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Perspectives

Recovery Strategies from the OR to Home

## In This Issue

Drains continue to be a common facet of the postoperative management of surgical patients. While they serve an important function they also are associated with complications, including hemorrhage, tissue inflammation, retrograde bacterial migration, drain entrapment or loss, pain, and fluid, electrolyte, and protein loss. Proper postoperative care from post-anesthesia care to hospital discharge can avoid complications, promote healing, and achieve a positive outcome.

Pancreatic cancer is a very aggressive tumor with a poor prognosis. The reported 5-year survival rate is less than 5%. The only curative treatment is a pancreaticoduodenectomy for those few who have resectable disease. This procedure has become the standard of care, but it is a complex procedure and recovery is difficult. Nursing care must focus on patient education, both to prepare the patient preoperatively and postoperatively. Ms. Daniels discusses the procedure and postoperative interventions to promote a successful discharge.



# Postoperative Care of Patients with Surgical Drains

CONTINUING EDUCATION FOR NURSING

*By Jody Scardillo, RN, MS, CWOCN*

The use of surgical drains and tubes continues to be a common facet of the postoperative management of surgical patients. Postoperative care and recovery strategies, from post-anesthesia care to hospital discharge, can avoid complications, promote healing, and achieve a positive outcome.

Shorter lengths of stay in the acute-care setting mean that nurses in home- and long-term care need a basic knowledge of tube and drain management. This article discusses the management of surgical drains and prevention of related complications in postoperative patients.

## Indications for surgical tubes and drains

Surgical drains are indicated for decompression in areas with:[1,4]

- a large potential dead space
- necrotic or infected tissue
- uncertain hemostasis
- a fistula
- a significant amount of fluid accumulation

Drains serve an important function but are associated with complications, including hemorrhage, tissue inflammation, retrograde bacterial migration, drain entrapment or loss, pain, and fluid, electrolyte, and protein loss. The appropriate use and early removal of drains decrease the risk of some complications.[1]

Drains can function in an active or passive fashion. They are used for a variety of abdominal surgeries, myocutaneous flap surgery, and breast and orthopedic procedures.

## Types of drains

### *Active drains*

These low-pressure suction devices continuously remove fluids against gravity via a closed drainage system. The drain is attached to a collapsible reservoir that exerts negative pressure to pull accumulated fluids from the wound bed. The collection reservoir expands, as it collects drainage. The advantages of active drains include:

- minimal tissue trauma
- accurate drainage quantification
- a closed system, which decreases infection risk

The consistency of fluid that is draining, tube diameter and length, and amount of negative pressure can impact the effectiveness of active drains.[1,2]

Jackson-Pratt and Hemovac drains are common active drains. Most Jackson-Pratt reservoirs hold 100 cc of fluid, while Hemovac reservoirs hold 500 cc. Jackson-Pratt drainage tubing is more flexible than Hemovac tubing.[3]

The nurse ensures that tubing is in a dependent position and free of kinks. The drainage reservoir is kept in an empty, collapsed position to maintain negative pressure and suction. The use of a commercially

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*Supported by an educational grant from Dale Medical Products Inc.*

# Perioperative management of patients with resectable pancreatic cancer

*by Betty Thomas Daniel, MS, RN, AOCN*

Pancreatic cancer is a very aggressive tumor with a poor prognosis. The reported 5-year survival rate is less than 5%. The only curative treatment is a pancreaticoduodenectomy. The 5-year survival rate in patients who have this procedure is 15% to 20%.[1] Pancreatic cancer is the second most common cancer of the gastrointestinal tract and the fourth leading cause of cancer deaths in the USA. The American Cancer Society estimated 30,300 new cases and 29,700 deaths due to pancreatic cancer in 2002.[2] Median age of patients with pancreatic cancer is about 70 years, and most are over the age of 65. The incidence is higher in the black population, with black men at the highest risk worldwide.[3]

Although little is known about the etiology of pancreatic cancer, a few risk factors have been identified. The most significant environmental risk factor is cigarette smoking. Heavy cigarette smokers have twice the risk of nonsmokers.[3] Diet is the second most important risk factor, although data are not as consistent as that for smoking. Generally, a higher risk is associated with animal protein and fat consumption and less risk, with the intake of vegetables and fruit.[4] Genetic predisposition is implicated in 5% to 10% of patients with pancreatic cancer. Other inconclusive risk factors are chronic pancreatitis, diabetes, alcohol use, and occupations, such as chemists, coal and gas exploration workers, and those in metal industries, leather tanning, textiles, aluminum milling, and transportation.[4,5,6,7]

