Wytyczne ESC dotyczące postępowania w ostrych zespołach wieńcowych bez przetrwałego uniesienia odcinka ST w 2015 roku

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ESC GUIDELINES

2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation

Task Force for the Management of Acute Coronary Syndromes in Patients Presenting without Persistent ST-Segment Elevation of the European Society of Cardiology (ESC)

- Diagnostyka
- Terapia przeciwpłytkowa / przeciwkrzepliwa
- Strategie leczenia: inwazyjna / zachowawcza
- Prewencja wtórna

Diagnostyka

It is recommended to base diagnosis and initial short-term ischaemic and bleeding risk stratification on a combination of clinical history, symptoms, vital signs, other physical findings, ECG and laboratory results.	I	A
It is recommended to obtain a 12-lead ECG within 10 min after first medical contact and to have it immediately interpreted by an experienced physician. It is recommended to obtain an additional 12-lead ECG in case of recurrent symptoms or diagnostic uncertainty.	I	B
Additional ECG leads (V_{3R}, V_{4R}, V_7–V_9) are recommended if ongoing ischaemia is suspected when standard leads are inconclusive.	I	C
Echocardiography is recommended to evaluate regional and global LV function and to rule in or rule out differential diagnoses.[d]	I	C

It is recommended to measure cardiac troponins with sensitive or high-sensitivity assays and obtain the results within 60 min.	I	A
A rapid rule-out protocol at 0 h and 3 h is recommended if high-sensitivity cardiac troponin tests are available.	I	B
A rapid rule-out and rule-in protocol at 0 h and 1 h is recommended if a high-sensitivity cardiac troponin test with a validated 0 h/1 h algorithm is available. Additional testing after 3–6 h is indicated if the first two troponin measurements are not conclusive and the clinical condition is still suggestive of ACS.	I	B
It is recommended to use established risk scores for prognosis estimation.	I	B

Ból dławicowy mogący wskazywać na ostry zespół wieńcowy

Anginal pain in NSTE-ACS patients may have the following presentations:

- Prolonged (>20 min) anginal pain at rest;
- New onset (de novo) angina (class II or III of the Canadian Cardiovascular Society classification);[21]
- Recent destabilization of previously stable angina with at least Canadian Cardiovascular Society Class III angina characteristics (crescendo angina); or
- Post-MI angina.

80%

20%

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„…dodatnie troponiny… zawał?!”

A combination of criteria is required to meet the diagnosis of acute MI, namely the detection of an increase and/or decrease of a cardiac biomarker, preferably high-sensitivity cardiac troponin, with at least one value above the 99th percentile of the upper reference limit and at least one of the following:

(1) Symptoms of ischaemia.
(2) New or presumed new significant ST-T wave changes or left bundle branch block on 12-lead ECG.
(3) Development of pathological Q waves on ECG.
(4) Imaging evidence of new or presumed new loss of viable myocardium or regional wall motion abnormality.
(5) Intracoronary thrombus detected on angiography or autopsy.

TYP 1

TYP 2

Type 2 MI is myocardial necrosis in which a condition other than coronary plaque instability contributes to an imbalance between myocardial oxygen supply and demand.[2]

Type 1 MI is characterized by atherosclerotic plaque rupture, ulceration, fissure, erosion or dissection with resulting intraluminal thrombus in one or more coronary arteries

Inne niż ostry zawał serca typu 1 przyczyny wzrostu stężenia troponin

Tachyarrhythmias
Heart failure
Hypertensive emergencies
Critical illness (e.g. shock/ sepsis/ burns)
Myocarditis[a]
Tako-Tsubo cardiomyopathy
Structural heart disease (e.g. aortic stenosis)
Aortic dissection
Pulmonary embolism, pulmonary hypertension
Renal dysfunction and associated cardiac disease
Coronary spasm
Acute neurological event (e.g. stroke or subarachnoid haemorrhage)
Cardiac contusion or cardiac procedures (CABG, PCI, ablation, pacing, cardioversion, or endomyocardial biopsy)
Hypo- and hyperthyroidism
Infiltrative diseases (e.g. amyloidosis, haemochromatosis, sarcoidosis, scleroderma)
Myocardial drug toxicity or poisoning (e.g. doxorubicin, 5-fluorouracil, herceptin, snake venoms)
Extreme endurance efforts
Rhabdomyolysis

Diagnostyka

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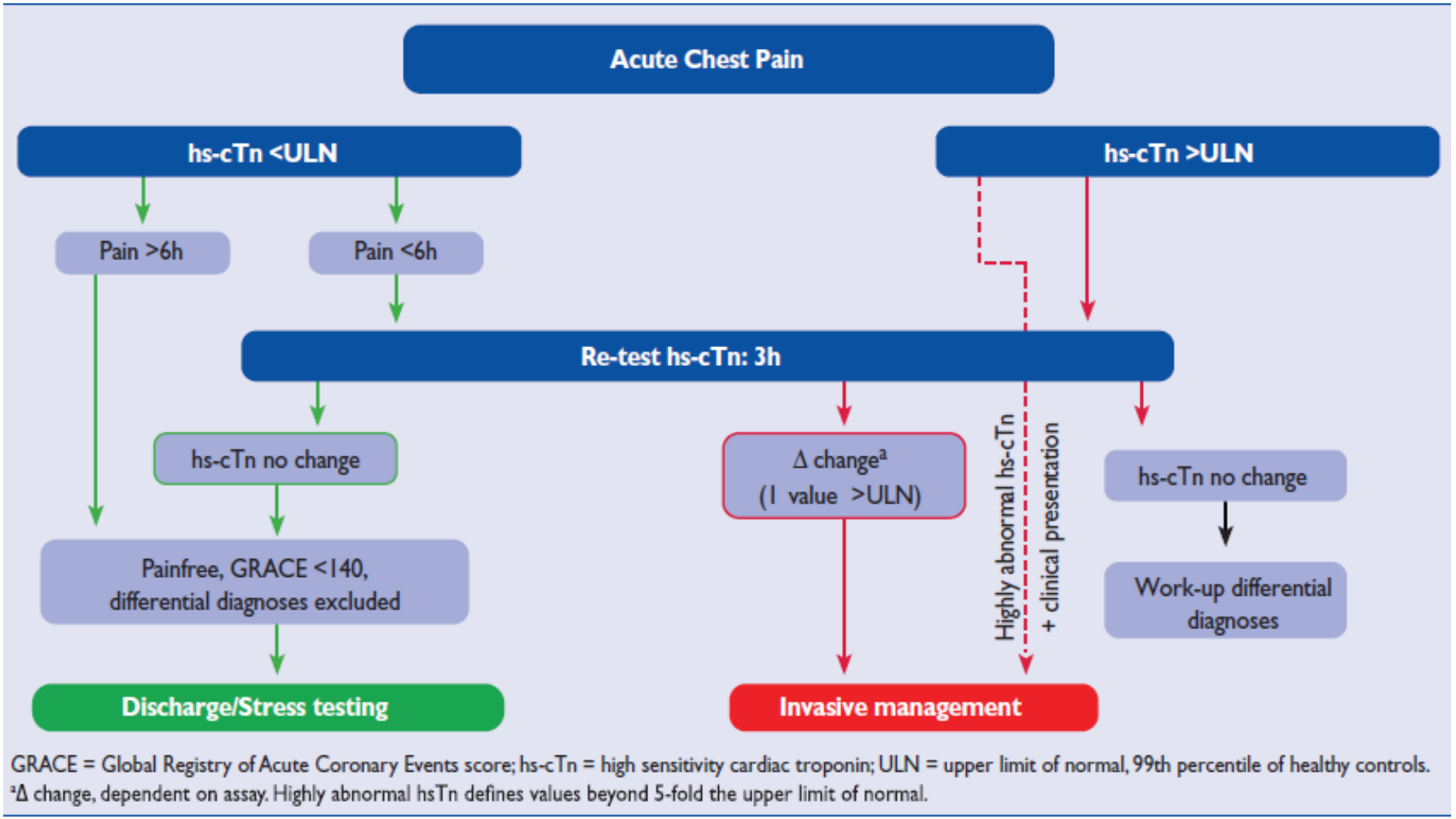
Protokół szybkiego wykluczenia 0 h/3 h



GRACE = Global Registry of Acute Coronary Events score; hs-cTn = high sensitivity cardiac troponin; ULN = upper limit of normal, 99th percentile of healthy controls.
[a]Δ change, dependent on assay. Highly abnormal hsTn defines values beyond 5-fold the upper limit of normal.

Diagnostyka

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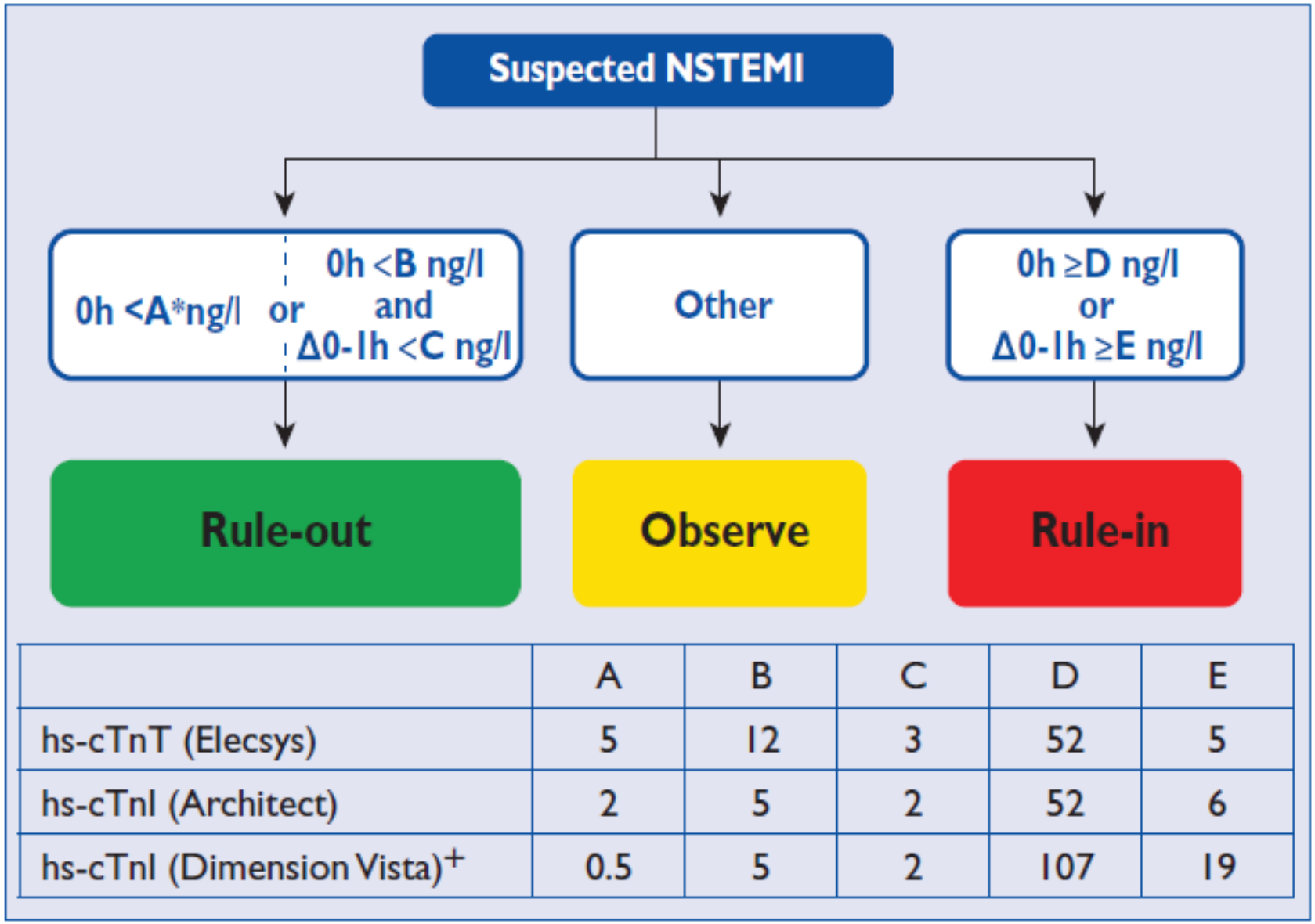
Protokół szybkiego wykluczenia 0 h/1 h



