

RECOMMENDATIONS from the Spanish
Society of Surgery (AEC)
WORKING GROUP **Surgery-AEC-Covid-19**



English Version



Version 1.5

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Calle O'Donnell, 16. 1º Izq
28009, Madrid
+34 913 190 400
aec@asociacioncirujanos.es

www.aecirujanos.es

Dear members of the Spanish Association of Surgeons, surgeons, residents and society in general,

The Spanish Association of Surgeons and today's society, as we know it, has never faced a problem of these characteristics. The crisis in which we are immersed due to the rapid spread of the **pandemic by the COVID-19** has found us unprotected to provide an adequate and rapid response.

It is **worth admiring** how **health professionals** from all statements are working in the front line to solve and control the current situation with the resources at our disposal. We must have only words of admiration and encouragement so that we have the strength to withstand the mental and physical pressure of being on the front line of the problem.

Surgeons, as Health professionals, are going to find ourselves fully immersed in the problem given that we have to continue to deal with circumstances that put our patients' lives at risk, such as the need to carry out emergency interventions and resolve oncological patients in the context of the different situations that are arising in our hospitals. Likewise, we will have to perform surgeries in COVID-19 positive patients and, if necessary, we will have to go down to the "front line" to work and help our colleagues.

It is time to send a message of **support and hope for the future** in order to overcome this crisis, knowing that it will be necessary to fight even if we expose our health and that of our families. It is time to praise all the surgeons and the residents who, because of the need of their centres, are already on "front line" and to send a message of solidarity with surgeons who have already given positive results. **Each and every one of you have the support of the Spanish association of Surgeons.**

It is time for unity, to be above other problems and concerns; and it is undoubtedly time for the Spanish association of Surgeons **to work on appropriate recommendations** to help manage the different situations that will arise in our activity as doctors and surgeons.

We will like to emphasize that the Spanish Association of Surgeons is with you, that we are open to your suggestions and to listen to your needs. We have set up groups of experts who are developing practical recommendations to help us make the most appropriate decisions in these situations, and as many committees as necessary will be set up to resolve the doubts and needs that arise during the evolution of this pandemic.

As surgeons and residents, as doctors and as persons we are all together to work with all the tools available to defeat this pandemic.

All our support to all of you,

Asociación Española de Cirujanos



Calle O'Donnell, 16. 1o Izq
28009, Madrid
+34 913 190 400
aec@asociacioncirujanos.es
www.aecirujanos.es

**PERIOPERATIVE RECOMMENDATIONS FOR THE MANAGEMENT
OF PATIENTS INFECTED WITH COVID-19
FROM THE SPANISH ASSOCIATION OF SURGERY (AEC)**

Given the important repercussions of the current pandemic caused by COVID-19, the AEC committee of Surgical Infections prepared these recommendations based on **9 questions** that will likely come up in your surgical practice. Extra-respiratory manifestations by COVID-19 are rare and usually limited to nonspecific symptoms (nausea, vomiting, epigastric pain...) in exceptional cases iatrogenic hepatotoxicity caused by currently used treatments.

As in other circumstances where surgeons have had to treat patients with highly transmissible or highly morbid infections, the AEC agrees that surgeons should tend to all potentially surgical patients, ideally by volunteering, but the current magnitude of this pandemic is hindering that, including the transfers to tertiary care centers. However, the current situation does not exclude the authorities of their obligations to give logistic support and to provide surgeons with all materials needed to conduct surgeries under these circumstances. Evaluations by the entire surgical team should be done and *“has to take into account the available equipment and/or materials to conduct high infectious risk procedures as well as the therapeutic benefit of that procedure”*. In the OR, the number of the entire team members should be the minimum possible to conduct the procedure and should be done by the most experienced team members or with the most training.

The only possible scenario that should be contemplated are urgent surgeries or elective surgeries that cannot be postponed. On the former, most cases will be of an infectious nature, in which a confirmed COVID-19 infection may pose a contraindication to the surgery depending on the setting and the overall state of the patient. The indication for an urgent surgery will be individualized and should be based on a highly accurate diagnosis. In many cases a non-operative approach should be considered, particularly on diagnoses that have a safe non-

operative option e.g. antibiotic treatment of a young patient with early acute appendicitis, conservative management of some acute cholecystitis, etc.). On the latter, given the declared pandemic, regulatory healthcare agencies will distribute resources accordingly and non-urgent procedures should be limited to a maximum, prioritizing pathologies that require prompt surgical intervention e.g. oncologic surgery. Again, two important factors have to be taken into account: overall state of the patient and the possibility of intra-hospital transmission. Although there is no published data, it seems that in Italy there has been an elevated incidence of respiratory complications and transmission on patients that underwent interventions in the past weeks. Most of them were oncologic patients who quickly developed severe SARS-Co-V2 with a high mortality rate. As with many urgent procedures, confirmed infection with COVID-19 can be considered a surgical contraindication specially in oncologic patients, immunosuppressed, or with comorbidities associated with a high surgical morbidity (especially respiratory comorbidities).

1 - Which precautions should be taken when intervening in a patient who has confirmed COVID-19?

In the setting of a confirmed positive patient, Protective Personal Equipment (PPE) should be worn underneath standard surgical wear to ensure proper protection of the surgical team. When a patient has a high suspicion of COVID-19 infection but has not been confirmed, it should be assumed that the patient is positive and the same measures as with a confirmed patient should be undertaken. There are many different types of PPE, we will discuss the minimum basic equipment needed to conduct a procedure safely.

Protective Personal Equipment (PPE)

PPE will be necessary in any procedure where there is “close contact” with the patient, which includes: surgical intervention as well as other OR procedures i.e. intubation, regional anesthesia, establishing an IV access, ect.

Necessary equipment:

1. Impermeable gown (Level 4)
2. Mask: Conventional surgical masks do not protect from aerosols. N95, or FFP2/FFP3 (filter 96 and 99% respectively) masks are required. Non valve masks are preferred as valve masks do not protect the patients from our own pathogens, if only valve masks are available, a standard surgical mask has to be used on top.
3. Eye wear: if aerosols will be produced during the procedure (we have to assume that they will be produced, depending on the procedure), it is fundamental to completely cover the eye with protective glasses, if not available, partial coverage to protect from splashing or direct contact is recommended.
4. Face shields: These do not protect from aerosols, but is necessary when there is a splash risk (blood, gastric contents, or other fluids). Face shields are particularly important when handling the airway. They can be an alternative to protective glasses or can be worn on top of them. If prescription glasses are worn they stay in place, and face shields should be worn on top.
5. Gloves: A pair of long nitrile gloves is sufficient.
6. It is convenient that all personnel with long hair completely pull their hair back and tie it securely and low to aid with wearing and fitting their PPE. Beards should be shaven to favor proper fitting and functionality of the masks.
7. Foot wear should be exclusive to the area of activity and should not have holes or perforations
8. Once all PPE equipment is worn, all standard sterile wear will be worn on top of PPE. Hand washing will be done with an alcohol based solution on top of the nitrile gloves and then standard sterile gown and gloves will be placed on top.

Step by step instructions on how to wear PPE (Annex 1)

It is fundamental that the entire surgical team has completed prior training on wearing and removing PPE prior to performing a procedure. Equally important is the group collaboration of all team members between themselves. There should be trained reserve personnel (for all members) readily available in case of an unexpected event e.g. PPE is not tolerated by any of the team members, dizziness or overheating ensues, etc.

STEPS:

1- Remove all personal objects from scrub pockets as well as watches, earrings, jewelry, etc. prior to wearing PPE

2- Wash hands with an alcohol based solution

3- Impermeable gown is opened, arms placed with its ends at the level of your palm, velcro closed and then its tied around the waist making sure there are no loose strings that can get caught and tying a knot that can be easily accessed.

4- Next the mask is placed. For adequate fixation it should be held by its convexity, applied to the chin, elastic straps passed behind the head. We recommend crossing the straps for a more tight fit. Then the metallic bridge is adjusted over the bridge of the nose. Ensure that there is a proper seal around the face with no air gaps.

5- Place surgical cap if one has not been previously placed

6- Eyewear or face shield placement. If it has an adjustable head band, it should be adjusted approximately to the size of your head to minimize posterior manipulation after placement. First place over the eyes and then pass the posterior fixation behind the head. Make sure that your mask does not get caught and moves it from proper position. If the mask has been properly placed with a good seal, there should be no fogging of the face shield or glasses.

7- Put on a pair of nitrile gloves covering the ends of the gown.

8- Mask: if a valve mask is being used a standard surgical mask should be placed on top

9- Hand wash with alcohol based solution on top of nitrile gloves

10- Enter the OR

11- Placement of sterile surgical gown using standard technique

12- Placement of sterile gloves using standard technique

Step by step instructions on how to remove PPE

When removing PPE it is fundamental to do it in a slow and calm fashion preventing sudden movements and under the supervision of a trained colleague. Ideally it should be removed one person at a time, away from the patient and close to the door. There should be a designated large container to dispose of all PPE as well as an alcohol based disinfectant for hands and surfaces. It can be helpful to have a designated “dirty” OR for removal of PPE with sufficient space.

