EMERGENCY SURGERY IN ELDERLY PATIENTS

(AND QUICK REVIEW OF COLORECTAL TRAUMA MANAGEMENT)

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INTRODUCTION

- **Emergency general surgery (EGS) accounts for 7% of hospitalizations in the United States.**
- **It contributes to a large proportion of postoperative mortality, morbidity and admissions to the intensive care unit (ICU) as compared to non-EGS patients.**
- **A chronological age of 65 has been accepted widely in western developed countries as elderly, but in countries with a lower life expectancy, an age of 50–55 can be used.**

Columbus AB, Morris MA, Lilley EJ, et al. Critical differences between electivand emergency surgery: identifying domains for quality improvement emergency general surgery. Surgery. 2018;163(4):832e838.

INTRODUCTION

- Mortality from conditions requiring emergency surgery remains significantly high contributing 28% of deaths worldwide. [1]
- In the United Kingdom, the National Emergency Laparotomy Audit (NELA) has reported that 56% of patients undergoing emergency laparotomy are over the age of 65 years old [2]

1- Meara JG, Leather AJM, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Lancet. 2015;386(9993):569–624.

2-Reports - The National Institute of Academic Anaesthesia. https://www.nela.org.uk/reports. Accessed January 18, 2021.

DEFINITIONS

- Elderly > 65 years
- ***Chronological age:*** is actual number of years lived
- ***Physiologic age***: is actual functional capacity of patient's organ systems

PHYSIOLOGIC EFFECTS OF AGING

- Stiffening of myocardium
- Decrease in pulmonary compliance

  Atrophic mucosa = decrease clearance sputum
- Loss renal reserve (creatinine clearance)
- Brain atrophy

  Decrease senses: vision and hearing
- Muscle mass, immune system

MANAGEMENT

- Management includes:

1. Preoperative: accurate risk assessment is very important.
2. Perioperative: there are multiple interventions specific to elderly patients that have been shown to improve outcomes.
3. Postoperative: elderly patients must be cared more in an appropriate setting in order to deliver the optimum management.

Halle-Smith, J.M., Naumann, D.N., Powell, S.L. *et al.* Improving Outcomes for Elderly Patients Following Emergency Surgery: a Cutting-edge Review. *Curr Anesthesiol Rep* **11**, 396–404 (2021)

PREOPERATIVE

- Preoperative identification of high-risk patients allows for both individualised perioperative care and more accurate counselling and decision-making. In contrast to elective care, this has to be achieved rapidly, and therefore, standard preoperative investigations (such as lung function, echocardiography or cardiopulmonary exercise testing) may be not feasible.

Alder L, Mercer S, Carter N, Toh S, Knight B. Clinical frailty and its effect on the septuagenarian population after emergency laparotomy. Ann R Coll Surg Engl. 2021;103(3):180–5

PREOPERATIVE RISK ASSESSMENT SCORING SYSTEMS

- There are several scoring systems that are used to try to predict the outcome of emergency surgery.
- Most of them include age of the patient as one of the important risk factors.
- In the following few slides , some of those systems will be discussed .