	A	B	C	D	E
hs-cTnT (Elecsys)	5	12	3	52	5
hs-cTnI (Architect)	2	5	2	52	6
hs-cTnI (Dimension Vista)$^{+}$	0.5	5	2	107	19

Diagnostyka

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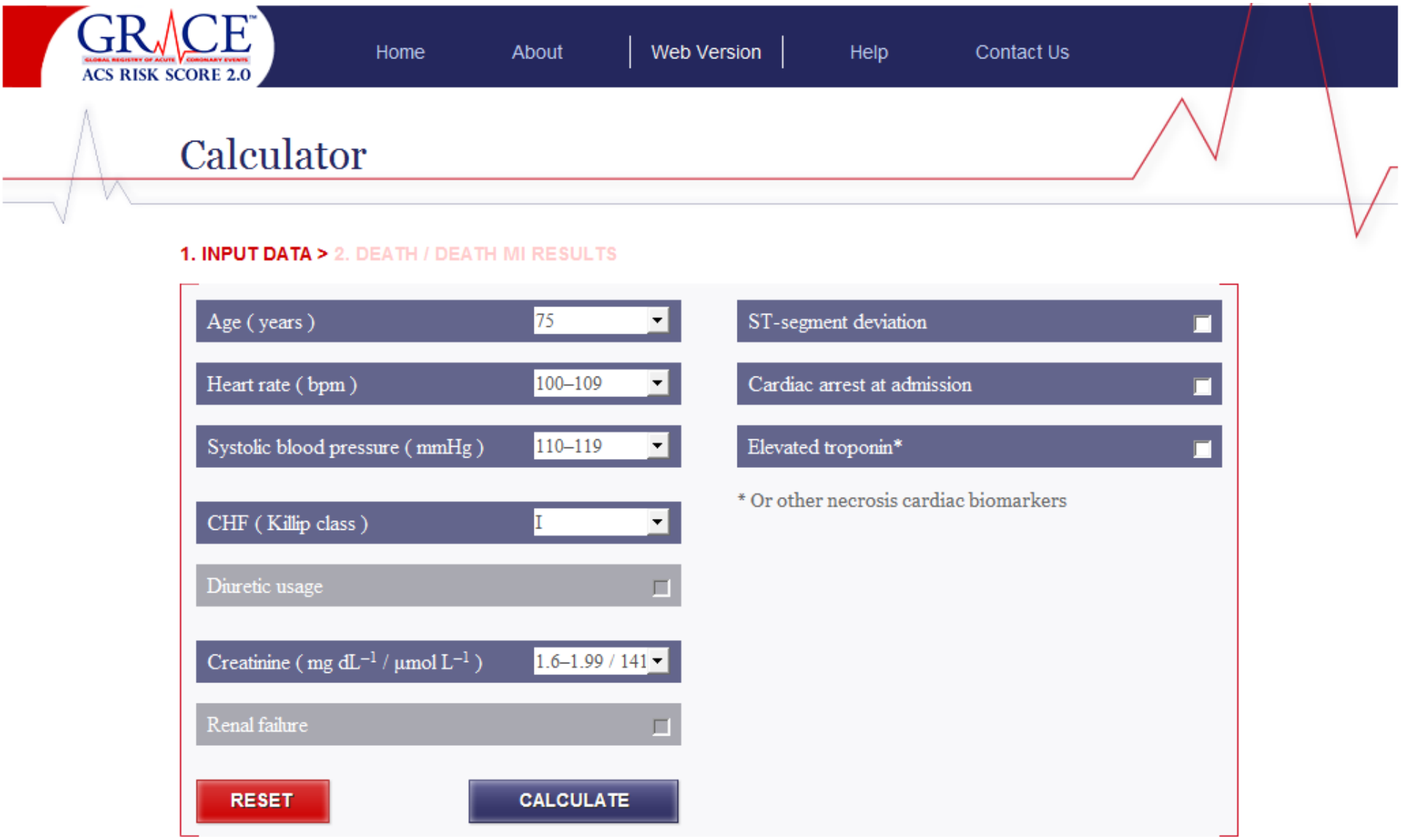
GRACE
GLOBAL REGISTRY OF ACUTE CORONARY EVENTS
ACS RISK SCORE 2.0
Home
About
Web Version
Help
Contact Us
Calculator
1. INPUT DATA > 2. DEATH / DEATH MI RESULTS
Age (years)
75
Heart rate (bpm)
100–109
Systolic blood pressure (mmHg)
110–119
CHF (Killip class)
I
Diuretic usage
Creatinine (mg dL−1 / µmol L−1)
1.6–1.99 / 141
Renal failure
ST-segment deviation
Cardiac arrest at admission
Elevated troponin*
* Or other necrosis cardiac biomarkers
RESET
CALCULATE

GRACE
ACS RISK SCORE 2.0

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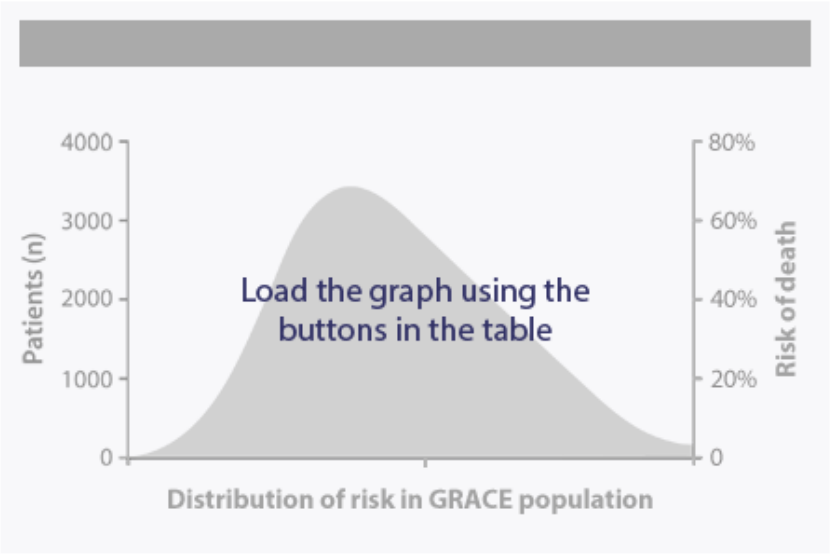
Calculator

1. INPUT DATA > **2. DEATH / DEATH MI RESULTS**

Death		
Time	% Risk (Score)	Histograms
In hospital	2.4	Not available
6 months	8.8 (124)	Not available
1 year	14	GRAPH
3 years	51	GRAPH

Death/MI		
Time	% Risk	Histograms
1 year	21	GRAPH



Area plot: distribution (log scale) of risk based on the entire GRACE population of 102,341 patients.

EDIT INPUT NEW CALCULATION

>140 punktów – wysokie ryzyko
110-139 punktów – pośrednie ryzyko
<109 punktów – niskie ryzyko

Rola tlenoterapii i opioidów

and cardiac troponin levels. While data in NSTE-ACS are lacking, a randomized comparison of oxygen vs. air administration in 441 normoxaemic patients with STEMI showed no benefit and possibly harm associated with oxygen administration. Oxygen should be administered when blood oxygen saturation is <90% or if the patient is in respiratory distress.[115] In patients whose ischaemic symptoms are not

spiratory distress.[115] In patients whose ischaemic symptoms are not
relieved by nitrates and beta-blockers, opiate administration is reasonable while waiting for immediate coronary angiography, with the caveat that morphine may slow intestinal absorption of oral platelet inhibitors.

Air Versus Oxygen in ST-Segment–Elevation Myocardial Infarction

Badanie AVOID

Circulation. 2015;131:2143-2150 May 2015

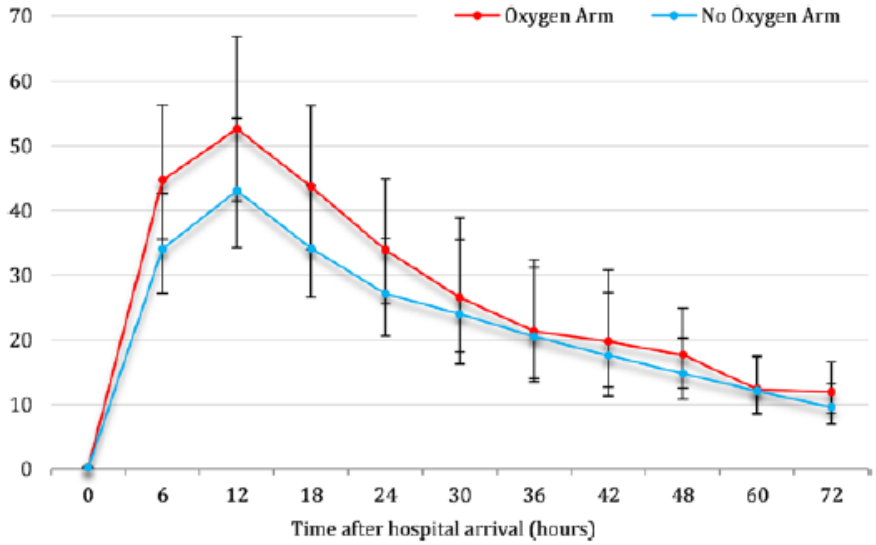


Figure 2. Geometric mean (95% confidence interval) for cardiac troponin I (cTnI) release (μg/L) over 72 hours in patients with confirmed ST-segment–elevation myocardial infarction. A repeated-measures analysis was used to estimate the overall profile of cTnI release over the 72-hour window. All available biomarker data were analyzed with linear mixed-effects regression with patient as a random effect, together with treatment group, time of assay, and an interaction term between treatment group and time of assay included as fixed effects.

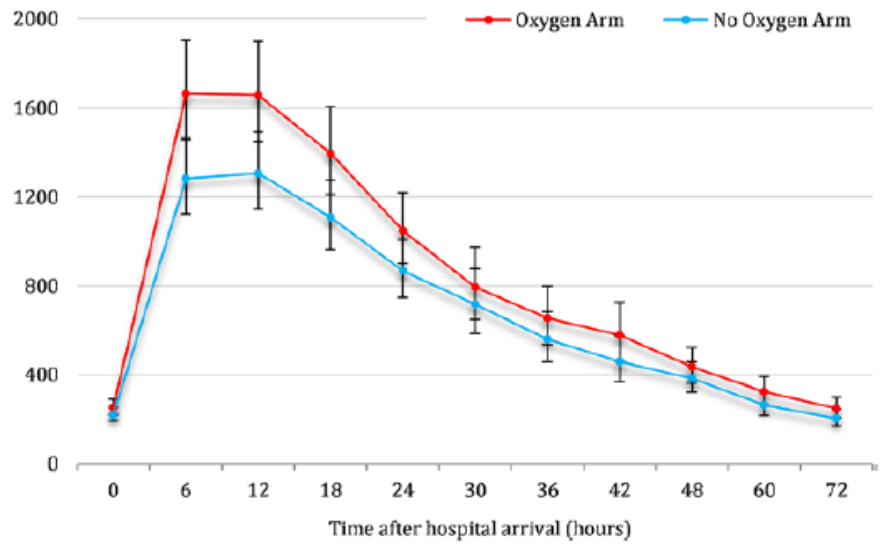


Figure 3. Geometric mean (95% confidence interval) for creatine kinase release (U/L) over 72 hours in patients with confirmed ST-segment–elevation myocardial infarction. A repeated-measures analysis was used to estimate the overall profile of CK release over the 72-hour window. All available biomarker data were analyzed with linear mixed-effects regression with patient as a random effect, together with treatment group, time of assay, and an interaction term between treatment group and time of assay included as fixed effects.