- 1- Remove sterile gown and gloves using standard technique avoiding touching the external part and rolling it inward and removing the sterile gloves inside out leaving the base gloves in place.
- 2- Disinfect base gloves (Using Trifectant®, Vikron®, potassium peroxymonosulfate, potassium hydrogen sulfate or similar virucidal agent)
- 3- Remove face shield grasping it from the back and ducking your head out of the shield
- 4- Disinfect base gloves (Using Trifectant®, Vikron®, potassium peroxymonosulfate, potassium hydrogen sulfate or similar virucidal agent)

- 5- Remove base gloves. Grasp first glove externally on the palm side and pull away inside out. Place clean finger inside of the second glove and pull out. Place gloves inside the container, they should not be thrown into the container as it should be close by, and they should not touch anything other than the inside of the container.
- 6- Hand wash with alcohol based solution
- 7- Remove impermeable gown. First undo the knot with two fingers if possible. Then without touching your neck place traction on the top of the gown to undo the velcro. Remove the gown touching only its inner portion folding it onto itself so that the outer part is completely covered and making sure that there are no loose strings that touch anything. Place inside of the container.
- 8- Hand wash with alcohol based solution
- 9- Eyeware or face shield removal: Ducking the head with eyes and mouth closed. Grab the adjustable head piece or the ends of the glasses posteriorly and remove carefully making sure it does not touch your face, place on a tray for disinfection if reusable or discard in the container.
- 10- Hand wash with alcohol based solution
- 11- Mask removal: Again, ducking the head with eyes and mouth closed the elastic bands or strings are undone and the mask is pulled forward and downward. The anterior part of the mask should NOT be touched as it may be contaminated and the mask should be disposed in the container only by touching the strings.
- 12- Hand wash with alcohol based solution
- 13- Step out of the OR
- 14- Disinfect footwear either by applying disinfectant or by careful removal of footwear and disinfection by immersion

15- Complete standard surgical hand washing up to elbows.

16- Careful revision of scrubs to assess for an inadvertent contamination.

17- Full body shower is recommended after finalizing the process.

2- Is there a preferred surgical approach in these patients?

We only have preliminary data and reported experiences are limited to case reports or case series. As of today general recommendations for surgery on patients with highly transmissible viral infections by way of fluids are minimally invasive approaches to minimize exposure of fluids to the surgical team. COVID-19 transmission is both by fluid and aerosol and fecal/oral transmission has not been ruled out. Thus aerosolization of particles and fluid has to be taken into account; currently evidence of the presence of virus in the pneumoperitoneum during laparoscopy is limited to a single experience with Hepatitis B virus.

During gastrointestinal surgery the use of the electrocautery and opening the GI tract can generate aerosols. Laparoscopy adds a physical barrier between the surgical team and a possible source of infection, limiting occupational exposure as well as cross contamination. Hand assisted surgery can be entertained with a properly sealed hand port if this adjunct will reduce surgical time without compromising oncologic or functional results. All equipment should be exhaustively revised to ensure proper functioning during the case. Effort should be taken to reduce the amount and size of trocars as well as the incision used to place the trocars. Central negative pressure systems should be established and smoke should be evacuated only once. Constant pressure insufflation systems can be used and it is recommended that if an additional incision is required for assistance, that the pneumoperitoneum is fully evacuated.

In relation to elective surgeries in China, NOSES or TaTME have been done for colorectal cancer under extreme precautions. It is important to remember that the creation of stomas (temporary or permanent), are a possible focus of transmission that should be taken into account by hospital personnel as well as family members.

However during your preoperative planning, you should **USE THE SURGICAL APPROACH THAT IS MOST BENEFICIAL TO THE PATIENT INDEPENDENTLY OF THEIR COVID-19 INFECTION.** If laparoscopy is to be used as the surgical approach, protective

measures should be undertaken to protect the airway and mucosal membranes (masks and eye protection) and caution should be taken not to have direct exposure during moments of gas release (smoke evacuation or final exsufflation). Though there is no evidence regarding smoke filters, if available, it is advisable to use smoke filters on each trocar.

3- What should a surgeon do if he or she suspects that they may be infected with COVID-19?

Any healthcare worker that has been in close contact with a patient under investigation, suspected or confirmed infection with COVID-19 should immediately report it to their designated hospital team to properly channel these suspicions based on their current hospital policy.

In the setting of a community acquired infection protocols regarding active or passive surveillance should be followed.

CLASSIFICATION OF CONTACT IN THE HOSPITAL SETTING:

1. Close contact with a patient that has suspected/confirmed COVID-19 with proper use of PPE
2. Close contact with a patient that has suspected/confirmed COVID-19 without proper use of PPE
3. Casual contact with a patient that has suspected/confirmed COVID-19 without proper use of PPE
4. International healthcare assistance given in areas with sustained local transmission of COVID-19

Close contact is defined as:

- Any person who has cared for a symptomatic patient with suspected or confirmed COVID-19: Healthcare workers who have not used PPE, family members or anyone else who has had similar physical contact.
- Any person who has been in the same place, within two meters, of a patient who had been symptomatic in that location (household members, visitors).

The designated hospital team will evaluate each case individually and stratify its risk, which then has to be reported to the public health authorities of its respective Autonomous Community (i.e State department). To perform a proper evaluation, these aspects have to be taken into consideration:

- A- Type of exposure (procedures that generate aerosols such as aspiration of the respiratory tract, intubation, bronchoscopy, CPR, accidents in the lab)
- B- Time of exposure (more than 15 minutes at a distance of less than two meters).
- C- The department where the exposure happened in regards to the level of assistance that was provided to the patient (units with vulnerable patients, hematology, ICU, oncology, burn units, etc.)

How to proceed:

1. Close contact with a patient that has suspected/confirmed COVID-19 with proper use of PPE: The healthcare worker shall continue with normal activities and passive surveillance will be done for developing symptoms.

2. Close contact with a patient that has suspected/confirmed COVID-19 without proper use of PPE:

- A. High risk exposure: the healthcare worker will be relieved of their duties for 14 days, or consideration can be taken to transfer the worker to another area of the hospital. They should remain available during the entire period of active surveillance. They should refrain from social activities and non-essential travel.
- B. Low risk exposure: the healthcare worker shall continue with normal activities with active vigilance will be done to assess for developing symptoms.

3. Casual contact with a patient that has suspected/confirmed COVID-19 without proper use of PPE: The healthcare worker shall continue with normal activities and passive surveillance will be done for developing symptoms.

4. International healthcare assistance given in areas with sustained local transmission of COVID-19: The designated hospital team will assess the type of contact and in conjunction with their respective Autonomous Community (State department) to where they return to will proceed

as stated in points 1-3. As a general rule and as currently indicated, unless symptoms ensue, no testing should be done.

Summary: If the healthcare worker, in this case the surgeon, once notifies the exposure and has been evaluated by the designated hospital team, does not have symptoms and has been considered a low risk exposure, we are currently recommending that the surgeon continues with normal activities checking their temperature twice daily and continuing with urgent and elective cases using appropriate protective measures. In any circumstance, if symptoms ensue, it will be notified to the designated hospital team ASAP or per the established route put forth by each Autonomous Community (i.e. State). The healthcare worker shall be relieved of their duties and protocol to notify the Public Health department should be activated and shall be considered under investigation. Established hospital policies on PPE shall be followed. In general any situation where there may be a risk of aerosol transmission, N95, FFP2 or FFP3 masks are recommended. In all other cases, local recommendations should be followed depending on availability.

4- What precautions should be taken when examining a patient that has a suspected or confirmed COVID-19 infection?

Entry to a surgical service has two routes: ER and elective admission. Both routes shall have predetermined triage areas as per hospital policy.

It is important to divide patients in two groups: suspected and confirmed. Although measures to evaluate these groups are the same, patients with confirmed COVID-19 may require different treatment modalities.

We summarize important aspects to take into consideration in each step:

- 1. Chart review:** To be done extensively and in an area away from the patient.
- 2. Case discussion with the physician responsible for the patient:** Prior to examining the patient, gather all information not present in the chart, obtain information from the family members by telephone if possible.
- 3. Preparation:** First, go to the area next to the room where the patient is located along with auxiliary and nursing staff that will aid in the placement of PPE. All personal belonging should be kept in a secure location, hair should be pulled back, scrub top tucked in, and if the scrub pants are too long, they should be tucked in the socks. Foot ware should not have holes or perforations. Once ready, the placement of PPE begins as established by hospital protocol. We

recommend starting with the cap, then mask, followed by internal gloves, gown, external gloves, lastly eyewear or face shield. Once PPE is properly worn you should enter the room and take the shortest route possible towards the patient avoiding touching or manipulating objects.

4. History taking: It is important to identify yourself as the patient will not recognize anyone wearing PPE. There may be noise contamination due to all ancillary equipment thus try to be concise and clear.

5. Physical exam: Standard abdominal examination should be done with exception of auscultation where due to circumstances; it may be difficult to perform. It's important to plan ahead if wounds or mucosal membranes are to be examined to ensure that you bring all material that you will need (gauzes, lubricant, sterile gloves, etc.)

6. Dirty zone: Once exploration of the patient is complete, we will go towards the designated area where the ancillary and nursing staff are waiting for us to help with removal of the PPE as virucidal agents are used during each step of the PPE removal followed by complete hand washing with antiseptic. We have to be extremely careful in this step to prevent exposure.

7. Medical area: Once finished, we should discuss findings with the physician responsible for the patient and we should discuss with family members via telephone to minimize exposure.

8. Consent: We should document on the chart the procedure, risks and benefits as normally done but it should be written that a signature cannot be taken due to security reasons (This should be discussed with your hospital's legal team and should follow hospital policy).

