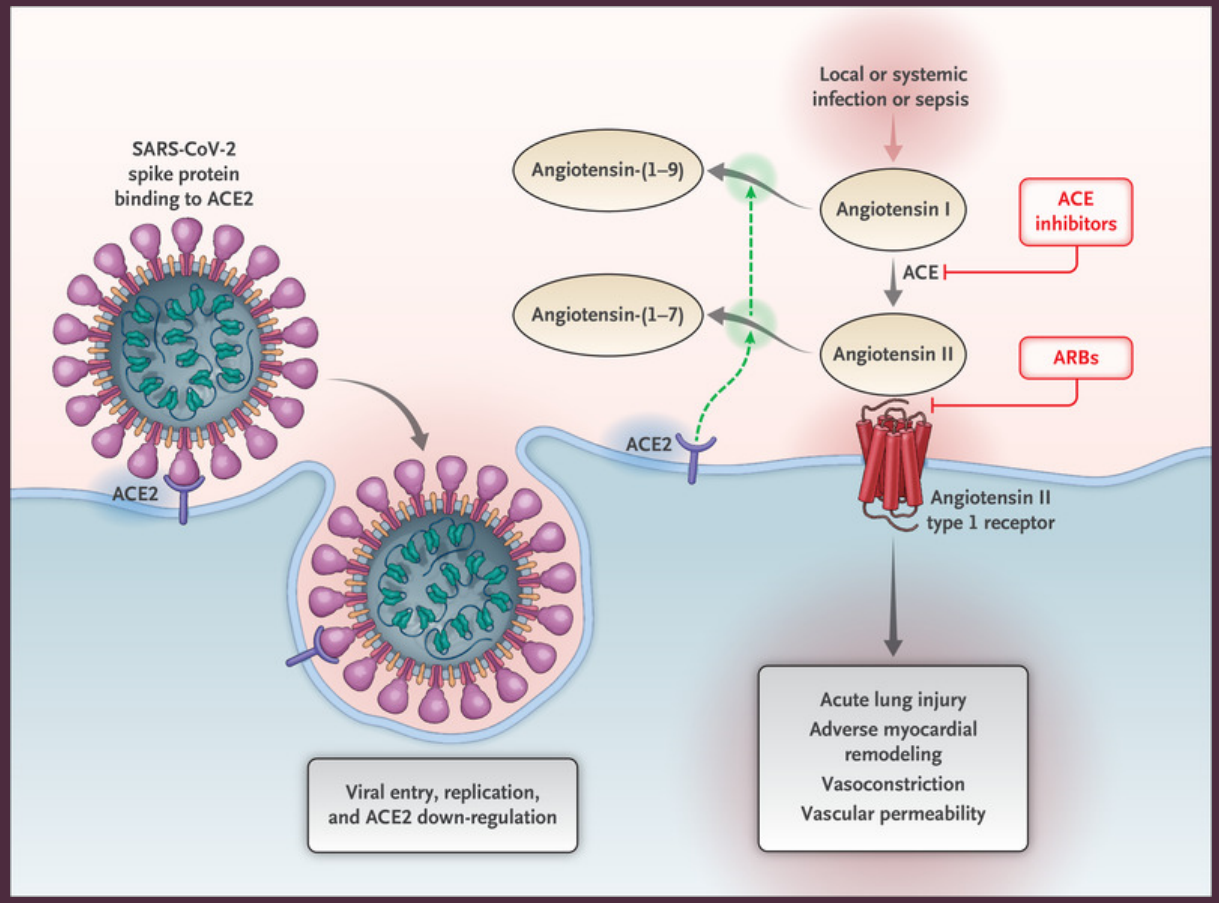
Table 1. Demographic Characteristics and Coexisting Conditions among Survivors and Nonsurvivors of Covid-19.*

