

# REALITA POUŽITÍ SKÓROVACÍCH ALGORITMŮ PRO STANOVENÍ RIZIKA

David Horák  
Krajská nemocnice Liberec a.s.



ČESKÁ  
KARDIOLOGICKÁ  
SPOLEČNOST

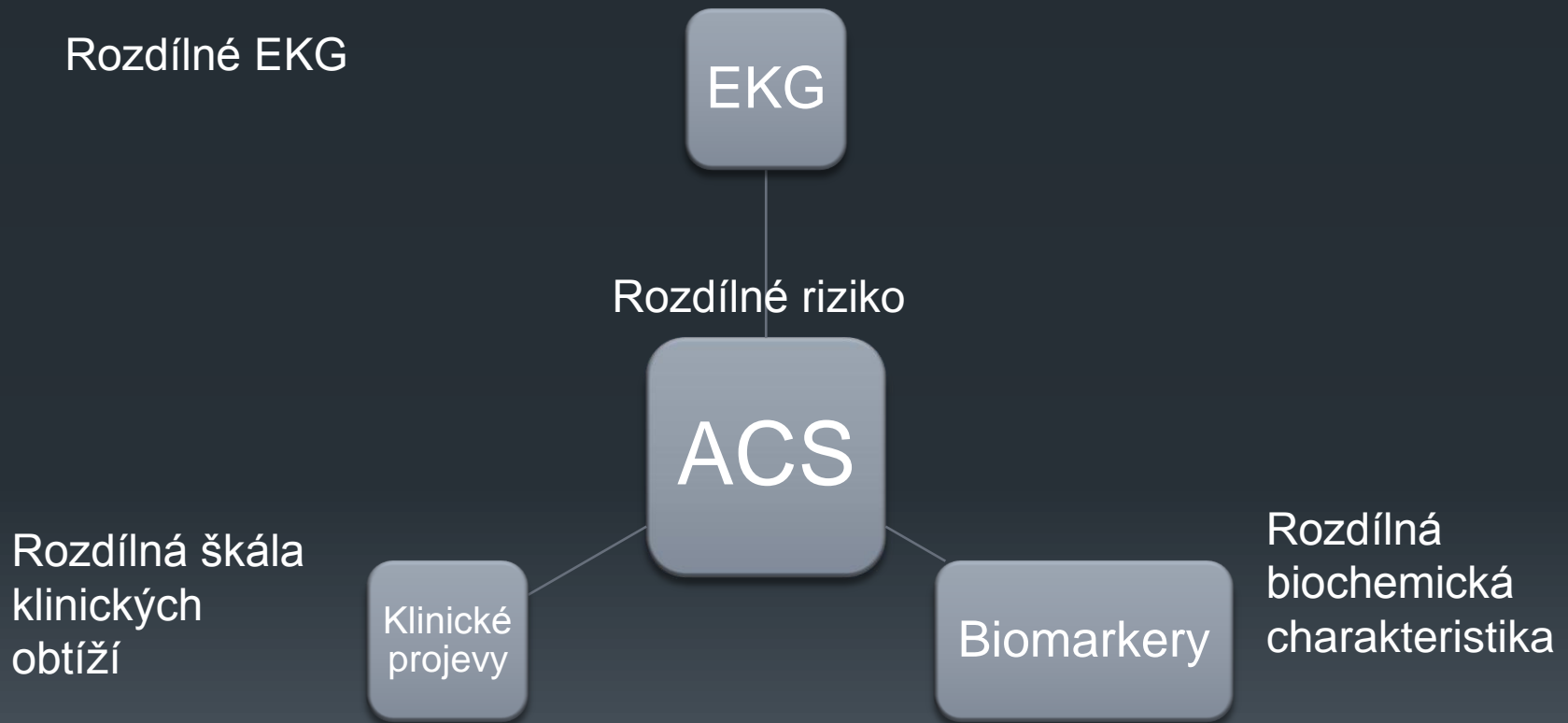
XXIV Výroční sjezd ČKS



# Skorovací systémy

- Funkce skórovacích systémů
- Přehled několika skorovacích systémů
- TIMI a GRACE risk score
- Jejich aplikace v guidelines
- Použití skorovacích systémů v praxi

# Akutní koronární syndromy



# Akutní koronární syndromy

- Až jedna třetina pacientů s ACS se prezentuje atypickými bolestmi
- Ale méně než jedna polovina pacientů přijatých pro bolesti na hrudi mají jako výstupní diagnózu ACS
- EKG: ST elevace mají vysokou specificitu, ale nízkou senzitivitu.  $\frac{3}{4}$  ACS nemá ST elevace
- Troponiny jsou citlivým biochemickým markerem, ale jejich použití je vprvních hodinách od nástupu obtíží limitováno jejich dynamikou

