Inpatient to Outpatient Transition for Negative Pressure Wound Therapy (NPWT): Factors for Consideration

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INTRODUCTION

Since the introduction of negative pressure wound therapy (NPWT) in 1994, rapid dissemination of this technology has helped manage many acute and chronic wounds. These devices are now preferred for many of the complex wounds that we treat. Originally, these devices were introduced and used within the hospital setting. Now, there are many devices produced by several manufacturers that are used in rehabilitation facilities, skilled nursing facilities, and in patient's homes. A rapid increase in use outside the hospital setting has been fueled by the trend to conduct more medical procedures in settings other than hospitals.

In 2014 the Agency for Healthcare Research and Quality (AHRQ) performed an extensive review of the literature and issued a comprehensive report on outpatient NPWT.[1] They identified several complications from NPWT that we will review. Many of the reported complications occurred outside of a hospital setting. In addition, the FDA issued a number of updates on safety concerns associated with these devices.[2] For the purpose of this article, we will focus on patients where NPWT devices are applied in the hospital with the patient going home or to a skilled nursing facility with a NPWT device.

PAIN

Wound pain can become worse when NPWT devices are applied. We often find that patients treated at a higher level of suction experience more pain. Also, patients that are on intermittent suction can experience pain as the device cycles and the pain can be substantial during dressing changes. In the hospital, we have access to intravenous pain medications, and local anesthetics that can be used to moderate the pain response.

These alternatives are not available in skilled nursing facilities or at home. When we prepare for a transition, we like to do one or two changes of the NPWT device in the hospital without the need for anesthesia or parenteral pain medications prior to discharge.

RETENTION OF FOREIGN BODIES

Most NPWT devices use a polymeric foam or gauze that does not have any radiopaque markers attached. Without vigilance, these devices can be left in the patient and cause substantial harm. We prefer to use a single interface device. When we use foam, we customize the cutting of the foam so that a single piece fills the entire wound. If more than one foam is placed, this needs to be specifically documented and communicated between providers. For patients with good mental capacity, we specifically tell them about this possibility and have them act as a second check to make sure that whatever is put into the wound is removed at the next dressing change.

BLEEDING

Bleeding can be a major problem when NPWT devices are used in the outpatient setting. Typically, dressings are changed by nurses from Visiting Nurses Associations (VNAs) who have limited equipment to stop substantial bleeding during dressing changes. An increasing number of patients are on blood thinners that can further increase this risk. As granulation tissue develops in the wound, bleeding can become worse with each subsequent dressing change. When this occurs, we modify the interface material in the wound or switch to another type of dressing.

DEATH FROM INFECTION OR BLEEDING

Unfortunately, there have been deaths reported in association with massive bleeding or infection. For wounds that are near major vessels (groin, sternal wounds, axillary wounds), we keep patients in the hospital or use a different type of dressing when they go home.

Infection remains a substantial issue for NPWT devices used outside the hospital setting in wounds that are not totally debrided. As these wounds are covered, they may not properly drain if an invasive infection develops. If there is necrosis in the wounds, patients need to be promptly seen to have the wound debrided to avoid invasive soft tissue infections. In our practice, we switch to a different wound care therapy in the presence of substantial necrosis.

POWER OUTAGES

Power outages do occur, particularly in a natural disaster when communications can often be limited. Most NPWT systems have battery backup for a few hours, but patients should realize that there is some risk of leaving a device in place on a wound without suction. There are several mechanical devices that do not rely on electricity that can obviate this problem. Patients and caregivers should be familiar with the back-up time of powered units with batteries.

PRACTICAL ISSUES

When considering transitioning to an outpatient NPWT there are a few questions that our care team asks of patients, specifically whether the patient, family and visiting healthcare staff have the resources and knowledge to manage a NPWT device.

In the US, most hospitals in urban and suburban areas have excellent home care support which may be lacking in certain rural areas of the country. Many of the NPWT devices come with alarms. In our experience, the most common alarm is when there is a loss of a seal over the wound. For many patients, troubleshooting these alarms can be problematic if they don't have easy access to help. VNAs are very helpful in troubleshooting device problems and some of the manufacturers have call centers with experienced nurses that can also help with troubleshooting over the telephone. We have some patients that live in environments not conducive to having these devices safely deployed. In these cases, we prescribe other types of dressings.

Another important practical issue is whether the home pump is compatible with the device applied in the hospital. The large growth of NPWT companies has resulted in several devices with incompatible connections. The hospital contracts often differ from the insurance contracts to home care agencies resulting in different products being approved for a specific environment. We generally have the home care device delivered to the hospital prior to discharge. If we can get a device from the same manufacturer, a simple change of the pump is all that is necessary. In some cases, we have to change the entire system prior to discharge.

HOW EASY IS IT TO GET A RELIABLE SEAL?

In the hospital setting, there are often several clinicians around that can assist with the placement of a NPWT device. Dressing changes are challenging in areas where they involve digits, orifices or fistulas. In the home setting, it is often a single nurse that needs to place these devices. We find that most experienced users have developed a few maneuvers to both diagnose and treat leaks. For example, running a digit along the edge of a seal and listening to the pump can often diagnose a leak. Stoma adhesive or small adhesive polyurethane film dressings can be useful adjuncts to seal small leaks.

PERI-WOUND PROBLEMS

A precise placement of a NPWT device results in the interface material only being in contact with the wound. When the foam contacts the normal skin, it can result in abnormal indentations into the skin. This can be prevented by applying a strip of a hydrocolloid dressing to the wound edge, so if some of the foam overlaps the wound, it will contact the hydrocolloid rather than the normal skin.

If fluid contacts the skin or gets under the drape, the skin can become inflamed or infected. The skin can be treated with a steroid and/or antifungal cream. In some cases, switching to another dressing for a few days will allow the skin to recover until NPWT can be reinstituted.

AVOIDANCE OF PRESSURE INJURIES

The stiff tubing and interface apparatus can cause pressure injuries within the wound or within the surrounding skin. We have noticed this in neurologically impaired patients that do not have the ability to turn themselves. In these cases, we create a bridge from the wound over the skin where no external pressure is applied. This can easily be done by placing a protective polyurethane drape directly over the surrounding skin where the foam will form the bridge. A second polyurethane drape is placed over the foam. The connection device that connects to the pump is placed on an area of the skin where pressure cannot be easily applied.

RETURN OF THE PUMPS TO THE MANUFACTURER

The large reusable pumps can often be quite expensive, and patients have an obligation to return these to the manufacturer without incurring a substantial bill. Our practice reminds patients, when they discontinue NPWT, to make sure they return the pumps.

SMALLER PUMPS

Many manufacturers are moving to smaller and disposable pumps, some of which are mechanically powered. These are particularly useful in smaller wounds and allow patients to be mobile. They have the disadvantage of not being as forgiving of leaks as larger pumps are under the same clinical conditions. Some of these smaller pumps can only be used for a short duration until their battery runs out.

MOVING TO THE FUTURE

As medical care continues to shift to the outpatient setting, it is not surprising to see more NPWT devices being used in these settings as well. For patients that have complex wounds, it is common for them to be elderly or debilitated with several co-morbid conditions. Patients want better adhesives for the overlying drape, less painful devices, devices that can better control infection, and devices that will more quickly accelerate wound healing. For the most difficult wounds, the hospital will continue to remain a safe place to apply these therapies.

References:

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