

## **RCEM Advisory Statement Regarding the Management of Adults Presenting to the Emergency Department Who May Require an Emergency Laparotomy**

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An emergency laparotomy covers a range of emergency abdominal procedures to manage pathologies such as intestinal obstruction, perforation, or ischaemia. Over 25 000 patients undergo an emergency laparotomy in England and Wales each year. The 30-day mortality for these patients is just over 9% [1]. Although this represents an improvement from around 15% in 2010-11, the mortality rate has been static for the last five years [1,2]. Around three quarters of these patients are admitted via the emergency department (ED), more than half of them are over the age of 65, and half of the patients are considered to be high risk (defined as a  $\geq 5\%$  risk of death) [1]. An individual patient's risk can be calculated using the following link [data.nela.org.uk/riskcalculator/](http://data.nela.org.uk/riskcalculator/).

Many of these patients encounter long delays from arrival in the ED to the decision to operate, and then again to their arrival in the theatre. Data from the National Emergency Laparotomy Audit (NELA) shows that the median time from arrival at the hospital to arriving in theatre was 10.3 hours for patients categorised as needing theatre within two hours. For patients requiring surgery within six hours, the median time from arrival in the ED to theatre, was 17.3 hours. For patients arriving at the hospital with suspected sepsis, time to theatre was 15.6 hours [1]. The Royal College of Surgeons (England) and the Academy of Medical Royal Colleges recommend that patients with suspected sepsis secondary to a surgically remediable source, should undergo surgery within three to six hours (depending on sepsis severity) [3,4]. When considering those patients that undergo an operation, analysing the total time from arrival to theatre only 20% of this time is accounted for; the remaining 80% is waiting, from arrival to the decision to operate [1]. This '80%' includes the wait for triage, clinical assessment, surgical assessment, CT scanning and reporting. Over 90% of these patients have cross sectional imaging [1]. Operative intervention is a time critical therapy for these patients. For example, for patients undergoing an emergency laparotomy for a perforated peptic ulcer, the 30-day mortality rate was 4.3% for patients who were in theatre within 1 hour, 44% for those patients in theatre within six hours, and 80% for those who waited over 24 hours for theatre [5].

These data would suggest that reducing the time to the decision to operate, could reduce the mortality risk of these patients. We therefore echo the call from NELA for "...locally agreed optimised pathways of care, with the aim of streamlining diagnosis with as little delay for patients as possible." [1].

## We make the following recommendations:

- The following group of patients should be considered at high risk for delayed recognition of the need for an emergency laparotomy when presenting with abdominal pain or related symptoms:

<ul style="list-style-type: none"><li>• Age &gt;65yrs</li><li>• Older people living with frailty</li><li>• Learning Disability</li><li>• Cognitive Impairment</li><li>• Immunocompromised (eg. Steroids, IDDM)</li></ul> <p><b>AND</b></p> <ul style="list-style-type: none"><li>• Where there is a clinical suspicion of intra-abdominal infection, perforation, ischaemia or bowel obstruction.</li></ul>
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The patients in the box above represent a group of patients in whom signs of peritonism (e.g. guarding, rebound) may be very limited or absent and as such may benefit from having their clinical assessment prioritised. Emergency Departments should have initial assessment processes which prioritise the above groups of patients when they present with abdominal pain or symptoms which may be related to significant intra-abdominal pathology. In-addition those patients who present with abdominal pain and have signs of peritonism and suspicion of intra-abdominal infection, perforation, ischaemia, or bowel obstruction should be managed as per the recommendations below. These recommendations represent the minimum standard expected.

- The relief of symptoms (pain and vomiting) should be prioritised [6]. Initial assessment should include a brief history and appropriate tests to exclude atypical presentations such as diabetic ketoacidosis (DKA), acute coronary syndrome (ACS), and sickle cell disease.
- Emergency Departments should have an initial assessment process that includes screening for sepsis using the National Early Warning Score (NEWS2). Patients identified as potentially having sepsis from a surgical source, should receive a sepsis care bundle, including timely intravenous antibiotics in keeping with national guidance [4] (see appendix 1), and early referral to the surgical team.
- A urinary pregnancy test or serum  $\beta$ hCG should be requested for all females of childbearing age.
- In-addition to standard blood tests, the requesting and reporting of those blood tests which are going to help make immediate management decisions or may delay the requesting of CT scans e.g., Lactate, amylase / lipase, should be prioritised. Hospitals should have processes in place which allow for the rapid reporting of amylase / lipase results.

