



# The Canadian Association for Enterostomal Therapy

## **Best Practice Recommendations Enterocutaneous Fistulae (ECF)**

April 2009



**The Canadian Association  
for Enterostomal Therapy  
Association Canadienne  
des Stomothérapeutes**

**Best Practice Recommendations for  
Management of  
Enterocutaneous Fistulae  
April, 2009**



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## Disclaimer

These best practice recommendations are related only to nursing practice and are not intended to take into account fiscal efficiencies. They are not binding for nurses and their use should be flexible, respecting the individual client/family wishes and circumstances. They neither constitute a liability nor discharge from liability. The Canadian Association for Enterostomal Therapy does not give any guarantee as to the accuracy of the information contained nor accepts any liability. Any reference to any pharmaceutical or medical product does not imply endorsement.

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Best Practice Recommendations for Management of Enterocutaneous Fistulae  
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## How to Use this Document

These recommendations are a comprehensive resource summarizing the current literature that supports the care of the person with an enterocutaneous fistula (ECF). They are the result of the decision of the Canadian Association for Enterostomal Therapy (CAET) to provide an open source guide to clinicians in the care of the person with ECF. The guiding framework for the work on this document was the following statement:

“A meta-analysis of the current literature leading to a set of management goals that enables the professional nurse to provide care that improves the quality of life of persons living with an enterocutaneous fistula (ECF) in all care settings.”

It is intended as a tool for nurses to assist in decision making and priority setting when developing individualized care plans. It is not intended to be a clinical practice guideline but, like its progenitor the CAWC Best Practice Recommendations for Wound Care, “it is a distillation of existing research, expert opinion and case studies” (WCC Vol. 4(1) 2006 p4) intended to enable clinicians to determine their clinical practice based on the best available evidence.

It is a living document and as such it is expected that having identified the gaps in knowledge and practice, clinicians will begin the research and publications necessary to fill in these gaps. Contributions to this body of knowledge are essential to an evolving improvement in care for patients living with ECF.

The target audience of these recommendations is the Nurse. However other health care professionals, administrators and educators may also employ the information contained in these recommendations to develop policies, procedures, protocols, programs, and assessment and documentation tools.

The CAET is interested in hearing how you have implemented these recommendations. Please contact us to share your story.

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A call for volunteers was made at the WUWHS meeting June 2008. Sixty-three (63) respondents reviewed the document prior to final draft.

Membership and participation in this working group was completely voluntary. No member of this group received financial or in-kind reimbursement, from any source related to this work.

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## Introduction

Evidence-based practice (EBP) supports excellence in the nursing care delivered on a day-to-day basis in all care settings; acute, long-term, chronic care facilities and in community care. A thorough review of the current nursing and medical literature has revealed that there are no published evidence-based guidelines that address the care of a person with an enterocutaneous fistula, herein referred to as ECF or fistula. There are a variety of options to manage the care of a patient with an ECF. These nursing interventions depend upon the wishes of the patient, the type of fistula, the care environment and the values, knowledge and experience of the nurse.

These 10 Best Practice Recommendations are the result of answering the question “What is the best way for the nurse to manage an adult patient living with an enterocutaneous fistula (ECF)”?

## Development Process

A voluntary working group was established in August 2007. The 7 members of the working group are all Enterostomal Therapy Nurses, members of the CAET and have experience caring for patients with ECF. The members of the working group met monthly by teleconference and corresponded by e-mail. A literature search was conducted.

## Search Strategy

Databases: CINAHL, Medline, Pubmed

## Search Terms

Articles were restricted to English and the following search terms were used:

“Fistula and”:

- Nursing Management
- Surgery
- Complications

## Search Results

48 articles were retrieved.



**Prior to reading the articles the working group agreed on the following themes to guide their reading:**

- Determining common definitions
- Etiology
- Prevalence and Incidence
- Patient outcome
- Fistula assessment
- Types of fistulae
- Barriers to care
- “How’s and why’s” of fistula management.

**From this reading of the literature the following goals of fistula management were developed:**

- Assessment
- Pharmaceutical interventions from the point of view of nursing management
- Patient mobility
- Patient comfort
- Patient education
- Skin care/skin protection
- Containment/odour control/ease of application
- Nutrition from the point of view of nursing management
- Psychosocial/spiritual/quality of life
- Operational/system barriers later renamed operational requirements

Each member of the working group focused on one or two goals of fistula management and suggested recommendations for practice. Each recommendation was reviewed by other working group members until the final recommendation was completed with the supporting levels of evidence indicated. Once the recommendations were completed, two of the group members synthesized the document. The final draft was reviewed by all members. The stakeholder review process was conducted over the internet using a survey posted on Survey Monkey. The survey was collated and the changes for each recommendation were completed by sub group authors. The document has been presented at WUWHS June 2008 by two working group members who put out a call for international peer reviewers.



## Definition of Terms

A fistula is a connection between two anatomical structures. Some fistulae are intentional and are constructed surgically as part of a gastrointestinal surgery.

Since these are not connected to the food source they do not expel fecal materials but provide an exit for mucous and debris from the diseased portion of the bowel (Milne p 289). These mucous fistulae are predictable and do not lead to increases in morbidity or mortality. Their management is relatively straight forward: usually with a dressing or pouch. Mucous fistulae will not be addressed in this document.

An ECF (also known as a gastrointestinal fistula) communicates between stomach, small or large bowel and the skin allowing gastrointestinal contents to flow onto the skin. The majority of ECF (75% - 85%) are the result of previous surgeries but it is estimated the 15% - 25% of patients may develop an ECF without having had a surgical procedure. These ECF are the result of a trauma, radiation enteritis, diverticular disease, malignancies, or inflammatory bowel disease.

ECF is the result of a myriad of factors including specific surgical technique and individual patient pre-existing co-morbidities. It is the unintentional, unpredicted and/or accidental result of pathology or injury. It is unexpected by the patient and as such it is always unwanted. The occurrence of ECF presents many challenges to the patient and the nurse, and significant cost to the healthcare system.

## The Recommendations

The published literature reveals that much of the current fistula care has never been researched in terms of efficacy of care or client outcomes. There is little supporting evidence for these strategies and most of the literature was found to be anecdotal ranging between level III and IV evidence; equivalent to case studies and expert opinion. There is no published data concerning how the person living with an ECF would describe the value or effectiveness of these care strategies.

It is recognized that the occurrence of ECF increases a patient's morbidity and mortality. It has been estimated that mortality rates for patients have ranged between 5.5% to as high as 30% (Kaur and Minocha 2000; Li et al. 2003)



The integration of available evidence into system policies is the key to the overall success of all Best Practice Recommendations. Without the support and coordination of the organization responsible for providing care for individuals with fistulae, all efforts risk fragmentation. Operational managers, professional practice advisors and administrators must work to dovetail the organization's missions, vision and values into workable frameworks for service delivery in the care of the person with an ECF.

These Best Practice Recommendations for fistulae care serve as a compilation of information from available published data written by subject matter experts in the assessment, care and education of persons with a fistula. When incorporating available evidence into policy, organizational credibility is strengthened.

The following Best Practice Recommendations should serve as operational goals from which an organization begins to examine existing practices and tools, internal/external/regional constraints and current processes.



## Table 1: Levels of Evidence

The following table outlines the levels of evidence that were used for the analysis of the literature reviewed in the domain of fistula care. They are the levels of evidence employed by the Registered Nurses Association of Ontario (RNAO).

| Interpretation of Evidence: RNAO Levels of Evidence |   |
|---|---|
| Ia  | Evidence obtained from meta-analysis or systematic review of randomized controlled trials   |
| Ib  | Evidence obtained from at least one randomized controlled trial   |
| IIa   | Evidence obtained from at least one well designed controlled study without randomization  |
| IIb   | Evidence obtained from at least one other type of well designed quasi-experimental study without randomization                              |
| III   | Evidence obtained from well designed non-experimental descriptive studies such as comparative studies, correlation studies and case studies |
| IV  | Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities                            |



**Table 2: Quick Reference Guide – Recommendations for Management of Enterocutaneous Fistulae**  
Detailed discussion of recommendations follows.

| No.  | Recommendations:   | Level of Evidence |
|--|--|-------------------|
| <b>Assessment</b>                                  |  |                   |
| 1  | Perform a comprehensive nursing assessment prior to initiation of therapy  | III-IV            |
| 2  | Determine nursing goals in a multidisciplinary environment   | III               |
| <b>Identify and Treat the Cause and Co-factors</b> |  |                   |
| 3  | Prevent malnutrition or replace existing deficiencies, using one or more strategies for nutritional support.           | III-IV            |
| 4  | Acknowledge the import and impact of potential adjunctive pharmaceutical therapies                                     | III-IV            |
| <b>Address Patient-centered Concerns</b>           |  |                   |
| 5  | Support and enhance the emotional well-being and quality of life of the patient.                                       | III-IV            |
| 6  | Provide educational support to the patient   | III-IV            |
| 7  | Ensure patient comfort and mobility  | IV                |
| <b>Provide Organizational Support</b>              |  |                   |
| 8  | Create policies, procedures and related staff education in order to standardize the assessment and management approach | IV                |
| 9  | Create a multidisciplinary team to coordinate Best Practice care   | IV                |
| 10   | Create programs that facilitate and support the return of patients to the community                                    | IV                |



## *Assessment*

### **Recommendation 1: (Level of evidence: III - IV)**

Perform a comprehensive nursing assessment prior to initiation of therapy.