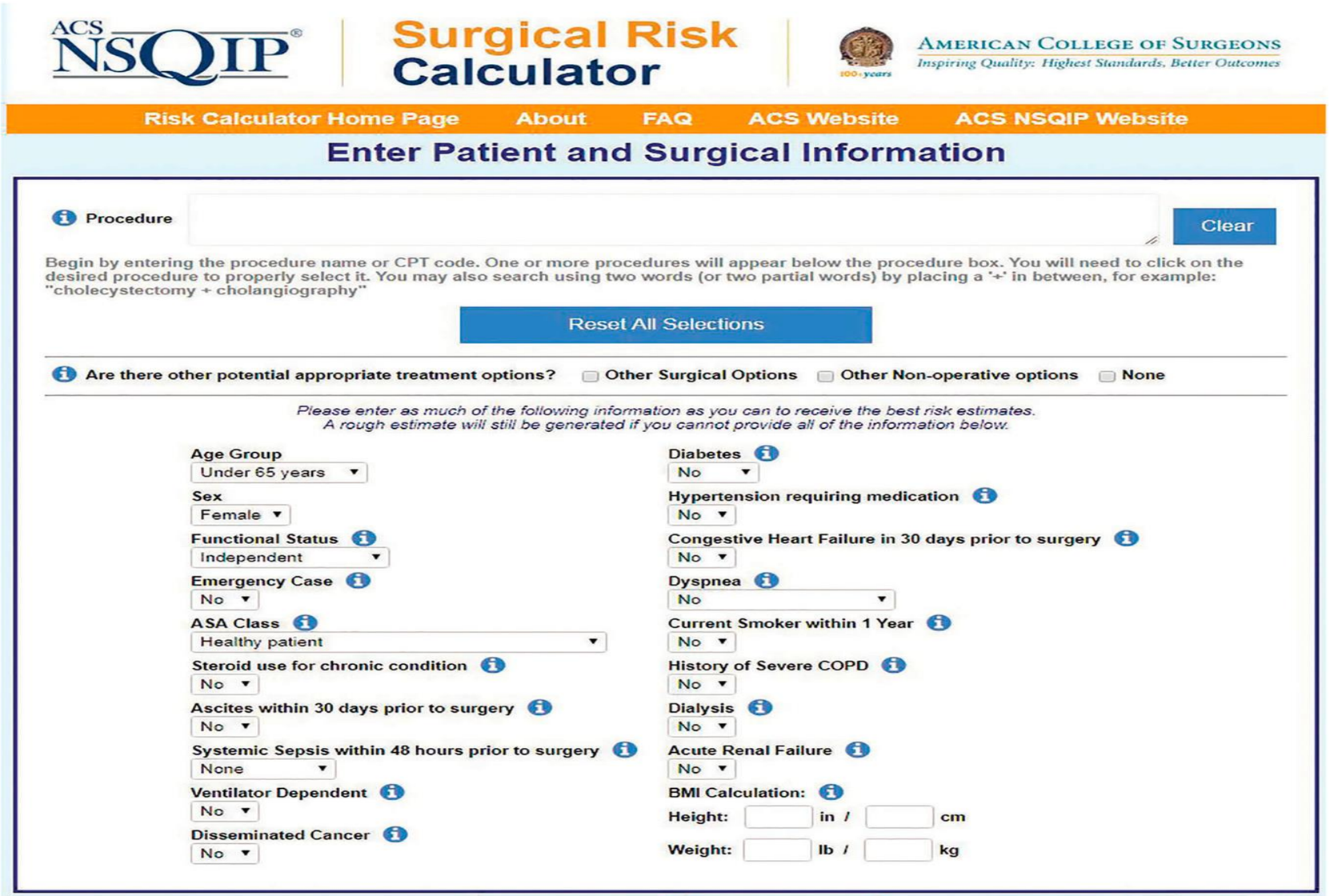
1- POSSUM SCORE

Parameters used in POSSUM scoring system

Physiological parameters	Operative parameters
Age	Operative severity
Cardiac Signs	Operative urgency
Respiratory history	Multiple procedures
Systolic blood pressure	Total blood loss
Pulse	Peritoneal soiling
Glasgow coma scale	Presence of malignancy
Haemoglobin	Mode of surgery
White cell count	
Urea	
Sodium	
Potassium	
Electrocardiogram	

POSSUM = Physiological and Operative Severity Score for enUmeration of Mortality and morbidity.

2-THE AMERICAN COLLEGE OF SURGEONS' NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM CALCULATOR (ACS-NSQIP)



3- SEQUENTIAL ORGAN FAILURE ASSESSMENT SCORE

SOFA score	0	1	2	3	4
Respiration					
PaO_2/FIO_2 (mmHg)	> 400	301–400	201–300	101–200	≤ 100
(kPa)	> 5.3)	(4.1–5.3)	(2.8–4.0)	(1.4–2.7)	≤ 1.3)
Coagulation					
Platelets ($x10^3/mm^3$)	> 150	101–150	51–100	21–50	≤ 20
Liver					
Bilirubin (mg/dl)	< 1.2	1.2–1.9	2.0–5.9	6.0–11.9	≥ 12.0
(μmol/l)	< 20)	(20–32)	(33–101)	(102–204)	≥ 204)
Cardiovascular					
Hypotension	No hypotension	MAP < 70 mmHg	Dopamine ≤ 5 or dobutamine (any dose)*	Dopamine > 5	Dopamine > 15
Central nervous system					
Glasgow coma score	15	13–14	10–12	6–9	< 6
Renal					
Creatinine (mg/dl)	< 1.2	1.2–1.9	2.0–3.4	3.5–4.9	> 5.0
(μmol/l)	< 110)	(110–170)	(171–299)	(300–440)	> 440)
or urine output				< 500 ml/day	< 200 ml/day

* adrenergic agents administered for at least 1 h (doses given are in μg/kg/min)

4- EMERGENCY SURGERY SCORE

- In 2021 , Emergency surgery score was published in the American journal of surgery.