Characteristic or Condition	Survivors (N=8395)	Nonsurvivors (N=515)	Difference (95% CI)†
Age — yr	48.7±16.6	55.8±15.1	−7.1 (−8.4 to −5.7)
Age >65 yr — no. (%)	1327 (15.8)	147 (28.5)	−12.7 (−16.0 to −9.4)
Female sex — no. (%)	3392 (40.4)	179 (34.8)	5.6 (1.3 to 10.0)
Race or ethnic group — no. (%)‡			
White	5306 (63.2)	351 (68.2)	−5.0 (−9.1 to −0.8)
Black	672 (8.0)	34 (6.6)	1.4 (−0.8 to 3.6)
Hispanic	529 (6.3)	32 (6.2)	0.1 (−2.0 to 2.3)
Asian	1637 (19.5)	84 (16.3)	3.2 (−0.2 to 6.5)
Native American	34 (0.4)	1 (0.2)	0.2 (−0.3 to 0.8)
Other	219 (2.6)	13 (2.5)	0.1 (−1.4 to 1.4)
Coexisting conditions — no. (%)			
Coronary artery disease	907 (10.8)	103 (20.0)	−9.2 (−12.8 to −5.7)
Congestive heart failure	160 (1.9)	29 (5.6)	−3.7 (−5.8 to −1.8)
Cardiac arrhythmia	269 (3.2)	35 (6.8)	−3.6 (−5.8 to −1.4)
Diabetes mellitus	1175 (14.0)	97 (18.8)	−4.8 (−8.3 to −1.3)
Hypertension	2216 (26.4)	130 (25.2)	1.2 (−2.8 to 5.1)
Hyperlipidemia	2535 (30.2)	180 (35.0)	−4.8 (−9.0 to −0.5)
COPD	193 (2.3)	32 (6.2)	−3.9 (−6.1 to −1.8)
Current smoker	445 (5.3)	46 (8.9)	−3.6 (−6.2 to −1.1)
Former smoker	1410 (16.8)	83 (16.1)	0.7 (−2.6 to 4.0)
Immunosuppressed condition	227 (2.7)	22 (4.3)	−1.6 (−3.4 to 0.2)

* Plus–minus values are means ±SD. The 95% confidence intervals (CIs) have not been adjusted for multiple testing and should not be used to infer definitive effects. COPD denotes chronic obstructive pulmonary disease, and Covid-19 coronavirus disease 2019.
† For mean age, the difference is given in years; for all other characteristics, the difference is given in percentage points.
‡ Race and ethnic group were reported by the patient.

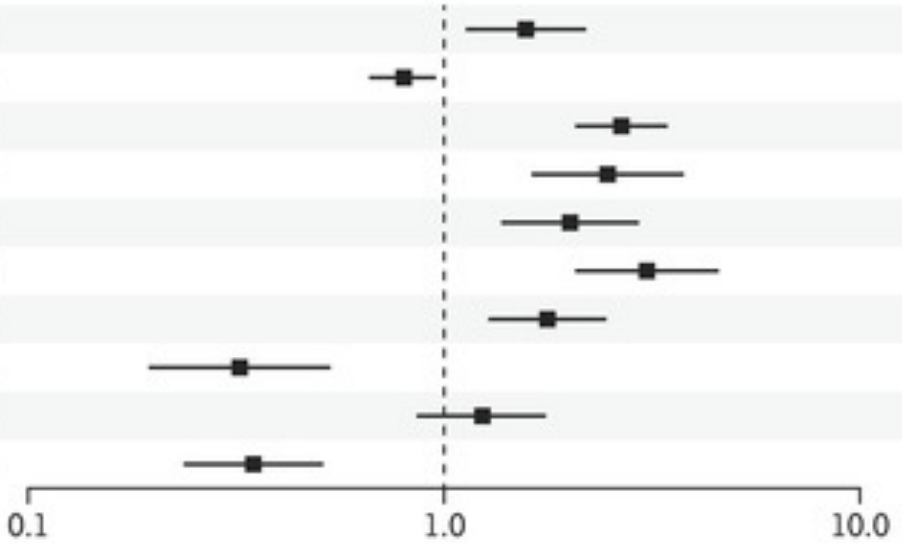
Practical Considerations: ACE-I/ARB Therapy

- ACE-2
  - Widely expressed in heart, kidneys, lung alv. Epithelial cells
  - The Bad: SARS-CoV-2 (and 1) enter host cells by binding ACE2
  - The Good: ACE-2 is homolog to ACE but is counter-regulatory: degrades Ang-II this lowers its effects on vasoconstriction, NA+ retention, fibrosis1,2