# Riziková skore

- TIMI risk skore
  - Pursuit RS
  - GRACE
- Z klinických studií
- Z mezinárodního registru



# Další skore pro stanovení rizika

- CHA2DS2-VASc
- HAS-BLED
- DAPT
- SYNTAX

# CHA2DS2-VASc

## CHA<sub>2</sub>DS<sub>2</sub>-VASc Calculator for Atrial Fibrillation

Evaluates ischemic stroke risk in patients with atrial fibrillation

Criteria		Poss. Point
<b>C</b> ongestive heart failure Signs/symptoms of heart failure confirmed with objective evidence of cardiac dysfunction	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
<b>H</b> ypertension Resting BP > 140/90 mmHg on at least 2 occasions <u>or</u> current antihypertensive pharmacologic treatment	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
<b>A</b> ge 75 years or older	<input type="checkbox"/> Yes <input type="checkbox"/> No	+2
<b>D</b> iabetes mellitus Fasting glucose > 125 mg/dL, or treatment with oral hypoglycemic agent and/or insulin	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
<b>S</b> troke, TIA, or TE Includes any history of cerebral ischemia	<input type="checkbox"/> Yes <input type="checkbox"/> No	+2
<b>V</b> ascular disease Prior MI, peripheral arterial disease, or aortic plaque	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
<b>A</b> ge 65 to 74 years	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1
<b>S</b> ex Category (female) Female gender confers higher risk	<input type="checkbox"/> Yes <input type="checkbox"/> No	+1



# Další skore pro stanovení rizika

- CHA2DS2-VASc
- HAS-BLED
- DAPT
- SYNTAX



# HAS-BLED

## HAS-BLED Calculator for Atrial Fibrillation

Evaluates bleeding risk in patients with atrial fibrillation

Criteria	Poss. Point
<b>H</b> ypertension Uncontrolled hypertension (systolic BP > 160 mmHg)	<input type="checkbox"/> Yes <input type="checkbox"/> No +1
<b>A</b> bnormal renal or liver function <b>Renal:</b> Chronic dialysis, renal transplant, serum creatinine $\geq$ 2.3 mg/dL (200 $\mu$ mol/L) <b>Liver:</b> Cirrhosis, bilirubin > 2x UNL with AST/ALT/AP > 3x UNL	None ▾ +1 or +2
<b>S</b> troke	<input type="checkbox"/> Yes <input type="checkbox"/> No +1
<b>B</b> leeding Bleeding history or predisposition (anemia)	<input type="checkbox"/> Yes <input type="checkbox"/> No +1
<b>L</b> abile INR Therapeutic time in range < 60%	<input type="checkbox"/> Yes <input type="checkbox"/> No +1
<b>E</b> lderly Greater than 65 years old	<input type="checkbox"/> Yes <input type="checkbox"/> No +1
<b>D</b> rugs or alcohol <b>Drugs</b> - other antiplatelet agents or NSAIDs <b>Alcohol</b> - more than 8 drinks per week	None ▾ +1 or +2



# Další skore pro stanovení rizika

- CHA2DS2-VASc
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# TIMI risk score

## TIMI RISK SCORE for UA/NSTEMI

HISTORICAL	POINTS	RISK OF CARDIAC EVENTS (%) BY 14 DAYS IN TIMI 11B*		
		RISK SCORE	DEATH OR MI	DEATH, MI OR URGENT REVASC
Age $\geq 65$	1			
$\geq 3$ CAD risk factors (FHx, HTN, $\uparrow$ chol, DM, active smoker)	1			
Known CAD (stenosis $\geq 50\%$ )	1	0/1	3	5
ASA use in past 7 days	1	2	3	8
<b>PRESENTATION</b>		3	5	13
Recent ( $\leq 24$ H) severe angina	1	4	7	20
$\uparrow$ cardiac markers	1	5	12	26
ST deviation $\geq 0.5$ mm	1	6/7	19	41
<b>RISK SCORE = Total Points (0 - 7)</b>				

\*Entry criteria: UA or NSTEMI defined as ischemic pain at rest within past 24H, with evidence of CAD (ST segment deviation or +marker)

