PHARMACY VISION 20/20

CSHP SEMINAR 20 • OCTOBER 21-25

Disneyland RESORT

What is the role of aspirin for primary prevention?

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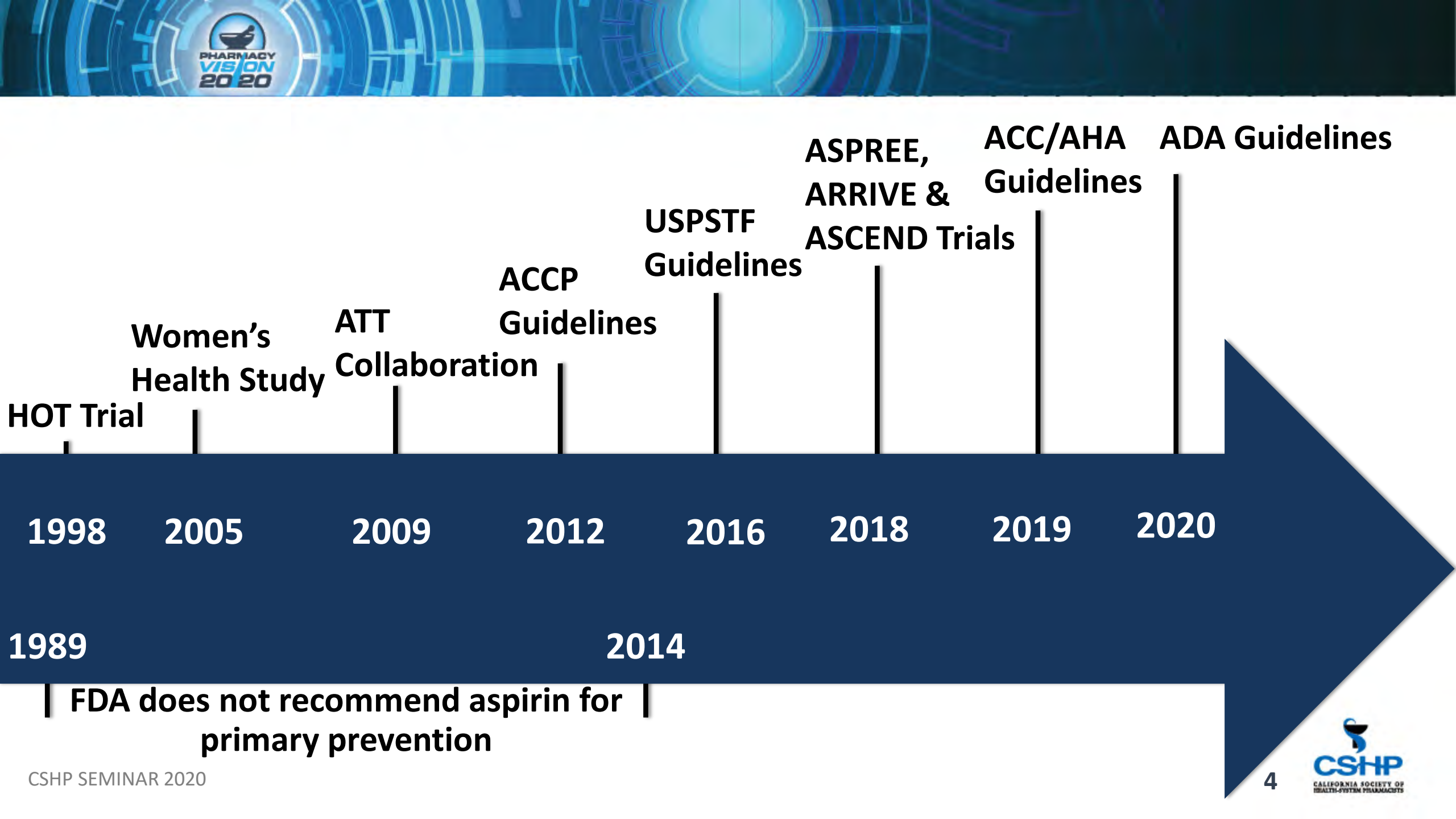
DISCLOSURE

All presenters of this session have no potential conflicts of interest

Learning Objectives

- Identify patients who are likely to benefit from aspirin for primary prevention
- Discuss the risks and benefits of using aspirin for a specific patient
- Implement strategies to improve appropriate use of aspirin therapy for primary prevention to reduce the risk of cardiovascular events


1998
HOT Trial
2005
Women's Health Study
2009
ATT Collaboration
2012
ACCP Guidelines
2016
USPSTF Guidelines
2018
ASPREE, ARRIVE & ASCEND Trials
2019
ACC/AHA Guidelines
2020
ADA Guidelines
1989
FDA does not recommend aspirin for primary prevention
2014

HYPERTENSION OPTIMAL TREATMENT (HOT) TRIAL (1998)

- Primary endpoint: Aspirin 75mg significantly decreased non-fatal myocardial infarction (MI), non-fatal stroke, and cardiovascular (CV) death by 15% (p = 0.03)
- All MI was 36% less frequent in the aspirin group (p = 0.002)
- No difference in stroke incidence between patients randomized to aspirin or placebo

1. Kjeldsen SE et al. J Hypertens. 2000

WOMEN'S HEALTH STUDY (2005)

- Primary endpoint: No significant difference between aspirin 100mg and placebo for non-fatal stroke, non-fatal MI, and CV death
- Fatal and non-fatal stroke was reduced by 17% (RR 0.83, 95% CI 0.69–0.99, p = 0.04)
- No change in the rates of MI or CV death

2. Ridker PM et al. N Engl J Med. 2005

ANTITHROMBOTIC TRIALISTS' (ATT) COLLABORATION (2009)

- Meta-analyses of six primary prevention trials
- 12% reduction in serious vascular events (0.51% aspirin vs 0.57% placebo per year, p = 0.0001)
  - Mainly due to non-fatal MI
- Stroke was not significant
- Aspirin increased major gastrointestinal (GI) and extracranial bleeds (0.10% vs 0.07% per year, p < 0.0001)

3. Antithrombotic Trialists' (ATT) Collaboration. Lancet. 2009

FOOD AND DRUG ADMINISTRATION (FDA)

- In 2003, Bayer Health Care petitioned the FDA to include an indication of aspirin for primary prevention. The FDA held off its decision until the completion of large randomized clinical trials

- In 2014, the FDA **did not recommend** aspirin for primary prevention

4. Use of Aspirin for Primary Prevention of Heart Attack and Stroke. FDA. 2014

American College of Chest Physicians (ACCP) 2012 Guidelines

- Recommend aspirin 75-100mg daily for persons ≥ 50 years without symptomatic cardiovascular disease (CVD) over no aspirin (Grade 2B)
- Relative benefit of aspirin is similar in patients with and without diabetes
- Patient decision to take long term therapy for “very small benefits”
- Acknowledge valuing preventing MI over avoiding GI bleed