## Clinical manifestations

Jaundice, associated with adenocarcinoma in the head of the pancreas, is present in about 50% of patients at diagnosis. It is associated with a less advanced stage of disease than other symptoms. However, few patients present with early disease, because signs and symptoms are usually vague and nonspecific. They include anorexia, weight loss, abdominal discomfort or pain, and nausea.[3] These complaints may delay diagnosis for months. The pain is described as severe, gnawing, and radiating to the mid or low back. It is due to tumor invasion of the celiac ganglia and mesenteric nerve plexus.[5]

## Diagnosis and staging

With the recent advances in diagnostic techniques, our ability to detect pancreatic cancer and obtain tissue for diagnosis has greatly improved. All patients with suspected pancreatic cancer should receive an abdominal CT scan and transabdominal ultrasound (US). Endoscopic retrograde cholangiopancreatography (ERCP) is performed to visualize the pancreatic duct and biliary tree in patients presenting with jaundice. Newer imaging techniques whose roles are still evolving include endoscopic ultrasound (EUS), positron emission tomography (PET), and magnetic resonance imaging (MRI).[7,8]

Transabdominal ultrasound is a relatively inexpensive and non-invasive procedure. It has a sensitivity of 70% and specificity of over 90% for the diagnosis of pancreatic cancer. It is commonly used as an initial screening technique for biliary-pancreatic disease.[7] This test is usually followed by an abdominal CT scan. Using spiral or helical CT imaging, unresectable tumors are predicted in 85% of patients and resectable tumors in 70% of patients. A mass at the head of the pancreas is the most common finding.[3,7] Evidence of unresectability on CT scanning includes regional lymphadenopathy, encasement or occlusion of the superior mesenteric or celiac artery, portal vein involvement, liver metastasis, invasion of adjacent organs, or peritoneal spread.

Endoscopic retrograde cholangiopancreatogram is indicated in the presence of obstructive jaundice. Brand refers to it as the "gold standard for the visualization of the pancreatic duct and biliary system."[7]

Endoscopic ultrasonography is a more recent technique that is felt to be more sensitive in diagnosing and staging adenocarcinoma of the pancreas. Accuracy is reported to be as high as 90%. [3]

PET is based on the assumption that glucose use is higher in malignant cells. In pancreatic cancer, there is a higher uptake of glucose analog. Identification of pancreatic cancers using the PET scan is greater than 93%, but false-negative reports and specificity is also high. Thus, the role of PET in diagnosing adenocarcinoma of the pancreas remains unclear.[7]

The use of MRI has not proved to be as accurate as CT.[3,7,8]

A laparoscopy may be performed as a routine part of the work-up in the outpatient setting. However, most surgeons do it immediately before a laparotomy. If unresectable disease is found, the procedure can be concluded.[8]

Although no standardized clinical and pathological staging system of pancreatic cancer exists in the USA, the American Joint Commission on Cancer (AJCC) has developed a staging system. This system is based on local disease, nodal involvement, and distant metastasis.[3,9] Unfortunately, it lends itself more to pathologic evaluation of resected specimens. With the advances in techniques and skills, the use of diagnostic imaging and endoscopic procedures make it possible to use clinical staging reliably to formulate realistic treatment plans.

## Treatment

Of all cancers, pancreatic cancer is most likely to have metastasis at the time of diagnosis – a primary reason why it continues to be one of the most difficult gastrointestinal cancers to treat. Surgery is the treatment of choice; however, only 15% of patients meet the criteria for curative surgery.[11]

Radiation therapy is used preoperatively, to make locally advanced tumors resectable, or postoperatively to eliminate any residual disease. Pancreatic cancer is very chemoresistant; however; new approaches are being investigated. For the purpose of this paper, only the surgical intervention for resectable adenocarcinoma of the pancreas will be presented.

## Pancreaticoduodenectomy (Whipple procedure)

Once the staging work-up is completed and the patient is identified as a candidate for curative surgery, the preoperative phase begins. Typically, the patient receives a complete history and physical, and the team reviews the imaging films and pathology reports. Consultations are requested for cardiology clearance, and additional consultations are requested as indicated. Blood work, which includes CEA and CA19-9 (serum markers for following disease and assessing adequacy of resection), is completed.[3] If the patient has undergone prior abdominal surgery, an arteriogram is requested.

## Preoperative patient instructions

Patient instructions are provided by all healthcare professionals, and printed educational materials are provided. The patient receives instructions about all aspects of surgery, including the placement of jejunostomy tube (J-tube) and gastrostomy tube

(G-tube), length of stay, and healthcare professionals involved in their care.