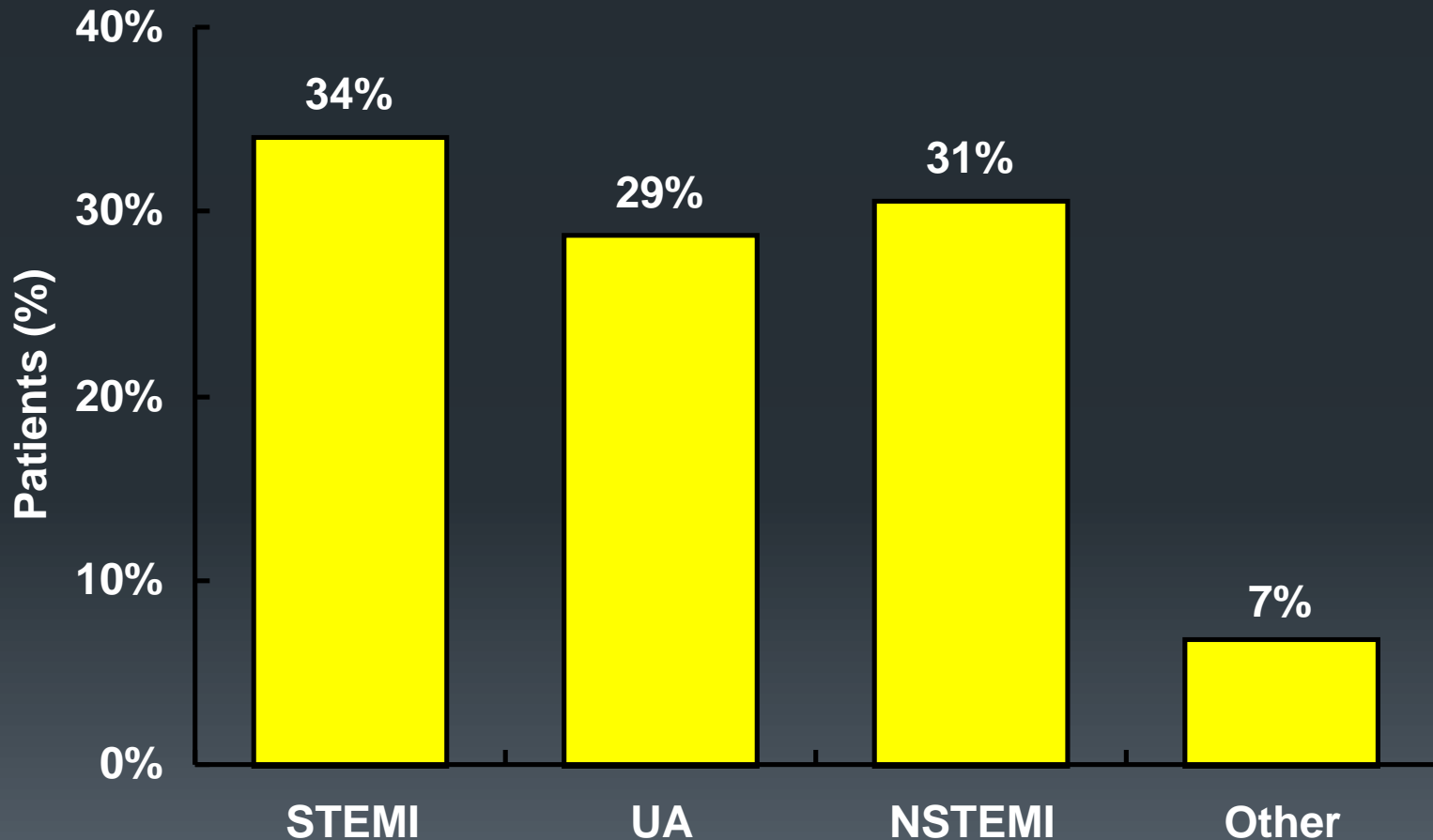
# TIMI risk score

<b>TIMI Risk Score</b>	<b>All-Cause Mortality, New or Recurrent MI, or Severe Recurrent Ischemia Requiring Urgent Revascularization Through 14 d After Randomization, %</b>
0-1	4.7
2	8.3
3	13.2
4	19.9
5	26.2
6-7	40.9

# GRACE risk score

- Global Registry of Acute Cardiac Events risk score
- Model pro výpočet celkové mortality (all cause mortality) nebo nového IM.
  - Komponenty:
    - Věk
    - Srdeční frekvence
    - Systolický tlak
    - Killip třída
    - Přítomnost srdeční zástavy
    - Sérový kreatinin
    - Deviace ST segmentů
    - Pozitivita kardiomarkerů