5. Vandvik PO et al. Chest. 2012

USPSTF 2016 GUIDELINES

Population	Recommendation	Grade
50-59yo + 10-year CVD risk ≥ 10%	Recommend low-dose aspirin for primary prevention of CVD and colorectal cancer (CRC)	B
60-69yo + 10-year CVD risk ≥ 10%	Decision to initiate low-dose aspirin use for the primary prevention of CVD and CRC should be individualized Persons who place a higher value on the potential benefits than the potential harms may choose to initiate low-dose aspirin.	C

6. U.S. Preventive Services Task Force. Ann Intern Med. 2016

OUTCOMES OF THE MAJOR STUDIES

Study Date	Nonfatal MI	Nonfatal Stroke	Major GI Bleed
1988	NS	NS	NS
1989	p<0.0001	NS	NS
1998	p=0.004	NS	NS
1998	p = 0.002	NS	p<0.001

7. Raber I et al. Lancet. 2019

OUTCOMES OF THE MAJOR STUDIES

Study Date	Nonfatal MI	Nonfatal Stroke	Major GI Bleed
1988	NS	NS	NS
1989	p<0.0001	NS	NS
1998	p=0.004	NS	NS
1998	p = 0.002	NS	p<0.001
2001	NS	NS	NS
2005	NS	p=0.02	NS
2005	NS	NS	NS
2008	NS	NS	NS
2010	NS	NS	NS
2013	p=0.02	NS	p=0.004

7. Raber I et al. Lancet. 2019

Risk Stratification

- Framingham Risk Calculator
- American College of Cardiology/American Heart Association (ACC/AHA) Pooled Cohort Equations CV Risk Calculator
- Systematic Coronary Risk Evaluation (SCORE) – European
- Coronary Artery Calcium (CAC) Scoring

Modern Primary Prevention Trials

ASPREE
Age > 70 years old

ARRIVE
Moderate RISK
(ASCVD < 20%)

ASCEND
People with Diabetes

ASPREE TRIAL

Effect of Aspirin on Disability-Free Survival in the Healthy Elderly

ASPREE

- Multicenter, randomized, double-blind, placebo-controlled
- Aspirin 100mg vs Placebo
- Setting: United States and Australia
- Median follow-up: 4.7 years
- Analysis: Intention-to-treat
- Primary endpoint: Disability-free survival

8.McNeil JJ et al. N Engl J Med 2018

ASPREE

Inclusion Criteria

- Age ≥ 70 years
- Age ≥ 65 if in the US and black or Hispanic

Exclusion Criteria

- Prior CVD
- Atrial fibrillation
- Dementia
- Severe physical disability
- Aspirin for secondary prevention
- Likely death within 5 years
- Uncontrolled hypertension

8. McNeil JJ et al. N Engl J Med 2018

ASPREE Baseline Characteristics

Characteristic	Aspirin (n = 9525)	Placebo (n = 9589)
Age — %		
65–73 years	49.5	50.3
≥74 years	50.5	49.7
Female sex — %	56.4	56.4
White race — %	91.5	91.1
Current smoking — %	3.7	4.0
Diabetes mellitus — %	10.8	10.7

8. McNeil JJ et al. N Engl J Med 2018

ASPREE Baseline Characteristics

Characteristic	Aspirin (n = 9525)	Placebo (n = 9589)
BMI	28.1	28.1
No. of CV risk factors		
0 or 1	31	30
2	42	42
3 or 4	28	28
Statin use — (%)	34.1	33.6
PPI use — (%)	25	25