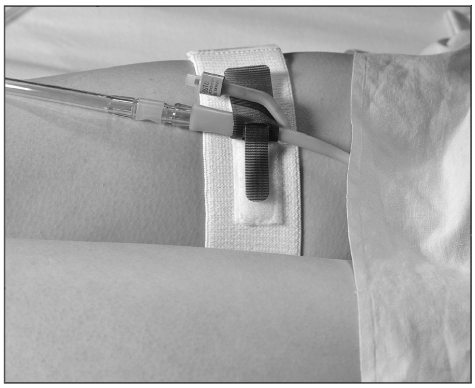
Preoperative instructions include information about diagnostic tests, smoking cessation, donation of blood, anesthesia, and discontinuing the use of aspirin, anti-inflammatory medication, and anticoagulants for 10 days prior to surgery. The patient is informed how to prepare for surgery, what to expect on the day of surgery, about the intensive care experience, what will happen on the hospital unit before discharge, and about home care. The patient learns how to use the incentive spirometer, patient-controlled analgesia pump, and how to do breathing exercises preoperatively, as these devices are very important to the recovery process. Detailed written instructions describe what is expected of the patient and caregiver and review what the patient can expect from the healthcare team on a daily basis.

## Surgical procedure

Four surgical procedures are used to treat adenocarcinoma in the head of the pancreas. They include the standard Whipple pancreaticoduodenectomy (PD), pylorus preserving PD, regional pancreatectomy, and total pancreatectomy.[12] For the purpose of this paper, the standard PD will be presented.

The recommended approach is a bilateral subcostal incision.[5] The liver and peritoneum are examined to identify any metastasis. The procedure does not proceed in the presence of metastasis. There are six steps to surgical resection. Firstly, the superior mesenteric vein is exposed at the inferior border of the pancreas. Secondly, an extended Kocher maneuver is performed, removing all fibrofatty and lymphatic tissue anterior to the inferior vena cava and aorta. The third step is dissection of the porta hepatis, which begins with dissection of the common hepatic artery and ligation and division of the gastroduodenal artery. The hepatic duct or common bile duct is divided, and the gallbladder removed from the liver bed. Fourthly, the stomach is transected at the level of the third or fourth transverse vein on the lesser curvature and at the confluence of the gastroepiploic veins on the greater curvature. Fifthly, transsection of the jejunum is followed by ligation and division of its mesentery. Step six is the transsection of the pancreas at the level of the portal vein. If there is evidence of tumor adherence to the portal vein or superior mesenteric vein, the pancreas is divided at a more distal location. The head of the pancreas is separated from the superior mesenteric vein by ligating and dividing the small venous tributaries.

The high incidence of recurrence after PD mandates careful attention to the retro-



Foley Catheter Holder. Dale Medical Products Inc.

peritoneal margin. The pathologist and surgeon should evaluate the specimen together to determine if any margin is positive. If positive, re-resection if performed.5

Reconstruction after pancreaticoduodenectomy occurs in four steps: pancreaticojejunostomy, hepaticojejunostomy, gastrojejunostomy, and insertion of drains.

Firstly, the pancreatic remnant is moved away from the retroperitoneum and splenic vein by about 2 to 3 cm. The resected jejunum is brought retrocolic through the defect in the transverse mesocolon to the left of the middle colic vessels. A two-layer, end-to-side, duct-to-mucosa pancreaticojejunostomy is performed over a stent. If the pancreatic duct is not dilated, the stent is not necessary.

Secondly, a biliary anastomosis is performed, carefully aligning the bile duct and jejunum to avoid tension on the pancreatic and biliary anastomosis. Thirdly, an end-to-end gastrojejunostomy is constructed. Gastrostomy and feeding jejunostomy tubes are placed. Two closed-suction drains are placed. The gastrostomy tube (G-tube) is placed for intermittent drainage. The feeding jejunostomy tube (J-tube) is placed for postoperative alimentation. This step is important, because the most common complications associated with the PD are poor gastric emptying and inadequate nutritional support.5

The last procedure performed before closure of the abdomen is the placement of the falciform ligament over the stump of the gastroduodenal artery. The vascularized falciform is placed between the stump and afferent limb of jejunum to prevent hepatic artery pseudoaneurysm formation at the origin of the gastroduodenal artery, causing an arterio-enteric fistula. This complication is usually due to a leak at the pancreaticojejunostomy and results in localized infection or abscess formation. Although infrequent, this complication is usually fatal; prevention is the best treatment.[5]

## Postoperative management

After surgery, the patient is admitted to the surgical intensive care unit. The patient will have a nasogastric tube (NGT) to low-wall suction, a G-tube to bedside gravity drainage, a Foley catheter, two closed suction drains, a clamped J-tube, and compression boots.

Management of some of the post-operative drains and tubing can be aided by the application of Velcro® type holders for the Foley catheter and drainage bulb (Dale Medical, Plainville, MA). The Foley catheter holder helps prevent movement of the catheter within the urethra, reducing the risk of urethral irritation or erosion, bladder spasm or inadvertent catheter "pull-out." The application of a drainage bulb holder will help to promote drain function, allowing quick easy access for emptying or drain removal and to provide your patient with the piece of mind that the tube will not be accidentally dislodged.

