INTRODUCTION

It has been clearly demonstrated that spinal supports in current use do not completely immobilize the lumbar spine (1,2). At most they provide for restriction or restraint of motion. Also, the supports do not appear to reduce activity of the back muscles, though they definitely do reduce the activity of the abdominal musculature (3). It would appear that one of the most important (if not the most important) functions of a spinal support is compression of the abdominal contents to increase the intra-abdominal pressure. This allows the abdomen to act as a semirigid cylinder which is attached to and surrounds the vertebral column and which is capable of reducing the load on the spine itself.

The support presented here is simply a modified body jacket. The essential features include:

1. A semiflexible body jacket fabricated from laminated fiber glass. This provides a certain amount of anterior-posterior and mediolateral motion restraint by the three-point fixation principle. The semiflexibility, however, provides for more comfort and patient tolerance.

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2. An anterior inflatable pad which allows for variable increase of intra-abdominal pressure so the patient can adjust it to comfort or tolerance.

3. An inflatable pelvic band which provides better and more comfortable fixation of the support to the pelvis. This band also has a tendency to rotate the sacral area anteriorly and to flatten the lumbar lordosis.

**CASTING PROCEDURE**

The casting procedure is explained to the patient. A suitable size stockinet is then applied. A cutting strip (rubber or plastic) is applied under the stockinet as a guideline and for reassurance to the patient for later removal. The patient is then cast in the conventional manner, in a standing position with knees and hips flexed at approximately 20 deg. Both knees rest anteriorly on a frame. The lumbar curve is slightly flexed or flattened to a degree which is comfortable to the patient (Fig. 1). (Either a Milwaukee casting frame or a hospital-type casting frame normally found in cast rooms is helpful but not essential.)

Intra-abdominal pressure is applied by the use of a convex plate (Fig. 2). This may be held by one of the assistants either by pushing (as illustrated) or by pulling from the posterior position. This plate should be applied while the cast is still wet and must be held in place until the plaster has set. The cast is then cut along the strip and removed from the patient. Plaster-of-paris bandages are applied to the negative and enclosed on the bottom. Plaster is poured into the negative with a ½-in. pipe protruding superiorly. The cast is allowed to dry and the negative is removed. Modifications of the positive mold are minimal.

**FABRICATION TECHNIQUE FOR BODY JACKET WITH INFLATABLE PELVIC SECTION**

The conventional laminating technique used for hip-disarticulation sockets is the technique of choice. The lay-up is as follows on a modified and sealed cast: A specially made PVA bag is applied, followed by one layer of Dacron felt and two or three nylon stockinets, depending on the size of the individual. An 8-in.-wide layer of fiber glass is sandwiched between the stockinets vertically on the posterior portion of the cast. Another special PVA bag is pulled and vacuum-tested. Two feeder bags are inserted, one anterior and one posterior. Mixed are 1500 to 2000 gm. of resin using 70 percent
4134 flexible and 30 percent 4110 rigid, with whatever amount of promoter and catalyst the technician feels will give him adequate working time. After the resin air-cures, the entire unit is placed in an oven set at 350 deg. Fahrenheit for 1 hour to finish curing the flexible resin.

FIGURE 1.—Casting to flatten lumbar lordosis.
The jacket is cut off and trimmed (Fig. 3, 4, and 5). The pelvic band bladder used is the complete 24-in.-long above-knee-type tourniquet used in surgery (Zimmer Company, Bourbon, Indiana, catalog number 1549242). The abdominal bladder may be an inflatable ptosis pad (S. H. Camp Company, Jackson, Michigan) or a...
football bladder (Seamless Rubber Company, New Haven, Connecticut). At the time of fitting, the bladders are applied to the patient so the exact entry holes can be cut for inflation. At this time, the area on both sides and the posterior side of the jacket are marked where the bladders optimally lie. Then, for each bladder, three strips of PILE Velcro are glued to the jacket, and the entire back portion of the bladder covers has hook Velcro sewn in, giving the physician an opportunity to shift the bladders to where points of pressure are desired (Fig. 6 and 7).
REFERENCES