8. McNeil JJ et al. N Engl J Med 2018

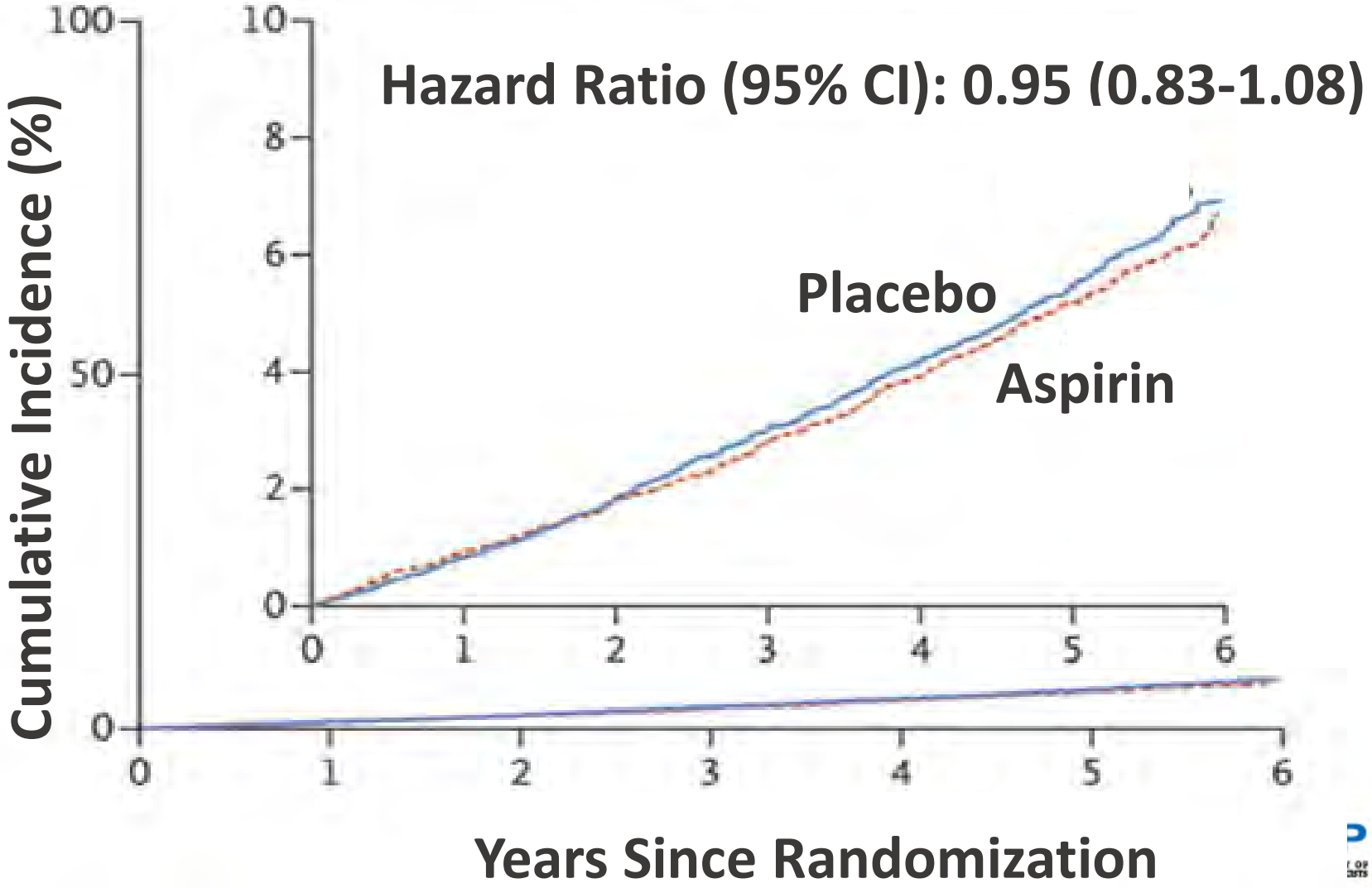
ASPREE Primary Endpoint

Type of Event no. (%)	Aspirin (n = 9525)	Placebo (n = 9589)	Rate Ratio (95% CI)	P Value
Primary endpoint	921 (9.7)	914 (9.5)	1.01 (0.92–1.11)	0.79
Death from any cause	558 (5.9)	494 (5.2)	1.14 (1.01–1.29)	
Dementia	283 (3.0)	292 (3.0)	0.98 (0.83–1.15)	
Persistent physical disability	188 (1.2)	224 (2.3)	0.85 (0.70–1.03)	

8. McNeil JJ et al. N Engl J Med 2018

ASPREE Secondary Endpoint

Composite:
fatal coronary disease, fatal MI, fatal/non-fatal stroke or initiation of heart failure



8. McNeil JJ et al. N Engl J Med 2018

ASPREE Secondary Endpoints

Type of Event no. (%)	Aspirin (n = 9525)	Placebo (n = 9589)	Hazard Ratio (95% CI)
Any death	558 (5.9)	494 (5.2)	1.14 (1.01–1.29)
Cancer death	295 (3.1)	227 (2.3)	1.31 (1.10–1.56)
Colorectal Cancer	35 (0.4)	20 (0.2)	1.77 (1.02–3.06)

8. McNeil JJ et al. N Engl J Med 2018

ASPREE Secondary Endpoints

Type of event	Aspirin (n = 9525)	Placebo (n = 9589)	Hazard Ratio (95% CI)	P Value
Major hemorrhage	361	265	1.38 (1.18–1.62)	< 0.001
Intracranial bleeding	107	72	1.50 (1.11–2.02)	
Upper gastrointestinal bleeding	89	48	1.87 (1.32–2.66)	
Fatal major hemorrhage	28	24	1.18 (0.68–2.03)	

8. McNeil JJ et al. N Engl J Med 2018

ASPREE Clinical Implications

- Aspirin did not improve disability-free survival in healthy elderly
- Significant increase in major hemorrhage, GI bleed, and intracranial hemorrhage risk
- No significant difference in fatal hemorrhage risk
- Moderate adherence and & high crossover
- Low CV event rate

SUMMARY OF MODERN PRIMARY PREVENTION TRIALS

ASPREE

Age > 70 years old

No CV benefit

↑ Bleeding rate

ARRIVE TRIAL

Use of aspirin to reduce risk of initial vascular events in patients at moderate risk of cardiovascular disease

ARRIVE

- Multicenter, randomized, double-blind, placebo-controlled trial
- Setting: Primary care offices in Germany, Italy, Ireland, Poland, Spain, the UK, and USA
- Aspirin 100mg vs placebo
- Analysis: Intention-to-treat and per-protocol
- Primary endpoint: Time to first occurrence of composite CV event

9. Baigent C et al. Lancet. 2009

ARRIVE Baseline Characteristics

Characteristic	Aspirin (n = 6270)	Placebo (n = 6276)
Age (years)	63.9	63.9
Male sex — %	70.5	70.4
White race — %	97.8	97.9
Current smoker — %	28.8	28.5
Mean BMI	28.3	28.5
Mean ACC/AHA 10-year ASCVD risk score — %	17.3	17.4
Mean Framingham 10-year risk score— %	13.9	14.1

9. Baigent C et al. Lancet. 2009

ARRIVE

Inclusion Criteria

- Men ≥ 55yo with 2-4 risk factors
- Women ≥ 60yo with ≥ 3 risk factors
- 10-year cardiovascular risk score of 10-20% (moderate)

Exclusion Criteria

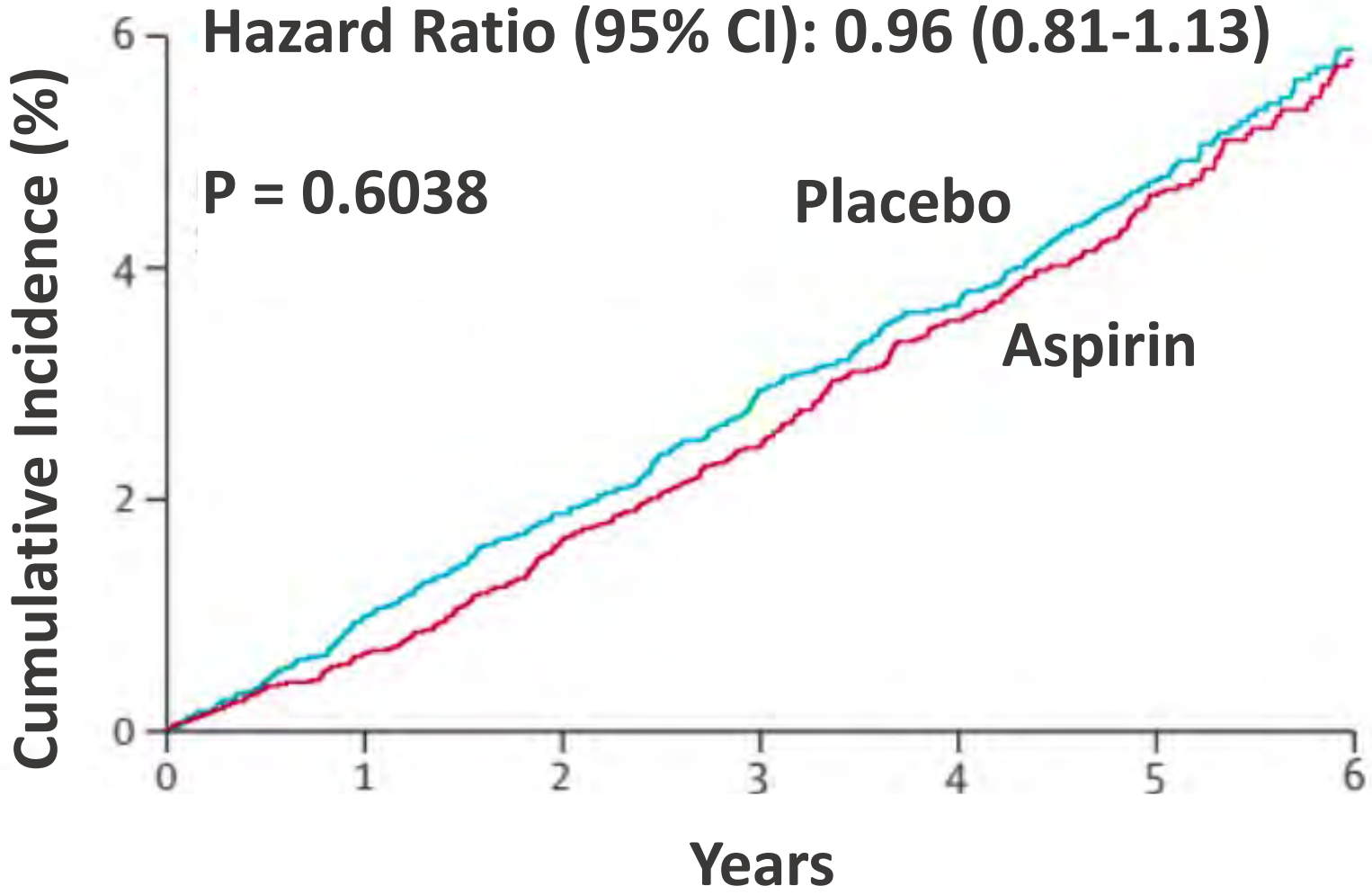
- High risk of GI bleed or other bleed
- Hx of vascular event
- Anticoagulation, antiplatelet, or frequent NSAID therapy
- Diabetes