Postoperative day (POD) one, the patient remains in intensive care. The NGT will be removed, if the patient is extubated. The patient will be instructed to use an incentive spirometer and turn, cough, and deep breathe every hour. Nebulizer treatments are administered three times daily. The patient will be expected to be out of bed after extubation.

POD two, the patient is still in intensive care. The dietitian will see the patient to write orders for tube feedings to start on

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### Resources for Pancreatic Cancer

***www.pancreasfoundation.org***
The National Pancreas Foundation – supports the research of diseases of the pancreas and provides information and humanitarian services to those people who are suffering from such illness.

***www.cancer.gov/cancer_information/cancer_type/pancreatic/***
The National Cancer Institute – provides information about cancer of the pancreas (treatment, prevention, genetics, causes, screening and testing, clinical trials, cancer literature, and related information.

***www.mdanderson.org/DEPARTMENTS/pancreatic/***
The University of Texas M. D. Anderson Cancer Center – provides information to physicians, patients, and the public about the diagnosis, treatment, and study of pancreatic cancer at M. D. Anderson Cancer Center.

***www.cancer.org***
The American Cancer Society – describes different kinds of cancer, methods of prevention and treatment, and includes recent news about clinical trials and research.

**Postoperative Care of Patients with Surgical Tubes and Drains – Continued from page 1**

available device that accommodates up to four Jackson Pratt tubes can allow for easy access for monitoring and emptying of the bulbs (Figure 1).

Initially, drainage from a surgical wound is serosanguinous or sanguinous. It becomes more serous in appearance as healing progresses. The amount and color of drainage is closely monitored. The reservoir is emptied when half-full to maintain maximum function. To unclog blood or tissue shreds, the tubing is gently milked or stripped, away from the patient's body.[4]

A dry gauze dressing is sometimes used around the surgical site. It is changed daily or as needed.

## Passive drains

Passive drains provide an exit for fluids, pus, blood, or necrotic debris that interfere with wound healing or provide a source for bacterial proliferation. The passive drain is usually placed in a stab wound near the incision site.

The Penrose drain is a common passive drain. Made of soft flat, flexible latex material, it enables fluid to escape by gravity and capillary action. A safety pin or holder is often used on this drain to prevent migration into the wound.[2] The surgeon may select this type of drain when drainage is expected to be too viscous to pass through an active drain.[2]

Dry gauze dressings are used over the passive drain to contain drainage. Split or fenestrated gauzes are particularly useful. These dressings are changed when saturated, with care, so the drain is not accidentally extracted when gauze is removed.

## Sump drain

Sump drains are double-lumen tubes with a large outflow lumen and smaller inflow lumen. Venting occurs when air enters the drainage area through the small inflow lumen. Air breaks the vacuum, displacing air and fluid into the larger lumen.

Figure 1. Jackson-Pratt Holder. Dale Medical Products Inc.

Initially, drainage from a surgical wound is serosanguinous or sanguinous. It becomes more serous in appearance as healing progresses.

Certain types of sump drains have a third lumen. It is used for infusing a wound irrigation, while maintaining suction from the other lumen. Sump drains are more common in complex abdominal surgeries.

Sump drains are sutured in place and covered with a dry dressing. Careful intake and output must be maintained, when caring for patients with a sump drain.

## Percutaneous drainage catheter

Occasionally, a postoperative patient needs a percutaneous drainage catheter. Implantation, performed by an interventional radiologist, enables non-operative diagnosis and drains fluid collections at many body sites.

Indications for use include:

- concern that a fluid collection is infected
- need for characterization of fluid
- if the collection is producing symptoms to justify drainage[5]

The catheter is connected to a dependent drainage system. A urinary leg bag or bile bag works well with these drains. The length of time needed for drainage depends on the patient's individual situation.

Sometimes, tube irrigation is performed to maintain patency of a percutaneous drainage catheter. When irrigating, the nurse uses an aseptic technique and the prescribed type, frequency, and volume of irrigant solution. Force or aspiration is never used to return the fluid. The return, color, and consistency of fluid, along with the patient's tolerance of the procedure, are documented.

## Salem sump

The Salem sump is used for nasogastric suction in many conditions. It is used to decompress the stomach after gastrointestinal surgery to prevent vomiting.[8] It is radiopaque with a drainage lumen and smaller vent lumen. Airflow through the vent prevents a vacuum from forming or the plugging of tube holes by gastric mucosa. The larger drainage lumen is connected to the suction mechanism. Continuous low suction is used.

