

# How well three surgical risk calculators can predict 30-day mortality after emergency abdominal surgery: a retrospective study from Northeastern Romania

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<b>Registration date</b> 30/12/2025	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 30/12/2025	<b>Condition category</b> Surgery	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Emergency laparotomy is a high-risk surgical procedure with significant mortality, especially in patients over 70. Risk prediction scores, such as NELA, ACS-NSQIP, and SORT, are commonly used internationally to estimate postoperative mortality, but their performance in Romania has not been evaluated. This study aims to compare the predicted 30-day mortality generated by these tools with the actual observed mortality in Romanian patients who underwent emergency laparotomy between 2022 and 2023. It also aims to assess long-term survival and identify the most common emergency procedures associated with a high mortality risk.

### Who can participate?

The study includes adults aged 18 and over who underwent emergency abdominal surgery (laparotomy or laparoscopy) in one of six hospitals in Northeastern Romania between January 1, 2022, and December 31, 2023. Patients are included based on the standard eligibility criteria defined by the National Emergency Laparotomy Audit (NELA).

### What does the study involve?

This is a retrospective observational study. Data will be collected from hospital records and will include patient demographics, surgical details, risk scores, and outcomes. The date of death will be ascertained by medical records scrutiny, contacting the general practitioner and as a last resort contacting the family. No intervention or treatment will be given as part of this study.

### What are the possible benefits and risks of participating?

There are no direct benefits or risks for patients, as all data are collected retrospectively. However, the findings may help improve risk prediction and surgical care for future patients undergoing emergency laparotomy.

Where is the study run from?

The study is coordinated by "Grigore T. Popa" University of Medicine and Pharmacy in Iași, Romania, and involves six hospitals in the Northeastern region.

When is the study starting and how long is it expected to run for?

The study period covers surgeries performed from January 2022 to December 2023. Data collection is scheduled for September - December 2025.

Who is funding the study?

The study is funded by a doctoral grant from "Grigore T. Popa" University of Medicine and Pharmacy, Iași (Romania).

Who is the main contact?

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## Contact information

### Type(s)

Scientific, Principal investigator, Public

### Contact name

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## Additional identifiers

## Study information

### Scientific Title

A retrospective longitudinal observational study of observed and predicted 30-day mortality after emergency laparotomy using NELA, ACS-NSQIP, and SORT risk scores in six hospitals in Northeastern Romania (Mortality In Romania: Real vs. predicted Outcomes in emergency laparotomy)

### Acronym

MIRRoR

### Study objectives

To determine the actual 30-day postoperative mortality following emergency laparotomy performed in six hospitals in Northeastern Romania and to compare it with mortality predictions generated by three preoperative risk assessment tools: NELA, ACS-NSQIP, and SORT. Analyses will be conducted for the entire cohort and stratified by age (<70 vs. ≥70 years). This is the first retrospective national initiative to evaluate the performance of these models in Romanian surgical practice.

### **Ethics approval required**

Ethics approval required

### **Ethics approval(s)**

approved 22/12/2025, Ethics Committee of the "Grigore T. Popa" University of Medicine and Pharmacy of Iași (Str. Universității nr. 16, Iași, 700115, Romania; +40 232 301 603; eticacercetarii@umfiasi.ro), ref: 691 / 22.12.2025.

### **Study design**

Multicentre retrospective longitudinal cohort study

### **Primary study design**

Observational

### **Study type(s)**

Efficacy, Prevention, Other

### **Health condition(s) or problem(s) studied**

Emergency general surgical conditions requiring laparotomy, including gastrointestinal perforation, bowel ischemia, intra-abdominal abscess, gastrointestinal bleeding, and mechanical obstruction. The study focuses on postoperative mortality following emergency laparotomy.

### **Interventions**

This is a multicentre, retrospective, longitudinal cohort study conducted across six hospitals in Northeastern Romania, including two tertiary-level centres. The study includes adult patients (≥18 years) who underwent emergency laparotomy between January 1, 2022, and December 31, 2023. Data are collected retrospectively from medical records, and the primary outcome is 30-day postoperative mortality. The observed mortality will be compared with that predicted by three risk assessment tools: NELA, ACS-NSQIP, and SORT.

### **Intervention Type**

Not Specified

### **Primary outcome(s)**

1. 30-day postoperative mortality is measured using hospital records at 30 days after surgery
2. Predicted mortality using NELA score is measured using NELA risk calculator at preoperative baseline
3. Predicted mortality using ACS-NSQIP score is measured using ACS-NSQIP risk calculator at preoperative baseline
4. Predicted mortality using SORT score is measured using SORT risk calculator at preoperative baseline

### **Key secondary outcome(s)**

Survival status is measured using Kaplan-Meier survival analysis at 3, 6, 12, 24, and 36 months postoperatively