9. Baigent C et al. Lancet. 2009

ARRIVE Primary Endpoint

Composite:

MI, stroke, CV Death, unstable angina, or TIA



9. Baigent C et al. Lancet. 2009

ARRIVE Secondary Endpoints

Type of Event	Hazard Ratio (95% CI)	P Value
MI, stroke, or CV Death	0.95 (0.79-1.15)	0.6190
MI	0.85 (0.64-1.11)	0.2325
Non-fatal MI	0.90 (0.67-1.20)	0.4462
Stroke	1.12 (0.80-1.55)	0.5072
CV Death	0.97 (0.62-1.52)	0.9010
Unstable angina	1.0 (0.54-1.86)	0.9979
TIA	0.93 (0.61-1.42)	0.7455

9. Baigent C et al. Lancet. 2009

ARRIVE Secondary Endpoints

	Type of Event	Hazard Ratio (95% CI)	P Value
Intention-to-treat	MI	0.85 (0.64-1.11)	0.2325
	Non-fatal MI	0.90 (0.67-1.20)	0.4462
Per-Protocol	MI	0.53 (0.36-0.79)	0.0014
	Non-fatal MI	0.55 (0.36-0.84)	0.0056

9. Baigent C et al. Lancet. 2009

ARRIVE Safety Analysis

Type of Event no. (%)	Aspirin (n = 6270)	Placebo (n = 6276)	Hazard Ratio (95% CI)	P Value
GI bleed	61 (0.97)	29 (0.46)	2.11 (1.36-3.28)	0.0007
Treatment-related GI bleed	15 (0.24)	2 (0.03)		
Treatment-related adverse events	1050 (16.75)	850 (13.54)		< 0.0001
Any death	160 (2.55)	161 (2.57)	0.99 (0.80-1.24)	0.9459

9. Baigent C et al. Lancet. 2009

ARRIVE Clinical Implications

- Aspirin did not lower CV risk in patients with multiple CV factors
- Estimated 10-year vascular risk of 17.3% was substantially lower than observed risk of < 10%
    - Risk calculators may overestimate based on older data
- No effect on CV events and all cause mortality in moderate risk patients

9. Baigent C et al. Lancet. 2009

SUMMARY OF MODERN PRIMARY PREVENTION TRIALS

ASPREE
Age > 70 year old

No CV benefit
↑ Bleeding rate

ARRIVE
Moderate CV Risk
(ASCVD < 20%)

No CV benefit
↑ Bleeding rate

ASCEND TRIAL

Effects of Aspirin for Primary Prevention in Persons with Diabetes
ASCEND (A Study of Cardiovascular Events in Diabetes)

ASCEND

- Multicenter, double-blind, randomized, controlled trial
- Aspirin 100mg vs Placebo
- Setting: United Kingdom
- Mean of follow-up: 7.4 years
- Analysis: Intention-to-treat
- Primary endpoint: first serious vascular event (MI, stroke, TIA, death from any vascular cause *excluding* ICH)

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND

Inclusion Criteria

- Age ≥ 40 years
- Diagnosis of diabetes
- No known CVD
- Substantial uncertainty antiplatelet therapy would confer worthwhile benefit

Exclusion Criteria

- Clear indication for aspirin
- Contraindication to aspirin
- Presence of other clinically significant conditions that might limit adherence to the trial regimen for at least 5 years

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Baseline Characteristics

Characteristic	Aspirin (n = 7740)	Placebo (n = 7740)
Mean — yr	63.2	63.3
White race — %	96.5	96.5
Sex (male) — %	62.6	62.5
Current smoker — %	8.3	8.3
Mean SBP (mmHg)	136.1	136.2
Vascular Risk Score — %		
Low	40.4	40.5
Moderate	42.6	42.0
High	17.0	17.4

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Baseline Characteristics

Characteristic	Aspirin (n = 7740)	Placebo (n = 7740)
A1C Distribution (%)		
< 6.5	21	21
6.5-8	30	30
> 8	12	12
unknown	37	37
Statin use (%)	75.6	74.9
PPI (%)	14	15
NSAID (%)	9	9

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Primary Efficacy Endpoint

Type of Event no. (%)	Aspirin (n = 7740)	Placebo (n = 7740)	Rate Ratio (95% CI)	P Value
Any serious vascular event including TIA	658 (8.5)	743 (9.6)	0.88 (0.79-0.97)	0.01

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

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Any serious vascular event excluding TIA	542 (7.0)	587 (7.6)	0.92 (0.82-1.03)	