# Classification of Cases



# GRACE risk score

**GRACE**  
ACS RISK SCORE 2.0

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## Calculator

1. INPUT DATA > 2. DEATH / DEATH IN RESULTS

Age ( years )

Heart rate ( bpm )

Systolic blood pressure ( mmHg )

CHF ( Killip class )

Diuretic usage

Creatinine ( mg dL<sup>-1</sup> / μmol L<sup>-1</sup> )

Renal failure

ST-segment deviation

Cardiac arrest at admission

Elevated troponin\*

\* Or other necrosis cardiac biomarkers

**RESET** **CALCULATE**

**CE**

**Disclaimer**

This risk scoring tool is intended for use by clinicians, in conjunction with individual patient assessment. We assume no responsibility for how you use or interpret the GRACE 2.0 ACS Risk Calculator app or any other information provided on this website. [Read more.](#)

# GRACE risk score kalkulátor

The screenshot shows the GRACE ACS Risk Score 2.0 mobile application interface. The top status bar displays the time as 19:15 and battery level at 98%. The app header includes the GRACE logo and the text 'ACS RISK SCORE 2.0'. The main form consists of several input fields and toggle switches:

- Age**: Input field with 'years' as the unit.
- Heart rate**: Input field with 'bpm' as the unit.
- Systolic blood pressure**: Input field with 'mmHg' as the unit.
- CHF**: Input field with 'Killip class' as the unit.
- Diuretic usage**: Toggle switch set to 'No'.
- Creatinine**: Input field with 'mg dL<sup>-1</sup> / μmol L<sup>-1</sup>' as the unit.
- Renal failure**: Toggle switch set to 'No'.
- ST-segment deviation**: Toggle switch set to 'No'.
- Elevated troponin\***: Toggle switch set to 'No'.
- Cardiac arrest at admission**: Toggle switch set to 'No'.

The bottom navigation bar contains three icons: a calculator icon labeled 'Calculator', a question mark icon labeled 'Help', and a heart rate icon labeled 'About'.



### Non STE-ACS: In-hospital Mortality

Risk Category (tertiles)	GRACE Risk Score	Probability of Death In-hospital (%)
Low	1-108	<1
Intermediate	109-140	1-3
High	141-372	>3

### Non STE-ACS: 6 Month Post-discharge Mortality

Risk Category (tertiles)	GRACE Risk Score	Probability of Death Post-discharge to 6 Months (%)
Low	1-88	<3
Intermediate	89-118	3-8
High	119-263	>8

### STE-ACS: In-hospital Mortality

Risk Category (tertiles)	GRACE Risk Score	Probability of Death In-hospital (%)
Low	49-125	<2
Intermediate	126-154	2-5
High	155-319	>5


### STE-ACS: 6 Month Post-discharge Mortality

Risk Category (tertiles)	GRACE Risk Score	Probability of Death Post-discharge to 6 Months (%)
Low	27-99	<4.4
Intermediate	100-127	4.5-11
High	128-263	>11

GRACE is supported by a grant from Sanofi

For general questions and information: [GRACE@umassmed.edu](mailto:GRACE@umassmed.edu) • 508.856.0081  
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# GRACE risk score

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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	4.9-5.3 (110)	Not available
1 year	4.9-5.3	<a href="#">GRAPH</a>
3 years	17	<a href="#">GRAPH</a>

Death/MI		
Time	% Risk	Histograms
1 year	9.5	<a href="#">GRAPH</a>

[EDIT INPUT](#)      [NEW CALCULATION](#)

### Number of patients by risk group for 3-year death




Distribution of risk in GRACE population

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

Line: risk of death or death/MI

Vertical bar: individual risk of death or death/MI  
green = low, yellow = intermediate, red = high