5. Is it necessary to test for COVID-19 patients that will undergo elective procedures that cannot be postponed?

NO.

Patients that will undergo a procedure will follow the same protocol as any other patient. In situations like this one it is important to use available equipment with judgment, to prevent patient stigmatization and unnecessary alarming situations

6. Which protocol should be followed in the case of a biological exposure?

For an exposure without PPE to a patient under investigation, suspected or confirmed infection by COVID-19, whether known at the time of exposure or known post-exposure, that

personnel should be considered as a close contact and will be managed according to hospital policy. All healthcare workers exposed should immediately report it to their designated hospital team to manage the situation according to their current hospital policy. Up to date there are no specific studies on post exposure prophylaxis (PEP) to COVID-19. One retrospective study from Park et al. from 2019 on PEP to MERS in a limited number of healthcare workers showed good results using a combination of antivirals (lopinavir/ritonavir plus ribavirin). It's worth saying that this study had bias that favored PEP. As of today, there is no evidence to recommend PEP for COVID-19.

7. Is it necessary to add COVID-19 treatment to patients that require antibiotics?

Not necessarily. Treatment should follow the same indications as for all COVID-19 infected patients. It is fundamental to keep in mind that guidelines are changing almost on a daily basis and they should be reviewed frequently. Only CONFIRMED cases should be treated and it should be written in the chart that the patient gave verbal consent (again, this should be done according to hospital policy). Currently we are using hydroxychloroquine and lopinavir/ritonavir. In elderly patients and/or polypharmacy patients we prefer only hydroxychloroquine but in the case of liver disease it is avoided. The most severely ill patients ALSO receive treatments with interferon/Tocilizumab. Remdesavir has been considered.

Other complementary measures include oxygen, avoiding corticosteroids and nebulizing treatments. With respect to the use of medications that alter the expression and/or function of Angiotensin converting enzyme 2, data is preliminary and no strong recommendations can be given at this time. The use of NSAIDS such as ibuprofen can be questioned, there is no evidence in humans that favors the infection or that it causes a worst outcome. When managing intrabdominal infections, standard protocols should not be changed, although possible interactions with antiviral medications should be investigated. We suggest the use of online registries e.g. www.covid19-druginteractions.org where interactions can be consulted easily and up to date.

8. Are there any clinical parameters or markers that can assist in differentiating systemic manifestations of COVID-19 and intrabdominal sepsis?

Recent data suggests that COVID-19 causes diffuse alveolar damage associated with direct damage to pneumocytes in contrast to other infections that cause damage by an

enhanced inflammatory response with endothelial damage. Furthermore, it unleashes a cascade of cytokinins similar to bacterial sepsis or even as in hemophagocytic lymphohistiocytosis.

All this translates to a nonspecific respiratory picture with frequent fevers specially in severe cases. We cannot forget that up to 10% of patients can present with GI symptoms such as diarrhea or nausea.

When evaluating laboratory results, there is no rise in WBC as seen in bacterial sepsis, nor a increase in neutrophils. What has been observed is that there is decreased lymphocytes in approximately 80% of patients and mildly decreased platelets in cases with the worst prognosis. It is also frequent to see a nonspecific rise in D-Dimers. It is important to note that procalcitonin is not elevated in COVID-19 patients, studies done have shown that 95% of patients have a procalcitonin less than 0.5 ng/mL. This point is important with respect to sepsis where it is a fundamental marker of systemic bacterial infections. On the other hand, C reactive protein, just as in sepsis, can have a direct correlation with severity of disease and prognosis, finding that it is more elevated in patients with hypoxemia and in patients that die from the disease.

9. OR protocol

Firstly, a thorough timeout must be done that includes the COVID-19 status of the patient. In regards to anesthesia, The AEC follows the recommendations of the Sociedad Española de Anestesiología, Reanimación y Terapéutica del Dolor (SEDAR).

Within the OR these factors should be considered:

We recommend a designated OR and all of its materials within to the exclusive treatment of COVID-19 patients for the duration of the pandemic. Ideally it should be away from other Operating Rooms and an established circuit for the transport of these patients from isolation to the OR and back has to be done in an organized, planned and in an uninterrupted fashion.

- 1- The use of AAMI level 4 gowns
- 2- Surgical approach as previously stated

- 3- Avoid sharp objects to a maximum, manipulation will be done with instruments, never directly with the hands
- 4- Use verbal cues for transferring instruments, avoid hand to hand transfers, use the mayo tray or a magnetic sheet.
- 5- Do not place sharp objects on the mayo tray unless previously deemed a neutral zone.
- 6- Maximize the use of alternative cutting mechanisms such as the electrocautery
- 7- Prioritize the use of mechanical sutures
- 8- Follow the previously stated recommendations on exsufflation during laparoscopy to minimize aerosol exposure.
- 9- Dispose of sharp objects in a designated container

Immediately after the procedure:

- 1- The patient should be transferred to an isolation room in recovery or alternatively the patient can recover in the same designated OR prior to returning to their isolation room or ICU.
- 2- Extensive cleaning of the room (allow a minimum of 1hr between cases) with decontamination of all surfaces, screens, cables, monitors, anesthesia machine, ect.
- 3- All medication, devices, intubation equipment that was not used should be discarded.
- 4- Vaporized hydrogen peroxide should be used to decontaminate the OR.
- 5- Postoperative prescriptions should be tailored to each patient and in accordance with established hospital protocols.

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WHAT SHOULD SURGEONS KNOW IN CASES OF ONCOLOGICAL PATHOLOGY IN THE CONTEXT OF COVID-19 PANDEMIC (SARS COV-2)?

RECOMMENDATIONS FROM THE SPANISH ASSOCIATION OF SURGERY (AEC)

- *In response to the rapid evolution that hospitals face concerning the COVID-19 pandemic, and to the doubts that arise regarding the management of cancer patients who need surgery, the Spanish Association of Surgeons (AEC) want to respond to the questions that arise in this situation.*
- *Given the changing environment of the pandemic, these proposals are subject to the recommendations of the Ministry of Health of each country and the available evidence.*

Situation analysis and decision making

In the situation in which we find ourselves from a COVID-19 pandemic, cancer patients are at a higher risk than other types of surgical patients for contracting the infection, because of both their underlying pathology and for the immunosuppression associated with the treatments they receive (chemotherapy and surgery).

Although we must be cautious in interpreting the published preliminary results (since these are short series and sometimes partial because they have been reported in different epidemiological phases), recommendations can be made for the treatment of this specific type of patient from these experiences.

The current objective in cancer patients is to minimize the risk of contracting the infection and avoid the possible complications associated with surgery, as well as making appropriate use of the available resources and protecting the health personnel involved in their treatment.

In addition to the general condition of the patient and the tumor stage in which they are, there are other variables that we must take into account in decision-making. The incidence of COVID-19 in each region, as well as the hospital situation, must be assessed together with the overall status of the patient to choose the best therapeutic option. The National risk map is very asymmetric, and the forecast of ICU admissions for SARS-CoV-2 in different Hospitals can vary between 216% in the areas of greatest impact to 1% in those with the least impact (<https://deim.urv.cat/~alephsys/COVID-19/spain/es/index.html>)

It is important that we are updated on the situation of our Hospitals and our environment to offer the best treatment available to each patient

1.- Is it necessary to carry out a preoperative screening of all cancer patients who are going to undergo surgery?

Data from the limited existing literature (mainly from China and many based on retrospective analysis of the situation) recommend the detection of COVID-19 infection to all cancer patients before surgery, intending to reduce the risk of postoperative complications. However, these tests are subject to the availability of the necessary tests in each center, within the order of priorities in which the hospital is currently located and must make rational use of the available resources following the protocols for screening infection by established COVID-19.

The publications, for now, do not describe what is the best approach regarding the type of screening and the results obtained in patients who require oncological surgery in areas where the incidence of SARS-CoV-2 infection is still low.

The European CanCer Organization (ECCO) has indicated that in cancer patients who are receiving active treatment (chemotherapy, radiation or surgery) it is of the utmost importance that health systems guarantee a rapid examination for the detection of COVID-19 disease. (<https://www.ecco-org.eu/Global/News/Latest-News/2020/03/NEWS-Statement-on-COVID-19-from-the-European-Cancer-Organisation-Board-of-Directors>).

2.- Are cancer patients more likely to develop COVID-19?

Cancer patients are more susceptible to infection than people without cancer due to both the malignant process itself and the state of immunosuppression caused by the treatments received, such as chemotherapy or surgery. Therefore, these patients may have an increased risk of COVID-19 and may have a worse prognosis.

Therefore, at present, cancer patients and their families should know and apply contact protection measures and take extreme precautions to avoid contracting the infection.

3.- How can we decide whether or not to postpone surgery in an oncological process in the presence of the COVID-19 pandemic?

Decisions on whether or not to postpone surgery should be made on an individual basis for each patient and according to various clinical and logistical considerations, because delays could lead to tumor progression and, ultimately, worse outcomes.

Given the uncertainty regarding the impact of COVID-19 in the coming months, the delay in surgery may cause not only the progression of the disease but also the development of serious urgent complications that may be difficult to resolve.

In addition to the availability of hospital resources (hospital beds available for cancer patients in separate modules from patients with COVID-19, ICUs, teams), the risk of the intervention should be carefully evaluated against the risk of delaying the procedure 6-8 weeks or more, when COVID-19 infection is less prevalent, although logically there is the uncertainty of the situation we will be in at that time.