The nurse assesses the tube every two hours for adequate function. The blue vent should be placed above the patient's midline. Many tubes have an anti-reflux valve. A low whistling sound signals that the air vent is sumping air.

After insertion, the tube is taped securely or held in place with a commercially available tube device to prevent injury or pressure areas on the nostril or nasal mucous membrane. The tubing is angled below the nares, rather than upward, to prevent nasal damage from pressure or tension. Some patients experience significant pain or irritation from the tube. Pain can be managed with a topical anesthetic spray, oral throat lozenge, or petrolatum ointment. Frequent mouth care promotes patient comfort.

## Tracheostomy tubes

These tubes are inserted through a tracheotomy, a stoma in the airway that assists breathing, either surgically or by traditional percutaneous techniques. Tracheostomy tubes are used for:

- postoperative care in some head and neck surgeries
- pulmonary toilet
- managing airway secretions
- maintaining the airway over time with or without mechanical ventilation
- treating upper airway obstruction

The tubes may be temporary or permanent, depending on the patient's need. They place the patient at risk of local infection, peritubular skin breakdown, tracheal stenosis, tracheo-esophageal fistula, aspiration, and accidental dislodgement, and alter the ability for verbal communication.[6]

Figure 2. Tracheostomy Holder. Dale Medical Products Inc.

After tubal placement, the tracheotomy site is monitored for signs of bleeding. Tracheostomy tubes are often sutured in place for the first four to five days.

Cotton-tip applicators permit a thorough cleansing of the intact skin around and under the tracheostomy flange. This area is gently cleansed with a mixture of half-strength normal saline and hydrogen peroxide. Precut drain sponges or fenestrated foam gauze dressings can be used around the tube to absorb excess secretions or bloody drainage.

Commercially available precut dressings decrease the risk of gauze fibers entering the stoma. The tracheostomy tube is best secured with commercially available securing devices. Tube holders secure the tube well but are loose enough to prevent skin breakdown (Figure 2). As postoperative edema subsides, ties should be monitored for proper fit.

Leakage of mucous secretions around the tracheostomy tube may cause local skin irritation. Adequate suctioning and management of secretions help to minimize this problem. Nurses are advised to store extra tubes or obturators at bedside in case of emergencies, such as accidental dislodgement. Securing the tracheostomy tube can prevent this all-too-common occurrence. Specialized tracheostomy tube holders, such as the Dale tracheostomy holder, can prevent dislodgement. This holder has a wider diameter neckband that distributes pressure and prevents skin irritation. Velcro®-type hook fasteners is used to secure the tube, making it easier and faster to apply. The holder has elastic in the band, promoting tube security and allowing patient movement.

To lessen the risk of infection, nurses must use an aseptic technique when suctioning and cleansing tracheostomy tubes. A disposable inner cannula, if used, must be replaced daily.

## Gastrostomy tubes

Gastrostomy tubes are used for postoperative decompression. Sometimes, they are chosen instead of a nasogastric tube to promote patient comfort, prevent nasal irritation and rhinitis, or when a prolonged need for the tube is anticipated.4

The surgeon may select a commercially available gastrostomy (G-) tube or the traditional Foley catheter. The commercial G-tube has an external disk or bumper, while the Foley catheter is sutured in place. The G-tube is connected to gravity drainage or low intermittent suction.

A bumper or disk or G-Tube holder (Velcro®-type) stabilizes the G-tube. It is important to stabilize the Foley catheter to avoid dislodgment or movement in the gastrointestinal (GI) tract. Movement causes the GI tract to enlarge and results in leakage of gastric contents around the tube. Suturing the tube in place prevents inward and outward movement but does not prevent lateral movement. Dry gauze dressings are used over the G-tube. It is not uncommon for the clinician to apply an abdominal binder over the dressings to prevent tube movement and patient tampering. G-tubes are often connected to gravity drainage or low intermittent suction sources.

Tubing should remain free of kinks, debris, or small clots. In tubes or drains that function by dependent or gravity drainage, such as a biliary or gastrostomy tube

## Biliary tubes

A biliary tube or T-tube is a soft, thin, rubber tube that passes through the skin and liver into the bile ducts to facilitate bile drainage. It is used to temporarily drain bile before or after surgical procedures, relieve blockage of the bile ducts, or bypass an opening in the duct. A surgeon or interventional radiologist places the biliary tube. It is connected to dependent drainage.