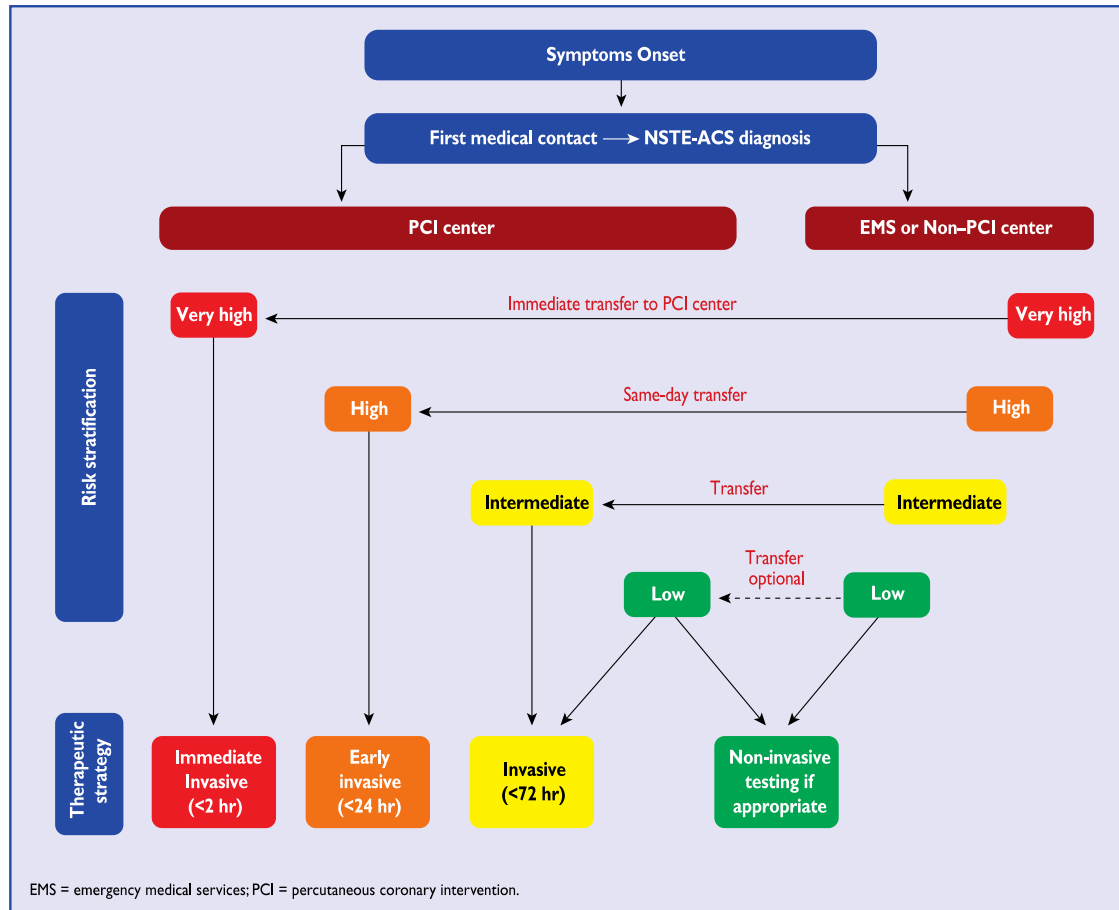
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**Table 13 Risk criteria mandating invasive strategy in NSTEMI-ACS**

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 m <sup>2</sup> )
• 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

CABG = coronary artery bypass graft; eGFR = estimated glomerular filtration rate; GRACE = Global Registry of Acute Coronary Events; LVEF = left ventricular ejection fraction; PCI = percutaneous coronary intervention; MI = myocardial infarction.



**Figure 6** Selection of non-ST-elevation acute coronary syndrome (NSTEMI-ACS) treatment strategy and timing according to initial risk stratification.

# Outcome of “Low-risk” Patients with ACS

- *Presentation with UA in the absence of dynamic ECG changes, no troponin elevation, no arrhythmia nor hypotension*
- Abnormal ECG in 38%,
- 27% stress test, 37% echo, 52% angio
- 6 month outcome:
  - 23% readmission
  - 12% revascularized
  - 3% deaths
- “Low-risk” is not no risk

# Realita využití skorovacích systémů TIMI a GRACE



# Realita využití skorovacích systémů TIMI a GRACE



- Liberec
- Turnov
- Česká Lípa
- Semily
- Jablonec nad Nisou
- Mladá Boleslav

# Realita využití skorovacích systémů TIMI a GRACE

	TIMI	GRACE
A	Nikdy	Nikdy
B	Nikdy	Nahodile
C	Nikdy	Nikdy
D	Nikdy	Nikdy
E	Nikdy	Nahodile
F	Nikdy	Nikdy



# Skorovací systémy pro stanovení rizika

- Objektivizace rizik
  - Zpřesnění diagnózy a prognózy
  - Vodítka k terapii a managementu
  - Zvýšení efektivity zdravotního systému
  - Zvýšení bezpečnosti
- 
- Riziková skóre jsou nástroje, které doplňují, ale nenahrazují zdravý klinický úsudek