### **Discussion 1**

The care of the patient with an enterocutaneous fistula (ECF) is complex and challenging to health care providers. Successful management is dependent upon a thorough and holistic patient assessment (Burch 2004; Cobb & Knaggs, 2003; Eakin 1991) and a systematic and comprehensive local assessment of the ECF.

Determining nursing goals of treatment and appropriate management of the patient with an ECF is contingent upon accurate acknowledgment of potentially contributing systemic factors and accurate assessment of local factors, including the fistula itself, peri-fistular skin contours and/or peri-fistular wound characteristics (Cobb & Knaggs 2003; Dearlove, 1996).

Other patient variables such as maintaining patient mobility, the impact on quality of life and body image, and the patient's preference for care should be included in the assessment. (Arebi & Forbes, 2004; Eakin, 1991; Kaushel et al, 2004; Renton et al, 2006). The location of care, skill sets of caregivers and access to supplies must also be considered (Burch 2004).

While comprehensive assessment tools for ECF are lacking, a systematic approach to assessments is recommended (Cobb & Knaggs, 2003). As such, the nursing assessment can be broadly characterized into physical and local parameters, community of care and patient dependent factors.

Documentation of the assessment is critical for determining progress or deterioration of the health of the patient. Re-assessment of all factors should be completed and documented regularly, and goals of care re-evaluated in a timely fashion dependent upon the patient's condition.





**Table 3: Assessment Parameter with Rationale**

|                                  | Assessment Parameter   | Rationale  | Supporting Reference   |
|----------------------------------|--|--|--|
| <b>Physical/local assessment</b> | 1. Complexity/location of ECF <ul style="list-style-type: none"> <li>• Intact surrounding skin</li> <li>• Within an open wound</li> <li>• Multiple fistulae, with or without skin bridges between</li> </ul> | -defines containment choices   | Arebi & Forbes (2004); Benbow & Losson (2002); Burch & Buchan (2004); Dearlove (1996); Kaushal & Carlson (2004); Kozell & Martins (2003) |
|                                  | 2. Matured versus non-matured fistula  | -contributes to determination of treatment goals and selection of topical therapy and /or containment choices  |  |
|                                  | 3. Volume and characteristics of drainage (low/high volume, odour, consistency, colour)  | -may help to determine location/level of fistula within GI tract<br>-provides information on management requirements (e.g., straight drainage, devices with/without taps)<br>-helps to determine response to systemic treatments<br>-helps to determine need for referral to other health care professionals | Burch & Buchan (2004); Dearlove (1996); Kozell & Martins (2003)  |
|                                  | 4. Peri-fistular skin/wound contours and condition, including proximity to bony prominences, drains, and muscle tone   | -helps to determine containment devices, wear-time of selected devices, types of products used (e.g., alcohol-based, belts)  | Burch & Buchan (2004); Dearlove (1996)   |
|                                  | 5. Presence/absence and type of mesh   | -determines topical treatment choices  |  |
|                                  | 6. Size of fistula and/or surrounding wound  | -determines topical management choices, including pouching options   |  |



|                               | Assessment Parameter   | Rationale  | Supporting Reference   |
|-------------------------------|--|--|--|
| <b>Community of Care</b>      | 1. Access to supplies/treatment options                      | -may determine treatment options   | Kordasiewicz (2004)  |
|                               | 2. Access to skilled personnel/support of agency             | -may determine location of care and treatment choices  | Kordasiewicz (2004)  |
|                               | 3. Location of care delivery                                 |  | Beitz & Caldwell (1998)  |
|                               | 4. Determining frequency of care                             | -may impact location of care   |  |
| <b>Patient Considerations</b> | 1. Maintaining mobility                                      | -contributes to quality of life<br>-reduction of further morbidity   | Beitz & Caldwell (1998); Burch (2003); Dearlove (1996); Draus et al. (2006); Kordasiewicz (2004)       |
|                               | 2. Ability to participate in management of fistula           | -contributes to independence   | Burch (2003)   |
|                               | 3. Quality of life   | -determines need for counseling/support and the inclusion of health care team members such as Pastoral Care and Social Work<br>-determines patient's or family members' ability or desire to participate in care | Arebi & Forbes (2004); Beitz & Caldwell (1998); Burch (2003); Draus et al. (2006); Kordasiewicz (2004) |
|                               | 4. Comfort with application and removal of management device | -determines ability to participate in care   | Burch (2003)   |

## Recommendation 2: (Level of Evidence III – IV)

Determine nursing goals of care in collaboration with a multidisciplinary healthcare team.

### Discussion 2

The effective determination of nursing goals cannot be done in isolation. Collaboration with other members of the team will ensure a comprehensive and safe approach to care (Lal et al 2006; Evenson & Fischer, 2006; Lloyd et al, 2005; Haffejee, 2004). Each team member will perform their specialty specific assessment and share their findings with team members prior to the initiation of therapy. Information provided by colleagues can include, but is not limited to the parameters delineated in Table 4.

**Table 4: Contributions of Healthcare team members to fistula care**

| Healthcare Team Member      | Information  |
|-----------------------------|--|
| Enterostomal Therapy Nurses | <ul style="list-style-type: none"> <li>• coordination of care between multi-disciplinary team members, along the continuum of care and with patient</li> <li>• determination of nursing goals of treatment, including provision of care-planning &amp; communication as appropriate</li> <li>• assessment of psycho-social needs of patient and family</li> <li>• maintenance of patient comfort and dignity</li> <li>• selection and procurement of appropriate topical management products</li> <li>• evaluation of appropriate wear-times/change times with ongoing evaluation</li> <li>• selection of strategies to maintain skin integrity</li> <li>• selection of odor control strategies</li> <li>• advocacy for utilization of best practices for care and management of patients</li> <li>• Education of attending nursing staff and patient</li> </ul> |
| Nursing                     | <ul style="list-style-type: none"> <li>• coordination of care and follow up with Enterostomal Therapy Nurse</li> <li>• implementation of Enterostomal Therapy Nurse directed interventions for the maintenance of skin integrity, odor control and use of containment devices</li> <li>• appropriate use of selected resources, including care planning tools</li> </ul>   |



| Healthcare Team Member                      | Information  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• assessment of patient pain and administration of analgesics as ordered</li> <li>• assistance with maintaining mobility</li> <li>• provision of emotional support to patient/family</li> </ul>   |
| Patient                                     | <ul style="list-style-type: none"> <li>• communication of needs, concerns and plans with health care team</li> <li>• participation in nutritional plan</li> <li>• participation in exercise and mobility strategies to maintain mobility</li> <li>• participation in self care activities as appropriate.</li> </ul>   |
| Physicians/Surgeons                         | <ul style="list-style-type: none"> <li>• assessment of contributing factors underlying disease process</li> <li>• determination of “healing ability” of fistula</li> <li>• assessment of potential for or presence of distal bowel obstruction</li> <li>• assessment of presence or absence of underlying abscess</li> <li>• determination of disposition of contributing mesh or foreign bodies</li> <li>• determination of supportive nutritional therapy</li> <li>• determination of goals and duration of medical therapy</li> </ul> |
| Pharmacists                                 | <ul style="list-style-type: none"> <li>• assistance with management of fluid and electrolyte balance</li> <li>• assistance with management of nutritional support</li> <li>• advise on use of adjunctive medications to control outputs</li> </ul>   |
| Dietitians                                  | <ul style="list-style-type: none"> <li>• assessment of nutritional deficiencies</li> <li>• calculation of nutritional requirements</li> <li>• advise on feeding route</li> <li>• maximize individualized nutritional support</li> </ul>  |
| Physiotherapist and Occupational Therapists | <ul style="list-style-type: none"> <li>• development of individualized exercise routines aimed at the maintenance of patient mobility</li> <li>• provision of re-activation exercises</li> <li>• development of strategies to prevent de-conditioning</li> </ul>   |
| Social Worker                               | <ul style="list-style-type: none"> <li>• psychosocial support to patient and family</li> <li>• assistance with financial support</li> <li>• assistance with community liaison and discharge planning</li> </ul>  |
| Chaplain                                    | <ul style="list-style-type: none"> <li>• spiritual support to patient and family</li> </ul>  |

***Identify and Treat the Cause and Co-factors***



## **Recommendation 3: (Level of evidence: III - IV)**

Prevent malnutrition or replace existing deficiencies, using one or more strategies for nutritional support, in consultation with the registered dietitian.