4.- Is the complication rate higher in cancer patients and COVID-19?

Although the available literature is infrequent in this scenario, a study from China, where most of the published literature comes from, observed that cancer patients had a higher risk of serious complications, in terms of the need for admission to the intensive care unit, requiring

invasive ventilation and an increase in mortality, compared to cancer-free patients, with deterioration being more rapid and severe in cancer patients (Liang W, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol.* 2020; 21: 335-7.).

5.- How should a patient with cancer NOT infected with COVID-19 be treated?

In patients without known infection by COVID-19 and when the logistical situation permits, surgery could be considered in most cases, and the epidemiological situation should be assessed, as always. However, decisions must be individualized after considering the general objectives of the treatment, the tumor stage as well as the general condition of the patient. It is recommended to avoid primary anastomosis in patients at risk (ultra-low anastomoses, diabetics, preoperative radiotherapy, fragile, elderly patients...), both due to the high risk of an added complication of infection by COVID-19 for the patient and to avoid septic symptoms that may subtract necessary resources in the health system.

The limited evidence available at present does not allow specific recommendations to be made for each tumor type but the attached bibliography can be consulted.

6.- How should a patient with cancer and COVID-19 infection be treated?

In patients infected with COVID-19, treatment of **infection** should be prioritized over cancer treatment, except in urgent situations (perforation, obstruction, bleeding). Therefore, surgical or chemotherapy treatment should be postponed. If surgery is required, it must entail the minimum necessary procedure and with less possibility of postoperative complications (assess regional anesthesia, use of stents, derivative stomata).

7.- Is an oncology patient awaiting surgery with neoadjuvant chemotherapy at an increased risk of complications?

The main cancer treatment associated with immunosuppression is chemotherapy, so patients who receive it can be considered a population vulnerable to serious complications after COVID-19 infection. For this reason, patients undergoing chemotherapy treatment should take extreme precautions to avoid transmission and assess the risk/benefit ratio of continuing their administration during the period of virus expansion.

Regarding adjuvant treatment, there is limited evidence of the consequences of delaying or stopping chemotherapy treatment versus the benefits of potential prevention of COVID-19 infection. Clinical decisions should be individualized taking into account factors such as the risk of tumor recurrence if adjuvant chemotherapy is delayed, modified or discontinued, the number of cycles of adjuvant chemotherapy already completed and the patient's tolerance for treatment.

8.- An oncology patient awaiting surgery with neoadjuvant chemotherapy, is it better to have surgery or another cycle of chemotherapy to postpone the surgery?

Although each case must be assessed individually, taking into account the general condition of the patient, their oncological situation and the risk of surgery (both due to the possibility of postoperative complications and the situation in each hospital), it would be advisable during the period of virus expansion to give an additional course of chemotherapy before surgery so that it can be delayed without losing the therapeutic window and expecting COVID-19 infection to be less prevalent then.

9. How to handle the resection pieces?

Surgical pieces are considered infectious samples, so they must be handled as such and will be delivered to the assigned department according to the protocol established by each Hospital.

10. How should follow-up of the cancer patient be done?

During the period of greatest transmission, the number of on-site medical visits should be minimized. It may be reasonable to postpone routine follow-up visits temporarily or even until after the epidemic ends or to make those appointments by phone or telematics whenever possible. Endoscopic or radiological tests for monitoring the cancer patient without active treatment may be delayed at this time.

If you need to contact the doctor in person for a specific problem or worsening of symptoms, you should try to make the appointment in an outpatient consultations to avoid going to the hospital.

In patients with preoperative obstruction, bleeding, perforation, or late staging, the endoscopic examination could be completed within 6 months after surgery, with subsequent follow-up once the pandemic has been controlled.

11.- What psychological support can we give to these patients?

Oncological pathology patients experience an uncertainty about the evolution of their disease and fear of getting infected with COVID-19 in this health emergency situation. Medical staff must acknowledge the psychological pressure of patients and their families and answer their questions with the best evidence available at all times. If necessary, specific psychological or psychiatric care will be recommended.

It should not be forgotten that healthcare professionals also experience symptoms of depression, insomnia, and anxiety in this situation, which must be properly addressed.

This document has been prepared with the bibliography cited below and the recommendations published by scientific societies (American College of Surgeons, American Society Clinical Oncology, Spanish Society of Medical Oncology, and Spanish Association of Coloproctology).

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**GENERAL RECOMMENDATIONS OF URGENT SURGICAL CARE
IN THE CONTEXT OF THE COVID-19 PANDEMIC (SARS COV-2) FROM THE
SPANISH ASSOCIATION OF SURGERY (AEC)**

- *These recommendations are subject to continuous review, depending on the global situation of the pandemic and the particular needs of each hospital, as well as the recommendations of the competent authorities and the evidence/bibliography that appears in this regard.*
- *It is important to highlight that the current scientific evidence in this regard is minimal and is mainly based on the extrapolation of other similar viral infections or the recommendations carried out by Scientific Organizations or expert meetings.*

1. How important is urgent surgical care in this situation?

Urgent surgical care has a fundamental role in this pandemic situation that we are experiencing since it is the only one that cannot be delayed or suspended.

In this way, our main objective must be aimed at preserving vital healthcare activity and protecting healthcare personnel, without forgetting the protection of our patients involved and the rest of the hospitalized/general population.

As in other circumstances in which surgeons have had to treat patients with highly infectious diseases or with very high mortality rates, the AEC agrees that the surgeon must attend to all potentially surgical patients. For this, the availability of personal protective equipment (PPE) and suitable masks (N95, FFP2, FFP3) must be required in each center.

2. How do we organize a Surgical Emergency Service at present?

Urgent surgical assistance must be ensured at all times, taking into account the general and organizational recommendations suggested by the AEC, with local adaptation coordinated with the device designated in each center for managing the current situation.

The number of professionals required for surgery should be minimized as much as possible and their degree of training and/or experience should be maximized.

3. What digestive symptoms do patients with COVID-19 present?

Extra-respiratory involvement by COVID-19 is very rare and is usually restricted to nonspecific symptoms (nausea, vomiting, epigastric discomfort...) and very exceptionally hepatotoxicity, mainly due to some of the treatments used.

Digestive symptoms, especially diarrhea (also nausea) may precede the respiratory symptoms. These patients may have a worse prognosis since it seems related to an increase in the viral load and therefore an increase in complications.

Forms of presentation of COVID-19 have been reported with gastrointestinal symptoms that simulate surgical diseases, mainly in a way similar to an acute pancreatitis (pancreatitis-like) picture, so its detection should be considered in patients presenting with this clinical picture, even without respiratory symptoms.

4. Should a SARS-CoV-2 screening test be performed in all patients with urgent surgical pathology?

SARS-CoV-2 screening is strongly recommended for every patient with surgical disease in the current epidemiological context, even in asymptomatic patients. This recommendation includes urgent surgical patients as the main target population.

Previously defined respiratory symptoms for SARS-CoV-2 coinfection must be investigated: fever, dyspnea, cough, anosmia, ageusia... as well as suggestive analytic markers like lymphopenia, thrombocytopenia, normal procalcitonin and high PCR, ferritin, D-dimer or abnormal enzymatic levels (LDH, AST/ALT).

Although the investigation of these symptoms mainly involves the initial contact of the patient with the Emergency Department, surgeons must strictly verify that this information has been collected and, if not, obtain it appropriately in the first contact with the potential patient with surgical urgency.

5. What test should we perform in patients with urgent surgical pathology?

For COVID status determination, available tests are recommended, performed independent or simultaneously with the diagnostic process of the urgent surgical pathology. Ideally, availability of quick tests warrants results in 10-15 minutes, lapse of time that may be delayed in all cases, but they are not available in all centers and their low sensitivity has been reported. Results of regular tests with PCR for SARS-CoV-2 RNA delays 6-8 hours, and the decision must be made to wait for or to operate without them, based on the time-dependent nature (and therefore the impossibility of delaying) of the pathology. Especially in the latest, though universal indication is recommended, the following diagnostic tests are suggested:

- Chest x-ray: Easy and quick to perform, recommended in all patients even with low suspicion of COVID-19. The possibility of a false negative during the first days of viral infection must be considered.
- Chest CT scan: Today, many abdominal surgical emergencies require a diagnostic abdominal CT scan. With the current evidence of the precocity and high sensitivity of chest CT as a diagnostic method of SARS-CoV-2 involvement, it is recommended that in all patients who are going to undergo an abdominal tomography, the examination be extended to the thoracic cavity. In those cases with US diagnostic and surgery cannot be delayed until disposal of the test results, Chest CT scan must be performed even in patients without viral coinfection symptoms; this indication may be limited to patients with suspected COVID in extremely urgent patients.
- POCUS (Point-of-Care Ultrasound): The portable ultrasound examination is equally effective in diagnosing SARS-CoV-2 lung involvement and prevents patient transfer, although it requires specific training and experienced personnel. The existence of at least 3 B-lines in 2 contiguous intercostal spaces is considered pathological. In those centers with qualified doctors, their diagnostic possibilities should be closely considered.

6. What measures should we take in case of urgent intervention in a confirmed or clinically suspected positive COVID-19 patient?

