injury, the axillary artery could not be palpated. The pulse oximeter probe had been previously placed on one of the fingers of the patient’s right hand and a good signal obtained. It was then noted that, when the axilla was palpated in the suspected anatomical vicinity of the artery, the oximeter signal would disappear. A 22-gauge needle was inserted at this point with subsequent elicitation of a satisfactory paresthesia. Following negative aspiration, a mixture of 50 cc of 0.75% bupivacaine with 1:200,000 epinephrine and 15 cc of 3% chloroprocaine was injected at this site. Adequate surgical anesthesia was obtained in the extremity within 15 min and lasted for the duration of the procedure. Since this initial case, we have utilized this technique in several other patients and have found it to be especially helpful in burned, obese, or very muscular individuals in whom landmarks are not easily found. Also, in a teaching setting, this maneuver allows the instructor to know with greater certainty whether the resident is indeed palpating the axillary artery with desired precision.

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Video Display for Teaching Fiberoptic Intubations

To The Editor.—Fiberoptic intubation is increasing in popularity as one of the preferred methods to accomplish difficult intubations. In experienced hands, a fiberoptic intubation can be accomplished easily and rapidly. However, teaching the technique to residents presents an unusual problem in that only the person actually manipulating the bronchoscope is able to visualize the anatomy. This results in the resident learning by trial and error rather than from instruction by the attending anesthesiologist. This inability to instruct and direct residents while performing the procedure results in resident frustration when the attending anesthesiologist “takes over” and accomplishes the intubation. We describe a method that allows more than one person to view the actual procedure while the resident is attempting the intubation.

The television camera commonly used during arthroscopic examinations easily attaches to the fiberoptic bronchoscope head. With proper adjustment of the television camera, orientation as to up and down is easily accomplished. During the intubation, both resident and attending anesthesiologist watch the television screen. The resident can then manipulate the bronchoscope with the attending anesthesiologist assisting in identification of structures and direction of movement. Our fiberoptic scope is an Olympus® LF1 pediatric bronchoscope. The camera used is a Karl Storz® model 9000 the output of which is fed into a video cassette recorder and television set.

Before inserting the fiberoptic bronchoscope, it is essential to obtain proper spatial orientation. This is easily accomplished by pointing the scope at some small object or print and observing the television screen for up/down/left/right orientation. Once proper orientation has been achieved, it is important to “fix” the camera on the fiberoptic bronchoscope so the camera does not rotate.

A video tape recording of the technique is possible and the video tape recording can be used for teaching purposes when new residents are first introduced to fiberoptic intubations.

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Pulse Oximeter Cost Per Use—Securing Savings

To the Editor.—Pulse oximetry has rapidly become a vital measurement for patients undergoing anesthesia and surgery. Our hospital adopted this new technology early in 1985 and quickly realized its clinical value; it took much longer to realize the associated supply costs. With the initial acquisition of the Nellcor® N-100 by the hospital, each unit came to the department with a reusable clip-on sensor (DS-100A), about 35 units and reusable sensors in all. We experienced some sensor breakage; however, the reusable sensors disappeared from the OR in about 4 months. Apparently, the reusable sensor was discarded by the clinical staff in favor of the disposable sensors which were initially estimated to last at least ten patient uses.

After reviewing the department's disposable sensor use in July of 1987, our annual usage figures indicated we were obtaining 4.9 patient uses per disposable sensor (25,440/5179) at an annual cost of $60,490; it appeared that many disposable sensors were sent with patients from the OR to the ICU or thrown away after a few uses. A pilot program
was instituted with the reusable sensor that securely fastened the reusable sensor to the Nelcor® patient signal cable by means of ¼-inch metal cabling and loop sleeves* such that the reusable sensor could not be separated from the patient cable without using large cable cutters (fig. 1).

All ORs were converted to using reusable sensors secured with cabling in October, 1987. Disposable sensors are still available in the OR—there are some instances in which only they will work, e.g., small pediatric patients. When this occurs, the reusable sensor is simply unplugged from the patient cable connector (slid up the patient cable and out of the way) and the disposable sensor plugged in its place. In addition, when the infrequent report of a failed reusable sensor does occur, disposable sensors can be used temporarily until a technician checks out the reported failure, cuts the securing cable, and replaces the failed reusable sensor. Many reported sensor failures are loose connections, bad patient cables, or operator error.

Since our conversion from all disposable to all reusable pulse oximeter sensors, the cost per patient use for the department has been reduced from $2.73 to $1.09, which includes the cost of replacing broken reusable sensors, with annual savings last year of over $42,000.

In a large teaching department such as ours, securing the reusable pulse oximeter sensor to the patient cable was necessary to insure against loss and encourage management to be a part of the replacement process. Smaller Anesthesia departments or hospitals may not need this measure of control. It appears reusable pulse oximeter sensors are very cost effective when used routinely.

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Cool Fingers and Pulse Oximetry

To the Editor—Frequently, intraoperative monitoring of patients via pulse oximetry is inhibited during a surgical procedure when the pulse oximeter fails to detect pulsation, from which arterial oxygen saturation is estimated. Hemodynamically the patient may be stable, but, on palpation, may have cool extremities. Because we did not think passive heating, which has been used in the past, would be helpful during this particular case, we devised an alternative solution to this problem.

While monitoring a patient undergoing radical prostatectomy with the D25 probe of a Nelcor® N100 pulse oximeter placed on the patient’s right first finger, the oximeter ceased to function, despite effective shielding from ambient light interference. We palpated the patient’s fingers, found they were quite cool, and therefore assumed the loss of signal was due to inadequate pulse amplitude. We loosely wrapped the patient’s forearm with a pediatric warming blanket, connected it to the warming source, and set the temperature at 39 ø C. After approximately 15 min, pulsation in the finger was reestablished and the pulse oximeter resumed readings of SpO₂. We placed an adult D25 Nelcor® finger probe on the first finger of the patients opposite hand, but pulsation was not detected. We then measured the skin tem-

* Small Parts, Inc., Miami, Florida 33238-1736