### **Discussion 3**

According to Chamberlain et al (1998) in a review of the National Institutes of Health's (NIH) medical records of patients with cancer who developed a fistula (1980 through 1994), malnutrition and sepsis developed in 60% of patients, with hypoalbuminaemia correlating with increased mortality. Over-feeding a patient with an ECF may result in worsening hyperglycemia and hepatic stenosis, as well as increased risk of sepsis (Lloyd, Gabe, & Windsor, 2006). This risk is heightened when parenteral nutrition is over fed.

Attention to adequate hydration and replacement of electrolyte and nutritional losses is mandatory.

The dietitian has a crucial role to play in the initial assessment of the patient's nutritional needs and should be consulted in the care of patients with ECF. Ongoing assessment by the dietitian is essential in order to monitor if the patient is meeting their nutritional requirements as well as guiding food selections to help prevent blockages (Burch & Buchan, 2004; Burch, 2003; Haffejee, 2004; Kaushal & Carlson, 2004).

Nutritional support is essential to the management of patients with enterocutaneous fistulae (ECF), whether the patient is awaiting spontaneous fistula closure or as a preliminary to surgical closure of the fistula (Chaudhry, 2004). One or more of the following strategies is used for nutritional support in the patient with an ECF.

- Consultation with a Registered Dietitian for assessment and ongoing monitoring (*Level of Evidence – IV*)
- A balanced diet to meet healing requirements and co-morbid conditions (e.g. cancer, hyperglycaemia, hepatic stenosis) (*Level of Evidence – IV*)
- Oral nutrition (*Level of Evidence – III - IV*)
- Enteral tube feeding (*Level of Evidence – Ia; III - IV*)
- Parenteral nutrition (*Level of Evidence – III - IV*)
- Fistuloclysis (*Level of Evidence – III - IV*)
- Reinfusion of fistula output (*Level of Evidence – IV*)



- Ongoing monitoring of nutritional intake, laboratory data  
(*Level of Evidence – III – IV*)

Oral intake helps maintain a healthy lining of the gastrointestinal tract. If patients are tolerating fluids and solid food, they should be advised to eat a high calorie, high salt, low fibre and low residue diet (Burch & Buchan, 2004). Conversely, oral intake may be of no nutritional value if the patient has decreased gut absorption (Kaushal & Carlson, 2004). Nightingale (2001) cautions regarding excessive oral fluid intake leading to increased fistula output and Kaushal and Carlson (2004) comment that the evidence is unclear whether allowing unrestricted access to oral diet and fluid in those patients whose fistulae might close spontaneously, would delay or prevent fistula closure. Haffejee (2004) supports the inclusion of supplementary nutrition until the patient is consistently consuming 1500 kcal by mouth.

Resting the bowel by keeping the patient NPO (nothing by mouth) is recommended for at least four to eight weeks (Yamada et al., 2003). In order to allow for normal bowel function and avoid atrophy of the mucosal villi, enteral nutrition is preferred (Pontieri-Lewis, 2005), with fibre free formulas fed as proximally as possible from the fistula to decrease output from distal fistulae (Willicutts, Scarano, & Eddins, 2005). Cycling tube feeding overnight may increase the patient's appetite during the day (Haffejee, 2004). In the critical care literature, the evidence supports enteral nutrition as opposed to parenteral nutrition in the intensive care unit and postoperative settings, with early enteral feedings potentially reducing the risk of anastomotic dehiscence (Lloyd, Gabe, & Windsor, 2006). There is evidence to suggest that enteral nutrition may allow earlier discharge from hospital and avoid increased financial burden associated with home TPN (total parenteral nutrition) (Willicutts, Scarano, & Eddins, 2005).

According to Lal, Teubner, and Shaffer (2006), patients may require a combination of both enteral and parenteral nutrition, dependent upon the degree of intestinal tract dysfunction. In addition, eating small amounts of food or providing trickle feeds of enteral nutrition will maintain the integrity of the lining of the remaining gut in stable patients with fistulae who are receiving TPN (Burch & Buchan, 2004). Patients with inflammatory bowel disease and fistulae requiring short-term TPN have been shown to be successfully managed in the community with acceptable rates of complications and readmissions. This strategy has allowed surgery to be deferred for 3-6 months when surgical conditions are more favourable which may allow for definitive surgery without



the need for a stoma or possibly even eliminate the need for surgical intervention as a result of fistula healing (Evans, Steinhart, Cohen, & McLeod, 2003).

Fistuloclysis is a safe, successful means of providing nutrition, maintaining metabolic status and is a less expensive option for patients with small bowel fistulae and the inability to heal, who otherwise would require TPN (Evenson & Fischer, 2006; Kaushal & Carlson, 2004; Lal, Teubner, & Shaffer, 2006; Teubner et al., 2004).

Reinfusion of proximal fistula output into a more distally placed jejunostomy tube has been employed to prevent loss of electrolytes, trace elements and proteins (Willicutts, Scarano, & Eddins, 2005).

There is support in the literature for monitoring the following parameters in patients with ECF:

- intake (oral, NG or IV) and output (urine, feces, vomit)
- weight
- blood work for albumin, prealbumin, folate, copper, selenium, potassium, sodium and magnesium
- signs of dehydration
- hyperglycaemia with TPN and rebound hypoglycaemia with discontinuation

(Burch, 2004; Burch & Buchan, 2004; Kaushal & Carlson, 2004; Misra & Gramlich, 2004)

## **Recommendation 4: (Level of evidence: III)**

**Acknowledge the importance and impact of potential adjunctive pharmaceutical therapies.**

### **Discussion 4**

Manipulation and control of fistula drainage may require the addition of a single or multiple medications to the management plan. (Evenson & Fischer, 2006; Lloyd et al, 2006). The reduction of intestinal losses can assist in the management of fluid and electrolyte balance, and the maintenance of intact skin (Lloyd et al, 2006). The role of nursing is to work collaboratively with pharmacists and physicians, to understand the implications of the medications prior to administration, and to educate the patient and family on the role of the medications in care.

Medications that may be considered in the management of ECF losses can be categorized into the following broad categories (Draus et al, 2006; Hollington et al, 2004; Lloyd et al, 2006; Nightingale, 2003; Parrish, 2005):

- Anti-secretory agents /reduction of gastric acid
  - protein pump inhibitors; histamine blockers, somatostatin, or octreotide
- Anti-motility agents
  - loperamide, Imodium, codeine
- Pancreatic enzymes
- Sulcrafate
- Bile salt loss agents
  - cholestyramine

The Ideal route, dosing, combination of and timing of medication administration should be considered in collaboration with pharmacists and medical-surgical colleagues (Arebi & Forbes, 2004; Burch & Buchan, 2004). Management of pain should also be included in the overall care plan (Benbow & Lossen, 2002; Kozell & Martins, 2003).

Clear guidelines for preferred medication administration are lacking, as is validated information on the role of medications in achieving closure of non-matured fistulae.





The use of Tumor Necrosis Factor (TNF) blocking therapy for the treatment (and potential resolution) of enterocutaneous fistulas has been described in the literature (Behm and Beckston, 2008) for patients with Crohn's disease. Either reduction of losses or closure of the fistula may occur with maintenance therapy. TNF blocking agents, however, do not necessarily negate the need for future surgery or alternate management. The determination of TNF Blocking agents as a part of the patient's treatment regime is determined by the physician.

## *Address Patient-centered Concerns*

### **Recommendation 5: (Level of evidence: III - IV)**

Support and enhance the emotional well-being and quality of life of the patient.

#### **Discussion 5**

Recommendation 5 is the result of a general consensus in the literature that the presence of an ECF is associated with negative psychological sequelae for the patient. Patient reports of negative feelings associated with this altered state of body image are present in a few case studies (Burch, 2004; Benbow & Losson, 2002; Burch & Buchan, 2004; Burch, 2003; Oneschuk & Bruera, 1997). There is an absence of studies directed to the psychological effects of an ECF and the assessment of interventions.