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

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NNT = 91 over 7.4 years

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Secondary Endpoint

Type of Event (%)	Aspirin (n = 7740)	Placebo (n = 7740)	Rate Ratio (95% CI)
Nonfatal MI	2.5	2.5	0.98 (0.80–1.19)
Nonfatal ischemic stroke	2.6	3.0	0.88 (0.73–1.06)
Vascular death excluding ICH	2.5	2.8	0.91 (0.75–1.10)
TIA	2.2	2.5	0.85 (0.69–1.04)

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Primary Safety Endpoint

Type of Event no. (%)	Aspirin (n=7740)	Placebo (n=7740)	Rate Ratio (95% CI)	P Value
Any major bleeding	314 (4.1)	245 (3.2)	1.29 (1.09–1.52)	0.003
Other major bleeding	74 (1.0)	43 (0.6)	1.70 (1.18–2.44)	
Serious GI bleeding	137 (1.8)	101 (1.3)	1.36 (1.05–1.75)	
Sight-threatening bleeding	57 (0.7)	64 (0.8)	0.89 (0.62–1.27)	
Intracranial hemorrhage	55 (0.7)	45 (0.6)	1.22 (0.82–1.81)	

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

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10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

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Other major bleeding	74 (1.0)	43 (0.6)	1.70 (1.18–2.44)	
Serious GI bleeding	**137 (1.8)**	**101 (1.3)**	**1.36 (1.05–1.75)**	
Sight-threatening bleeding	57 (0.7)	64 (0.8)	0.89 (0.62–1.27)	
Intracranial hemorrhage	55 (0.7)	45 (0.6)	1.22 (0.82–1.81)	

NNH = 112 over 7.4 years

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Secondary Endpoint

Type of Event (%)	Aspirin (n=7740)	Placebo (n=7740)	Rate Ratio (95% CI)
GI tract cancer	2.0	2.0	0.99 (0.80–1.24)
Any cancer	11.6	11.5	1.01 (0.92–1.11)

10. The ASCEND Study Collaborative Group. N Engl J Med. 2018

ASCEND Clinical Implications

- NNT = 91 vs NNH = 112
- 25% of patients were prescribed PPI by the end of the trial
- Well controlled comorbidities
- Observed CV risk lower than predicted

SUMMARY OF MODERN PRIMARY PREVENTION TRIALS

ASPREE
Age > 70 year old

No CV benefit
↑ Bleeding rate

ARRIVE
Moderate CV Risk
(ASCVD < 20%)

No CV benefit
↑ Bleeding rate

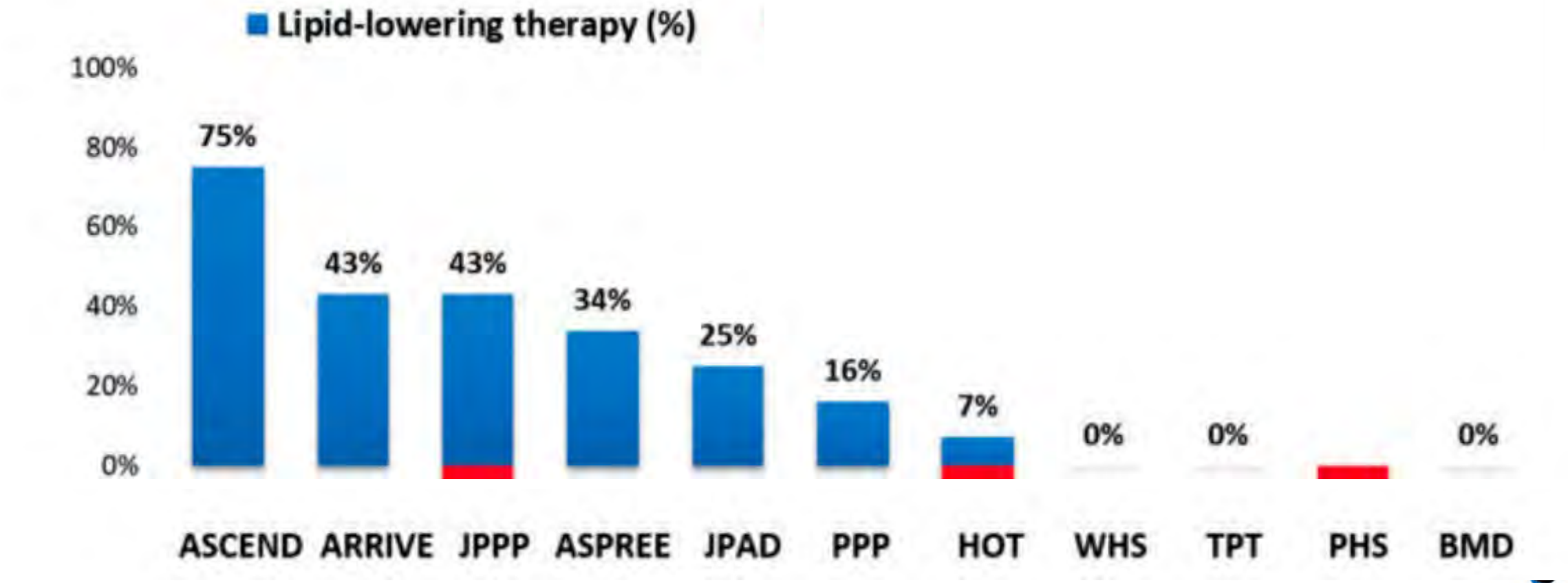
ASCEND
Patients with
Diabetes

↓ Rate of CV event
↑ Bleeding rate

Modern Trial Considerations

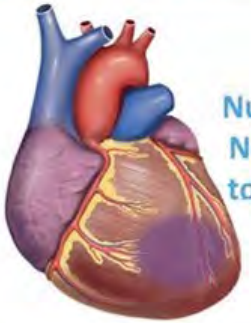
- All event rates lower than expected (low to intermediate risk patients)
  - Differences in pharmacotherapy and lifestyle modifications
  - More specific criteria for MI and stroke
- Adherence to aspirin was between 60% and 70%