El Hechi M, Kongkaewpaisan N, El Moheb M et al. The emergency surgery score (ESS) and outcomes in elderly patients undergoing emergency laparotomy: A post-hoc analysis of an EAST multicenter study. Am J Surg. 2021 May;221(5):1069-1075

Variable	*Points*
Demographics	
Age >60 y	2
White race	1
Transfer from outside emergency department	1
Transfer from an acute care hospital inpatient facility	1
Co-morbidities	
Ascites	1
BMI <20 kg/m^2	1
Disseminated cancer	3
Dyspnea	1
Functional dependence	1
History of COPD	1
Hypertension	1
Steroid use	1
Ventilator requirement within 48 h pre-operatively	3
Weight loss >10% in the preceding 6 mo	1
Laboratory values	
Albumin <3.0 U/L	1
Alkaline phosphatase >125 U/L	1
Blood urea nitrogen >40 mg/dL	1
Creatinine >1.2 mg/dL	2
International normalized ratio >1.5	1
Platelets $<150 \times 10^3$ mcL	1
SGOT >40 U/L	1
Sodium >145 mg/dL	1
WBC $\times 10^3$ mcL	
<4.5	1
>15 and ≤25	1
>25	2
Maximum score	29

BMI = body mass index; COPD = chronic obstructive pulmonary disease; SGOT = serum glutamic oxaloacetic transaminase; WBC = white blood cell.

Adapted from Sangji NF, Bohnen JD, Ramly EP, et al. Derivation and validation of a novel Emergency Surgery Acuity Score (ESAS). J Trauma Acute Care Surg 2016;81:213–220.

How to save lives in emergency laparotomy

Emergency Laparotomy Collaborative

Screen patient
NEWS/SIRS/arterial lactate

Is the patient septic?
Antibiotics within one hour

Theatre
within 6 hours of decision to operate

ICU
for all patients

Cardiac output monitored **goal-directed fluid therapy**

Consultant surgeon and anaesthetist in theatre

www.emergencylaparotomy.org.uk
rsc-tr.emergencylaparotomy@nhs.net
@emlapcollaborative

NELA National Emergency Laparotomy Audit

The Health Foundation Inspiring Improvement

AS A SURGEON

1. Avoid unnecessary surgeries.
2. Frail patients should be operated upon by senior surgeon
3. Try to shorten the time of the operation as much as possible (do the least possible)
4. Do not do a risky anastomosis.

MAIN COLORECTAL SURGICAL EMERGENCIES

1. Colonic Obstruction.
2. Pathological Colonic Perforations.
3. **Traumatic Colonic Perforations (colonic injuries).**

MECHANISMS OF INJURY

- **Falls**

  - Are the most common

  - Decrease in senses, postural instability

  - Causes 70% of all deaths in geriatrics

MECHANISM OF INJURY

- **RTA**

  - Newest drivers ……. Higher incidence of accidents

  -Decrease vision, hearing and longer reaction…. All may be predisposing factors

- **Pedestrian**

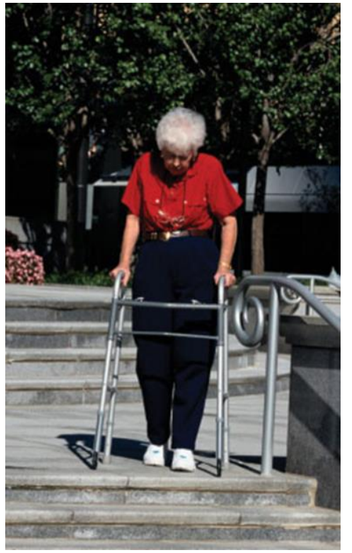
  - Highest mortality

MECHANISM OF INJURY

- **Gun shot and shot gun**

  - follow pedestrian

Worst outcome compared to younger population



PITFALLS IN MANAGEMENT

- Pre-Hospital and initial resuscitation follows ATLS guidelines.
- Checking airway and remove any Fb or fallen dental prosthesis.
- Cervical spine protection and stabilization are indicated.
- If times permit information and clues regarding comorbid problems should be obtained.

PITFALLS IN MANAGEMENT

- During primary survey a clinically stable patient may be in cardiogenic shock

  - Some have recommended early and aggressive invasive monitoring in ICU setting

  - Rely more in pre-hospital history and mechanism of injury

  - Over resuscitation may be as morbid as under resuscitation

COLORECTAL TRAUMA – ETIOLOGY

COLON

- Penetrating

  - >85%

  - 1/3 penetrating abdominal injuries

- Blunt

  -RTA and fall from height

  -Multiple injuries

  Take care from delayed presentation

COLORECTAL TRAUMA – ETIOLOGY

RECTUM

- **Penetrating**

  - Majority

  - Impalement / straddle injuries

  - Iatrogenic

  - Foreign body

- **Blunt**

  - Pelvic fractures

- Trauma to perineum

COLORECTAL TRAUMA – H&P

- Trauma algorithms
  - ABCDE of primary survey
- History
- Physical examination
  - Abdomen
  - Flank
  - Perineum

COLORECTAL TRAUMA – STUDIES

- FAST

  Fast , cheap , noninvasive and Repeatable

  Either +ve for –ve for fluid collection

- CT SCAN with Triple contrast

  The investigation of choice .