The psychological consequences of an enterocutaneous fistula are numerous: Initially, fear and anxiety may be felt when the patient is faced with an unexpected complication (Eakin, 1991; Kaushal & Metcalf, 1999; Carlson, 2004) or with bowel fluid leaking out of the body. (Cobbs & Knaggs, 2003; Eakin, 1991; Kaushal & Carlson, 2004; Lloyd et al., 2006). Patient's self-esteem is threatened and there is fear of the loss of love from family and significant others. (Eakin, 1991).

Prolonged hospitalization, financial burdens, separation from loved ones and altered body image can all contribute to feelings of loss of control, frustration, embarrassment, hopelessness and demoralization. (Eakin, 1991; Haffejee, 2004; Kaushal & Carlson, 2004; Kozell & Martins, 2003; Lloyd et al., 2006; Renton et al., 2006). These feelings can be aggravated by management strategies that necessitate a "trial and error" process when there is repeated failure in the containment protocol (Kozell & Martins, 2003). In addition, some patients find that not being allowed to eat is traumatic (Burch, 2004). Unfortunately, patients with cancer who develop enterocutaneous fistulae may not be able to proceed with further curative or palliative adjunctive treatments (Chamberlain et al., 1998). The ensuing isolation, withdrawal and depression may take months to resolve (Kaushal & Carlson, 2004).

The goal of psychosocial interventions is to assist the patient to live as normally as possible (Eakin, 1991), and to increase the patients psychological well-being (Kozell & Martins, 2003). Some feel that attempts to deal with and mitigate the



psychological morbidity associated with enterocutaneous fistulae must be made before proceeding with other treatment (Kaushal & Carlson, 2004). The psychosocial needs of the family unit need to be assessed and addressed as part of the plan of care. Long term hospitalization can result in considerable family stress that in turn can affect patient well-being.

A multidisciplinary approach to the psychological care of the patient is imperative. Many authors promote the involvement of a Clinical Psychologist in the care of the patient with an ECF (Kaushal & Carlson, 2004; Lal et al., 2006), while others highlight the value of team members in Social Work and Chaplaincy.

Assessment of the general psychological state of the patient should be done early in the admission by an attentive Enterostomal Therapy Nurse or general nurse (Arebi & Forbes, 2004). It is important to build rapport with the patient (Kaushal & Carlson, 2004), as well as to set aside time to give the patient an opportunity to express their feelings of fear and anxiety (Cobbs & Knagg, 2003). Active listening and good communication skills are essential (Eakin, 1991; Kaushal & Carlson, 2004) and some feel this may be enough to resolve many problems (Kaushal & Carlson, 2004). Many authors stress the inclusion of professionals adept at in-depth assessment and management of psychological issues on the multidisciplinary team.

The patient's preferences and choices regarding care need to be solicited and incorporated into the plan of care. By encouraging realistic, positive expectations, the Enterostomal Therapy Nurse can best assist the patient to resolve their distressing feelings (Benjamin, 2002). The Enterostomal Therapy Nurse should elicit and reinforce the patient's own coping skills (Eakin, 1991) and enlist the support of family members in maintaining the motivation of the patient over the often prolonged period of healing (Burch, 2003). Self managed care of the fistula by the patient can help the patient to regain a sense of self confidence and control (Burch & Buchan, 2004). Diversional activities can also be of benefit to their psychological well-being (Kozell & Martins, 2003).

A patient's quality of life is enhanced when effluent is contained and odor and pain reduced. (Recommendation 8) Education is an important component of the care plan to decrease the anxiety associated with ECF. (Recommendation 6)

When there is no contraindication, Kaushal and Carlson (2004) promote oral nutrition as a means of raising morale in the patient. Even in the absence of



nutritional benefit, the social and psychological benefits of eating cannot be underestimated (Burch & Buchan, 2004; Forbes, 1997).

Evans et al (2003) studied the quality of life of those Canadian patients suffering from IBD and fistulae who were able to avoid prolonged hospitalization and/or early surgical intervention by returning home on total parenteral nutrition. The psychological benefits for this patient group included reduced stress on the family, increased independence, and the ability to return to normal activities including work and study (Evans, Steinhart et al., 2003).

## **Recommendation 6: (Level of evidence: IV)**

Provide educational support to the patient.

### **Discussion 6**

Educational support to patients with ECF is crucial to the success of their treatment plan and quality of life. Particular to the client with an enterocutaneous fistula are the anecdotal reports of specific anxiety/depression and lack of control associated with this morbidity (Cobb & Knaggs, 2003; Eakin, 1991; Kozell, & Martins, 2003; Metcalf 1999). Information provided to the patient's significant others is essential to decrease anxiety (Cobb & Knaggs, 2003).

The education of the patient and family must go beyond the usual procedural explanations given to patients in the hospital. Given the reported anxiety of patients with ECF, the primary establishment of good communication and a trusting relationship with the staff is essential (Kaushal & Carlson, 2004). Thus, the determination of what the patient desires to learn should stem naturally from active listening.

Education should be individualized to determine the patient's needs based on diagnosis, physical and emotional reaction to disease.

The client can regain a sense of control by participating in their care, gaining independence and by contributing to their care planning (Eakin, 1991; Burch & Buchan, 2004).

The importance of teaching the patient that the management plan will change over time is highlighted in the literature (Kozell & Martins, 2003; Eakin, 1991). In doing this, the nurse assists the patient in gaining realistic expectations (Burch, & Buchan, 2004). Re-education is necessary as the plan changes (Kozell & Martins, 2003).

## **Recommendation 7: (Level of evidence: IV)**

**Ensure patient comfort and mobility by employing a management method that contains the fistula effluent and serves to protect/heal the perifistular skin/wound.**

### **Discussion 7**

Though skin and wound care is only one component of the overall management of patients with a fistula, it plays a significant role in promoting patient comfort and well-being by minimizing pain, preventing trauma to the perifistula skin and facilitating patient mobility.

Effluent from an enterocutaneous fistula contains active gastric juices which are highly corrosive to the surrounding skin and wound bed. A complete assessment of the patient that includes the abdominal contours, skin condition and output will help determine what type of management method is appropriate to prevent skin irritation and heal any skin breakdown that occurred prior to the assessment.

Frequent dressing changes, often the conventional management for low-output fistulae, often prove to be uncomfortable and limiting for patients. Beitz (1998), Burch (2004) and Cobb (2003) concur with this finding, citing that the corrosive enzymatic output of the small bowel causes skin breakdown and increases pain for the patient. Odour is often noticeable when using dressings in managing the output. The patient can become socially isolated as a result.

An appliance, often a type of ostomy pouch, is a containment option that consists of a skin barrier and an odor proof pouch to collect the fistula drainage and protect the surrounding skin. Burch (2004) suggests that appliances are often more useful than dressings to contain the fistula output, to prevent skin breakdown and to manage odour. Generally, appliances are changed 2 to 3 times per week, though some appliances can remain in place for up to a week. When the appliance begins to lift or leak, it is advisable to replace it as soon as the leak is discovered since this impacts future pouch applications and causes unnecessary discomfort for the patient. The appliance should be pliable enough to provide conformity and feel comfortable to the patient (Cobb & Knaggs, 2003). Depending on the complexity of the patient's anatomy (abdominal contours etc.), appliance changes can take time to complete. Though possibly labour-intensive, a well-applied system remains leak-proof and thus ensures patient comfort.



Patients are able to become more mobile and work towards independence when they feel that their appliance is comfortable and secure.

A more recent option in the management of a wound surrounding an ECF is negative pressure wound therapy (NPWT). This system involves placing an open-cell polyurethane foam dressing into the wound cavity and creating an air-tight seal by covering it with a transparent film dressing.

A small opening is made into the system in order to attach an evacuation tube that is attached to a vacuum pump that applies a controlled sub-atmospheric pressure (typically 125 mm Hg below ambient pressure) to the wound.

This system may be considered if the patient with a fistula has a deep, open wound with omentum, fascia or granulation tissue at the base with no visible bowel. Negative pressure wound therapy is not used if there is an obstruction distal to the fistula, if there is an abscess associated with the fistula, or if drainage is too thick and can not be separated from the remainder of the wound. The goal of NPWT depends on whether the fistula being treated is considered acute or chronic. For the acute fistula, the goal is to attempt closure. For the chronic fistula, the fistula is segregated from the surrounding wound. This allows the effluent from the fistula to be diverted into an appliance for containment while the patient's condition is optimized and the wound is allowed to heal sufficiently so that the fistula can be surgically repaired.