STATIN USE IN TRIALS



11. Valgimigli M. Eur Heart J. 2019

Myocardial Infarction



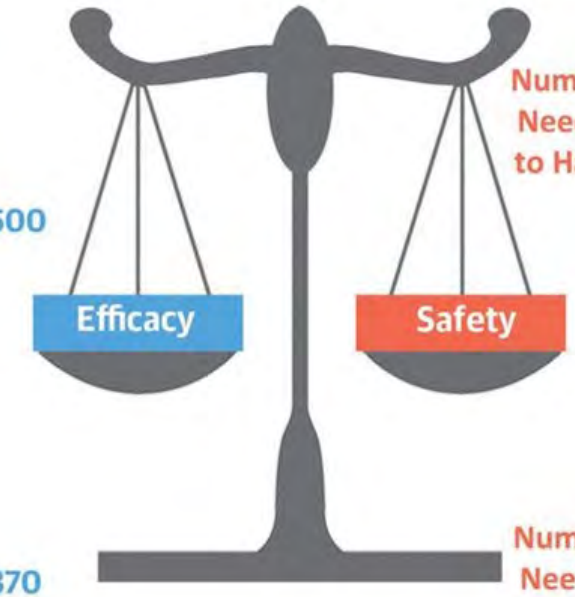
Number Needed = 357 to Treat

Major Bleeding

Number Needed = 222 to Harm

Ischemic Stroke

Number Needed = 500 to Treat



Intracranial Bleeding

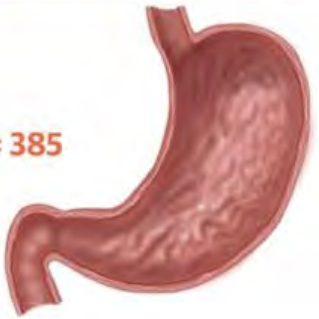
Number Needed = 1,000 to Harm

Transient Ischemic Attack

Number Needed = 370 to Treat

Gastrointestinal Bleeding

Number Needed = 385 to Harm



Major Adverse Cardiovascular Events

12. Abdelaziz, H. e al. J Am Coll Cardiol. 2019

AMERICAN DIABETES ASSOCIATION (ADA) 2020

Recommendation: Aspirin 75–162mg may be considered for diabetics at an increased CV risk after a comprehensive discussion with the patient on the benefits versus the comparable increased risk of bleeding

13. American Diabetes Association. Diabetes Care. 2020

ADA 2020 (Key Points)

Age	Comments
< 50yo	• Aspirin is not recommended for low risk ASCVD • Clinical judgment should be used for those at intermediate risk
50-70yo	• Recommendation aspirin for patients with diabetes and at least 1 additional major risk factor who are not at increased risk of bleeding
> 70yo	• Appears to have greater risk than benefit

13. American Diabetes Association. Diabetes Care. 2020

2019 American Geriatrics Society BEERS Criteria

Population	Rationale	Recommendation	Quality of Evidence	Strength of Recommendation
Aspirin for primary prevention of CVD and colorectal cancer	Risk of major bleeding increases markedly in older age. Several studies suggest lack of net benefit when used for primary prevention in older adult with CV risk factors, but evidence is not conclusive	Use with caution in adults ≥ 70 years	Moderate	Strong

14. American Geriatrics Society BEERS Criteria Update Expert Panel. J Am Geriatr Soc. 2019

2019 ACC/AHA Primary Prevention Guidelines

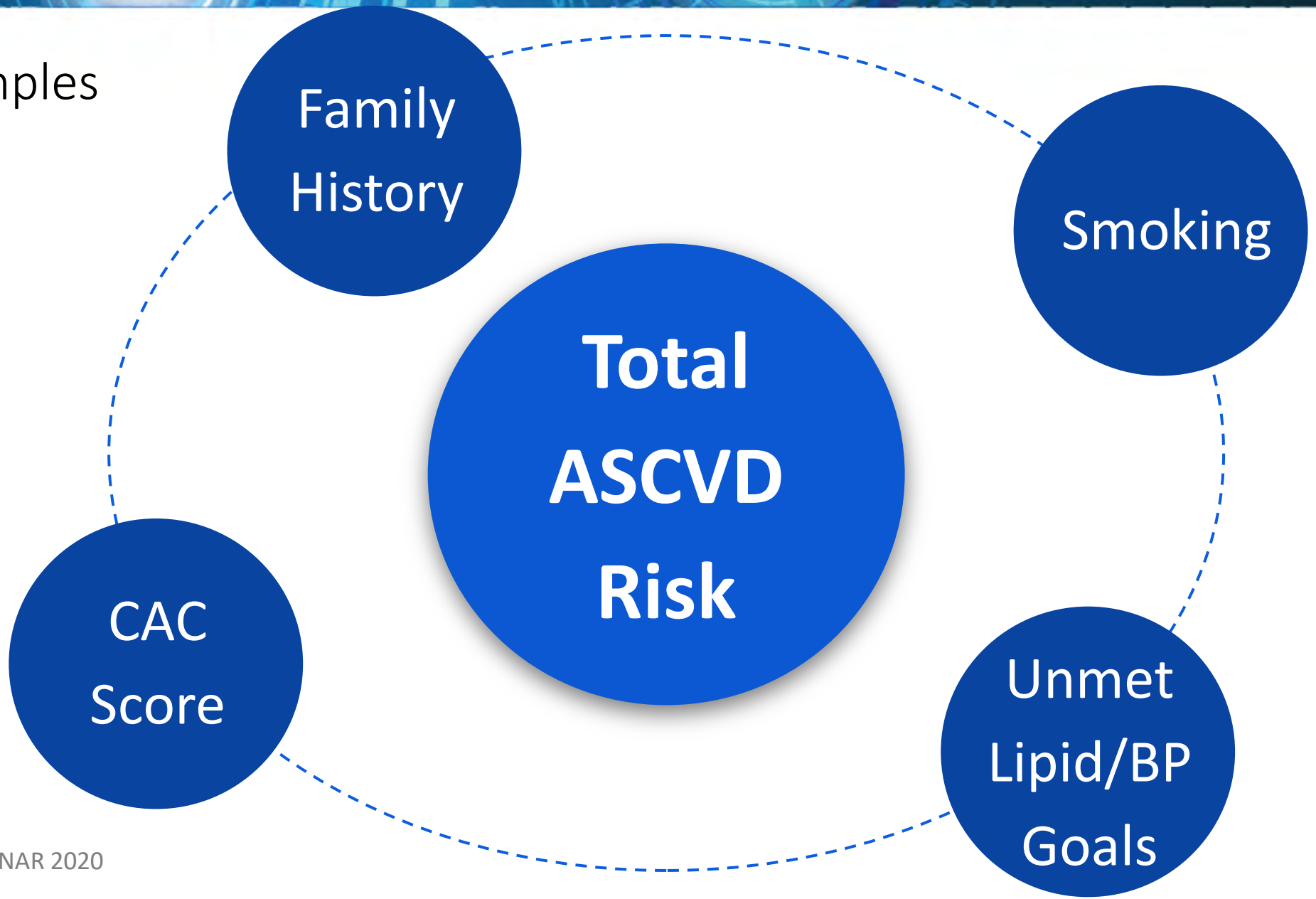
Population	Recommendations	LOE*	COR**
40-70yo at high ASCVD risk but not at a high bleed risk	Low-dose aspirin (75-100 mg orally daily) might be considered for the primary prevention of ASCVD	A	IIb
Adults > 70yo	Low-dose aspirin should not be administered for primary prevention	B-R	III: Harm
Adults of any age increased risk of bleeding	Low-dose aspirin (75-100 mg orally daily) should not be administered for the primary prevention of ASCVD	C-LD	III: Harm