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doi:10.1093/eurheartj/ehv547

Morphine delays and attenuates ticagrelor exposure and action in patients with myocardial infarction: the randomized, double-blind, placebo-controlled IMPRESSION trial

Badanie IMPRESSION

Jacek Kubica[1†], Piotr Adamski[2†*], Małgorzata Ostrowska[2], Joanna Sikora[3], Julia Maria Kubica[1], Wiktor Dariusz Sroka[4], Katarzyna Stankowska[5], Katarzyna Buszko[6], Eliano Pio Navarese[1,7], Bernd Jilma[8], Jolanta Maria Siller-Matula[9], Michał Piotr Marszałł[4], Danuta Rość[5], and Marek Koziński[2]

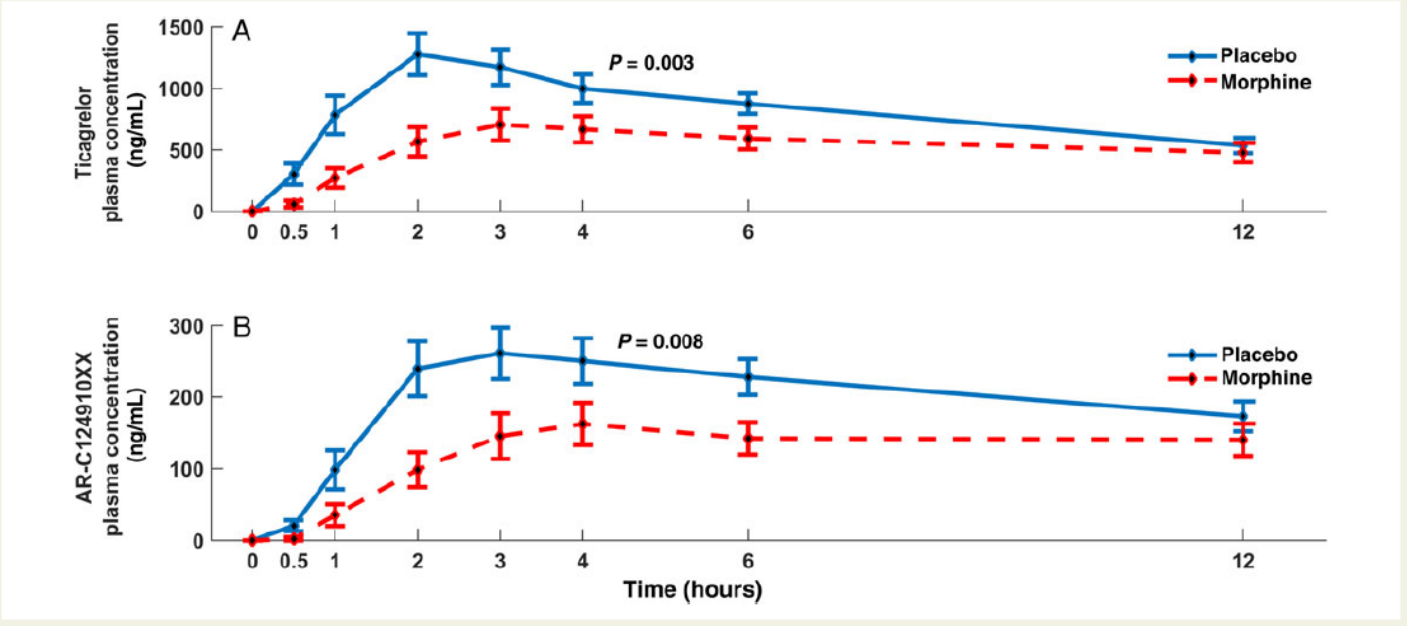


Figure 2 Plasma concentrations of ticagrelor and AR-C124910XX. Plasma concentrations of (*A*) ticagrelor and (*B*) AR-C124910XX after oral administration of a 180 mg ticagrelor loading dose, which followed intravenous injection of placebo (blue) or morphine (red).

Monitorowanie rytmu serca

Continuous rhythm monitoring is recommended until the diagnosis of NSTEMI is established or ruled out.	I	C
It is recommended to admit NSTEMI patients to a monitored unit.	I	C
Rhythm monitoring up to 24 h or PCI (whichever comes first) should be considered in NSTEMI patients at low risk for cardiac arrhythmias.[e]	IIa	C
Rhythm monitoring for >24 h should be considered in NSTEMI patients at intermediate to high-risk for cardiac arrhythmias.[f]	IIa	C
In the absence of signs or symptoms of ongoing ischaemia, rhythm monitoring in unstable angina may be considered in selected patients (e.g. suspicion of coronary spasm or associated symptoms suggestive of arrhythmic events).	IIb	C

e – jeżeli żadne z poniższych kryteriów nie jest spełnione

f – jeżeli przynajmniej jedno z poniższych kryteriów zostało spełnione

Czynniki podwyższonego ryzyka wystąpienia arytmii:

- Niestabilność układu krążenia
- Poważne arytmie
- LVEF <40%
- Nieskuteczna reperfuzja
- Pozostawione inne ciasne zwężenie dużej gałęzi tętnicy wieńcowej
- Powikłanie związane z PCI

Leczenie przeciwniedokrwienne

Early initiation of beta-blocker treatment is recommended in patients with ongoing ischaemic symptoms and without contraindications.	I	B
It is recommended to continue chronic beta-blocker therapy, unless the patient is in Killip class III or higher.	I	B
Sublingual or i.v. nitrates are recommended to relieve angina;[d] i.v. treatment is recommended in patients with recurrent angina, uncontrolled hypertension or signs of heart failure.	I	C

genic shock.[119] A registry study of 21 822 NSTEMI patients found that in patients at risk of developing cardiogenic shock (i.e. age >70 years, heart rate >110 beats/min, systolic blood pressure <120 mmHg) the observed shock or death rate was significantly increased in patients receiving beta-blockers within 24 h of hospital admission.[120] Therefore early administration of beta-blockers should be avoided in these patients if the ventricular function is unknown. Beta-blockers should not be administered in patients with

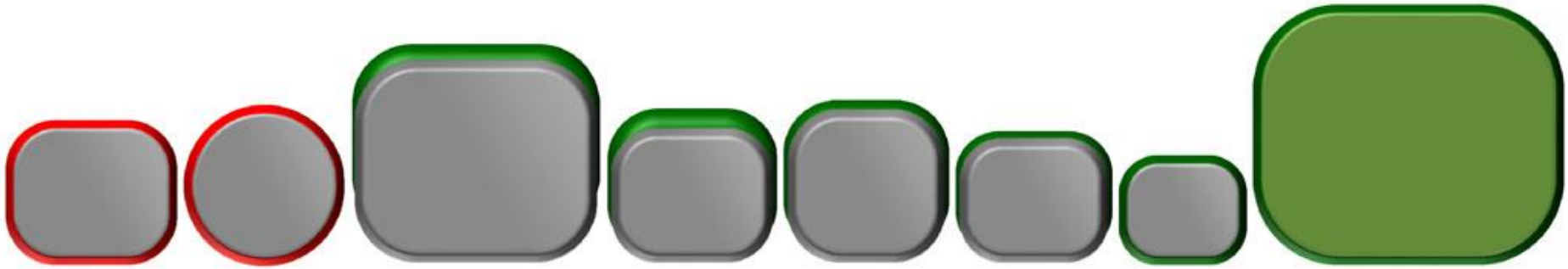
Leczenie przeciwpłytkowe

A $P2Y_{12}$ inhibitor is recommended, in addition to aspirin, for 12 months unless there are contraindications such as excessive risk of bleeds.	I	A
• Ticagrelor (180 mg loading dose, 90 mg twice daily) is recommended, in the absence of contraindications,[e] for all patients at moderate-to-high risk of ischaemic events (e.g. elevated cardiac troponins), regardless of initial treatment strategy and including those pretreated with clopidogrel (which should be discontinued when ticagrelor is started).	I	B
• Prasugrel (60 mg loading dose, 10 mg daily dose) is recommended in patients who are proceeding to PCI if no contraindication.[e]	I	B
• Clopidogrel (300–600 mg loading dose, 75 mg daily dose) is recommended for patients who cannot receive ticagrelor or prasugrel or who require oral anticoagulation.	I	B

Aspirin is recommended for all patients without contraindications at an initial oral loading dose[d] of 150–300 mg (in aspirin-naive patients) and a maintenance dose of 75–100 mg/day long-term regardless of treatment strategy.	I	A
$P2Y_{12}$ inhibitor administration for a shorter duration of 3–6 months after DES implantation may be considered in patients deemed at high bleeding risk.	IIb	A
$P2Y_{12}$ inhibitor administration in addition to aspirin beyond 1 year may be considered after careful assessment of the ischaemic and bleeding risks of the patient.	IIb	A
It is not recommended to administer prasugrel in patients in whom coronary anatomy is not known.	III	B

Stenty DES nowej generacji i BVS

Durable polymer-coated stent		Biodegradable polymer-coated stent					Bioresorbable drug-eluting stent
Abbott/ Boston	Medtronic	Biosensors	Terumo	Translumina	Boston	Biotronik	Abbott
Xience/ Promus	Resolute	BioMatrix	Ultimaster	Yukon Choice PC	Synergy	Orsiro	ABSORB
CoCr/PtCr-EES	CoNi-ZES	316L-BES	CoCr-SES	316L-SES	PtCr-EES	CoCr-SES	PLLA-EES



Strut thickness

81 µm	91 µm	120 µm	80 µm	87 µm	74 µm	60 µm	150 µm

Polymer coating

Circumferential	Abluminal	Circumferential

Risk of Stent Thrombosis Among Bare-Metal Stents, First-Generation Drug-Eluting Stents, and Second-Generation Drug-Eluting Stents

