

Postoperative Knee Bracing

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Durable medical equipment (DME) is frequently used in the orthopaedic setting, ranging from the simplest of injuries to the most complex surgical procedures. Bracing by itself also ranges from relatively straightforward to rather intricate, depending on the situation. Proper application and patient education regarding specific DME are vital for compliance throughout the healing process. Repeated, improper donning and doffing of DME are a frequent cause of confusion to both patients and untrained medical staff alike, possibly leading to further injury. Durable medical equipment knowledge is valuable and useful, as orthopaedic nurses will undoubtedly encounter these situations and will be looked to for guidance or advice. Although there are multiple styles and indications for knee bracing, this article focuses on the surgical knee brace, its initial application immediately following surgery, as well as the most common adjustments made throughout rehabilitation.

Many differing factors are cited for the use of knee braces following surgical intervention (Lowe, Warth, Davis, & Bailey, 2017). Also, there is debate in the orthopaedic community regarding the overall efficacy of postoperative knee bracing (Rodriguez-Merchan, 2016). In addition, those who agree on postoperative knee brace usage have differing opinions regarding the time frame of weaning off the brace (Nylandet al., 2016). Regardless of varying opinions, postoperative knee bracing is prevalent enough to warrant a greater understanding of correct positioning. It is important to note that postoperative bandaging will initially alter the fit of the brace, but the bandages should be easily accessible without brace removal. This also allows for wound care management, including suture/staple removal, as well as the ability to check for any abnormal skin reactions. The principles discussed may be applied to both bandaged and nonbandaged knees, with only minor adjustments necessary due to bulky surgical dressings.

Many patients complain of the constant need to “pull up” the postoperative knee brace during ambulation, which is caused by loose straps on the brace. This problem most likely arises from too much slack allowed posteriorly. When the brace is too loose, it may shift medially or laterally, although usually it will migrate toward the patient’s ankle, as seen in Figures 1 and 2. Depending on the manufacturer, postoperative knee braces will have a total of four or six straps (even numbers above and below the joint line), with either a buckle or quick-release button to fasten the strap. Tighten and remove



FIGURE 1. Anterior view of the postoperative knee brace set too low on the knee. Notice strap incorrectly placed directly over the patella.

slack from all straps, ensuring a snug fit. Once the straps are secured, the patient need to use only the buckle/quick-release button for removal of the brace. This allows for a simpler on-and-off procedure, with less chance of variability. If there is an incision located directly underneath one strap, as in an anterior cruciate ligament reconstruction, be mindful to not overtighten, which will cause undue stress and pain to the patient. Figure 3 shows proper height positioning of the brace. Some surgeons require the brace to be worn during sleeping hours, which may also cause loosening of the brace. Patients should be instructed to retighten the brace after sleep, as this will help avoid shifting during waking hours.

As the patient progresses through the first weeks after surgery, it is common for significant atrophy to

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The author and planners have disclosed no potential conflicts of interest, financial or otherwise.

DOI: 10.1097/NOR.0000000000000489



FIGURE 2. Lateral view of the postoperative knee brace set too low on the knee. Notice lower end of the brace pushing incorrectly into the ankle.

occur (Hughes, Rosenblatt, Paton, & Patterson, 2018). For this reason, the postoperative knee brace will require periodic tightening and adjustment of the straps. Also, just as atrophy will change the fitting of the brace, so will different styles of clothing. The optimal fit for postoperative knee bracing is directly on the surgical leg. If this is not practical, the thinnest form of clothing is preferred compared with a looser or bulkier



FIGURE 4. Postoperative knee brace range-of-motion hinges set incorrectly anterior to the knee joint, hindering available motion.

fitting garment. Conversely, clothing may be worn over the brace, as long as the brace remains in proper alignment underneath. Orthopaedic nurses may be called on to discuss these types of brace adjustments with patients. The previously described methodology applies in these instances as well, focusing on a snug-fitting brace, with careful attention paid to avoid overtightening.



FIGURE 3. Proper positioning of the postoperative knee brace for both straps and range-of-motion hinges.



FIGURE 5. Postoperative knee brace range-of-motion hinges set incorrectly inferior to the knee joint, hindering available motion.



FIGURE 6. Anterior view of the flexed knee with postoperative knee brace range-of-motion hinges and straps centered to allow for proper motion.

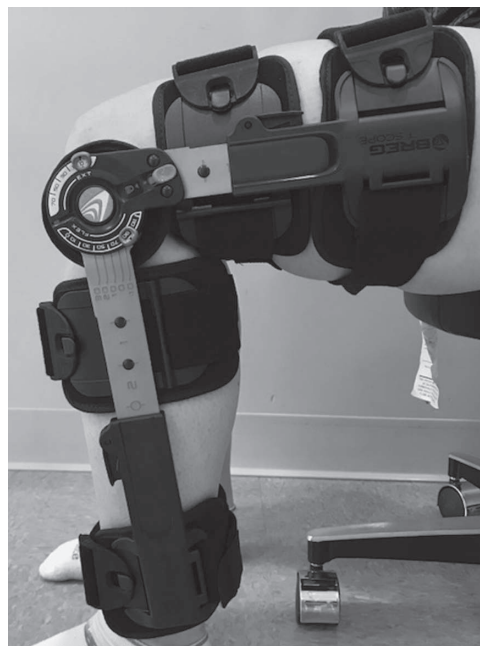


FIGURE 7. Lateral view of the flexed knee with postoperative knee brace range-of-motion hinges and straps centered to allow for proper motion.

An additional issue with the postoperative knee brace is the improper placement of the range of motion (ROM) hinges. These hinges may allow full ROM about the joint or may be utilized to limit motion, depending on the surgeon and the surgical procedure (Prentice, 2017). Proper hinge alignment is a significant factor when addressing the stability of the brace (Chachula, Cameron, Svoboda, & Owens, 2011). Improper hinge alignment may restrict motion, as well as limit the stability offered by the brace. Figure 4 presents with the hinges placed too far anterior to the joint, whereas Figure 5 demonstrates a hinge that is too inferior. The knee joint line should be centered between both the medial and lateral ROM hinges, allowing for proper ROM per the physician's protocol. Figures 6 and 7 demonstrate proper ROM hinge positioning in a flexed knee. Throughout the rehabilitation process, the surgeon may want the ROM degrees adjusted. This does not change the positioning and fitting principles for the brace. However, refer to each manufacturer's instructions for use to adjust the degrees, as each ROM hinge differs by manufacturer.

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