*LOE = level of evidence

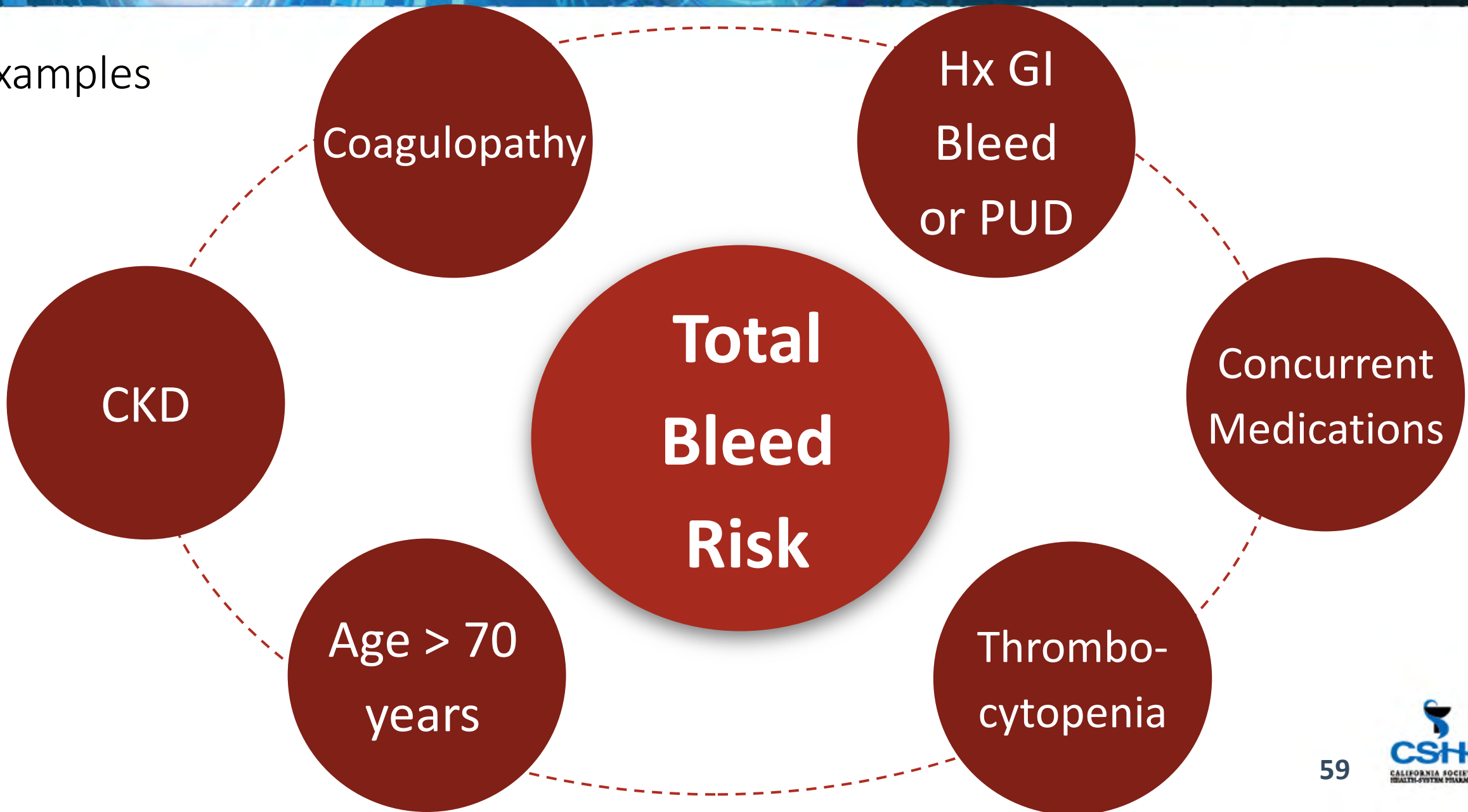
**COR = class of recommendation (strength of recommendation/magnitude of certainty)

15. Arnett, DK et al. Circulation. 2019

Examples


Family History
Smoking
Total ASCVD Risk
CAC Score
Unmet Lipid/BP Goals

Examples


Coagulopathy
Hx GI Bleed or PUD
CKD
Total Bleed Risk
Concurrent Medications
Age > 70 years
Thrombo-cytopenia

SHARED DECISION MAKING

CONCLUSION

- Aspirin generally not recommended in patients older than 70yo
- Many patients may not be good candidate for aspirin for primary prevention. However, Aspirin may be considered in the context of high cardiovascular risk with low bleeding risk
- Modern primary prevention trials did not show benefit for the occurrence of colorectal cancer
- Clinical shared decision making should be implemented when deciding to add or remove aspirin

Patient Case 1

JB is a 67yo female who recently moved to the area and is establishing care with your primary care clinic

- Significant PMH: controlled hypertension and diabetes
- No known personal or family history of vascular disease
- Swims 5x/week
- Unremarkable physical exam
- Medications: Aspirin 325mg, lisinopril 10mg, metformin 1000mg BID

QUESTION 1

What things would you consider in deciding if aspirin is appropriate to continue for JB?

A. Patient's goals of care
B. Cardiovascular risk factors
C. Bleeding risk factors
D. All the above

QUESTION 1

What things would you consider in deciding if aspirin is appropriate to continue for JB?

A. Patient's goals of care
B. Cardiovascular risk factors
C. Bleeding risk factors
D. All the above

PATIENT CASE 2

KA is a 62yo male seen by a clinical pharmacist for chronic disease state management. At his appointment he asks about starting “baby aspirin” after reading about it in a magazine.

- PMH: uncontrolled hypertension and diabetes, obesity, dyslipidemia
- Current smoker
- Sedentary lifestyle
- Denies any CV symptoms
- Medications: atorvastatin 20mg, metformin 1000mg BID, amlodipine 5mg, empagliflozin 10mg

QUESTION 2

Which of the following patient factors would favor KA initiating aspirin for primary prevention?

A. Uncontrolled diabetes
B. Sedentary lifestyle
C. Smoking
D. All the above

QUESTION 2

Which of the following patient factors would favor KA initiating aspirin for primary prevention?

A. Uncontrolled diabetes
B. Sedentary lifestyle
C. Smoking
D. All the above

QUESTION 3

What do you recommend regarding aspirin therapy for primary prevention for KA?