Follow the general recommendations issued by the AEC in the event of surgical intervention in the context of the current pandemic ([https://www.aecirujanos.es/files/noticias/152/documentos/Manejo_quirurgico_v2\(1\).pdf](https://www.aecirujanos.es/files/noticias/152/documentos/Manejo_quirurgico_v2(1).pdf))

Structurally, it is recommended that the centers have a specific operating room only for COVID-19 confirmed patients. Patients with high clinical or radiological suspicion of viral coinfection with time-dependent pathology and impossibility to wait for test results must be also operated in this area. Specific protection measures (PPE + N95/FFP2/FFP3 masks) must be available for every urgent surgical operation independently of the patient Covid status.

Staff in the operating room must be minimized, entrance of the surgical team (surgeon, assistant/s, surgical technician) must be delayed until the beginning of the surgical procedure and they must exit the surgical theatre before extubation.

7. Should we change the surgical indications for urgent surgical pathology in this situation?

There is great controversy as to the responses that can be made in this regard. Some publications with very few cases have reported a higher rate of viral-related symptoms with a poor prognosis in postoperative courses, as well as a higher rate of complications. This, along with the healthcare pressure of some centers concerning the pandemic, has led to the proposal to change certain common surgical indications for conservative management options (antibiotic treatment in uncomplicated appendicitis, conservative treatment of cholecystitis ...). In contrast, there is a fear that an unsatisfactory evolution will determine a more serious condition that will require a higher level of care that we may not be available, while a decisive surgery may translate to an early discharge. In this context, it is generally recommended **TO CONSIDER NON OPERATIVE MANAGEMENT OPTIONS CLEARLY DEFINED FOR SEVERAL DISEASES ACCORDING TO PATIENT'S GENERAL AND COVID STATUS AND HEALTHCARE CONDITIONS**. Each decision must be individualized and must be based on an accurate diagnosis.

In those patients with suspicion or confirmation of concomitant SARS-CoV-2 infection, consideration of the need for intervention should be especially rigorous in light of the data previously reported, and the severity of the infection should be included in the decision making process.

In any case, it is recommended that each center follows the same indication criteria for surgical urgencies.

In the pandemic context, and according with reports concerning current and progressive hospital occupation, individualized and specific evaluation of patients with doubtful postoperative course is strongly recommended, with a multidisciplinary approach (Anaesthesia, ICU) that supports any final decision. Acute disease, previous general status, provision of care needs and hospital occupation must be taken into account.

8. Should we modify our surgical technique in case of an urgent surgical intervention?

In general, we should not modify our surgical technique, but we can take into account the following recommendations:

- *Surgical approach:* Currently, some evidence has been published regarding viral contamination and personnel exposure that occurs during the laparoscopy through the aerosols generated. However, in contrast, there is information related to the use of electrocautery and aerosolization in open gastrointestinal procedures, as well as greater contact with surgical gloves that could generate micro-breaks on the barrier mechanisms. On the other hand, the repercussion in terms of postoperative stay related to the laparoscopic approach is well known, an element to be especially taken into account in this time of mass occupation. Thus, the general recommendations are to WEIGHT SPECIFIC RISK/BENEFIT PARAMETERS CONCERNING THE USE OF LAPAROSCOPIC APPROACH IN THE PATIENT WITH SURGICAL EMERGENCY AND COINFECTION BY SARS-CoV-2. In the case of opting for the laparoscopic approach, the individual protection procedure must be strictly followed, devices must be used to filter released CO₂, work must be carried out at the lowest possible pneumo-pressure, as long as it does not compromise the exposure of the surgical field, prolonged Trendelenburg positioning should be avoided due to the deleterious effects on the cardiopulmonary function of the COVID patient, the use of energy devices should be limited, specially when used continuously in the same area, **continuous change of surgical instruments should be limited** and the insufflation should be suctioned thoroughly before trocar removal. We refer again to

the recommendations issued in the general document issued by the AEC.

([https://www.aecirujanos.es/files/noticias/152/documentos/Manejo_quirurgico_v2\(1\).pdf](https://www.aecirujanos.es/files/noticias/152/documentos/Manejo_quirurgico_v2(1).pdf)).

- *Surgical technique*: Although it is a general principle of Emergency Surgery to carry out THE GREATEST POSSIBLE BENEFIT WITH THE LOWEST SURGICAL TIME AND MINIMIZING POSTOPERATIVE COMPLICATIONS, its strict compliance at the current juncture is recommended. **Time must be considered when defining a surgical strategy in order to minimize ventilation and exposure, particularly when wearing PPE.** Despite the existence of publications that show a greater risk of viral transmission with the creation of ostomies, related to the presence of the virus in feces, in the current situation it is recommended to minimize high risk anastomoses in order to avoid major complications and the consumption of resources, especially in Intensive Care Units.
- *Surgery must be performed* by the LOWEST NUMBER OF PEOPLE POSSIBLE to carry out the surgery safely and quickly, as well as led by the surgeon who has the most experience at that time to minimize risks, complications and the time of exposure in the operating room.

9. What are the post-operative implications of SARS-CoV-2?

The confirmed or highly suspicious patient should be evaluated postoperatively by a single professional, taking appropriate measures at all times.

There is no clear evidence, but it seems that postoperative complications are greater in this type of patient, in most cases associated with a respiratory infection.

10. What considerations should be raised in the care of the trauma patient in the current situation of the pandemic due to SARS-CoV-2?

The evaluation of a trauma patient must be carried out in the trauma bay with the established protective measures.

Due to the epidemiological context, all trauma patients should be considered as potentially infected and, therefore, extreme individual protection measures should be taken: WATERPROOF COATS, GLASSES, WATERPROOF SHOES AND GLOVES that will be maintained throughout the patient's care: transfer to CT, Rays of Vascular, operating room or ICU. **When procedures with potential of aerosolization have to be performed (as chest tubes placement), extreme protection with complete PPE must be considered.**

The trauma team personnel assigned to initial care in the current situation should be minimized.

DYNAMIC SCALE FOR SURGICAL ACTIVITY DURING THE PANDEMIC COVID19

• Phase I. Almost normal scenario

- *Census* - <5% COVID-19 related admissions without ongoing urgent necessities
- *Resources* - no impact on hospital resources
- *Surgical activity*: no impact on normal activity

• Phase II. Low level alert scenario

- *Census* - 5-25% COVID-19 related admissions to ward and ICU
- *Resources* - no impact on hospital resources but with pandemic alertness in the hospital with appropriate separate triage in the ER for respiratory symptoms vs non respiratory symptoms
- *Surgical activity*: activity limited to:
 - o Oncology
 - If an increase in the infection curve is suspected, use phase 3 scenario for oncological surgical activity
 - o Urgencies

• Phase III. Medium level alert scenario

- *Census* - 5-25% COVID-19 related admissions to ward and ICU
- *Resources* - impact on hospital resources with pandemic alertness in the hospital with appropriate separate triage in the ER for respiratory symptoms vs non respiratory symptoms. ICU beds and wards reserved for COVID-19 patients
- *Surgical activity*: activity limited to:
 - o Oncologic patients where a lack of treatment would compromise their 3 month's survival
 - o Oncologic patients who cannot receive neoadjuvant treatment to slow progression of disease
 - o Oncologic patients who will not require prolonged ICU stay
 - o Urgencies

• Phase IV. High level alert scenario

- *Census* – 50-75% COVID-19 related admissions to ward and ICU
- *Resources* – Significant impact on hospital, healthcare workers and ICU beds.
- *Surgical activity*: activity limited to:
 - o Urgencies

• Phase V. Emergency scenario

- *Census* – >75% COVID-19 related admissions to ward and ICU
- *Resources* – Significant impact on hospital, healthcare workers and ICU beds. Limited ICU and ventilation resources, limited OR resources or a rapid infection increase in the hospital.
- *Surgical activity*: activity limited to:
 - o Urgencies where the patient will not survive unless intervened within the next few hours after a preoperative triage is done by the ethics committee.



Calle O'Donnell, 16. 1º Izq
28009, Madrid
+34 913 190 400
aec@asociacioncirujanos.es

www.aecirujanos.es

SAGES/EAES “Closing the Back Door” recommendations in the fight against COVID-19

1.0 Purpose

This Standard Operating Procedure (SOP) document outlines recommended procedures for screening, identification, tracking, and management of patients located in non-COVID-19 hospital units who may have symptomatic or asymptomatic COVID-19 infection.. Recommendations are also provided regarding screening and testing of patients scheduled for surgical interventions.

2. Introduction

In our common global effort to defeat the COVID-19 pandemic, it is extremely important to promote the concept of “closing the back door” in order to avoid unsuspected transmission by asymptomatic COVID-19 positive patients .

While many healthcare professionals are managing patients with confirmed COVID-19 infection as well as patients under investigation (PUI) for COVID-19 infection in dedicated COVID-19 units, it is equally important to control the spread of the virus to and from non-COVID-19 or “clean areas” of our hospitals. Frequent screening of inpatients in “clean areas” as well as screening of all pre-operative patients, is essential for early identification and isolation of newly infected cases to minimize the spread of infection to other patients and healthcare professionals. Institutions with a high clinical burden of COVID-19 infections have also recommended systematic testing of all pre-operative patients regardless of whether they are symptomatic or not, in order to minimize the risk of unsuspected contamination.

3.0 Scope

This Standard Operating Procedures (SOP) document applies to medical care delivered in non-COVID-19 hospital units or “clean inpatient areas” during the COVID-19 pandemic, including Surgical and Medical Wards, Emergency Departments (ED), and Operating Rooms (OR).