- The high-risk group of patients as outlined in the box above should be discussed with a senior clinical decision maker (ST4+ or equivalent in emergency medicine). Referral to the surgical team should not be delayed by the requesting or reporting of cross-sectional imaging.
- If the patient is assessed as potentially needing an emergency laparotomy, there should be early referral to the surgical team, with the expectation that the patient will be seen by a senior surgeon (ST3+) within 30-60 minutes of referral, as per the Royal College of Surgeons England (RCS(Eng)) standard, see table 1, [3].
- The surgical team should assess the patient within the RCS(Eng) recommended time frame and request the appropriate CT imaging. If the surgical team are unable to prioritise the patient assessment and meet the recommended times for senior review e.g. in-theatre operating; a senior EM clinician (ST4+) should request the cross-sectional imaging. In the emergency setting, waiting for renal function tests or precautionary pre-loading of fluid to prevent Contrast Induced Acute Kidney Injury is not a pre-requisite for a contrast CT scan [7].
- Hospitals should have agreed pathways of care to ensure timely access to CT scans for this group of patients. CT scan reporting for these patients should be within one hour of the scan [3].
- There should be agreed hospital pathways of care for patients, that cover the following eventualities.
  - The need for emergency laparotomy.
  - The need for conservative management and observation.
  - The need for palliation.
  - A 'negative scan' but on-going symptoms or signs requiring treatment or observation.

These pathways must be aligned with the relevant speciality recommendation and the need for the hospital and ED to deliver the 4-hour emergency access standard. Pathways should also align with the Royal College of Surgeons Recommendations [3], including the time to theatre for those requiring emergency surgery.

- Emergency Departments should identify an emergency medicine clinician to be their NELA lead. This clinician should have funded time within their job plan to support service improvement in collaboration with the local NELA surgical, anaesthetic, radiology, and geriatric leads. The best way to improve patient outcomes is through understanding local data (which is possible through the NELA dataset) with multidisciplinary feedback and discussion.

Table 1. Royal College of Surgeons Recommendations -adapted from reference (3)

	<b>Immediate Surgery</b>	<b>Non-Immediate Surgery</b>	<b>Non-Operative</b>
<b>Examples of suspected Surgical diagnoses</b>	<ul style="list-style-type: none"> <li>•Faeculent or purulent peritonitis,</li> <li>•GI or Gall bladder perforation or infarction</li> <li>•Strangulated hernia</li> <li>•Necrotising fasciitis</li> </ul>	<ul style="list-style-type: none"> <li>•Non-tender small or large bowel obstruction</li> <li>•Infection without sepsis eg. diverticulitis, cholecystitis</li> <li>Appendicitis, perianal or soft tissue abscess</li> </ul>	<ul style="list-style-type: none"> <li>•Pancreatitis</li> <li>•Diverticulitis</li> <li>•Adhesional small bowel obstruction</li> <li>•Cholangitis</li> </ul>
<b>Surgical time to review (ST3 or above) from referral</b>	30 minutes	60 minutes (30 mins if septic)	60 minutes (30 mins if septic)
<b>Surgical CT Request</b>	Immediate, if applicable	6-12 hours, if applicable	Immediate, if applicable

## References

- 1 NELA Project Team. Eighth Patient Report of the National Emergency Laparotomy Audit. Royal College of Anaesthetists (RCOA) London 2023
- 2 Saunders DI, Murray D, Pichel AC, Varley S, Peden CJ. Variations in mortality after emergency laparotomy: the first report of the UK Emergency Laparotomy Network. UK Emergency Laparotomy Network, British Journal of Anaesthesia, 22 Jun 2012, 109(3):368-375
- 3 The High-Risk General Surgical Patient: Raising the Standard. Royal College of Surgeons of England, November 2018
- 4 Bion J, Barton G, Boyle A et al, Academy of Medical Royal Colleges Statement on the Initial Antimicrobial Treatment of Sepsis. Academy of Medical Royal Colleges 2022 (version 2).
- 5 Buck DL, Vester-Andersen M, Møller MH. Surgical delay is a critical determinant of survival in perforated peptic ulcer. Br J Surg 2013; 100(8): 1045–1049.
- 6 RCEM Best Practice Guidance, Management of pain in adults. June 2021. [https://rcem.ac.uk/wp-content/uploads/2021/10/RCEM\\_BPC\\_Management\\_of\\_Pain\\_in\\_Adults\\_300621.pdf](https://rcem.ac.uk/wp-content/uploads/2021/10/RCEM_BPC_Management_of_Pain_in_Adults_300621.pdf) accessed 13.05.2024
- 7 Joint Advisory Statement between Royal College of Radiologists & Royal College Emergency Medicine regarding Emergency Computed Tomography scans and the use of Intravenous Iodinated Contrast Agents. May 2023. [https://rcem.ac.uk/wp-content/uploads/2023/05/Emergency\\_CT\\_Scans\\_Requiring\\_IV\\_Iodinated\\_Contra\\_st\\_Agent.pdf](https://rcem.ac.uk/wp-content/uploads/2023/05/Emergency_CT_Scans_Requiring_IV_Iodinated_Contra_st_Agent.pdf) accessed 13.05.2024