The biliary drainage tube must be anchored to prevent dislodgment or backflow of bile and secured to prevent kinking. Some practitioners prescribe daily tube flushing to prevent blockage.[7]

## Management

Before managing the postoperative patient, a nurse must know[4]:

- type and purpose of surgical drain
- location of surgical drain
- proper management strategies
- potential problems
- how to troubleshoot complications

In the immediate postoperative period, the nurse should connect the tube or drain to the suction source, if indicated. Suction is set at the prescribed volume, then monitored. Whatever drain is used, the nurse ensures that its system is intact and that the drain is secured carefully to prevent dislodgment. The nurse notifies the physician if a sudden increase in amount or a change in the character of drainage occurs.

A priority for nurses is the accurate measurement and recording of drainage output. This information helps the clinician to determine how long the drain needs to remain in place. When the patient has more than one drain, the nurse labels each by location or number and records output separately. Labeling should be consistent from one caregiver to another to avoid confusion about the volume and character of output. The nurse notes the instillation of irrigation solution separately on the intake form.

Stabilization of the drain prevents dislodgment and the infection or irritation of surrounding skin. A secure tube or drain can function properly; however, securing the tube too tightly can put excess tension on the drain and insertion site. The application of a commercial tube holder (Dale Medical Products) will help prevent the tube from being secured too tightly and keep multiple bulbs organized.

Tubing should remain free of kinks, debris, or small clots. In tubes or drains that function by dependent or gravity drainage, such as a biliary or gastrostomy tube, the collection device should be maintained below the level of the tube. Because the Dale Drainage Bulb Holder can be applied in a variety of positions, the holder can always be positioned below the drainage bulb.

If the tube or drain is not working properly, the nurse should check its patency from the patient's skin to the collection device and verify proper placement. Tubing is checked for kinks, shreds of mucous, or blood clots. The tube is gently milked, away from the patient's body, if any kinks or debris are spotted. The suction source is checked to ensure that it is working with the prescribed amount of suction.

Early mobilization is another important facet of postoperative recovery. The presence of a tube or drain does not affect the patient's ability to walk. The Jackson-Pratt or Hemovac drain reservoir can be secured to clothing by pinning to the plastic tab or using the attached clip. The Salem sump tube can be disconnected from suction and clamped, while the patient is walking. Other types of dependent drainage receptacles can be carried beside the patient.

When drain removal is planned, the patient is informed that momentary pain or discomfort may occur as the tube is pulled out. The patient's need for pain medication is assessed. After the drain is removed, a dry dressing is placed over the site. It can be replaced, as needed. Some drainage from the site commonly occurs until the tract heals. Drains left in place for an extended period may be difficult to remove, if tissue growth has occurred around the drain.

## Skin care

The risk to surrounding skin depends on the type and volume of drainage. The skin around all insertion sites must be kept clean and dry to prevent infection and skin irritation.

Dry gauze dressings are used around and over drains and tubes to protect them from damage or external contamination, absorb small amounts of drainage, and assist with tube stabilization. These dressings are replaced, as needed.

A pouching system is used to contain high-volume output that exceeds the capacity of dressings or to contain leakage around a tube or drain. Pouching helps the nurse to quantify output and protects the patient's skin. Before applying a pouch, it is important to determine the cause of leakage. The WOC(ET) nurse can assist in managing these complex situations.

Appropriate dressing size is determined by the wound size, patient's body habits, and expected volume of drainage. Absorptive dressings, such as those made of calcium alginate, foam, or hydrofiber, are used if drainage exceeds the capacity of standard gauze. These dressings are usually changed as needed, when saturation occurs. If irritation is present or there is high output from a drain, a barrier wipe or cream is applied after the surrounding skin is gently cleansed. The manufacturer's directions guide the application of skin barriers.

## Preventing complications

Preventing complications, such as infection, is an important aspect of caring for the post-operative patient with tubes and drains. The nurse should maintain:

- preventive measures, such as handwashing before and after patient care
- use of aseptic techniques when cleansing and dressing surgical tubes and drains
- appropriate containment and disposal of drainage
- maintaining a closed system, whenever possible
- implementing appropriate precautions against infection, e.g., avoid contact with anyone who has a respiratory, wound or skin infections, including major skin abscess, cellulitis, or pressure ulcers with uncontained drainage
- use of individual disposal containers for each person's drains to avoid cross contamination
- correct procedures for disposal of drains, e.g., the use of chest tube receptacles, active drains, sump drains

## Patient education

Patient and caregiver education is essential when a patient is discharged with a surgical tube or drain. When the patient or caregiver has the ability to manage these devices at home, he or she regains a sense of control over bodily functions.

When instructing the patient or caregiver, clear, concise written and verbal instructions are needed. A return demonstration of the technical aspects of care confirms that both patient and caregiver have understood their lessons. The patient should know the:

- purpose of the tube
- expected output
- drain care and emptying
- how to troubleshoot
- whom to contact

Patients and caregivers are instructed to wash their hands before and after handling the drain or site. They are shown how to measure and record output on a form that can be brought to physician visits. Sometimes, a home-care referral is needed, so the patient can learn how to assess and monitor complications.