A. Aspirin 81mg daily
B. Aspirin 325mg daily
C. Aspirin 81mg daily + omeprazole
D. No antiplatelet therapy

QUESTION 3

What do you recommend regarding aspirin therapy for primary prevention for KA?

A. **Aspirin 81mg daily**
B. Aspirin 325mg daily
C. Aspirin 81mg daily + omeprazole
D. No antiplatelet therapy

REFERENCES

1. Kjeldsen, S. E., Kolloch, R. E., Leonetti, G., Mallion, J. M., Zanchetti, A., Elmfeldt, D., Warnold, I., & Hansson, L. (2000). Influence of gender and age on preventing cardiovascular disease by antihypertensive treatment and acetylsalicylic acid. The HOT study. Hypertension Optimal Treatment. *Journal of Hypertension*, *18*(5), 629–642. https://doi.org/10.1097/00004872-200018050-00017
2. Ridker PM, Cook NR, Lee IM, Gordon D, Gaziano JM, Manson JE, Hennekens CH, Burging JE. A Randomized Trial of Low-Dose Aspirin in the Primary Prevention of Cardiovascular Disease in Women . *New England Journal of Medicine*, 352,1293-1304. https://www.nejm.org/doi/full/10.1056/NEJMoa050613
3. Collaboration, A. T. (ATT). (2009). Aspirin in the primary and secondary prevention of vascular disease: Collaborative meta-analysis of individual participant data from randomised trials. *The Lancet*, *373*(9678), 1849–1860. https://doi.org/10.1016/S0140-6736(09)60503-1
4. Use of Aspirin for Primary Prevention of Heart Attack and Stroke. *FDA*. https://www.fda.gov/drugs/drug-information-consumers/use-aspirin-primary-prevention-heart-attack-and-stroke
5. Vandvik, P. O., Lincoff, A. M., Gore, J. M., Gutterman, D. D., Sonnenberg, F. A., Alonso-Coello, P., Akl, E. A., Lansberg, M. G., Guyatt, G. H., & Spencer, F. A. (2012). Primary and secondary prevention of cardiovascular disease: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*, *141*(2 Suppl), e637S-e668S. https://doi.org/10.1378/chest.11-2306
6. Bibbins-Domingo, K., & U.S. Preventive Services Task Force. (2016). Aspirin Use for the Primary Prevention of Cardiovascular Disease and Colorectal Cancer: U.S. Preventive Services Task Force Recommendation Statement. *Annals of Internal Medicine*, *164*(12), 836–845. https://doi.org/10.7326/M16-0577
7. Raber, I., McCarthy, C. P., Vaduganathan, M., Bhatt, D. L., Wood, D. A., Cleland, J. G. F., Blumenthal, R. S., & McEvoy, J. W. (2019). The rise and fall of aspirin in the primary prevention of cardiovascular disease. Lancet (London, England), 393(10186), 2155–2167. https://doi.org/10.1016/S0140-6736(19)30541-0

REFERENCES CONTINUED

8. McNeil, J. J., Nelson, M. R., Woods, R. L., Lockery, J. E., Wolfe, R., Reid, C. M., Kirpach, B., Shah, R. C., Ives, D. G., Storey, E., Ryan, J., Tonkin, A. M., Newman, A. B., Williamson, J. D., Margolis, K. L., Ernst, M. E., Abhayaratna, W. P., Stocks, N., Fitzgerald, S. M., Murray, A. M. (2018). Effect of Aspirin on All-Cause Mortality in the Healthy Elderly. *New England Journal of Medicine*, *379*(16), 1519–1528. https://doi.org/10.1056/NEJMoa1803955
9. Gaziano, J. M., Brotons, C., Coppolecchia, R., Cricelli, C., Darius, H., Gorelick, P. B., Howard, G., Pearson, T. A., Rothwell, P. M., Ruilope, L. M., Tendera, M., & Tognoni, G. (2018). Use of aspirin to reduce risk of initial vascular events in patients at moderate risk of cardiovascular disease (ARRIVE): A randomised, double-blind, placebo-controlled trial. *The Lancet*, *392*(10152), 1036–1046. https://doi.org/10.1016/S0140-6736(18)31924-X
10. ASCEND Study Collaborative Group, Bowman, L., Mafham, M., Wallendszus, K., Stevens, W., Buck, G., Barton, J., Murphy, K., Aung, T., Haynes, R., Cox, J., Murawska, A., Young, A., Lay, M., Chen, F., Sammons, E., Waters, E., Adler, A., Bodansky, J., Armitage, J. (2018). Effects of Aspirin for Primary Prevention in Persons with Diabetes Mellitus. *The New England Journal of Medicine*, *379*(16), 1529–1539. https://doi.org/10.1056/NEJMoa1804988
11. Valgimigli M. The remarkable story of a wonder drug, which now comes to an end in the primary prevention setting: say bye-bye to aspirin!. *Eur Heart J*. 2019;40(7):618-620. doi:10.1093/eurheartj/ehy872
12. Abdelaziz, H. K., Saad, M., Pothineni, N. V. K., Megaly, M., Potluri, R., Saleh, M., Kon, D. L. C., Roberts, D. H., Bhatt, D. L., Aronow, H. D., Abbott, J. D., & Mehta, J. L. (2019). Aspirin for Primary Prevention of Cardiovascular Events. *Journal of the American College of Cardiology*, *73*(23), 2915–2929. https://doi.org/10.1016/j.jacc.2019.03.501
13. American Diabetes Association. (2020). 15. Diabetes Care in the Hospital: Standards of Medical Care in Diabetes-2020. *Diabetes Care*, *43*(Suppl 1), S193–S202. https://doi.org/10.2337/dc20-S015
14. The 2019 American Geriatrics Society Beers Criteria® Update Expert Panel: Fick, D.M, Semla, T.P., Steinman, M., Beizer, J., Brandt, N., Dombrowski, R., DuBeau, C.E, Pezzullo, L., Epplin, J.J, Flanagan, N., Morden, E., Hanlon, J., Hollmann, P., Laird, R., Linnebur, S., Sandhu, S. (2019). American Geriatrics Society 2019 Updated AGS Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults. *Journal of the American Geriatrics Society,* 67(4):674-694.doi: 10.1111/jgs.15767.
15. Arnett, D. K., Blumenthal, R. S., Albert, M. A., Buroker, A. B., Goldberger, Z. D., Hahn, E. J., Himmelfarb, C. D., Khera, A., Lloyd-Jones, D., McEvoy, J. W., Michos, E. D., Miedema, M. D., Muñoz, D., Smith, S. C., Virani, S. S., Williams, K. A., Yeboah, J., & Ziaeian, B. (2019). 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Circulation*, *140*(11), e596–e646. https://doi.org/10.1161/CIR.0000000000000678

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