

Pershina E.S.^{1,2}, Shilova A.S.¹, Nesterov A.P.¹, Solovieva V.A.¹,
Tuul D.M.¹, Shchekochikhin D.Yu.^{1,2}, Gilyarova E. M.¹, Kovalev K. V.¹,
Magomedova Z. M.^{1,2}, Meshkov V. V.¹, Romashkina E. R.²,
Pakhomov P. V.³, Ognerubov D. V.⁴, Khairullin I. I.¹, Sinitsyn V. E.⁵

¹ Pirogov Municipal Clinical Hospital #1, Moscow, Russia
² Sechenov First Moscow State Medical University, Moscow, Russia
³ National Medical Research Center of Otolaryngology, Moscow, Russia
⁴ Russian Presidential Academy of National Economy and Public Administration, Moscow, Russia
⁵ Lomonosov Moscow State University, Moscow, Russia

CLINICAL AND ECONOMIC EFFECTIVENESS
OF CT ANGIOGRAPHY METHODS IN THE EMERGENCY
DEPARTMENT FOR INTERMEDIATE-RISK PATIENTS
WITH NON-ST-SEGMENT ELEVATION ACUTE CORONARY SYNDROME
SUPPLEMENTARY MATERIALS

Table 1. Indications and contraindications for CTA in the emergency department

| | |
|--|---|
| Indications for CTA | Suspected NSTEMI-ACS in patients at medium risk of AMI (GRACE score 109-140 and/or HEART 4-6) |
| Indications for triple rule-out protocol | Difficulties in differential diagnosis between ACS, PE, and AAS Based on clinical, investigational, and laboratory data (physical examination, ECG, echocardiogram, troponin, D-dimer) and PE and AAS probability scores (Wells, Geneva, ADvISED) |
| Contraindications for CTA | 1. Known allergy to an iodinated contrast agent 2. Glomerular filtration rate (GFR) < 30 mL/min/1.73m ² 3. For CTA: known history of myocardial infarction, stenting of coronary arteries, coronary artery bypass grafting (CABG). 4. Severe calcification of coronary arteries |

CTA, computed tomography angiography, which includes CT coronary angiography and the triple rule-out protocol;
NSTEMI-ACS, non-ST-segment elevation acute coronary syndrome, AMI, acute myocardial infarction;
PE, pulmonary embolism; AAS, acute arterial syndrome.

Table 2. Number of all patients diagnosed with NSTEMI-ACS in the specified period (69 days)

| Parameter | Number of medium-risk patients diagnosed with NSTEMI-ACS | | |
|------------------------------------|--|--|----------------------------------|
| | Absolute value | Relative value (of all medium-risk patients) | Relative value (of all patients) |
| CTA performed (medium risk), total | 37 | 34% | 14.3% |
| ACS was not confirmed by CTA | 27 | 25% | 10.0% |
| ACS was confirmed by CTA | 7 | 6.4% | 2.7% |

NSTEMI-ACS, non-ST-segment elevation acute coronary syndrome,
CTA, computed tomography angiography (CT coronary angiography and triple rule-out protocol).

Table 3. Economic costs associated with the utilization of CTA techniques for medium-risk patients with NSTE-ACS

| Types of costs | Cost of treatment per patient, rubles | Number of patients in this cohort | Cost of treatment of all patients, rubles |
|---|--|-----------------------------------|---|
| <i>Costs of examinations of patients in whom NSTE-ACS was ruled out when using a protocol including CTA in appropriate cases</i> | | | |
| Costs for treatment of all medium-risk patients with unconfirmed NSTE-ACS using CTA | 17,000 (diagnostic therapeutic MES including CTA) | 27 | 459,000 (17,000 × 27) |
| Costs for treatment of all medium-risk patients with unconfirmed NSTE-ACS for whom CTA was not utilized | 20,429 (ICU stay until transfer to the department) + 55,921 (mean cost of cardiac MES in the department) | 61 | 4,657,350 (20,429 + 55,921) × 61 |
| Estimated treatment costs for all patients with unconfirmed NSTE-ACS in the analyzed period | – | – | 459,000 + 4,657,350 = 5,116,350 |
| Estimated treatment costs for all patients with unconfirmed NSTE-ACS per year* | – | – | 27,064,750 |
| <i>Costs of examination of patients in whom NSTE-ACS was ruled out using the protocol with hospitalization for further evaluation in all cases (standard approach, without CTA)</i> | | | |
| Costs for treatment of all medium-risk patients with unconfirmed NSTE-ACS in the analyzed period | 20,429 (ICU stay) + 55,921 mean cost of cardiac MES in the department) | 27 + 61 = 88 | 6,718,800 (20,429 + 55,921) × 88 |
| Estimated treatment costs for all patients with unconfirmed NSTE-ACS per year* | – | – | 35,541,478 |

* Recalculation per year using the proportional method. NSTE-ACS, non-ST-segment elevation acute coronary syndrome, CTA, computed tomography angiography; ICU, intensive care unit; MES, medical and economic standard.