Results From a Registry of 18,334 Patients

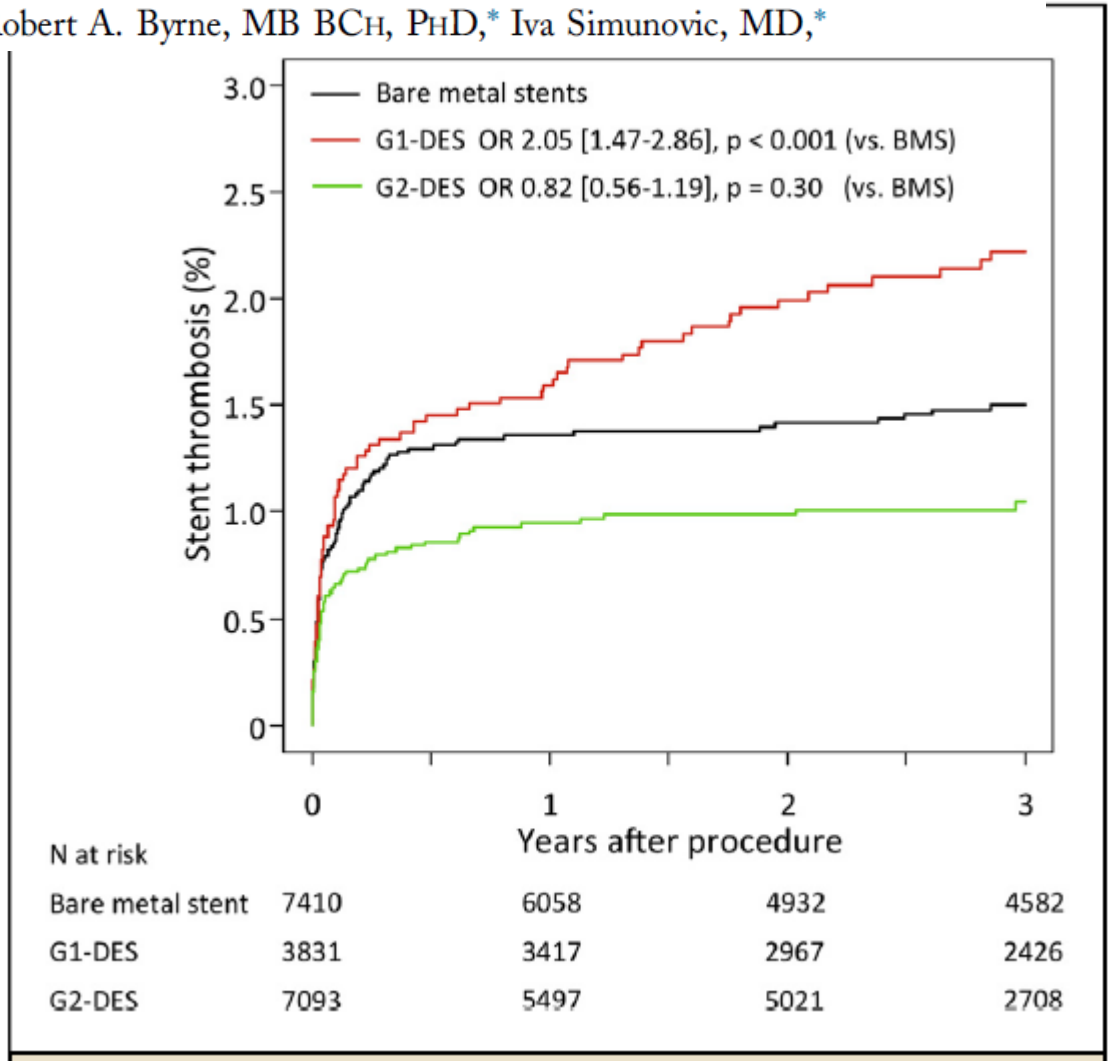
JACC: CARDIOVASCULAR INTERVENTIONS

VOL. 6, NO. 12, 2013

ISSN 1936-8798/$36.00

http://dx.doi.org/10.1016/j.jcin.2013.06.015

Tomohisa Tada, MD,* Robert A. Byrne, MB BCH, PHD,* Iva Simunovic, MD,*



Leczenie przeciwpłytkowe

A $P2Y_{12}$ inhibitor is recommended, in addition to aspirin, for 12 months unless there are contraindications such as excessive risk of bleeds.	I	A
• Ticagrelor (180 mg loading dose, 90 mg twice daily) is recommended, in the absence of contraindications,[e] for all patients at moderate-to-high risk of ischaemic events (e.g. elevated cardiac troponins), regardless of initial treatment strategy and including those pretreated with clopidogrel (which should be discontinued when ticagrelor is started).	I	B
• Prasugrel (60 mg loading dose, 10 mg daily dose) is recommended in patients who are proceeding to PCI if no contraindication.[e]	I	B
• Clopidogrel (300–600 mg loading dose, 75 mg daily dose) is recommended for patients who cannot receive ticagrelor or prasugrel or who require oral anticoagulation.	I	B

Aspirin is recommended for all patients without contraindications at an initial oral loading dose[d] of 150–300 mg (in aspirin-naive patients) and a maintenance dose of 75–100 mg/day long-term regardless of treatment strategy.	I	A
$P2Y_{12}$ inhibitor administration for a shorter duration of 3–6 months after DES implantation may be considered in patients deemed at high bleeding risk.	IIb	A
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It is not recommended to administer prasugrel in patients in whom coronary anatomy is not known.	III	B

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ESTABLISHED IN 1812 DECEMBER 4, 2014 VOL. 371 NO. 23

Badanie DAPT

Twelve or 30 Months of Dual Antiplatelet Therapy after Drug-Eluting Stents

Laura Mauri, M.D., Dean J. Kereiakes, M.D., Robert W. Yeh, M.D., Priscilla Driscoll-Shempp, M.B.A., Donald E. Cutlip, M.D., P. Gabriel Steg, M.D., Sharon-Lise T. Normand, Ph.D., Eugene Braunwald, M.D.,

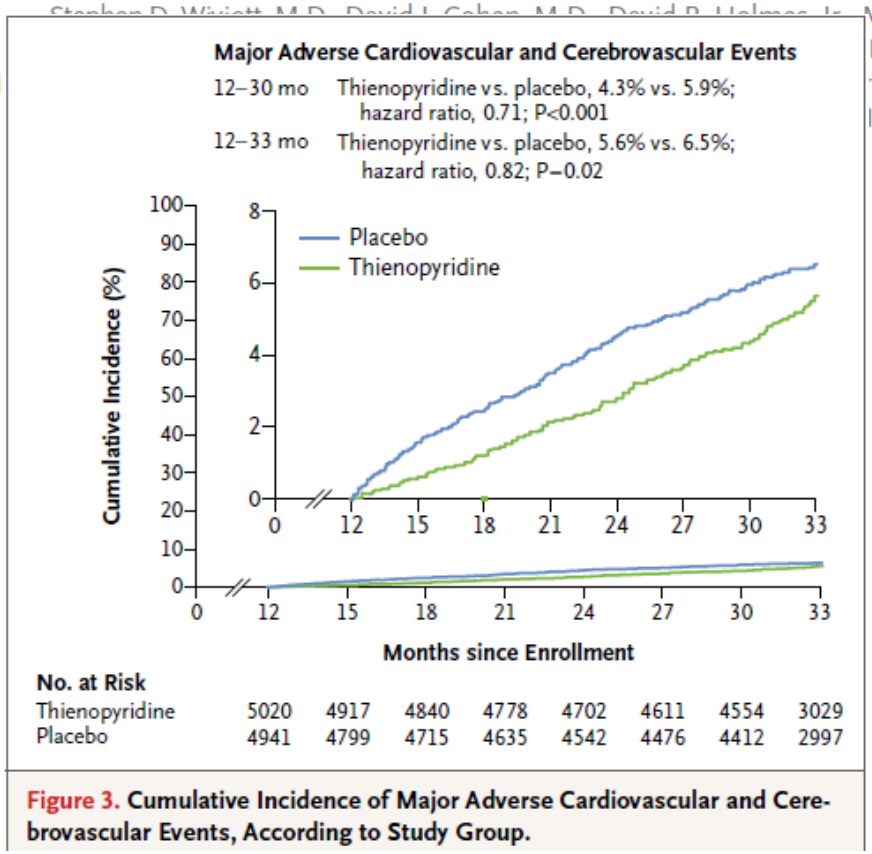

Figure 3. Cumulative Incidence of Major Adverse Cardiovascular and Cerebrovascular Events, According to Study Group.

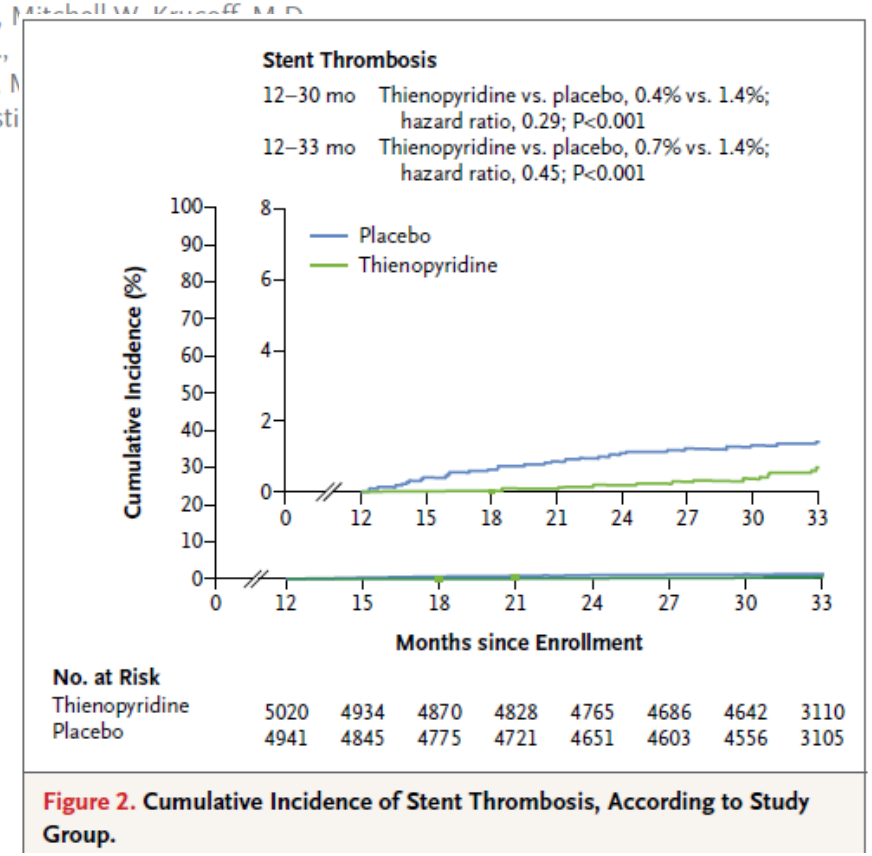

Figure 2. Cumulative Incidence of Stent Thrombosis, According to Study Group.

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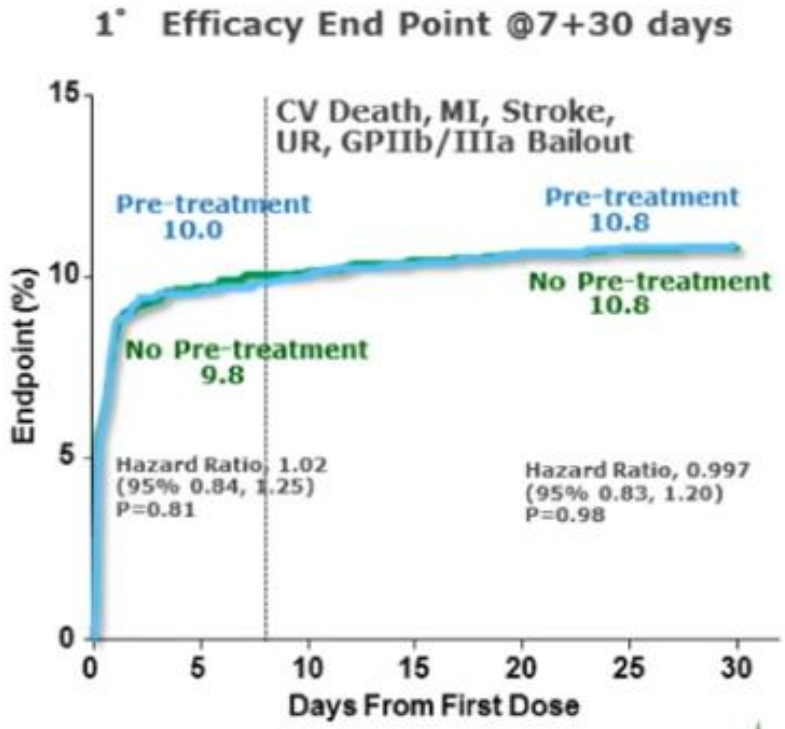
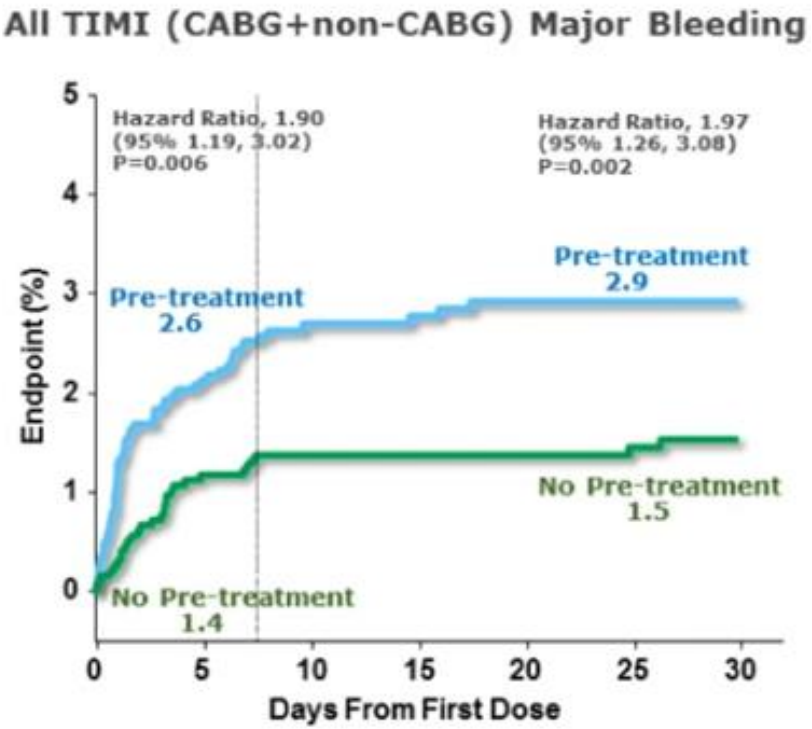
It is not recommended to administer prasugrel in patients in whom coronary anatomy is not known.	III	B