## Conclusion

Surgical tubes and drains are often used in patient care. Frequent assessment, meticulous care, and prevention of complications are key to promoting a positive outcome.

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POD three. Diet is advanced to sips of clear liquids and popsicles.

On POD three, the patient is transferred to the floor if the following criteria are met: extubated, hemodynamically stable, afebrile, pain score less than five, and stable fluid status. The case manager is consulted to identify any patient home needs and to check insurance approval for enteral feedings and pump. Tube feedings are initiated, and instructions on G- and J-tube management and wound care begin. The patient is encouraged to be out of bed and walking with assistance.

On POD four, the caregiver performs a return demonstration of the management of G- and J-tubes. The diet is advanced to clear liquids, if tolerated.

On POD five, the G-tube is clamped for three hours on and one hour off. J-tube feedings are increased by 10cc/hr per day, if bowel movements or flatus is present. Instructions begin for insulin administration, if indicated.

On POD six, the G-tube is clamped and released only if the patient experiences nausea/vomiting or abdominal distention. Nebulizer treatments are discontinued. The diet may be advanced to full liquids, if tolerated. J-tube feedings continue. Instructions on the management of the G- and J-tubes and diabetes management are reinforced, as needed.

On POD seven, the diet is advanced to regular, if tolerated, and calorie counts are started and continued for three days. J-tube feedings are decreased, if the patient tolerates a regular diet. The patient should be walking without assistance.

On POD eight, care is focused on preparing for discharge in two days. Instructions are reinforced, as needed. J-tube formula is changed per dietitian. Take-home supplies are ordered.

On POD nine, the calorie count is continued. The G-tube should be clamped. The patient should be out of bed most of day.

On POD 10, instructions for home care are completed. Intravenous access is

Table 1: **Discharge criteria**

- clamped G-tube
- no nausea
- drains are removed
- no fever
- walks without assistance
- enteral feeding (2-4 cans per night)
- clean incision
- no pulmonary complications or infections
- caregiver demonstrates ability to manage G- and J-tubes and diabetes (if necessary)

discontinued. The patient is discharged. Discharge criteria are listed in Table 1.

The patient has a follow-up visit in one week, one month, and then every four months with the surgeon.

## Postoperative complications

Perioperative death after PD is currently >6% at major surgical centers, where surgeons are more experienced with the procedure.[3,,12] Morbidity still remains high, with complications, such as delayed gastric emptying, anastomotic leak, and fistula or abscess formation. Delayed gastric emptying, the number one cause of morbidity, occurs in about 35% of PD patients.[12] Prophylactic use of intravenous erythromycin postoperatively reduced the incidence of delayed gastric emptying by 37%.[12] Anastomic leaks and fistulas are seen in 5% to 15% of patients. Most fistulas close spontaneously with the addition of somatostatin analog treatment. Fistulas heal with conservative measures in 80% of patients.[3]

## Conclusion

Pancreatic cancer continues to be a challenge for patients as well as healthcare professionals. Early diagnosis is rarely seen, so many patients are diagnosed at late stages, when curative surgery is not an option. Pancreaticoduodenectomy is the treatment of choice for those few who have resectable disease. This procedure has become the standard of care, but it is a complex procedure and recovery is difficult. Nursing care must focus on patient education, both to prepare the patient preoperatively and postoperatively. During the postoperative period, the nurse focuses on patient comfort, nutrition, activity, and home-care instructions. It is with good nursing care that the patient is able to return home successfully.

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*Perspectives*, a quarterly newsletter focusing on postoperative recovery strategies, is distributed free-of-charge to health professionals. *Perspectives* is published by Saxe Healthcare Communications and is funded through an education grant from Dale Medical Products Inc. The newsletter's objective is to provide nurses and other health professionals with timely and relevant information on postoperative recovery strategies, focusing on the continuum of care from operating room to recovery room, ward, or home.

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Cross Country University is an accredited provider of continuing education in nursing by the American Nurses Credentialing Commission on accreditation.