4.0 Responsibilities

4.1 Clinical units

In areas with high prevalence of COVID-19, visitors should be prohibited to enter hospitals, including visitors to emergency departments, inpatient units, ambulatory sites and other facilities. There may be exceptions for healthy visitors previously screened for symptoms of COVID-19 (e.g. labor and delivery, pediatric units, and palliative care settings).

4.1 Inpatient setting

It is the responsibility of the designated responsible medical/surgical team leader to ensure that all patients are evaluated daily for symptoms suggestive of potential COVID-19 infection. COVID-19 testing should be promptly performed and the

patient moved to a PUI unit if symptoms suggestive of infection are identified. All suspected COVID-19 infection-related precautions should be implemented by all members of the medical/surgical and nursing team.

4.2 Pre-operative setting

Patients scheduled to undergo any type of surgical intervention should be screened for COVID-19 symptoms within 24 hours of the scheduled intervention. In areas with a high clinical burden of COVID-19 infection, it is recommended that when possible all inpatients and outpatients scheduled for a surgical intervention, undergo COVID-19 PCR testing within 24-48 hours of the planned procedure. It is the responsibility of the surgical attending to ensure that testing is completed and results available prior to the procedure to inform the decision to proceed with surgery.

5.0 Procedure

5.1 Identification of newly suspected COVID-19 cases

- Clinical team to screen patients for typical and atypical symptoms of COVID-19:
 - Most typical symptoms: respiratory symptoms and fever
 - Other symptoms: diarrhea, anosmia, loss of taste, severe fatigue and/or weight loss
- During clinical assessment for COVID-19 symptoms, all members of the clinical team should maintain their distance, wear gloves and a surgical mask.
- Once a suspected case has been identified, the infectious disease department or equivalent institutional overseer must be informed, and PCR testing for COVID-19 accomplished.
- While awaiting the test result, those patients with suspected symptoms must be placed in isolation according to PUI protocols.
- Any health care personnel attending those patients must wear PPE according to Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) recommendations, following institutional guidelines.
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirator-use-faq.html>
https://apps.who.int/iris/bitstream/handle/10665/331498/WHO-2019-nCoV-IPCPE_use-2020.2-eng.pdf
- If these patients are tested positive, then they will be transferred to a COVID unit.
- If they are negative, but still having symptoms, they should remain isolated until a second test results is available. PPE must be used by their health care team.
- These measures must also apply to any other clean areas such as the OR and or clean areas within the ED.
- For patients who have tested positive for COVID-19 pre-operatively, the clinical team (surgeon and anesthesiologist) will need to weigh the risk and benefits of proceeding with surgery or delaying intervention.

APPENDIX 1

New COVID-19 PATIENT NOTIFICATION FORM

Individual reporting:
Location:
Current diagnosis/ reason for admission:
Brief details of the current symptoms or exposures to suspect of COVID-19:
Date of when the symptoms started:
Date of COVID-19 test and outcome:
Hand over the current surgical/ medical care
Original surgical plan
Implication of COVID-19 on the surgical care

Please return completed form to:

Date received: _____

APPENDIX 2

COVID-19 Close the back door flow chart



New case of COVID-19 observed



Notify the infectious disease department/team



PCR testing



Isolate patient if confirmed or awaiting results



PPE for all staff and visitor restrictions

**GENERAL RECOMMENDATIONS FOR ACTION AND BASIC
ORGANIZATION OF SURGERY UNITS IN AREAS
WITH LOW AFFECTATION
BY THE COVID-19 PANDEMIC (SARS COV-2)
FROM THE SPANISH ASSOCIATION OF SURGERY (AEC)**

These measures are subject to revision, according to the global situation of the hospital, daily needs and the recommendations of the Ministry of Health.

Each surgical service will consider implementing them according to their particular circumstances.

Objective

To protect hospitalized patients and health personnel from the risks of SARS Cov-2 infection and to ensure vital healthcare activity.

General guidelines

- 1- Provide training on the use of the safety measures recommended for patients with COVID-19 to all General Surgeons, for the evaluation of all patients and for possible urgent surgeries that are necessary for patients who are COVID-19 +.
- 2- All off duty attendings and residents must be readily available to collaborate if needed, and if necessary, to cover a colleague for unexpected withdrawal or quarantine.
- 3- Consider dividing the service into groups that do not coincide with each other or even establish work shifts in periods of 7-15 days to avoid the rapid spread of transmission among the service personnel.

Elective surgery

- 1- Review all scheduled elective surgeries to minimize, postpone, or cancel nonessential interventions until the peak of the epidemic has passed.
- 2- Cancel all minor surgery or non-cancer outpatient major surgical interventions.

- 3- Only program procedures that, if postponed, would immediately endanger the life of the patient or cause significant sequelae (oncology, recurrent cholecystitis/pancreatitis, obstructive symptoms...).

Hospitalization

1. Daily rounds: Maintain all the protection measures established by the Infectious Disease Service of the hospital.
2. Minimize inpatient stays by avoiding unnecessary admissions; minimizing the census on the surgical ward.
3. Minimize gathering of doctors in the same room and encourage the same small group of doctors visit all patients admitted for at least one week and the rest do not come into contact with hospitalized patients.

Outpatient Clinics/ Outpatient Consults

- 1- Review all outpatient appointments to minimize in-person patient attendance in the consultation waiting room. Assess the telemedicine consultations of all possible appointments and postpone appointments that require face-to-face care in cases where such delay does not endanger the patient's life or may cause sequelae.
- 2- Contact the patients by telephone to give the results of pathological results, laboratory tests or radiological tests, and avoid unnecessary patient visits to the hospital.
- 3- In cases where face-to-face consultation is essential, it is recommended to contact the patient before going to the hospital to confirm that they have no symptoms (fever or respiratory symptoms), confirm that they have not been in contact with a diagnosed case of COVID-19 or that they do not come from a high incidence area; confirm that face-to-face consultation is essential. Treat the patient in an area away from the hospitalization area using PPE in the case of explorations or wound healing. Patients must enter the clinic alone, unaccompanied.

On Call

1. It is recommended to designate a call shift coordinator, in such a way that he/she will check the availability of the call team and the backup team list daily. Each service will have a weekly list of call and another parallel list, with the back up team.

Clinical sessions, morning report, coffee breaks, and multidisciplinary committees

- 1- Suspension of clinical sessions and multidisciplinary committees. The relationship with other services by telephone or telematics means will be maintained.
- 2- The call sign out is made between two people.
- 3- Avoid coincidence of doctors in coffee breaks

Research and communication

1. Participate in the Covid19 study to improve knowledge about this pathology worldwide. (<https://docs.google.com/forms/d/e/1FAIpQLScTc7m9OkxK-6YuJsVmQppgwlD1nthIFK1snBjrqspl72IIA/viewform>) In this link, they carry the registration worldwide
2. Prospective collection of epidemiological data in each service, in collaboration with the Epidemiology Service.
3. Staying communicated and connected through social networks and media.



Calle O'Donnell, 16. 1o Izq
28009, Madrid
+34 913 190 400
aec@asociacioncirujanos.es
www.aecirujanos.es

**GENERAL RECOMMENDATIONS FOR ACTION AND BASIC
ORGANIZATION OF SURGERY UNITS IN AREAS
HIGHLY AFFECTED
BY THE COVID-19 PANDEMIC (SARS COV-2)
FROM THE SPANISH ASSOCIATION OF SURGERY (AEC)**

These measures are subject to revision, according to the global situation of the hospital and daily needs and the recommendations of the Ministry of Health and Autonomous Communities.

Each surgical service will consider implementing them according to their particular circumstances.

Goal

To protect hospitalized patients and healthcare personnel from the risks of SARS Cov-2 infection and to ensure vital healthcare activity.

General guidelines

1. Establish a communication channel for the entire Service (Specialists and Residents) so that the Chief of Service or COVID coordinator, who is in contact with the Board, can provide updates on the current situation to both the Service and the Hospital on a daily basis.
2. Assess reprogramming work shifts for the next two weeks (the incubation period of the disease).
3. The usual activity of the service will be reduced by the decrease in ordinary activity, so the surgeon who does not have an assigned activity or has completed it **will remain at home** to reduce exposures and transmissions and will be available for any emergency. This distribution must be coordinated by the person designated for this purpose (Head of Service or COVID-19 coordinator).

4. PPE Training: All staff must receive practical training in PPE as established in each center.
5. Work areas, offices, and classrooms must be ventilated and the safety distance between doctors and other hospital personnel must be maintained.

Elective Surgery

1. Suspension of all ambulatory surgical activity and non-oncological (some cases can be individualized) is recommended and case-by-case prioritization of oncological cases should be done (weigh Covid19 mortality ratio against oncological mortality, especially in patients with high risk).
2. Preference will be given to patients who do not require ICU admission after surgery.

Hospitalization

1. Daily Rounds: Maintain all the protection measures established by each Preventive Medicine Service of the hospital.
2. Wearing a surgical mask is mandatory in the entire hospital environment and gloves have to be worn both in patients with or without respiratory symptoms.
3. Attention to admitted patients with + Covid19: Assessment by a **single surgeon** and with protective measures established by the corresponding entity.
4. All hospitalized surgical patients with respiratory symptoms will wear a surgical mask and will be reported to the designated hospital team (ID, epidemiology, ect).
5. In the case of a patient who is confirmed POSITIVE, a strict record of all personnel who have been in contact with the patient has to be kept and has to be communicated to the designated hospital team.