Badanie ACCOAST

Jedyne badanie, którego celem było wykazanie zasadności podania dawki wysycającej inhibitora P2Y12 (Prasugrelu) u pacjentów z NSTEMI przed wykonaniem koronarografii





ACCOAST

Montalescot et al.
NEJM 2013;369:999

Leczenie przeciwpłytkowe

(95% CI 1.19, 3.02), $P = 0.006$]. Arguments for and against pretreatment with $P2Y_{12}$ inhibitors in NSTE-ACS patients have been discussed extensively and the topic remains controversial.[165,166] As the optimal timing of ticagrelor or clopidogrel administration in NSTE-ACS patients scheduled for an invasive strategy has not been adequately investigated, no recommendation for or against pretreatment with these agents can be formulated. Based on the ACCOAST results, pretreatment with prasugrel is not recommended. In NSTE-ACS patients planned for conservative management, $P2Y_{12}$ inhibition (preferably with ticagrelor) is recommended, in the absence of contraindications, as soon as the diagnosis is confirmed.

Leczenie przeciwkrzepliwe

Parenteral anticoagulation is recommended at the time of diagnosis according to both ischaemic and bleeding risks.	I	B
Fondaparinux (2.5 mg s.c. daily) is recommended as having the most favourable efficacy–safety profile regardless of the management strategy.	I	B
Bivalirudin (0.75 mg/kg i.v. bolus, followed by 1.75 mg/kg/h for up to 4 h after the procedure) is recommended as an alternative to UFH plus GPIIb/IIIa inhibitors during PCI.	I	A
UFH 70–100 IU/kg i.v. (50–70 IU/kg if concomitant with GPIIb/IIIa inhibitors) is recommended in patients undergoing PCI who did not receive any anticoagulant.	I	B

In patients on fondaparinux (2.5 mg s.c. daily) undergoing PCI, a single i.v. bolus of UFH (70–85 IU/kg, or 50–60 IU/kg in the case of concomitant use of GPIIb/IIIa inhibitors) is recommended during the procedure.	I	B
Enoxaparin (1 mg/kg s.c. twice daily) or UFH are recommended when fondaparinux is not available.	I	B
Enoxaparin should be considered as an anticoagulant for PCI in patients pretreated with s.c. enoxaparin.	IIa	B
Additional ACT-guided i.v. boluses of UFH during PCI may be considered following initial UFH treatment.	IIb	B
Discontinuation of anticoagulation should be considered after PCI, unless otherwise indicated.	IIa	C

Crossover between UFH and LMWH is not recommended.	III	B

Leczenie przeciwkrzepliwe

eGFR < 30 mL/min/1.73m^2. LMWH should not be administered in patients with eGFR < 15 mL/min/1.73m^2. Monitoring of anti-Xa activity is not necessary except in patients in whom the eGFR is 15–30 mL/min/1.73m^2 or bodyweight is >100 kg. In NSTE-ACS patients pretreated with enoxaparin, no additional enoxaparin is recommended during PCI if the last subcutaneous (s.c.) enoxaparin injection was administered <8 h before PCI, whereas an additional 0.3 mg/kg i.v. bolus is recommended if the last s.c. enoxaparin injection was administered ≥ 8 h before PCI.[214,215] Crossing over to another anticoagulant during PCI is strongly discouraged.[216] A

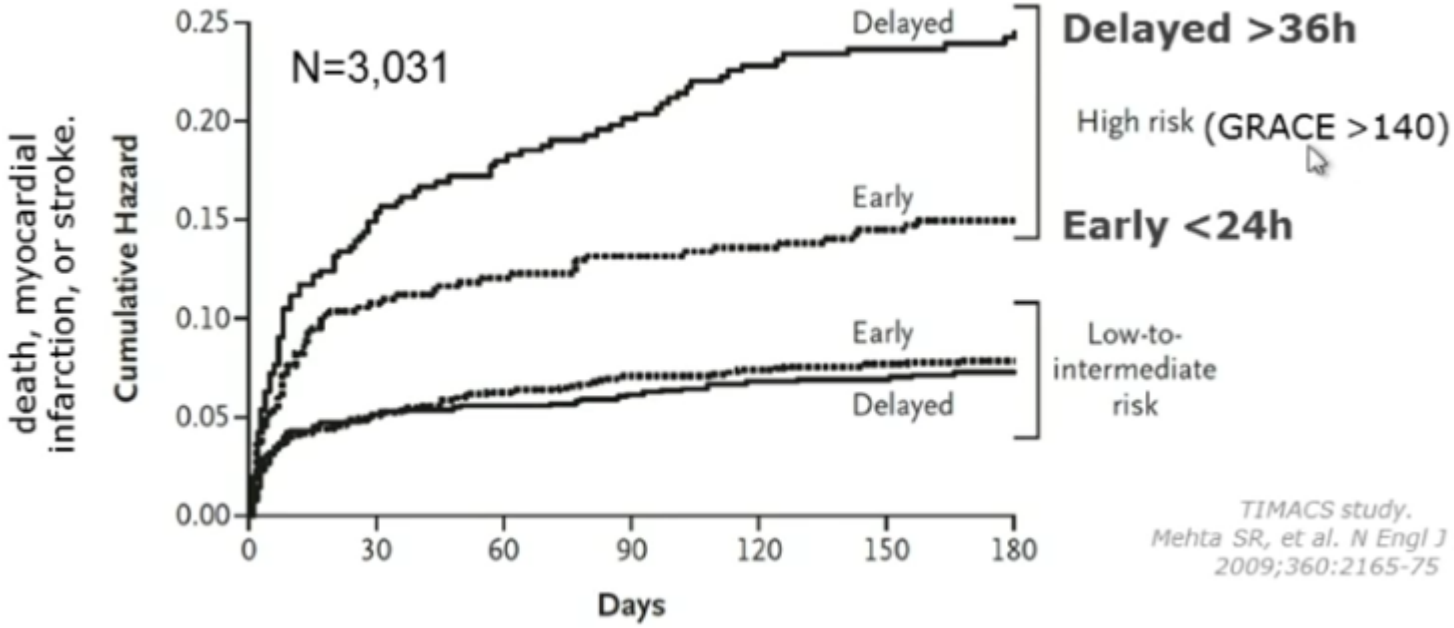
Kryteria kwalifikacji do strategii inwazyjnej

Very-high-risk criteria
• Haemodynamic instability or cardiogenic shock
• Recurrent or ongoing chest pain refractory to medical treatment
• Life-threatening arrhythmias or cardiac arrest
• Mechanical complications of MI
• Acute heart failure
• Recurrent dynamic ST-T wave changes, particularly with intermittent ST-elevation
High-risk criteria
• Rise or fall in cardiac troponin compatible with MI
• Dynamic ST- or T-wave changes (symptomatic or silent)
• GRACE score >140
Intermediate-risk criteria
• Diabetes mellitus
• Renal insufficiency (eGFR <60 mL/min/1.73 m²)
• LVEF <40% or congestive heart failure
• Early post-infarction angina
• Prior PCI
• Prior CABG
• GRACE risk score >109 and <140
Low-risk criteria
• Any characteristics not mentioned above

An immediate invasive strategy (<2 h) is recommended in patients with at least one of the following very-high-risk criteria: – haemodynamic instability or cardiogenic shock – recurrent or ongoing chest pain refractory to medical treatment – life-threatening arrhythmias or cardiac arrest – mechanical complications of MI – acute heart failure with refractory angina or ST deviation – recurrent dynamic ST- or T-wave changes, particularly with intermittent ST-elevation.	I	C
In patients with none of the above mentioned risk criteria and no recurrent symptoms, non-invasive testing for ischaemia (preferably with imaging) is recommended before deciding on an invasive evaluation.	I	A

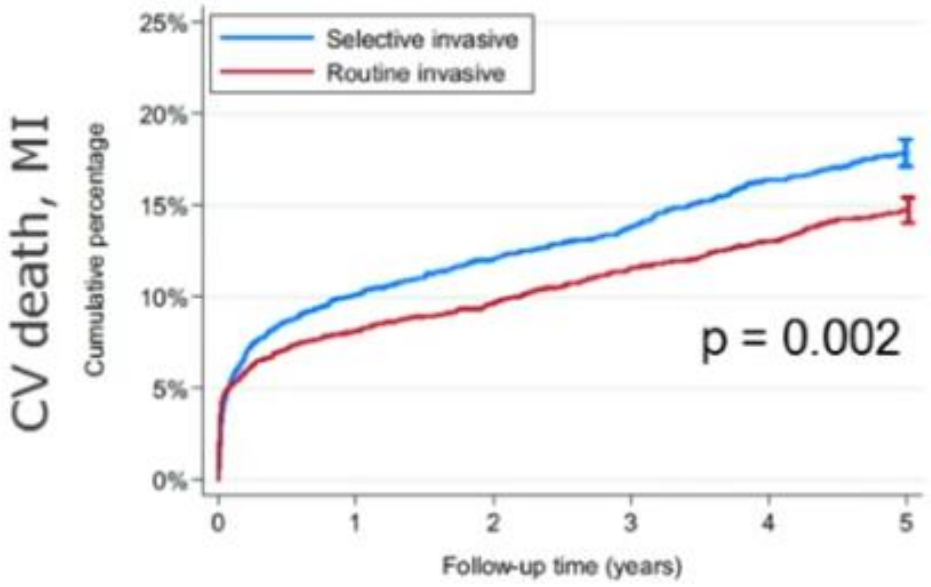
An early invasive strategy (<24 h) is recommended in patients with at least one of the following high-risk criteria: – rise or fall in cardiac troponin compatible with MI – dynamic ST- or T-wave changes (symptomatic or silent) – GRACE score >140.	I	A

Pacjenci spełniający kryteria wysokiego ryzyka - zalecana wczesna strategia inwazyjna (<24 godzin)



An invasive strategy (<72 h) is recommended in patients with at least one of the following intermediate-risk criteria: – diabetes mellitus – renal insufficiency (eGFR <60 mL/min/1.73 m^2) – LVEF <40% or congestive heart failure – early post-infarction angina – recent PCI – prior CABG – GRACE risk score >109 and <140, or recurrent symptoms or known ischaemia on non-invasive testing.	I	A

