Covid-19: BSTI/BSGAR decision tool for chest imaging in patients undergoing CT for acute surgical abdomen

Acute Surgical Abdomen Clinical decision already made that Urgent CT abdomen / pelvis is required Patient is stable enough to be sent to CT Assess Covid-19 Probability* Take swab for PCR if not already done High Probability* Low Probability* Lymphopenia (<1.0) Neutrophilia No other likely cause (NB **Apyrexial** coronavirus can cause Alternative diagnosis more abdominal symptoms) likely **CXR** (if already done) showing CXR (if already done) normal or classic or probable COVID-10** showing alternative diagnosis** Do not do CXR just to look for COVID if the patient needs a CT A/P anyway CT ON NON-COVID SCANNER CT ON COVID SCANNER CT Abdomen/Pelvis (typically PV phase) CT Abdomen/Pelvis (typically PV phase) Plus EITHER low dose non-con CT chest OR Plus EITHER low dose non-con CT chest OR all post-contrast (i.e. CT CAP) all post-contrast (i.e. CT CAP) **RAPID CT REVIEW** Non-COVID/indeterminate **COVID** classic/probable **Cannot exclude COVID** However, combination of Consider the patient COVIDnegative CT and low positive probability could aid surgical Correlate with swab when decision to operate or treat result available conservatively Clean CT scanner as per COVID If at all possible, wait for swab protocol

results as well

^{**}In some cases the patient may have already had a CXR, and this could help guide COVID probability assessment as per the BSTI/NHSE radiology decision tool. See https://www.bsti.org.uk/covid-19-resources/. If no CXR has been performed, as per NELA guidance we would suggest going straight to CT.





^{*}Probability assessment as per PHE & local guidance

Rationale for the tool

- In the patient with an acute abdomen requiring potential emergency surgical intervention, intubation and ventilation could be aerosolgenerating.
- Reports are also emerging of increased mortality in Covid-19 positive patients in the setting of the acute surgical abdomen. As such, it may be useful to offer increased diagnostic confidence for Covid-19 in this setting, as it may influence the timing and approach to surgery.
- CT may help identify patients with Covid-19 before swab results are available; its sensitivity relative to RT-PCR has been quoted as 97% in high risk patients with respiratory symptoms. Although this is almost certainly an overestimate, a CT suspicious for Covid-19 in the emergency acute abdomen setting could be taken to suggest Covid-19.
- CT is only 54% sensitive in asymptomatic patients who are RT-PCR positive for SARS-nCOV-2 (Inui et al, Radiology Cardiothoracic Imaging March 2020 https://doi.org/10.1148/ryct.2020200110); as such, a negative CT cannot be considered to have sufficient negative predictive value to exclude Covid-19. However, in the emergency acute abdomen setting, a negative CT as well as low probability of Covid-19 could aid the confidence in the surgical decision to take the patient to theatre or manage the patient conservatively.
- As such, we advocate CT thorax (entire chest) opportunistically, if the clinical decision has already been made to send the patient for CT abdomen and pelvis, assuming cardiovascular and pulmonary stability.
- We stress that this recommendation does not apply to patients in whom abdominal CT (or MRI) is being performed for other reasons, or electively.
- We would recommend against extending the abdominal scan to only the caudal half of the thorax for two reasons: (1) an abnormality may be detected at the cranial-most aspect of the chest acquisition, leading to uncertainty; (2) although it would be rare for Covid-19 pulmonary findings to be solely located in the cranial half of the thorax, this is reported.
- We also suggest that rapid review by the acute reporting radiologist (ideally on the scanner table, if feasible) is obtained, to help guide probability of Covid-19 with respect to cleaning the scanners and directing the patient's subsequent disposition (Covid vs non-Covid bays).