## **Completion date**

31/03/2026

## **Eligibility**

### **Key inclusion criteria**

1. Adults aged 18 years and older
2. Open, laparoscopic, or laparoscopically-assisted abdominal procedures performed in an expedited, urgent, or emergency setting (as defined by NCEPOD)
3. Procedures involving the stomach, small bowel, colon, or rectum
4. Cases involving: gastrointestinal perforation, intestinal ischaemia, intra-abdominal abscess, gastrointestinal haemorrhage, or mechanical obstruction
5. All procedures where appendicitis is the primary diagnosis, regardless of severity or extent
6. Laparotomy or enterotomy for gallstone ileus
7. Any laparotomy or laparoscopy undertaken for primary oesophageal pathology
8. Emergency laparotomy/laparoscopy for gastric pathologies, including haemorrhage, hiatal hernia repair, and removal of foreign bodies or gastric bands
9. Emergency procedures for bleeding duodenal ulcers, gallstone ileus, or foreign body removal from the small intestine
10. Emergency surgery for colorectal pathology, including iatrogenic perforations post-endoscopy
11. Emergency formation of a colostomy or ileostomy as a primary procedure via midline laparotomy
12. Return to theatre for major abdominal wound dehiscence ("burst abdomen")
13. Emergency laparotomy for bowel ischaemia not preceded by primary vascular or endovascular intervention
14. Return to theatre requiring general surgical assistance following gynaecology-oncology surgery
15. Washout or drainage of peritoneal abscess or haematoma
16. Emergency repair of inguinal, femoral, incisional, or parastomal hernias involving adhesiolysis or bowel resection/repair
17. Laparotomy or laparoscopy undertaken exclusively for adhesiolysis
18. Any abdominal procedure performed for blunt or penetrating trauma, including laparotomy for foreign body removal from the sigmoid or rectum
19. All procedures related to organ transplantation, including reoperations
20. Any reoperation for complications following elective upper gastrointestinal or colorectal procedures meeting NELA criteria, and returns to theatre involving general surgical assistance following gynaecology-oncology surgery or interventional radiology procedures

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Mixed

**Lower age limit**

18 years

**Upper age limit**

120 years

**Sex**

All

**Total final enrolment**

1512

**Key exclusion criteria**

1. Children under 18 years
2. Elective (non-emergency) surgical procedures
3. Diagnostic laparotomy/laparoscopy where no therapeutic procedure is performed due to inoperable findings (e.g., peritoneal or hepatic metastases, non-viable ischaemic bowel)
4. Surgeries targeting the oesophagus, spleen, kidneys, liver, gallbladder, biliary tract, pancreas, or urinary tract
5. Any primary surgery of the gallbladder or biliary tract, unless incidental to a major gastrointestinal procedure
6. Iatrogenic gastric perforation following endoscopic procedures
7. Foreign body removal from the colon or rectum (considered trauma cases)
8. Emergency stoma formation via trephine incision or laparoscopic approach
9. Minor or superficial wound dehiscence unless it results in bowel pathology necessitating resection
10. Laparotomies for primary vascular pathologies or complications following vascular procedures, regardless of whether bowel resection was performed
11. Laparotomies for primary gynaecological pathology, including ruptured ectopic pregnancy or pelvic abscess due to pelvic inflammatory disease
12. Returns to theatre for complications of gynaecological surgery unless involving gastrointestinal complications secondary to gynaecology-oncology procedures
13. Any procedure related to pancreatitis, removal of peritoneal dialysis catheters, or washout /drainage procedures related to appendicectomy, cholecystectomy, or vascular/urological /gynaecological surgery
14. Emergency hernia repairs not involving adhesiolysis or bowel resection/repair
15. All procedures related to organ transplantation, including reoperations
16. Returns to theatre for complications following non-gastrointestinal surgery (e.g., renal, urological, vascular, hepatic, pancreatic, oesophageal, or splenic surgery), except where complications follow gynaecology-oncology surgery or interventional radiology and require general surgical intervention

**Date of first enrolment**

23/12/2025

**Date of final enrolment**

31/03/2026

**Locations**

**Countries of recruitment**

Romania

**Study participating centre**

**Spitalul Clinic Județean de Urgență "Sf. Spiridon" Iași**

Bld. Independenței nr. 1

Iași

Romania

700111

**Study participating centre**

**Spitalul Clinic Județean de Urgență "Sf. Ioan Cel Nou" Suceava**

Bld. 1 Mai nr.21

Suceava

Romania

720237

**Study participating centre**

**Spitalul Clinic Județean de Urgență "Sf. Apostol Andrei" Galați**

Str. Brăilei, Nr. 177

Galați

Romania

800578

**Study participating centre**

**Spitalul Municipal Fălticeni**

Strada Cuza Vodă, nr.1

Fălticeni

Romania

725200

**Study participating centre**

**Spitalul Municipal de Urgență Pașcani**

Str.Gradinitei nr.5

Pașcani

Romania

705200

**Study participating centre**

**Spitalul Municipal de Urgență "Elena Beldiman" Bârlad**  
Str. Republicii nr.300  
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Romania  
731054

## Sponsor information

### Organisation

Universitatea de Medicina și Farmacie Grigore T. Popa - Iași

## Funder(s)

### Funder type

Not defined

### Funder Name

Universitatea de Medicina și Farmacie Grigore T. Popa - Iasi

### Alternative Name(s)

Universitatea Grigore T. Popa - Iasi, Grigore T. Popa University of Medicine and Pharmacy, UMF Iasi

### Funding Body Type

Private sector organisation

### Funding Body Subtype

Universities (academic only)

### Location

Romania

## Results and Publications

### Individual participant data (IPD) sharing plan

#### IPD sharing plan summary

Not expected to be made available

#### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
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[Protocol file](#)

29/12/2025

No

No