Pacjenci spełniający kryteria pośredniego ryzyka - zalecana strategia inwazyjna (<72 godzin)

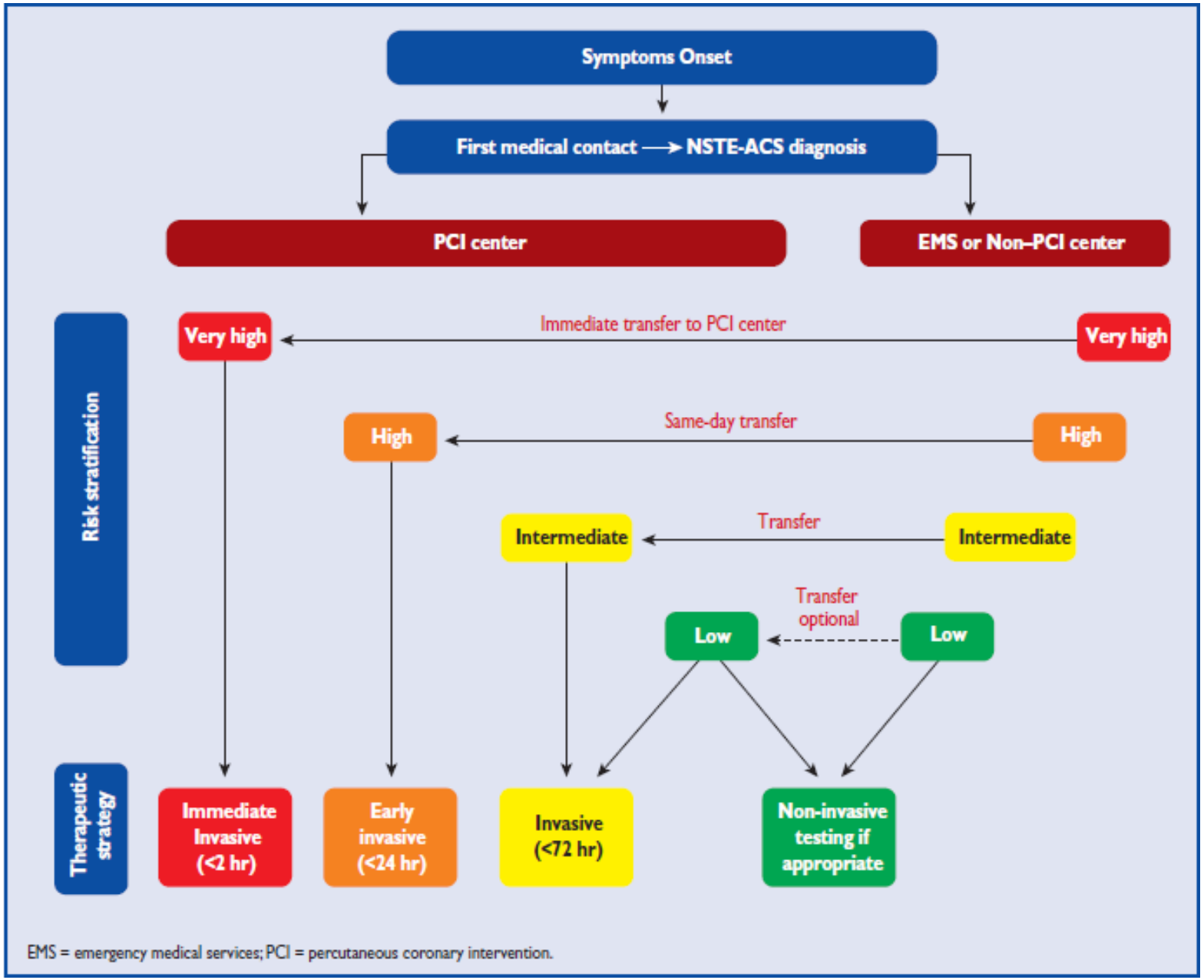


Individual patient-level data metaanalysis with 5y follow-up

Routine invasive = ICA with **48h** (ICTUS), **72h** (RITA-3), **7d** (FRISC-II)

Benefit most pronounced in patients with intermediate-to-high risk

Fox Ka et al. J Am Coll Cardiol 2010;55:2435–45



EMS = emergency medical services; PCI = percutaneous coronary intervention.

In patients with multivessel CAD, it is recommended to base the revascularization strategy (e.g. ad hoc culprit-lesion PCI, multivessel PCI, CABG) on the clinical status and comorbidities as well as the disease severity (including distribution, angiographic lesion characteristics, SYNTAX score), according to the local Heart Team protocol.	I	C

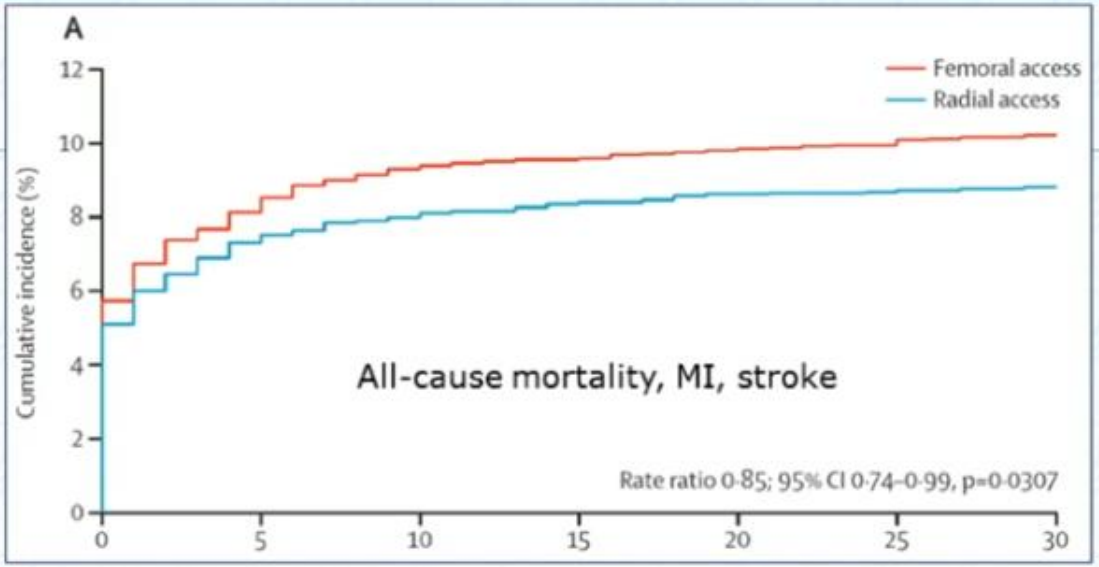
In centres experienced with radial access, a radial approach is recommended for coronary angiography and PCI.	I	A
In patients undergoing PCI, new-generation DESs are recommended.	I	A

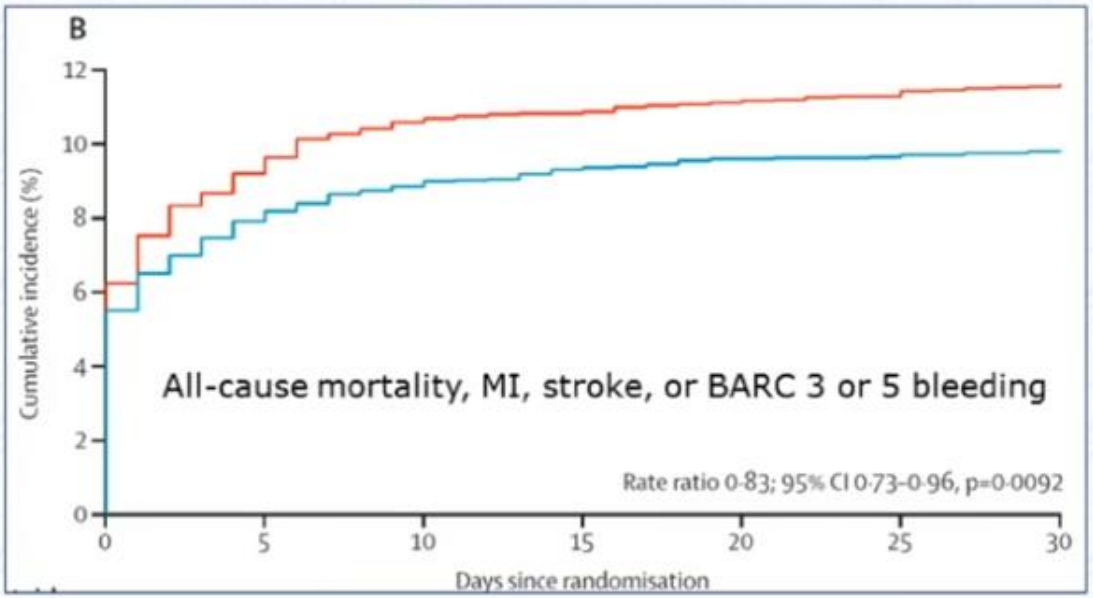
Zalecenia w zależności od rozległości CAD	CABG		PCI	
	Klasa[a]	Poziom[b]	Klasa[a]	Poziom[b]
Choroba jedno- lub dwunaczyniowa bez zwężenia w proksymalnym odcinku LAD	IIb	C	I	C
Choroba jednonaczyniowa ze zwężeniem w proksymalnym odcinku LAD	I	A	I	A
Choroba dwunaczyniowa ze zwężeniem w proksymalnym odcinku LAD	I	B	I	C
Choroba pnia lewej tętnicy wieńcowej oraz ≤ 22 punkty w skali SYNTAX	I	B	I	B
Choroba pnia lewej tętnicy wieńcowej oraz 23–32 punkty w skali SYNTAX	I	B	IIa	B
Choroba pnia lewej tętnicy wieńcowej oraz > 32 punkty w skali SYNTAX	I	B	III	B
Choroba trójnaczyniowa oraz ≤ 22 punkty w skali SYNTAX	I	A	I	B
Choroba trójnaczyniowa oraz 23–32 punkty w skali SYNTAX	I	A	III	B
Choroba trójnaczyniowa oraz > 32 punkty w skali SYNTAX	I	A	III	B