After reading this article, the learner should be able to:

1. Describe commonly used drains in the postoperative patient.
2. Discuss management and prevention of complications related to drain use in the postoperative patient

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1. **The first action the nurse would take when caring for the patient with leakage from around a drainage tube is to**
   a. identify the cause of leakage
   b. apply a dressing around the tube
   c. irrigate the tube
   d. apply a skin barrier to the surrounding skin

2. **A commonly used tube for gastric decompression after abdominal surgery is the**
   a. Penrose drain
   b. Jackson-Pratt drain
   c. Salem sump
   d. biliary tube

3. **A patient would receive a gastrostomy tube instead of a nasogastric tube after abdominal surgery if:**
   a. it is the surgeon's preference
   b. the patient chooses
   c. prolonged use is anticipated
   d. there is increased risk of infection

4. **A passive drain would be used by the surgeon when:**
   a. viscous drainage is anticipated
   b. an extended length of time for drainage is anticipated
   c. accurate output is needed
   d. a closed system is indicated

5. **When the collection device is compressed on a Jackson-Pratt drain, this indicates that the drain:**
   a. needs irrigation
   b. is clogged
   c. is ready to be removed
   d. is functioning well

6. **What should the nurse instruct the patient to expect when a surgical drain is removed?**
   a. drainage from the site
   b. pain as the drain is removed
   c. gauze dressing until drainage stops
   d. all of the above

7. **Which drain has a lumen that can be used to infuse an irrigating solution?**
   a. Penrose drain
   b. Sump drain
   c. Jackson-Pratt drain
   d. Salem sump

8. **A patient notices sanguinous drainage in her Hemovac drain one day after surgery. The best response by the nurse is to:**
   a. Notify the surgeon
   b. Irrigate the drain
   c. Explain that this is normal
   d. Empty the drain

9. **A priority nursing action when the nurse assesses postoperative drains is to:**
   a. ensure that the drain is intact
   b. check the patient's vital signs
   c. irrigate all drains
   d. administer pain medication

10. **After checking for placement and function the best action by the nurse to manage large amounts of leakage around a percutaneous drain is to:**
    a. reposition the drain
    b. cleanse the skin with antiseptic
    c. apply antibiotic ointment
    d. place an ostomy pouch

11. **Mr. Smith is 2 days post-op from a total prostatectomy. He asks the nurse why the bulb on his Jackson-Pratt drain is collapsed. The best response by the nurse is to:**
    a. connect the drain to low wall suction
    b. instruct the patient that the negative pressure of the system is working
    c. empty the drain and record the output
    d. tell the patient that the drain should be removed

12. **Ms. Smith is having copious amounts of serous drainage from a sump drain. The best action by the nurse is to:**
    a. irrigate the drain
    b. apply an ostomy pouch
    c. use extra gauze dressings
    d. notify the physician

13. **Jane has a nephrostomy tube. What remark indicates she understands what she has been taught about infection control?**
    a. I need to follow-up with my physician for regular tube changes.
    b. I don't have to worry about bladder infections.
    c. I am glad I can take a tub bath.
    d. I am not going to flush the tube.

14. **What drain would the surgeon most likely use when irrigation solution needs to be infused?**
    a. Penrose drain
    b. Jackson Pratt drain
    c. Sump drain
    d. Levin tube

## Mark your answers with an X in the box next to the correct answer

| | A | B | C | D |
|---|---|---|---|---|
| 1 | ☐ | ☐ | ☐ | ☐ |
| 2 | ☐ | ☐ | ☐ | ☐ |
| 3 | ☐ | ☐ | ☐ | ☐ |
| 4 | ☐ | ☐ | ☐ | ☐ |
| 5 | ☐ | ☐ | ☐ | ☐ |
| 6 | ☐ | ☐ | ☐ | ☐ |
| 7 | ☐ | ☐ | ☐ | ☐ |
| 8 | ☐ | ☐ | ☐ | ☐ |
| 9 | ☐ | ☐ | ☐ | ☐ |
| 10 | ☐ | ☐ | ☐ | ☐ |
| 11 | ☐ | ☐ | ☐ | ☐ |
| 12 | ☐ | ☐ | ☐ | ☐ |
| 13 | ☐ | ☐ | ☐ | ☐ |
| 14 | ☐ | ☐ | ☐ | ☐ |

## Participant's Evaluation

1. What is the highest degree you have earned? 1. Diploma 2. Associate 3. Bachelor's 4. Master's 5. Doctorate

Using 1 =Strongly disagree to 6= Strongly agree rating scale, please circle the number that best reflects the extent of your agreement to each

| | Strongly Disagree | | | | | Strongly Agree |
|---|---|---|---|---|---|---|
| 2. Indicate to what degree you met the objectives for this program: | | | | | | |
| ■ 1. Describe commonly used drains in the post-operative patient. | 1 | 2 | 3 | 4 | 5 | 6 |
| ■ 2 Discuss management and prevention of complications related to drain use in the post-operative patient | 1 | 2 | 3 | 4 | 5 | 6 |

3. Have you participated in a home study in the past? ■ Yes ■ No
4. How many home-study courses do you typically use per year? _____
5. What is your preferred format? ■ video ■ audio-cassette ■ written ■ combination
6. What other areas would you like to cover through home study? _____

For Iowa nurses, you may submit the evaluation to Iowa Board of Nursing.

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