

Component Separation Advisory

February 2023

Much advancement and innovation has occurred in recent years with regard to techniques and strategies for recreating, reconstructing, and re-establishing abdominal wall continuity in patients with complex abdominal wall defects. The use of myofascial advancement techniques and giant prosthetic reinforcement have evolved significantly over the decades with major advances noted as a function of our understanding of abdominal wall anatomy, further refinement of technique, and broad dissemination of minimally invasive and endoscopic techniques.

The “Component Separation” moniker was first used by Dr. Oscar Ramirez, allowing for various myofascial layers of the abdominal wall to be safely dissected and advanced to provide for closure of large abdominal defects without undue tension decreasing hernia recurrence rates. Modern day component separation techniques include anterior component separation (e.g., external abdominal oblique release) and posterior component separation (e.g., Rives-Stoppa repair and transversus abdominis release). The technical aspects of these operations can be achieved through open, laparoscopic, robotic, and endoscopic means. Beyond re-approximation of defects without undue tension, these operations necessitate the use of mesh implants to improve long-term durability of repair. The success of these operations is multifactorial and dependent upon patient, surgeon, and system factors to achieve optimal outcomes.

The indications for these operations have similarly expanded as abdominal wall surgeons have realized that outcomes related to traditional approaches to hernia repair are associated with a high burden of recurrence. As such, the American Hernia Society (AHS) has developed this document to highlight prerequisites and indications for the use of these techniques.

1) Preoperative Considerations:

- a) **Appropriate training:** A thorough understanding of relevant clinical anatomy of the abdominal wall is absolutely essential to ensure appropriate outcomes. Given the advanced nature of these operations, it is recommended that individuals utilizing such techniques complete advanced training through fellowship, cadaver-based simulation, and/or close mentorship by surgeons experienced in these techniques. While there is no current minimum number of surgeries required to achieve competency, additional advanced exposure to complex cases will improve proficiency.
- b) **Access to critical care:** Patients undergoing complex abdominal wall reconstruction may need higher levels of care post-operatively, including stays in the intensive care unit. These surgeries should be done in institutions that can provide or have access to such advanced level of care.
- c) **Abdominal wall reconstruction adjuncts:** Surgeons participating in complex AWR procedures should be familiar with pre-operative adjuncts such as pre-operative chemodenervation of the abdominal wall using botulinum toxin, tissue expanders, and progressive pre-operative pneumoperitoneum (PPP)

- 2) **When to Utilize a Component Separation:** Decision making related to component separation is guided by a variety of factors beyond simply hernia defect dimensions or volume of herniated contents. Although component separation techniques may be anticipated in advanced abdominal wall defects, the AHS recognizes that other factors may necessitate the need for myofascial advancement, some of which are listed below:

- a) **Physiologic-Tension Closure:** If intraoperative assessment reveals impossibility or unacceptable tension on the defect closure, component separation techniques can be employed to achieve desired approximation of the fascia without undue tension. There are no specific defect size criteria, and at times, a component separation technique may be required for smaller defects that are associated with decreased abdominal wall compliance or significant diastasis recti.
 - b) **Proximity of Hernia Defect to Difficult Locations or Bony Prominences:** Defect size and location have been well described as being predictive of need for myofascial advancement via component separation. Utilizing standardized nomenclature schema can facilitate an understanding of the hernia size and dimension. Defect size relative to rectus width, proximity of defects to abdominal wall landmarks (e.g., xiphoid process, costal margin, pubic symphysis, bony pelvis), and circumstances requiring resection of portions of the abdominal wall (e.g., mesh explantation, soft tissue tumor resection) may necessitate component separation technique even for smaller defects.
 - c) **Anatomic Plane for Prosthetic Mesh Reinforcement:** The concepts of component separation and myofascial advancement are often used interchangeably, though this is not necessarily always true. In circumstances where a component separation technique is utilized to develop an anatomic space/plane for prosthetic mesh reinforcement of a defect (e.g., performing a limited transversus abdominis release to manage a Spigelian defect), the release is performed not to bring fascial margins closer together, but to allow for a broad mesh coverage. In such circumstances, the surgeon may need to clarify that component separation was performed to allow for a prosthetic reinforcement of the visceral sac and not just a defect closure.
- 3) **When to Avoid Performing a Component Separation:** While this is a technique that can be an important tool in the hernia surgeon's armamentarium, it is also worthwhile to know the instances when a component separation should typically be avoided. These include emergency surgeries with both non-hernia pathology (e.g. perforated diverticulitis, trauma, etc) along with an incarcerated/strangulated abdominal wall hernia, open abdomen, in cases of significant contamination, especially in the emergent setting, as well as cases where definitive repair is delayed. In cases where patients have already had a prior component separation, care must be taken to avoid destabilization of the abdominal wall, if an additional component separation using an alternative technique is required.
 - 4) **Minimally Invasive Approach:** The technical approach, whether it is open, laparoscopic, endoscopic, or robotic, should be recommended based on surgeon's experience, training, and comfort with the technique. The goals of minimally invasive approaches to component separation and myofascial advancement are identical to those of open techniques. We advise that surgeons utilizing minimally invasive approaches to component separation maintain the same goals that are established for open operations.

Finally, it should be noted that there are no size criteria mentioned in this document, and this is not an exhaustive list of when a component separation should and should not be used. Each patient is unique and it is very possible that the exact same size defect may require component separation in one patient, but not another. Many factors need to be taken into account, and this advisory aims to act as a guide in the decision-making process with the common goals of excellent surgical outcomes while minimizing postoperative complications and recurrence. A multidisciplinary approach may often be necessary to optimize outcomes. Further, surgeons are encouraged to maintain robust data related to surgical and patient reported outcomes to allow for iterative improvement of technique and outcomes and participate in quality improvement initiatives.