Many clinicians find it helpful to follow an algorithm for selecting a fistula containment system – refer to Table 5: Algorithm for Selecting a Fistula Containment System (Kozell & Martins, 2003). Often the decision as to which method or product to use for each patient may initially require a trial-and-error period and a period of close re-evaluation and modifications as the nature of the fistula and/or the wound changes. It is expected that by the time the patient is ready for discharge from hospital, that a simpler system will be employed so that the ECF is manageable by the patient with the support of a visiting nurse.

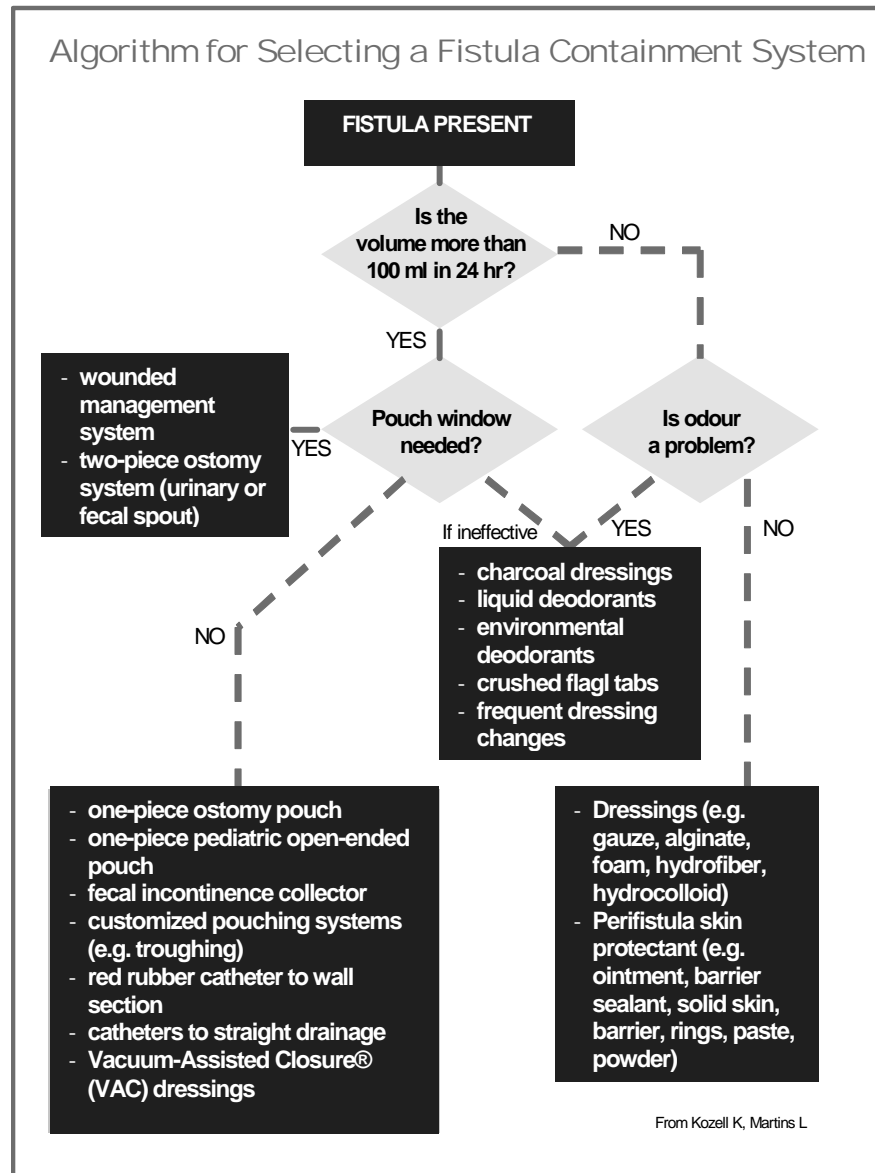
## Table 5: Algorithm for Selecting a Fistula

### Containment System

Source: Kozell K, Martins, L. Managing the challenges of enterocutaneous fistulae. Wound Care Canada. 2003; 1(1): 10-14

Clinical skill and knowledge are helpful in determining the products that are appropriate for a given situation. Product availability and cost may be limiting factors in the selection process.

The ideal containment system provides skin and wound care, odor control and facilitates patient comfort and optimal physical function. It is also important that the system allows for quantification of the fistula output. This is especially true for high output fistulae since the patient is at risk for fluid and electrolyte imbalance. The overall goal is to improve the quality of life for a person who has an enterocutaneous fistula.



Skin protection and containment of fistula effluent can be provided by a variety of products as outlined in Table 6: Fistula products and their indication (Willicuts, K., Scarano, K. & Eddins, C.W.).





**Table 6: Fistula products and their indications**

| Product/Accessory            | Action  | Indications  |
|------------------------------|---|--|
| Skin Barrier Wipes or Sprays | Provides a protective film to the skin.                                     | <b>Low output fistulae</b> – provides protective layer to skin. Use in combination with dressings.<br><b>High output fistulae</b> – use in combination with pouches, suction systems and Negative Pressure Wound Therapy to increase adhesion and protect skin.  |
| Moisture Barrier Creams      | Repels moisture and protects skin   | <b>Low output fistulae</b> – provides protection to skin around fistula. May be used in combination with dressings.<br><b>High output fistulae</b> – not indicated. Does not provide enough protection with high output drainage. Contraindicated with use of any adhesive products (i.e., pouches) as creams will not allow products to adhere to skin. |
| Pectin Barriers              | Provides physical barrier to effluent/ stool                                | <b>Low output fistulae</b> – skin protection against effluent.<br><b>High output fistulae</b> – used to fill in uneven surfaces for pouching or as part of pouching system.  |
| Pouches                      | Contain effluent/ stool and odour from fistula                              | <b>Low output fistulae</b> – where odour is a problem or patient prefers to change pouch as opposed to dressings.<br><b>High output fistulae</b> – to contain stool and odour.   |
| Suction systems              | Contain effluent in combination with low intermittent suction and dressings | <b>Low output fistulae</b> – not indicated<br><b>High output fistulae</b> – where pouching systems are not effective due to large amounts of liquid effluent. Not a long-term solution.  |
| NPWT Therapy                 | Direct pressure closure   | <b>Low output fistulae</b> – not indicated.<br><b>High output fistulae</b> – where closure is a possibility. No abscess can be present. Patient must be NPO on TPN. There can be no evidence of epithelial cells on opening of fistula.  |
| Dressings                    | Absorb drainage   | <b>Low output fistulae</b> – for use in combination with other skin protectants such as skin barrier wipes, barrier creams and pastes and pectin wafers.<br><b>High output fistulae</b> – not indicated.   |

Source: Adapted from Willcuts K, Scarano K, Eddins CW. Ostomies and fistulae: a collaborative approach. Practical Gastroenterology 2005; November: 63-79



Low-output fistulae (less than 100 mls/24 hours) can be managed with gauze dressings while applying protective barrier products such as ointments, sealants and powders to the surrounding skin (Pontieri-Lewis, 2005). Though gauze dressings may need to be changed frequently, the dressing is easy to do and can be assumed by the patient or family. Another option is the use of polyurethane foam, alginate or hydrofiber dressings as these products absorb fistula drainage while keeping the wound bed moist. These dressings can remain in place for up to 7 days.

Bryant (1992) states that a good rule of thumb to follow when dressings are used to contain effluent and require changing more often than every 4 hours is to consider application of a pouch system. Selecting a pouching system to contain the fistula drainage involves assessment of the patient's abdominal contours, fistula location and the volume and consistency of the effluent (Pontieri-Lewis, 2005). An Enterostomal Therapy Nurse (ETN) can significantly contribute to the care of patients with a fistula with diligent effort, creativity, product knowledge and innovation.

A one-piece or two-piece urostomy or drainable ostomy appliance with a hydrocolloid skin barrier may be suitable for a small wound/fistula with an output greater than 100 mls/24 hrs. In cases where a wound is large, a wound manager or collector can be employed. Some systems have windows which allow for wound care between changes of the wound managers. These systems are also available with adaptors that allow them to be attached to gravity or a continuous low suction drainage system to prevent the device from overflowing (Nashide, 2001; Kaushal et al., 2004). Customized systems employing troughing, saddle bagging or bridging techniques can also be constructed for challenging wound situations where one or more fistulae may be draining within a large open wound.

*Troughing:* A technique often employed when a routine pouching system fails because the fistula rests within the depressions of a wound. Strips of solid skin barrier are applied to the edges of the wound and the wound is occluded with a transparent film dressing. A small opening is then made in the transparent film dressing and a drainable ostomy pouch is applied over this opening.