## Appendix 1.

Clinical Decision Support framework for initial evaluation of sepsis in adults ≥16 years [4].

		0	1-4	5-6	≥7	
<b>Vital signs</b>	Vital signs: NEWS-2 'Physiology first'	0	1-4	5-6	≥7	
<b>Initial assessment</b>	History, examination, lab results	<b>If clinical or carer concern, continuing deterioration, surgically remediable sepsis, neutropaenia, or blood gas / lab evidence of organ dysfunction, including elevated serum lactate, upgrade actions at least to next NEWS-2 level →</b>				
<b>Initial assessment</b>	Comorbid disease, frailty, patient preferences?	<i>Consider influence of comorbid disease, frailty and ethnicity on NEWS-2, and patient preferences for treatment intensity, limits, end-of-life care</i>				
<b>Initial (generic) actions</b>	Monitoring and escalation plan	Standard observations	<ul style="list-style-type: none"> <li>Registered nurse review &lt;1 h</li> <li>Obs 4-6 hrly if stable.</li> <li>Escalate if no improvement</li> </ul>	<ul style="list-style-type: none"> <li>Obs hourly.</li> <li>Review &lt;1 hr by clinician competent in acute illness assessment</li> <li>Escalate if no improvement</li> </ul>	<ul style="list-style-type: none"> <li>Obs every 30 mins.</li> <li>Review &lt;30 min by clinician competent in acute illness assessment.</li> <li>Senior doctor review &lt;1 hr if no improvement: refer to Outreach or ICU</li> </ul>	
<b>Initial (generic) actions</b>	Initial treatment of precipitating condition	Standard care	<6 hr	<3 hr	<1 hr	
<b>Initial (generic) actions</b>	Unlikely	Standard care	Review daily and reconsider infection if diagnosis remains uncertain			
<b>Likelihood of infection &amp; specific actions</b>	Possible	Review at least daily	<ul style="list-style-type: none"> <li>&lt; 6 h</li> <li>Source identification &amp; control plan documented.</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 3 h:</li> <li>Microbiology tests</li> <li>Antimicrobials: administer or revise</li> <li>Source identification &amp; control plan documented.</li> <li>&lt; 6h</li> <li>Source control initiated</li> <li>48 – 72 h</li> <li>Review antimicrobials with ID/micro/senior clinician</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 1 h:</li> <li>Microbiology tests</li> <li>Antimicrobials: administer or revise (broad-spectrum if causative organism uncertain).</li> <li>&lt; 3 h</li> <li>Source identification</li> <li>3-6 h</li> <li>Source control initiated according to clinical urgency</li> <li>48 – 72 h:</li> <li>Review antimicrobials with ID/micro/senior clinician</li> </ul>	
<b>Likelihood of infection &amp; specific actions</b>	Probable or definite	<ul style="list-style-type: none"> <li>&lt; 6 h</li> <li>Diagnostic tests &amp; R plan</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 6 h</li> <li>Microbiology tests</li> <li>Antimicrobials: administer or revise</li> <li>Source identification &amp; control plan.</li> <li>D/w ID/micro if uncertain, &amp; review</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 3 h:</li> <li>Microbiology tests</li> <li>Antimicrobials: administer or revise</li> <li>Source identification &amp; control plan documented.</li> <li>&lt; 6h</li> <li>Source control initiated</li> <li>48 – 72 h</li> <li>Review antimicrobials with ID/micro/senior clinician</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 1 h:</li> <li>Microbiology tests</li> <li>Antimicrobials: administer or revise (broad-spectrum if causative organism uncertain).</li> <li>&lt; 3 h</li> <li>Source identification</li> <li>3-6 h</li> <li>Source control initiated according to clinical urgency</li> <li>48 – 72 h:</li> <li>Review antimicrobials with ID/micro/senior clinician</li> </ul>	