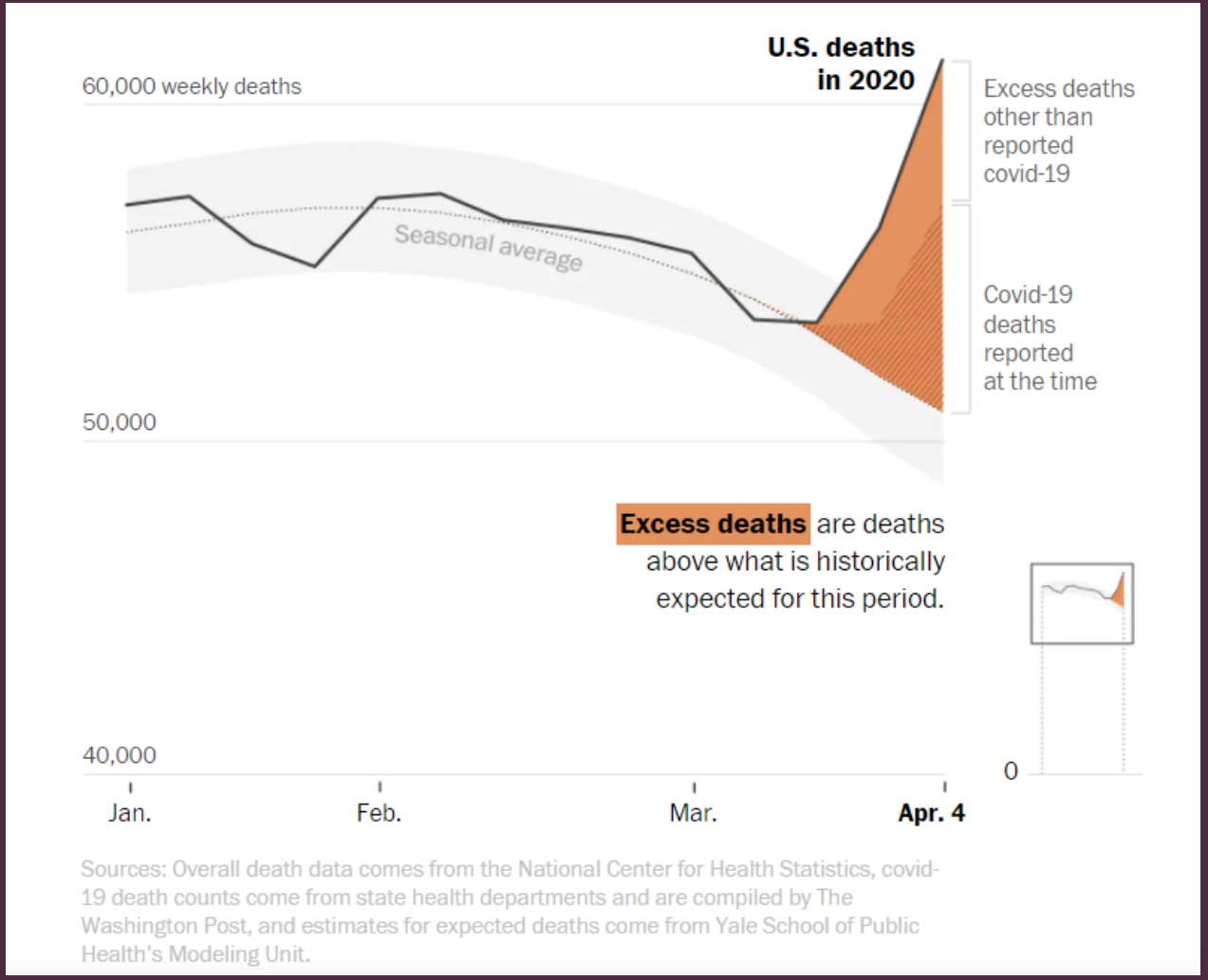


ACEi/ARB Therapy and COVID-19 Infection

Risk Factor	Risk Factor Present	Risk Factor Absent	Odds Ratio (95% CI)
	no. of patients who died/total no. (%)		
>65 yr of age	147/1474 (10.0)	368/7436 (4.9)	1.93 (1.60–2.41)
Female sex	179/3571 (5.0)	336/5339 (6.3)	0.79 (0.65–0.95)
Coronary artery disease	103/1010 (10.2)	412/7900 (5.2)	2.70 (2.08–3.51)
Congestive heart failure	29/189 (15.3)	486/8721 (5.6)	2.48 (1.62–3.79)
Arrhythmia	35/304 (11.5)	480/8606 (5.6)	1.95 (1.33–2.86)
COPD	32/225 (14.2)	483/8685 (5.6)	2.96 (2.00–4.40)
Current smoker	46/491 (9.4)	469/8419 (5.6)	1.79 (1.29–2.47)
Receiving ACE inhibitor	16/770 (2.1)	499/8140 (6.1)	0.33 (0.20–0.54)
Receiving ARB	38/556 (6.8)	477/8354 (5.7)	1.23 (0.87–1.74)
Receiving statin	36/860 (4.2)	479/8050 (6.0)	0.35 (0.24–0.52)



Excess Deaths Beyond COVID-19



What to Do When Seen Back in the Office

- Athletes:
  - Depends on severity of disease
  - Depends on level of competition
    - Echo
    - Trop
    - EKG
    - MRI?
- Aspirin