Outpatient Clinics / Outpatient Consults

1. Suspension or reprogramming after a case-by-case review by the surgeon in charge and individually evaluating cancer cases, following the guidelines of each center. Consider Telemedicine.
2. In patients with neoplastic pathology who must be seen, they will be treated taking into account all personal protective measures. The doctor/surgeon must wear a mask. Increase the distance with the patient and family for the interview. We recommend that only one relative is allowed with the patient.
3. The areas of the consultation will be cleaned and disinfected (tables, keyboards, etc.).

On Call

1. Given the reduction of the ordinary activity during call shifts, in-house location of the staff on call should be reassessed.

2. It is recommended to designate a call shift coordinator, in such a way that he/she will check the availability of the call team and the backup team list daily. Each service will have a weekly list of call and another parallel list, with the back up team.
3. Consider bringing food and drink to the call shifts (given the possibility of closure of the cafeteria/physician's lounge) and, if possible, a spray to disinfect common areas and call material (pagers and telephones) (virucidal wipes or bleach dissolved in water to 1% prepared each day with disposable paper towels).

Clinical sessions, morning report, coffee breaks, and multidisciplinary committees

1. Suspension of all sessions. The intra-service and inter-service relationship will be maintained by telephone or other telematic means.

Research and communication

Participate in the Covid19 study to improve knowledge about this pathology worldwide.

(<https://docs.google.com/forms/d/e/1FAIpQLScTc7m9OkxK-6YuJsVmQppgwd1nthIFK1snBjrqspl72IIA/viewform>) In this link, they have a worldwide registration

1. Prospective collection of epidemiological data in each service, in collaboration with the Epidemiology Service.
2. Staying communicated and connected through social networks and media.

VALUE AND SCENARIOS OF DIFFERENT TEST

Authors:

Salvador Morales-Conde,

Federico Garcia (Microbiologist)

Eduardo Targarona,

Nicolas Demartines,

Mario Alvarez

And the collaborative group “Corona Virus Global Surgical Collaborative (CVGSC)” and “Surgery-AEC-COVID”

“Surgery-AEC-COVID”: Salvador Morales-Conde, Estíbaliz Álvarez Peña, Mario Álvarez Gallego, José Manuel Aranda Narváez, Josep María Badia, José María Balibrea, Sandra García Botella, Xavier Guirao, Eloy Espín Basany, Esteban Martín Antona, Elena Martín Pérez, Sagrario Martínez Cortijo, Isabel Pascual Miguelañez, Lola Pérez Díaz, José Luis Ramos Rodríguez, Inés Rubio Pérez, Raquel Sánchez Santos

TEST FOR DIRECT DIAGNOSIS

TYPE OF TEST	What does this test measure?	Sample origin	Testing timing	Meaning if positive	Meaning if negative	Sensitivity	False negative	Timing of test positivity* (approx.)	Timing of test negativity* (approx.)	Clinical significance
Test for Direct Diagnosis										
PCR	Viral RNA	Swab from nasopharynx	Symptom onset and screening of asymptomatic	Patient is infected	Not infected or False –	High	Low (very dependent on correct sampling)	Before symptom onset	8 days after symptoms onset	If +, the patient is contagious
		Sputum	Symptom onset		or Disease is finished and no possibility to infect	High	Low	After symptom onset	From day 7 to day 22 after symptom onset	If +, the patient is contagious (less likely than in above scenario)
		Stool (not a commonly used diagnostic test)	Symptom onset		or infected but in a very early stage	High	Low	After symptom onset	From day 7 to day 22 after symptom onset	If +, the patient is contagious, although doubts (although it is not known very well but while it is demonstrated, it is necessary to be very cautious)
Antigen**	Viral antigens	Swab from nasopharynx	Not recommended due to low sensitivity	Patient is infected	Same as PCR	Low	High	Same as PCR	Same as PCR	Not yet recommended for COVID 19 acute phase
		Sputum	Not recommended	Patient is infected		-	-			

* Subject to individual variations

** Fast tests

TEST FOR INDIRECT DIAGNOSIS OR SEROLOGY

TYPE OF TEST	What does this test measure?	Sample origin	Testing timing	Meaning if positive	Meaning if negative	Sensitivity	False negative	Timing of test positivity* (approx.)	Timing of test negativity* (approx.)	Clinical significance
Test Indirect diagnosis or Serology										
IgM**	IgM antibody	Blood/Serum/Plasma	Any time	Active infection, being the first antibodies produced during the immune response	Not infected but does not exclude active infection	High (highest 10 days after onset of infection)	Moderate	5-7 days from infection (best results 8-14 days)	30 days from infection	<p>If positive without possibility of a test for PCR: Active infection and patient should be isolate and treat</p> <p>If positive after PCR becoming negative: assess individually</p> <p>They are important if symptomatic and PCR -</p>
IgG**	IgG antibody	Blood/Serum/	Any time	Antibodies produced in a late stage (past infection)	Early infection or Not infected	High (high after 10 days after infection) 60% at day 7 and 100% at day 14	Low	15-21 days from infection	Unknown	<p>If positive: Past infection (even in asymptomatic patients) but Small % of patients could have PCR + and possibility of infect contacts</p>

* Subject to individual variations

** Fast tests

TEST INTERPRETATION

PCR*	IgM	IgG	Fig 1	Stage of infection	Interpretation pitfalls*/**	Risk of infecting contacts
-	-	-	1	Negative (not infected)	Risk of false negative in early stage of infection. (Watch out if contact with infected patient or symptomatic!!)	Low chance of infecting contacts. Infective, if PCR is false negative
+	-	-	2	Window stage or Initial stage of the disease	-	High chance of infecting contacts
+	+	-	3	Early stage of the disease	Warning: When performing only IgM testing: If only serological tests are performed, one can mistakenly assume past infection, and still be contagious	High chance of infecting contacts
+	+	+	4	Active stage of the disease	Warning: When performing only IgM: If only serological tests are performed, one can mistakenly assume past infection, and still be contagious	High chance of infecting contacts
+	-	+	5	Final stage of the disease	Warning: If only serological tests are performed, one can mistakenly assume past infection, and still be contagious	High chance of infecting contacts
-	+	-	6	Initial stage of the disease with PCR false negative or last phase of the initial stage with low viral load	Warning: Patient can be contagious if PCR is a False negative. False positive of IgM	High chance of infecting contacts if PCR is false negative Moderate chance if true negative
-	-	+	7	Past Infection	Warning: Patient can be contagious if PCR is a false negative.	Low chance of infecting contacts
-	+	+	8	Disease is evolving	Warning: Patient can be contagious if PCR is a false negative.	Low chance of infecting contacts

*Results from the test for antigens would be considered as the PCR, but only if the results of the test for antigen is positive since sensibility of this test is low