*Saddle Bagging:* A technique employed to pouch over a large wound surface by attaching two open-end drainable pouches along the adhesive surface in order to create a large adhesive surface. A large solid skin barrier is then attached to the combined adhesive surface. This allows the fistula to drain into both pouches.



***Bridging:*** A technique employed to isolate one area of a wound from another part of the wound. Solid skin barrier is cut into small pieces to fill the wound at the selected bridge location and layered into place. A pouching system is then applied over the bridge that now exists in the wound.

Recently, several authors have reported the use of negative pressure wound therapy such as Vacuum Assisted Closure (V.A.C., Kinetic Concepts International, San Antonio, TX) as a treatment option. Nienhuijs et al (2003) reported that negative pressure wound therapy (NPWT) reduces the number of dressing changes to three times per week. Despite having to be attached to a portable pump, this therapy enables the patient to be more mobile. In addition, Cro et al. (2002) found NPWT to be highly effective in promoting healing of excoriated skin, thus promoting comfort. Since NPWT is manageable in the home setting, many patients with an ECF have benefitted from a decreased length of stay in hospital. It is important that care givers read the published guidelines for VAC Therapy published by KCI to ensure legally defensible use of the system.

It has been reported that negative pressure wound therapy may also offer some healing potential. Evanson et al. (2006) cite several studies (Erdmann et al., 2001; Alvarez et al., 2001; Cro et al., 2003) that suggest when an enterocutaneous fistula is large and difficult to dress, NPWT therapy may make skin care easier. Draus et al. (2006) reported that the V.A.C. device was applied to 13 clients with deep, open wounds with omentum, fascia or granulation tissue at the base without visible bowel and with a fistula tract tunneling through the granulation tissue. He observed that the V.A.C. system reduced skin irritation and erythema. In several clients, the V.A.C. device promoted wound contracture and healing. There were no reports of sepsis in these cases and the fistula output did not increase. Nienhuijs et al (2003) reported on a case series of 10 clients with high-output enterocutaneous fistulae that developed skin erosion of the abdominal wound during management with multiple daily dressing changes. The median duration of vacuum therapy was 25 days. Four cases had spontaneous healing of the fistula while five went on to surgical closure. In four cases, the vacuum therapy was carried out on an outpatient basis.

Reports of successful outcome with negative pressure wound therapy for enterocutaneous fistula management remain anecdotal. A review of the literature yielded a consensus that negative pressure wound therapy makes it possible to effectively control the fistula output, reduce the number of dressing changes to three times per week, and prevents an increase in the size of the fistula as well as the inflammation of the surrounding skin. Spontaneous closure of the enterocutaneous fistula occurred in 4 of the 10 patients.

### *Provide Organizational Support*

## **Recommendation 8: (Level of evidence: IV)**

**Create policies, procedures and related staff education in order to standardize the assessment and management approach.**

### **Discussion 8**

Literature sources refer to the frequency of inexperienced caregivers caring for patients with ECF and the resultant setbacks to patient progress when erroneous choices are made in the care of those with fistulae (Rolstad & Wong, 1993; Cobb & Knaggs, 2003, Beitz & Caldwell, 1998). To mitigate this, it is suggested that a carefully followed comprehensive assessment form provides evidence of a thorough evaluation for those patients/clients who suffer with fistulae (Cobb & Knaggs, 2003; Lal, Teubner & Shaffer, 2006). The standardization of assessment and management approaches and the inclusion of a care pathway increase administrative confidence in consistent, evidence-based care. This in turn is important to corporate risk management.

The adoption of documentation to support evidence-based practice must be accompanied by staff education. The transfer of theory to practice is accomplished with competency-orientated learning objectives focused on the assessment and care of a client with an ECF.

Enterostomal Therapy Nurses have formal, competency-based education on the assessment and management of all aspects of care for patients with ECF. The Enterostomal Therapy Nurse can be instrumental in the development of care pathways, documentation, policy and procedures as well as in the delivery of staff education.

Two authors suggest that nurses should instigate interventions to manage fistula as soon as symptoms develop and should not wait until a medical diagnosis has been made (Phillips & Walton, 1992). The rationale is inferred that earlier interventions to prevent sepsis, skin breakdown, and malnutrition would prevent a worsening condition. Administrators who support early care delivery should empower their employees with adequate policy.



## **Recommendation 9: (Level of evidence: IV)**

**Create a multidisciplinary team to coordinate best practice care.**

### **Discussion 9**

The concept of a multidisciplinary team to meet the assessment and care requirements of those patients/clients with fistulae seems to be universal within literature sources on fistula care. The name assigned to these teams is variable: nutritional support team (Haffagee, 2004), intestinal failure team (Hollington, Mawdsley et al., 2004) and simply, a multidisciplinary team (Lal et al., 2006). However, there is consensus in the literature on the professionals required to meet the complex care needs of those patients/clients with fistulae.

The composition of the teams includes: enterostomal therapy nurses, dietitians, pharmacists, general and advanced practice nurses, social workers, surgeons and physicians (Hollington, Mawdsley et al., 2004; Haffagee, 2004; Lal, et al., 2006). Some centers also include biochemists, microbiologists, pain specialists, psychologists and radiologists (Lal et al., 2006) as well as physiotherapists and occupational therapists (Oneschuk & Bruera, 1997). Depending on the nature of the fistula, urologists, gynecologists and plastic surgeons may also be required on the team (Lal et al., 2006).

## **Recommendation 10: (Level of evidence: IV)**

Create programs that facilitate and support the return of patients to the community.

### **Discussion 10**

Literature from the United Kingdom recognizes the need for community support in order for patients to return to the community pending definitive surgical correction or while awaiting spontaneous closure of the fistula (Burch & Buchan, 2004; Hollington, Mawdsley et al., 2004; Makhdoom et al., 2000). Given that elective surgical procedures are not recommended before 4 to 6 months (Arebi & Forbes, 2004), the transfer of patient care to community settings could represent considerable institutional savings as well as significant increase in normalcy for the patients.

However, this transfer of care should never be done without due diligence to ensure proper community care, 24 hour a day support and education of all involved family members and professional caregivers.

Patients slated for discharge to community in the UK undergo a structured education programme on the care of their central venous catheter line and total parental nutrition. Additionally, patients on home parental nutrition have access to a support line on a 24 hours basis, in hospital access to a nutrition nurse specialist and community nutrition clinics (Burch & Buchan, 2004).

In Canada, a study by Evans et al. (2003) demonstrated that an outpatient total parenteral nutrition program was a viable option to early surgical intervention of a group of patients with Inflammatory Bowel Disease and fistulae.

Before the patient is discharged to the community it is critical that community staff have the skills and expertise, together with all necessary equipment, to deal with appliance changes in the patient's home (Cobbs & Knaggs, 2003). Both skin care and appliance management should be included in the community education plan for the patient and family. The relative small number of ECF patients in the community renders the maintenance of nursing skills and expertise in assessment, care and education of community patients with ECF unrealistic. This supports the inclusion of an Enterostomal Therapy Nurse in the community.



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23. Kozell, K., & Martins, L. (2003). Managing the challenges of enterocutaneous fistulae. *Wound Care Canada*, 1(1), 10-14.
24. Lal, S., Teubner, A., & Shaffer, J. L. (2006). Review article: intestinal failure. *Aliment Pharmacol Ther*, 24, 19-31.





25. Li, J., Ren, J., Zhu, W., Yin, L., & Han, J. (2003). Management of enterocutaneous fistulae: 30-year clinical experience. *Chinese Medical Journal*, 116(2), 171-175.
26. Lloyd, D, A. J., Gabe, S. M., & Windsor, A. C. J. (2006). Nutrition and management of enterocutaneous fistula. *British Journal of Surgery*, 93, 1045-1055.
27. Lynch, A. C., Delaney, C. P., Senagore, A. J., Connor, J. T. et al. (2004). Clinical outcome and factors predictive of recurrence after enterocutaneous fistula surgery. *Annals of Surgery*, 240(5), 825-831.
28. Makhdoom, Z. A., Komar, M. J., & Still, C. D. (2000). The small intestine, nutrition and malabsorption. *J Clin Gastroenterol*, 31(3), 195-204.
29. McDoniel, K. et al. (2007). Use of clonidine to decrease intestinal fluid losses in patients with high output short-bowel syndrome. *Journal of Parenteral and Enteral Nutrition*, 28(4), 265-269.
30. Metcalf, C. (1999). Enterocutaneous fistulae. *Journal of Wound Care*, 8(3), 141-142.
31. Misra, T., & Gramlich, L. (2004). Gastrointestinal fistulas: nutritional considerations. *Clinical Nutrition Rounds*, 4(7).
32. Nienhuijs, S. W., Manupassa, R., Strobbe, L. J., & Rosman, C. (2003). Can topical negative pressure be used to control complex enterocutaneous fistulae? *Journal of Wound Care*, 12(9), p. 343-5.
33. Nightingale, J. M. D. (2003). The medical management of intestinal failure: methods to reduce the severity. *Proceedings of the Nutritional Society*, 62, 703-710.
34. Nishide, K. (1997). Development of closed-suction pouch drainage for giant fistulae: a report on two cases. *WCET Journal*, 17(1), 16-19.
35. Oneschuk, D., & Bruera, E. (1997). Successful management of multiple enterocutaneous fistulae in a patient with metastatic colon cancer. *Journal of Pain and Symptom Management*, 14(2), 121-124.,
36. Parrish, C. (2005). The Clinician's Guide to Short Bowel Syndrome. *Practical Gastroenterology, Series 31*, 67-106.
37. Pontieri-Lewis, V. (2005). Management of gastrointestinal fistulae: a case study. *MEDSURG Nursing*, 14(1), 68-72.