- DPL ??
- Rigid Proctosigmoidoscopy ??
- Exploratory Laparotomy

OPERATIVE MANAGEMENT

- Options
  1. Primary repair
  2. Resection and anastomosis
  3. Repair w/proximal diversion
  4. Exteriorization

OPERATIVE MANAGEMENT

- **The Question**

  - Proximal diversion of fecal stream?????

- Prevent septic complications
  - Colon: anastomotic leak
  - Rectum: pelvic sepsis
  - Pelvic abscess

GRADING SCORE FOR COLON INJURY

Trauma, 7th Ed., CHAPTER 33. Colon and Rectal Trauma, *Demetrios Demetriades and Kenji Inaba*

Grade	Injury Description
I	(a) Contusion or hematoma without devascularization (b) Partial thickness laceration
II	Laceration ≤50% of circumference
III	Laceration >50% of circumference
IV	Transection of the colon
V	Transection of the colon with segmental tissue loss

Management of Colon Injuries

- **Non-Destructive Wounds (Grade I – III)**

  Primary repair or resection + anastomosis

- **Destructive wounds (IV – V)**

  - Traditionally → diverting colostomy or exteriorization

  - Resection + primary anastomosis

  - Demetriades et al 200….no difference, or improved outcomes with primary repair

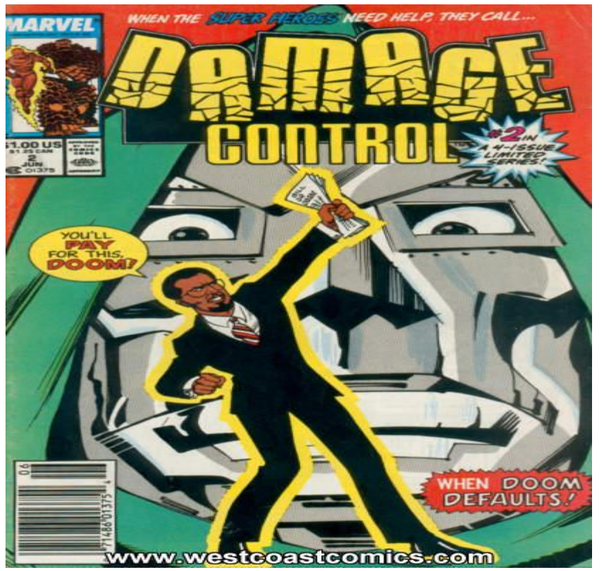
  - Patients at risk for anastomotic breakdown

    Immunocompromised patients, transfusion > 6 units, shock, other injuries > 2 and delay of operation

THE EXCEPTION: DAMAGE CONTROL

- The lethal triad:

1. Hypothermia
2. Coagulopathy
3. Acidotic



***Resect if needed, no anastomosis then* Planned second look**

MANAGEMENT OF RECTAL INJURIES

- **Intraperitoneal**

As colonic injuries

- **Extraperitoneal**
  - Diversion…. End vs. loop colostomy
  - Drainage

    - Closed or open drainage of presacral space

    - Transverse incision anococcygeal raphe into subcutaneous tissue, lateral issection on each side of raphe to avoid transection of coccygeal attachments to access presacral space

    - Penrose drainage
  - Repair

    - If feasible, avoid unnecessary dissection

CONCLUSIONS

- **Colon Trauma**

  1. Primary repair, resection + primary anastomosis
  2. Exceptions destructive injuries w/risk factors
  3. Shock, delay to management, associated organ injury, transfusion requirement, co-morbid disease

- ***Rectal Trauma***

  1. Intraperitoneal…….as colonic injuries
  2. Extraperitoneal

  Diversion and presacral drainage

TAKE HOME MESSAGES FOR MANAGEMENT OF EMERGENCY SURGICAL GERIATRIC PATIENT

- Identification of higher risk patients and early escalation of care.
- Multidisciplinary team involvement – including surgeons, anaesthetists and physicians
- Always try to do the least procedure possible.
- Shared decision-making to allow better information on risk and outcomes prior to the decision to operate.

QUESTIONS??

THANK YOU