Badanie MATRIX

MATRIX
Co-primary composite outcomes at 30 days

- N=8404
- NSTE-ACS + STEMI
- Radial vs. femoral

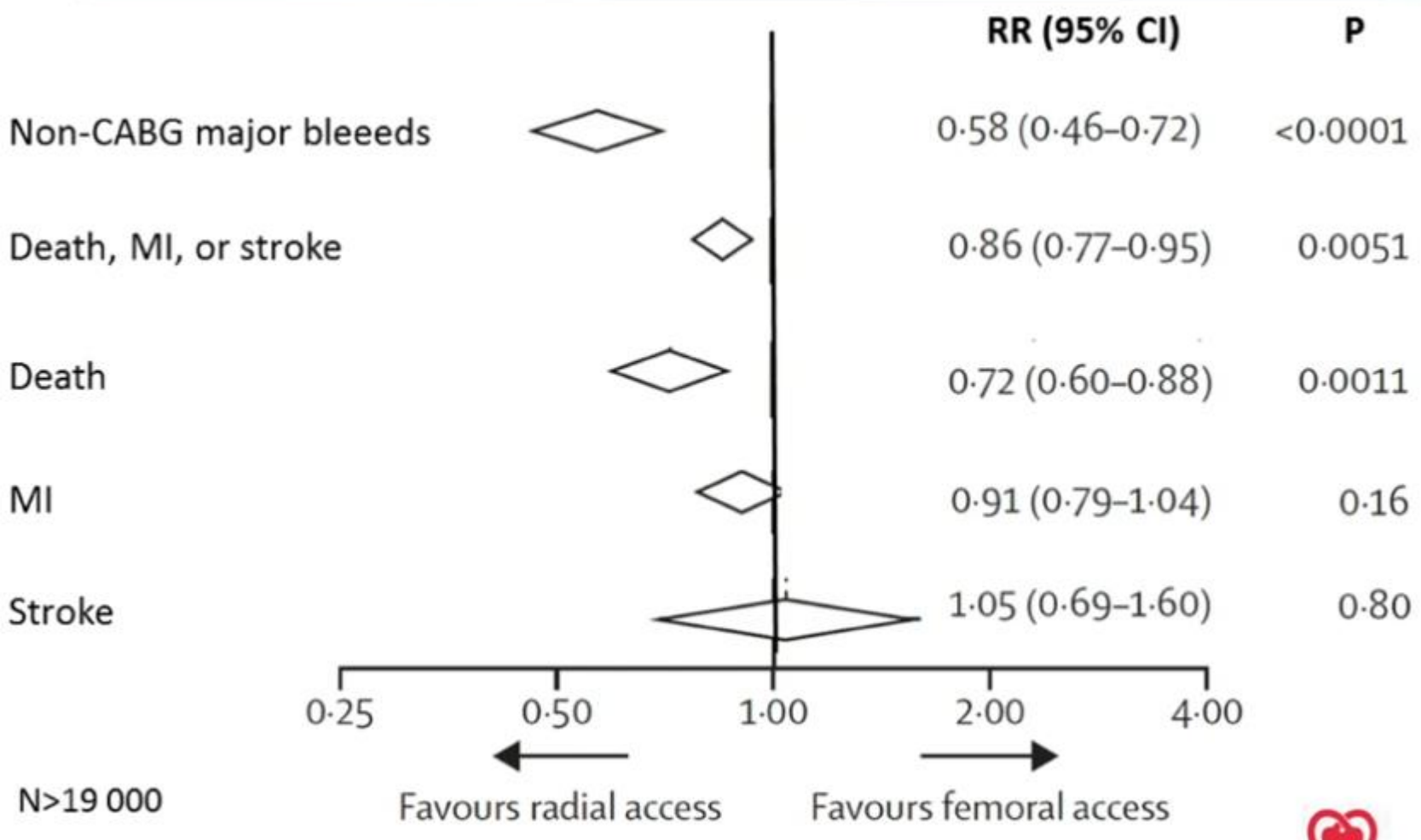




Valgimigli M et al.
Lancet. 2015;385:2465-76

www.escardio.org

Radial vs femoral meta-analysis



Valgimigli M et al.
Lancet. 2015;385:2465-76

Postępowanie u pacjentów w podeszłym wieku

It is recommended to tailor antithrombotic treatment according to bodyweight and renal function.	I	C
Elderly patients should be considered for an invasive strategy and, if appropriate, revascularization after careful evaluation of potential risks and benefits, estimated life expectancy, comorbidities, quality of life, frailty and patient values and preferences.	IIa	A
Adjusted dosing regimens of beta-blockers, ACE inhibitors, ARBs and statins should be considered to prevent side effects.	IIa	C

Strategie mające na celu ograniczenie ryzyka powikłań krwotocznych

- Anticoagulant doses adjusted to bodyweight and renal function, especially in women and elderly patients.
- Radial approach preferred.
- Proton pump inhibitors in patients on DAPT at higher than average risk of gastrointestinal bleeds (i.e. history of gastrointestinal ulcer/haemorrhage, anticoagulant therapy, chronic NSAIDs/corticosteroid use, or two or more among age ≥65 years, dyspepsia, gastrooesophageal reflux disease, *Helicobacter pylori* infection, and chronic alcohol use).
- In patients on OAC
  - PCI performed without interruption of VKAs or NOACs.
  - In patients on VKAs, do not administer UFH if INR value >2.5.
  - In patients on NOACs, regardless of the timing of the last administration of NOACs, add additional low-dose parenteral anticoagulation (e.g. enoxaparin 0.5 mg/kg i.v. or UFH 60 IU/kg).
  - Aspirin indicated but avoid pretreatment with $P2Y_{12}$ inhibitors.
  - GPIIb/IIIa inhibitors only for bailout of periprocedural complications.

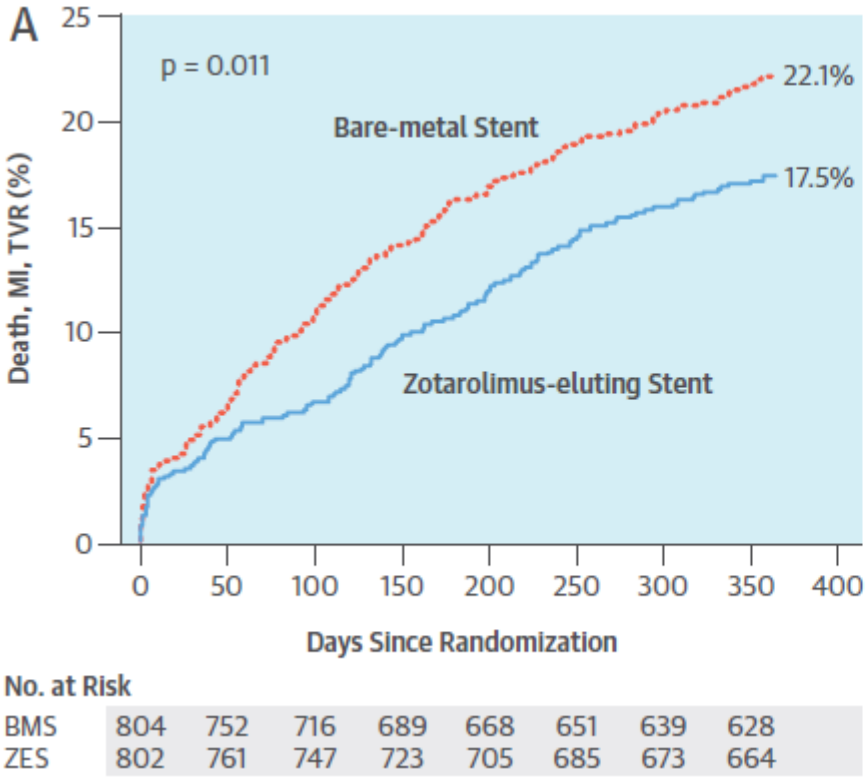
Strategie mające na celu ograniczenia ryzyka powikłań krwotocznych

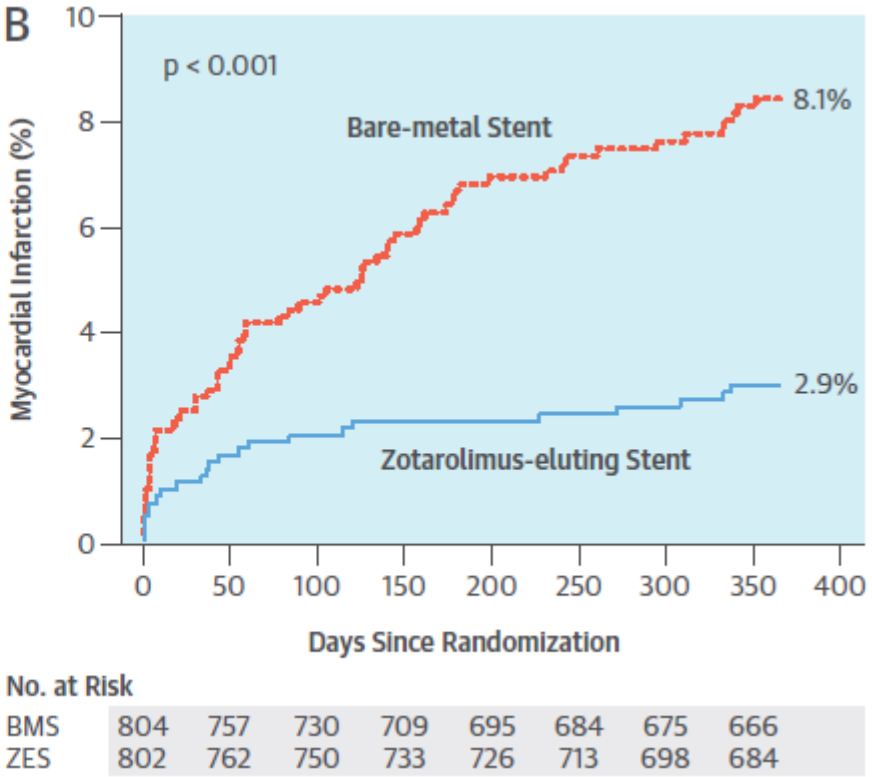
A proton pump inhibitor in combination with DAPT is recommended in patients at higher than average risk of gastrointestinal bleeds (i.e. history of gastrointestinal ulcer/haemorrhage, anticoagulant therapy, chronic NSAID/ corticosteroid use or two or more of the following: age ≥65 years, dyspepsia, gastro-oesophageal reflux disease, *Helicobacter pylori* infection, chronic alcohol use).	I	B
In patients on $P2Y_{12}$ inhibitors who need to undergo non-emergency major non-cardiac surgery,[f] postponing surgery for at least 5 days after cessation of ticagrelor or clopidogrel, and for 7 days for prasugrel, should be considered if clinically feasible and unless the patient is at high risk of ischaemic events.	IIa	C
In case of a non-cardiac surgical procedure that cannot be postponed or of a bleeding complication, discontinuation of the $P2Y_{12}$ inhibitor may be considered after a minimum of 1 and 3 months from PCI with BMS and new-generation DES, respectively.	IIb	C

Leczenie inhibitorem pompy protonowej nie powinno być stosowane rutynowo u pacjentów leczonych DAPT!

Zotarolimus-Eluting Versus Bare-Metal Stents in Uncertain Drug-Eluting Stent Candidates