38. Renton, S., Robertson, I., & Speirs, M. (2006). Alternative management of complex wounds and fistulae. *British Journal of Nursing*, 15(16), 851-3.
39. Rolstad, B. S., & Bryant, R. A. (2000). Management of drain sites and fistulae. In *Acute & Chronic Wounds*. St. Louis, CV Mosby. 317-341.
40. Schaffner, A., Hocevar, B.J., & Erwin-Toth, P. (1994). Case: small-bowel fistulae complicating midline surgical wounds. *J WOCN*, 21, 161-165.
41. Teubner, A., Morrison, K., Ravishankar, H. R., Anderson, I. D., Scott, N. A., & Carlson, G. L. (2004). Fistuloclysis can successfully replace parental feeding in the nutritional support of patients with enterocutaneous fistula. *British Journal of Surgery*, 91, 625-631.
42. Thomas, Hess C. (1999). Assessing an external fistula: Part 1. *Nursing* 99, January, 14, 14-15.
43. Thomas, Hess C. (1999). Managing a fistula. *Nursing* 99, March, 18.
44. Thomas, Hess C. (2002). Managing an external fistula, part 1. *Nursing* 2002, 32(8), 22.
45. Thomas, Hess C. (2002). Managing an external fistula, part 2. *Nursing* 2002, 32(9), 22-24.
46. Willicutts, K., Scarano, K., & Eddins, C. W. (2005). Ostomies and fistulae: a collaborative approach. *Practical Gastroenterology*, November, 63-79.
47. Willy, C., & Bergenthal, G. (editors) (2006). The Theory and Practice of Vacuum Therapy - Scientific Basis, Indications for Use, Case Reports, Practical Advice. Part B, Chapter 20.
48. Wiltshire, B. L. (1996). Challenging enterocutaneous fistula: a case presentation. *J WOCN*, 23(6), 297-301.
49. Yamada, T., Alpers, D.H., Laine, L., Owyang, C., & Powell, D.W. (2003). Intra-abdominal abscesses and fistula. *Textbook of Gastroenterology*, 4<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins.



## Appendix A: A Partial Annotated Bibliography

### Comfort & Containment

1. Beitz, J. M., Caldwell, D. (1998). Abdominal wound with enterocutaneous fistula: a case study. *J WOCN*, 25, 102-106.
  - Patient comfort one of the challenges of nursing staff and WOC specialist. (p106).
  - Burch, J., Buchan, D. (2004). Support and guidance for failure and enterocutaneous fistula care. *Gastrointestinal Nursing*, 2(7), 25-32.
  - The most common stoma problem for patients is sore skin (Benjamin 2002). Soreness is usually secondary to a high faecal output, either rectally or via stoma/fistula touching the skin. (p. 26)
  - Pain is reduced by shaving the peri-fistular area where the appliance adheres to the skin. (p.26).
  - Burch, J. (2003). The nursing care of a patient with enterocutaneous faecal fistulae. *British Journal of Nursing*, 12(12), 736-740.
  - “When cleaning the fistula, warm tap water is required as cold water is not very comfortable to use (Flanagan, 1998)” p. 738
  
2. Cobb, A., & Knaggs, E. (2003). The nursing management of enterocutaneous fistulae: a challenge for all. *Wound Care September*: S32-S38.
  - “Nursing interventions to manage the fistula effectively need to begin as soon as the patient presents with symptoms of a fistula and should not be left until a medical diagnosis has been made (Phillips and Walton, 1992)” p. s35
  - “The appliance needs to feel comfortable and pliable for the patient.” P.s37
  
3. Cro, C., George, K. J., Donnelly, J., Irwin, S. T., & Gardiner, K. R. (2002). Vacuum assisted closure system in the management of enterocutaneous fistulae. *Postgrad Med, J.*, 78(920), p. 364-5.
  - Case studies of three individuals with enterocutaneous fistulae who suffered skin breakdown with conventional fistula management and who were treated with negative pressure therapy are presented.
  - The authors concluded that the negative pressure therapy system can contain fistula drainage, can improve the perifistular skin, and may promote fistula healing.



- 4. Dearlove, J. L. (1996). Skin care management of gastrointestinal fistulae. *Surgical Clinics of North America*, 76(5), 1095-1109.**
  - Dressings can cause wetness, odour, burning pain and discomfort as well as the additional discomfort from frequent dressing changes. P. 1095
  - “Dressings should be secured with Montgomery straps or tubular netting to eliminate the chance of epidermal stripping from removal of adhesives from the skin.” p. 1100
  - In the case of where definitive resolution of the problem is prolonged, skin care management and patient comfort may be the primary focus. P. 1109
  
- 5. Kozell, K., & Martins, L. (2003). Managing the challenges of enterocutaneous fistulae. *Wound Care Canada*, 1(1), 10-14.**
  - Failure to achieve adequate containment can result in a cascade of events that compromise patient comfort and condition. P. 13
  - Long-term pain issues must be addressed and colleagues in both acute and palliative care can provide expert guidance in this area. P.13
  - Odor assessment scoring tool available in article. P.12
  
- 6. Li, J., Ren, J., Zhu, W., Yin, L., & Han, J. (2003). Management of enterocutaneous fistulae: 30-year clinical experience. *Chinese Medical Journal*, 116(2), 171-175.**
  - The authors described the basis for improved therapeutic outcomes of 1168 patients with enterocutaneous fistulae including spontaneous versus surgical closure, improved control of sepsis, application of nutritional support, and enhanced patient monitoring of electrolyte imbalances, malnutrition, sepsis, and multiple-organ dysfunction. The need for ongoing study to further improve the overall rates of spontaneous closure and mortality, as well as prolonged treatment duration, is identified. Treatment strategies for fistulae of special etiology, such as Crohn’s disease or irradiation injury, require further research.
  
- 7. Lloyd, D. A. J., Gabe, S. M., & Windsor, A. C. J. (2006). Nutrition and management of enterocutaneous fistula. *British Journal of Surgery* 93, 1045-1055.**
  - The enzyme content of fistula effluent leading to skin breakdown... is painful and distressing to the patient P.1047



- 8.** Nightingale, J. M D. (2003). The medical management of intestinal failure: methods to reduce the severity. *Proceedings of the Nutritional Society*, 62, 703-710.
  - The patient with a high-output stoma is likely to feel thirsty. P.705
  
- 9.** Oneschuk, D., & Bruera, E. (1997). Successful management of multiple enterocutaneous fistulae in a patient with metastatic colon cancer. *Journal of Pain and Symptom Management*, 14(2), 121-124.
  - “a cream containing silver sulfadiazide was applied, and this alleviated the burning of the abdominal skin.” p. 122
  - The pain and itching caused by the contact of effluent with the patient’s unprotected skin was severe and contributed to the patient’s distress. P.123
  
- 10.** Pontieri-Lewis, V. (2005). Management of gastrointestinal fistulae: a case study. *MEDSURG Nursing*, 14(1), 68-72.
  
- 11.** Renton, S., Robertson, I., & Speirs, M. (2006). Alternative management of complex wounds and fistulae. *British Journal of Nursing*, 15(16), 851-3.
  - Some dressing changes may take hours.... This may be a painful experience for the pt, not only physically but psychologically. P. 852
  
- 12.** Thomas, Hess C. Assessing an external fistula. *Nursing99*; January: 14
  - The pouch is more comfortable for the patient ... than gauze dressings. P14
  
- 13.** Thomas Hess C. (1999). Managing a fistula. *Nursing99*; March:18
  - The goals of the care plan should include keeping the pt comfortable. P.18
  - Through case study analysis, provides and overview for the assessment of fistulas, including location, body contours and skin condition, characteristics of drainage
  - Emphasizes the determination of goals of treatment
  
- 14.** Nienhuijs, S. W., Manupassa, R., Strobbe, L. J., & Rosman, C. (2003).
  - Can topical negative pressure be used to control complex enterocutaneous fistulae? *Journal of Wound Care*, 12(9), p. 343-5.