**The risk of interpretation is also based on the correct sampling for PCR

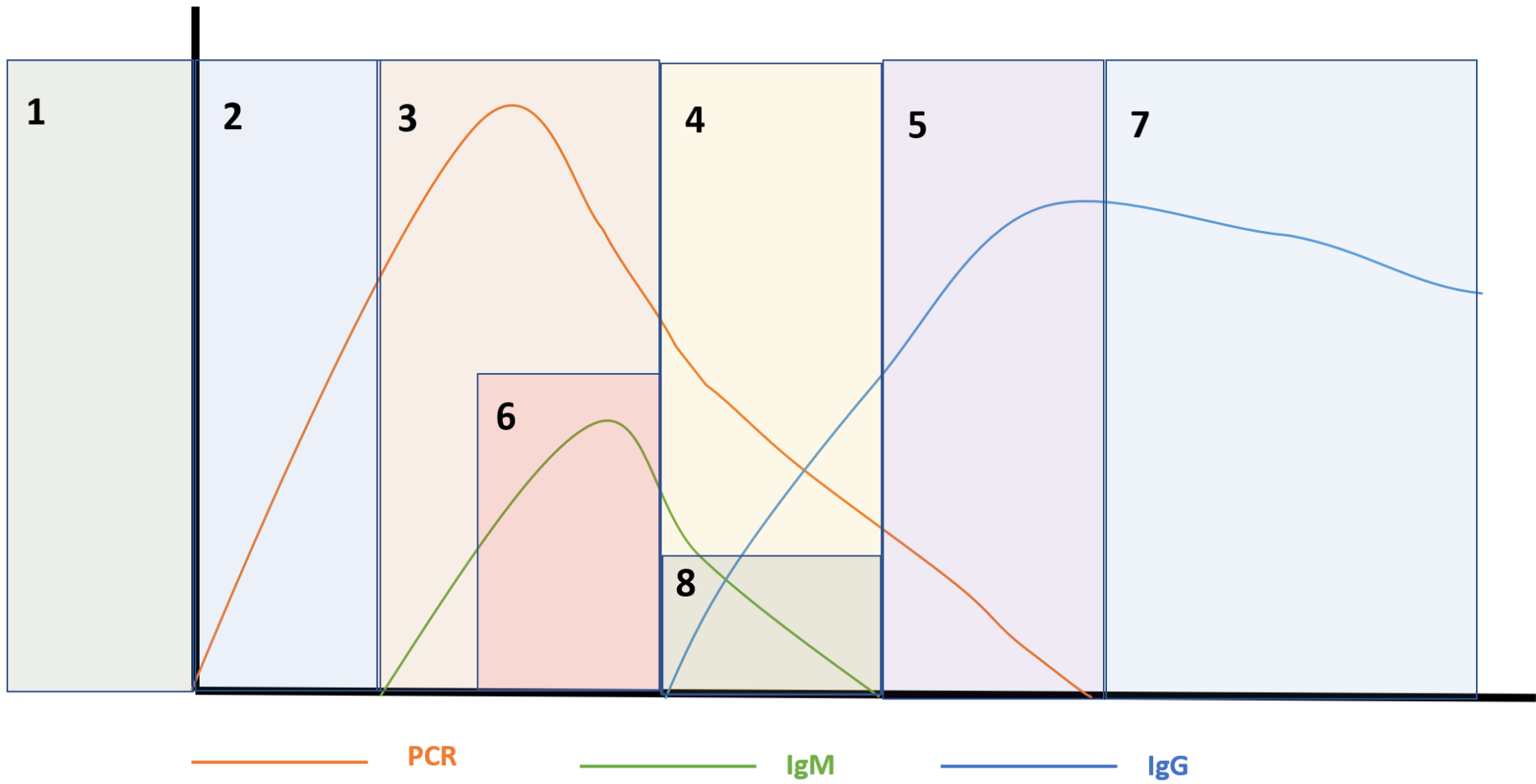


Figure 1.- Different combinations of the results of the test

(1)(2)(3)(4)(5)(6)(7)

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RECOMMENDATIONS FOR RESIDENTS OF GENERAL SURGERY IN THE FACE OF THE SARS COV-2 PANDEMIC

FROM THE SPANISH ASSOCIATION OF SURGERY (AEC)

You are all aware of the situation in which we find ourselves. We have to continue taking care of our surgical patients, but each of us must take extreme precautions to avoid further infections.

We are facing new measures this week, which we hope will allow us to control the transmission of the disease and to help ensure continuity of care. These measures can be reviewed in the coming days as the staff's situation evolves, as well as the regional or national situation.

Although the situation changes from one region to another and may change from day to day, in most Services the elective oncological surgery is maintained in initially healthy patients during this week, but remember to keep the same precautions with them, as well as with all hospitalized patients. There is a possibility that this types of surgeries may not continue in the next few days.

It is recommended to optimize the organization of work so that the residents who come to the hospital are as few as possible and each one has a previously designated specific work objectives.

In many Services, morning sessions are going to be suspended so each one will go to their workplace directly. It seems that the long sleeve of the lab coat can be a vehicle of propagation, so it is better to put on scubs and maximize hand washing.

While on call, avoid unnecessary walks through the Emergency Department and plan the assistance that you are going to give to urgent patients before attending them (medical history, examination, request for tests and first treatment at the same time). Remember that you can call to ask questions without having to wait to see another resident or the attending physician in person.

During surgery in patients with COVID19 or highly suspected of having it, priority will be given to performing a fast and safe surgery for the patient and healthcare personnel and not to surgical training. Follow the rules that the AEC has given.

Remember the work areas, offices, and classrooms, must be kept ventilated and the safety distance between the doctors must be kept, as well as with the rest of the hospital staff.

It is going to be a very intense few weeks, so those of you who are at home due to infection and those who have to rest, do not rush because this is a long-distance race. When at home make sure you rest to offer the best assistance when it's time to return to work.

It is very important that you protect yourself, in the next few days you will probably be given training in PPE.

Your attendings, tutors, chiefs, and the AEC are here for what you need both from assistance and also a personal point of view.

Cheers to everyone, together and coordinated we can overcome this.



Working group “Surgery-AEC-COVID-19”
SPANISH ASSOCIATION OF SURGEONS (AEC)

Coordinator of the working group:

Salvador Morales Conde
Hospital Universitario Virgen del Rocío, Sevilla

Members of the working group:

Estíbaliz Álvarez Peña
Hospital Universitario La Paz, Madrid.

Esteban Martín Antona
Hospital Clínico San Carlos, Madrid.

Mario Álvarez Gallego
Hospital Universitario La Paz, Madrid

Elena Martín Pérez
Hospital Universitario de la Princesa, Madrid.

José Manuel Aranda Narváez
Hospital regional Universitario, Málaga

Sagrario Martínez Cortijo
Hospital de Talavera de la Reina, Toledo

Josep María Badia
Hospital General de Granollers, Barcelona

Isabel Pascual Miguelañez
Hospital Universitario La Paz, Madrid

José María Balibrea
Hospital Clínic, Barcelona

Lola Pérez Díaz
Hospital Gregorio Marañón, Madrid.

Sandra García Botella
Hospital Clínico San Carlos, Madrid

José Luis Ramos Rodríguez
Hospital Universitario de Getafe, Madrid

Xavier Guiro
Hospital Parc Taulí, Barcelona

Inés Rubio Pérez
Hospital Universitario La Paz, Madrid.

Eloy Espín Basany
Hospital Vall d'Hebron, Barcelona

Raquel Sánchez Santos
Complejo Hospitalario de Vigo, Vigo.

Authors of the recommendations on emergency surgery:

José Manuel Aranda Narváez
Hospital regional Universitario, Málaga
Coordinator of the Spanish Chapter of Emergency Surgery

José Ceballos Esparragón
Hospital Vithas Santa Catalina, Las Palmas

David Costa Navarro
Hospital Vithas Alicante

Antonio Jesús González Sánchez
HRU Málaga

José María Jover Navalón
Hospital de Getafe

Gonzalo Martín Martín
Quirúrgica Barcelona Hospital CIMA Sanitas

Soledad Montón Condón
Hospital García Orcoyén, Estella

Salvador Morales Conde
Hospital Universitario Virgen del Rocío, Sevilla

Salvador Navarro Soto
Hospital Parc Taulí, Sabadell

Felipe Pareja Ciuró
Hospital Virgen del Rocío, Sevilla

Lola Pérez Díaz
Hospital Gregorio Marañón, Madrid.

Ignacio Rey Simó
Complejo Hospitalario Universitario A Coruña

Luis Tallón Aguilar
Hospital Universitario Virgen del Rocío, Sevilla

Gonzalo Tamayo
Hospital de Cruces, Bilbao

Fernando Turégano Fuentes
Hospital Gregorio Marañón, Madrid

Carlos Yáñez Benítez
Royo Villanova Zaragoza

Authors of the recommendations on HBP surgery:

Miguel Ángel Gómez Bravo
Hospital Universitario Virgen del Rocío, Sevilla
Coordinator of the Spanish Chapter of HBP Surgery

Manuel Barrera
Hospital Universitario de Tenerife

Mikel Gastaka
Hospital de Cruces. Bilbao

Sandra García Botella
Hospital Clínico San Carlos, Madrid

Marcelo di Martino.
Hospital de la Princesa, Madrid.

Rafael López Andújar
Hospital Universitario La Fe, Valencia

Santiago López Ben
Hospital Son Trueta. Girona

Elena Martín Pérez
Hospital Universitario de la Princesa, Madrid.

Santi Sánchez Cabus
Hospital San Pau. Barcelona

Belinda Sánchez Pérez
Hospital Regional de Málaga

Juan Carlos Sanjuan
Hospital Marques del Valdecillas, Santander.

Authors of the recommendations on Upper G-I surgery:

Ismael Díez del Val
Hospital Universitario Basurto

Coordinator of the Spanish Chapter of Upper G-I Surgery

M Jesús García Brao
Complejo Hospitalario Universitario A Coruña

Carlos Loureiro González
Hospital Universitario Basurto

Coro Miranda Murua
Complejo Hospitalario de Navarra

Dulce Momblán
Hospital Clinic Barcelona

Purificación Parada González
Hospital Clínico Universitario de Santiago de Compostela

Lourdes Sanz Álvarez
Hospital Universitario Central de Asturias

Eider Talavera Urquijo
Ospedale San Raffaele

Peter Vorwald
Fundación Jiménez Díaz Madrid

All documents have been reviewed and approved by the Scientific Committee of the Spanish Association of Surgery:

Salvador Navarro Soto
Hospital Universitario Parc taulí, Sabadell
Presidente del Comité Científico

Raquel Sánchez Santos
Complejo Hospitalario de Vigo, Vigo
Secretaria del Comité Científico

Luis Sabater Ortíz
Hospital Clínico Universitario, Valencia
Vocal del Comité Científico

Manuel Pera Román
Hospital del Mar, Barcelona
Vocal del Comité Científico

Victor Soria Aledo
Hospital general Universitario Morales Messeguer, Murcia.
Vocal del Comité Científico

Xavier Serra Aracil
Hospital universitario Parc Taulí, Sabadell
Vocal del Comité Científico

Eduardo Targarona Soler
Hospital de Santa Creu i Sant Pau, Barcelona
Director de la Revista Cirugía Española

Translation of documents:

To english:

Jennifer Petrie
BD – Global Surgical Education Manager

Jean Carrasquilla
Cirujano Puerto Rico

To Portuguese:

Jose Luis Domínguez Tristancho
Hospital Universitario “Fundación Jiménez Díaz”. Madrid

To Polish:

Piotr Mysliwiec
Centrum Medycznego Medicover. Sprawdz



DOCUMENTOS DE POSICIONAMIENTO
RECOMENDACIONES

Cirugía-AEC-Covid-19