JACC VOL. 65, NO. 8, 2015
MARCH 3, 2015:805–15





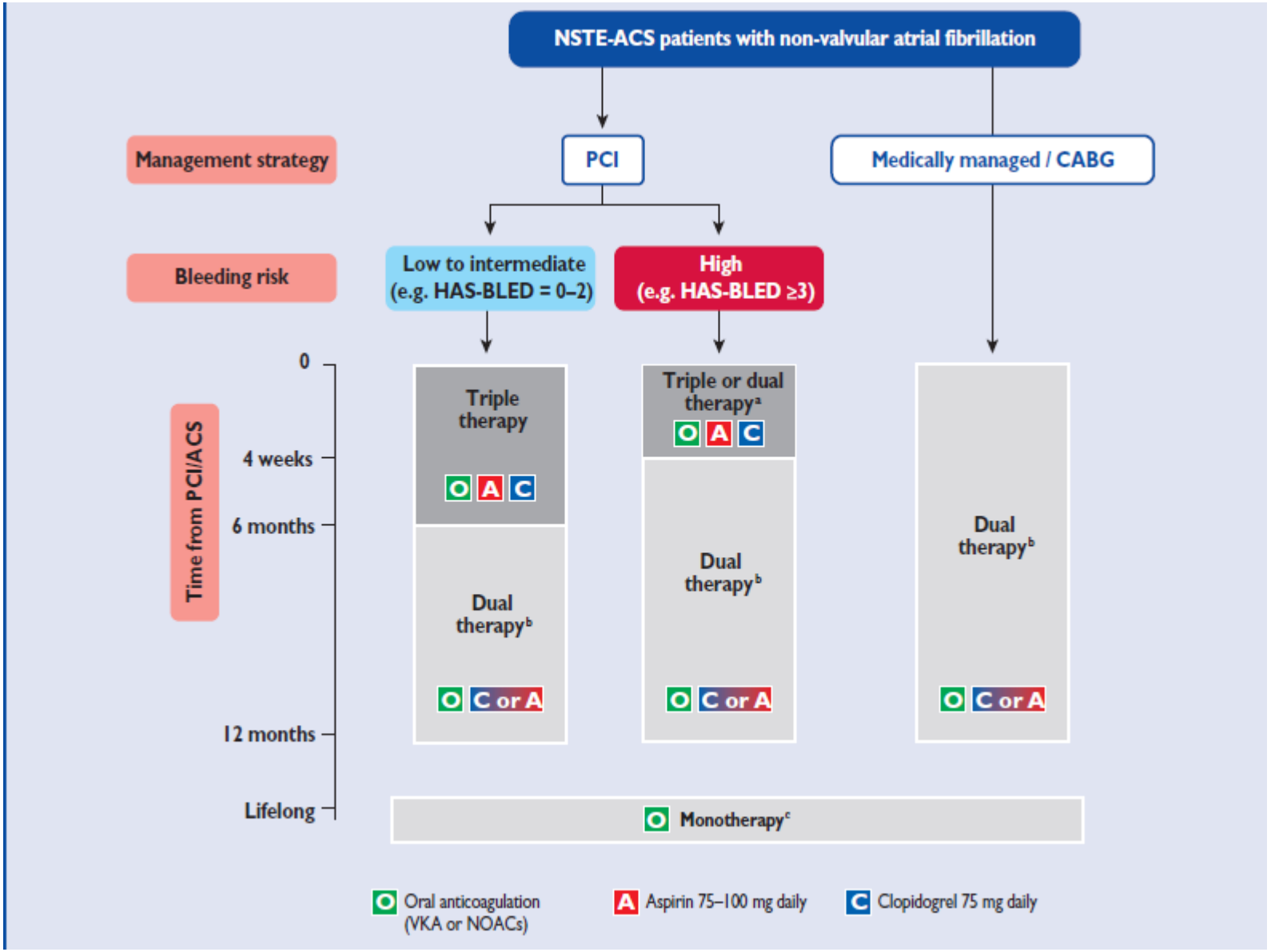
- 1606 pacjentów, „niepewni kandydaci do implantacji DES”
- Randomizacja 1:1 BMS vs DES-ZES
- Mediana stosowania DAPT: 33 dni w grupie BMS i 31 dni w grupie DES-ZES

Zasady łączenia leczenia przeciwkrzepliwego i przeciwpłytkowego u pacjentów z NST-ACS

In patients with a firm indication for OAC (e.g. atrial fibrillation with a CHA_2DS_2-VASc score ≥ 2, recent venous thromboembolism, LV thrombus or mechanical valve prosthesis), OAC is recommended in addition to antiplatelet therapy.	I	C
An early invasive coronary angiography (within 24 h) should be considered in moderate- to high-risk patients,[d] irrespective of OAC exposure, to expedite treatment allocation (medical vs. PCI vs. CABG) and to determine the optimal antithrombotic regimen.	IIa	C
Initial dual antiplatelet therapy with aspirin plus a $P2Y_{12}$ inhibitor in addition to OAC before coronary angiography is not recommended.	III	C

During PCI, additional parenteral anticoagulation is recommended, irrespective of the timing of the last dose of all NOACs and if INR is <2.5 in VKA-treated patients.	I	C
Uninterrupted therapeutic anticoagulation with VKA or NOACs should be considered during the periprocedural phase.	IIa	C
Following coronary stenting, DAPT including new $P2Y_{12}$ inhibitors should be considered as an alternative to triple therapy for patients with NSTE-ACS and atrial fibrillation with a CHA_2DS_2-VASc score of 1 (in males) or 2 (in females).	IIa	C

Zasady łączenia leczenia przeciwkrzepliwego i przeciwpłytkowego u pacjentów z NST-ACS



Zasady łączenia leczenia przeciwkrzepliwego i przeciwpłytkowego u pacjentów z NST-ACS

If at low bleeding risk (HAS-BLED ≤2), triple therapy with OAC, aspirin (75–100 mg/day) and clopidogrel 75 mg/day should be considered for 6 months, followed by OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) continued up to 12 months.	IIa	C
If at high bleeding risk (HAS-BLED ≥3), triple therapy with OAC, aspirin (75–100 mg/day) and clopidogrel 75 mg/day should be considered for a duration of 1 month, followed by OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) continued up to 12 months irrespective of the stent type (BMS or new-generation DES).	IIa	C
Dual therapy with OAC and clopidogrel 75 mg/day may be considered as an alternative to triple antithrombotic therapy in selected patients (HAS-BLED ≥3 and low risk of stent thrombosis).	IIb	B

The use of ticagrelor or prasugrel as part of triple therapy is not recommended.	III	C

Radial over femoral access is recommended for coronary angiography and PCI.	I	A
The use of new-generation DES over BMS should be considered among patients requiring OAC.	IIa	B

Medically managed patients		
One antiplatelet agent in addition to OAC should be considered for up to 1 year.	IIa	C

Use of clopidogrel with or without aspirin in patients taking oral anticoagulant therapy and undergoing percutaneous coronary intervention: an open-label, randomised, controlled trial

Willem J M Dewilde, Tom Oirbans, Freek W A Verheugt, Johannes C Kelder, Bart J G L De Smet, Jean-Paul Herrman, Tom Adriaenssens, Mathias Vrolix, Antonius A C M Heestermans, Marije M Vis, Jan G P Tijsen, Arnoud W van 't Hof, Jurriën M ten Berg, for the WOEST study investigators

Badanie WOEST

Lancet 2013; 381: 1107–15

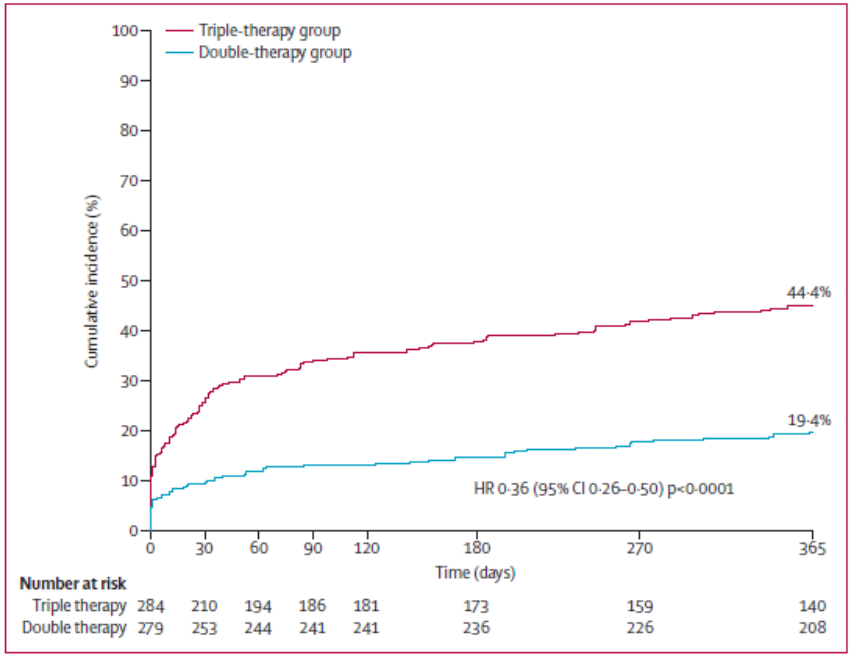


Figure 2: **Incidence of the primary endpoint (any bleeding)**

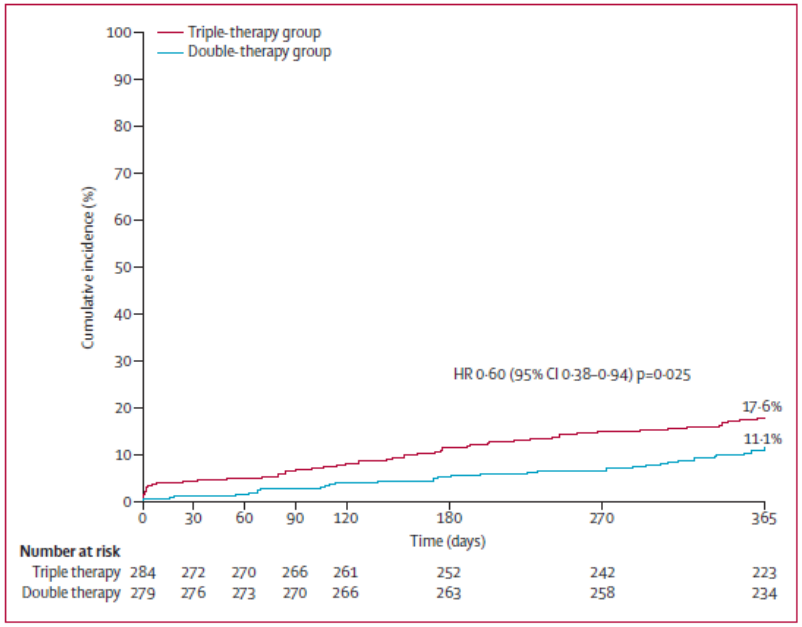


Figure 3: **Cumulative incidence of the secondary endpoint (death, myocardial infarction, stroke, target-vessel revascularisation, and stent thrombosis)**

- 573 pacjentów poddanych PCI, wymagających przyjmowania VKA ze względu na AF bądź mechaniczną protezę zastawkową, randomizacja 1:1:
  - VKA + ASA + Klopidogrel (1)
  - VKA + Klopidogrel (2)
- Obserwacja: 1 rok

Wyniki

- Krwawienie :
  - Grupa 1 vs grupa 2: 44.4% vs 19.4% p<0.0001
- Zakrzepica w stencie:
  - Grupa 1 vs grupa 2: 3.2% vs 1.4% p=0.165

Zasady łączenia leczenia przeciwkrzepliwego i przeciwpłytkowego u pacjentów z NST-ACS

If at low bleeding risk (HAS-BLED ≤2), triple therapy with OAC, aspirin (75–100 mg/day) and clopidogrel 75 mg/day should be considered for 6 months, followed by OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) continued up to 12 months.	IIa	C
If at high bleeding risk (HAS-BLED ≥3), triple therapy with OAC, aspirin (75–100 mg/day) and clopidogrel 75 mg/day should be considered for a duration of 1 month, followed by OAC and aspirin 75–100 mg/day or clopidogrel (75 mg/day) continued up to 12 months irrespective of the stent type (BMS or new-generation DES).	IIa	C
Dual therapy with OAC and clopidogrel 75 mg/day may be considered as an alternative to triple antithrombotic therapy in selected patients (HAS-BLED ≥3 and low risk of stent thrombosis).	IIb	B

The use of ticagrelor or prasugrel as part of triple therapy is not recommended.	III	C

Radial over femoral access is recommended for coronary angiography and PCI.	I	A
The use of new-generation DES over BMS should be considered among patients requiring OAC.	IIa	B

Medically managed patients		
One antiplatelet agent in addition to OAC should be considered for up to 1 year.	IIa	C

Prewencja wtórna

It is recommended to advise all patients on lifestyle changes (including smoking cessation, regular physical activity and a healthy diet).	I	A
It is recommended to start high-intensity statin therapy as early as possible, unless contraindicated, and maintain it long term.	I	A
A diastolic blood pressure goal of <90 mmHg is recommended (<85 mmHg in diabetic patients).	I	A
Participation in a well-structured cardiac rehabilitation programme to modify lifestyle habits and increase adherence to treatment should be considered.	IIa	A
In patients with LDL cholesterol ≥70 mg/dL (≥1.8 mmol/L) despite a maximally tolerated statin dose, further reduction in LDL cholesterol with a non-statin agent[e] should be considered.	IIa	B
A systolic blood pressure goal of <140 mmHg should be considered.	IIa	B

DZIĘKUJĘ ZA UWAGĘ!