- Summarizes a retrospective non-controlled study of topical negative pressure wound therapy on ten patients with ECF.
- Treatment was only initiated when conventional dressings did not sufficiently protect the perifistular skin, and was used to control effluent, and was continued with success for four patients in the outpatient setting.s
- All patients showed improvement in their perifistular skin, and drainage was adequately controlled.
- Four patients had spontaneous closure of their fistulae.
- No patients suffered any adverse effects with the negative pressure therapy.

**15.** Willy, C., & Bergenthal, G. (editors) (2006). *The Theory and Practice of Vacuum Therapy – Scientific Basis, Indications for Use, Case Reports, Practical Advice.* Part B, Chapter 20.

- A summary of 8 peer-reviewed publications (level 4 and 5 evidence, 2000 – 2006, n = 26 patients) is provided, focusing on the use of negative pressure wound therapy in managing high-output enterocutaneous fistulae. Although the role of this therapy in the treatment of these fistulae types remains controversial, this review clearly showed that vacuum therapy was found to enhance patient comfort, save costs when provided on an outpatient basis, and promote healing without further surgery, when these fistulae failed to respond to conventional treatment.

**16.** Rolstad, B. S., & Bryant, R. A. (2000). Management of drain sites and fistulae. In *Acute & Chronic Wounds*, St. Louis, CV Mosby. 317-341.

- The authors, both certified wound, ostomy and continence nurses (COWCN), present a comprehensive summary of fistula management in a textbook chapter. The goals for the medical management of fistulae, including fluid and electrolyte replacement, perifistular skin protection, infection control, nutrition and measures to enhance closure, are reviewed. The authors discuss how to apply the principles of wound care and ostomy management in caring for a patient with a fistula and provide charts and algorithms that are instrumental for decision-making. Techniques for perifistular skin care and containment of effluent are well illustrated.



## Mobility

- 17.** Benbow, M., & Losson, G. (2002). Fistula management following an appendectomy: nursing challenges. *Journal of Wound Care* Feb: 11(2), 59-61.
- Pain and weakness can lead to difficulties in repositioning and increase risk of pressure ulcer development: employ preventative strategies such as specialized mattresses. (p60)
- 18.** Burch, J. (2004). Priorities in nursing management of fistulae in a community setting. *Wound Care*, June: S6-S14.
- Ensure the fistula pouch is empty prior to moving and encourage the patient to check for leakage or potential leakage sites before getting out of bed. (p. s14)
- 19.** Cobb, A., & Knaggs, E. (2003). The nursing management of enterocutaneous fistulae: a challenge for all. *Wound Care*, September: S32-S38.
- Mobility may be restricted by wound drainage pouching systems that are otherwise acceptable to the patient for managing effluent, odor and skin protection. P. s35
  - The appliance used should effectively collect effluent and not restrict mobility. P. s37
- 20.** Dearlove, J.L. (1996). Skin care management of gastrointestinal fistulae. *Surgical Clinics of North America*, 76(5), 1095-1109.
- Mobility (mobile or bed-bound) must be considered when assessing methods of skin care to be used for the patient with a GI fistula or multiple GI fistulae. P. 1096
  - It may be difficult to maintain a closed system with suction or drain sumps in an ambulatory patient. P. 1100
- 21.** Eakin, M. (1991). Fistulae: a nursing challenge. *Dimensions in Oncology Nursing*, 5(3), 26-31.
- The ideal appliance should allow the patient freedom of movement.
  - Although suction catheters are sometimes necessary, their use limits the patient's ability to ambulate.



- 22.** Kaushal, M., & Carlson, G. L. (2004). Management of enterocutaneous fistulae. *Clinics in Colon and Rectal Surgery*, 17(2), 79-87.
- Inability to control fistula drainage impairs mobility and rehabilitation. P. 83
- 23.** Nishide, K. (1997). Development of closed-suction pouch drainage for giant fistulae: a report on two cases. *WCET Journal*, 17(1): 16-19.
- Closed-suction wound drainage with the catheter fixed to the trunk restricts patient movement. P.16
- 24.** Oneschuk, D., & Bruera, E. (1997). Successful management of multiple enterocutaneous fistulae in a patient with metastatic colon cancer. *Journal of Pain and Symptom Management*, 14(2), 121-124.
- [In a case study] early on in her treatment course [for ECF], the patient had become largely bedridden and thus developed severe muscle atrophy and a sacral pressure ulcer. P.122
  - [In a case study] the remaining midline fistula could be covered with an ostomy bag, permitting the patient the ability to begin ambulation.
- 25.** Pontieri-Lewis, V. (2005). Management of gastrointestinal fistulae: a case study. *MEDSURG Nursing*, 14(1), 68-72.
- [In a case study], the success of a pouching system allowed Mr. X to ambulate. P.72
- 26.** Schaffner, A., Hocevar, B. J., & Erwin-Toth, P. (1994). Case: Small-bowel fistulae complicating midline surgical wounds. *J WOCN*, 21, 161-165.
- [In a case study], if the fistula had been located more distally or the patient had been ambulatory, suction probably would not have been used. P.161
- 27.** Thomas, Hess C. (1999). Managing a fistula. *Nursing99*, March, 18.
- The goals of the care plan should include keeping the pt mobile. P.18
- 28.** Wiltshire, B. L. (1996). Challenging enterocutaneous fistula: a case presentation. *J WOCN*, 23(6), 297-301.
- Attaching the patient's pouching system to a leg bag allowed greater activity and mobility. P.300
  - Goal was to keep SN active for as long as possible with a pouching system that provides comfort etc.... p. 300





## Nutrition

- 29.** Arebi, N., & Forbes, A. (2004). High Output Fistula. *Clinics in Colon and Rectal Surgery*, 17(2), 89-98.
- Early recognition of the complicating factors associated with short bowel syndrome is crucial to a good outcome. These complicating factors include problems with fluid balance and reduced absorptive capacity. (p91)
  - The physiological impact on the patient is investigated with strict charting of fluid intake and losses in urine and stool from each fistula, stoma and wound.
  - “Electrolyte losses are replaced whenever possible by oral electrolyte therapy” (p93)
  - “The typical patient is encouraged to limit ordinary (hypotonic, sodium-free) fluid intake severely-perhaps to no more than 0.5 L in 24 hours. This is balanced by the addition of electrolyte or oral rehydration solution.”
  - “Each litre of solution should contain 90 mmol of sodium and 111 mmol of glucose, as in the World Health Organization solution”
  - “Ideally it should replace in equal volume the fluid collected from fistulae and stomas, it is unrealistic to expect patients to manage more than 1.5 to 2.0 L in 24 hours. Where greater volumes are required, parenteral support is needed”(p93)
- 30.** Burch, J. (2004). Priorities in nursing management of fistulae in a community setting. *Wound Care*, June: S6-S14.
- Careful monitoring of these patients to identify if any intervention is required [for malnutrition]. Ps8
  - “in the hospital setting monitoring may include input (oral, nasogastric or intravenous) and output (urine, faeces, vomit)”Ps8
  - “Weight is often a good indicator of the balance between the intake and the output, with a weight reduction possibly indicating dehydration.” Ps8
  - “Bloods and general observations are also essential (Davidson, 2004)”: daily basis in the hospital.
  - “once the patient is discharged they are not always required to monitor their fistula output, but monitoring bloods needs to be continued in the community setting, as there is a risk of potassium, sodium or magnesium depletion (Collett, 2002).” Ps8



- “The line used for the parental nutrition should not be used for anything else”
- “care must be taken to keep the line [used for the parental nutrition] away from the fistula to reduce the risk of infection” (ps12)
- “the oral intake may not be of nutritional value because of reduced absorption” (ps12)
- “The majority of fistula appliances have small outlet apertures and food particles can become caught in the opening, therefore Education on an appropriate diet is essential.”(p. s12)
- “the patient can be given advice on foods that should pass more slowly through the digestive tract, including low-fibre and low-residue foods.” (p. s12)
- “it is essential to chew the food thoroughly, to reduce food boluses into small pieces” (p. s12)
- “foods with a high fat content tend to pass more quickly through the digestive tract”
- “Separating meals and fluids is used to reduce the output as fluids travel faster than solids (Small, 2003).” (p. s12)

**31.**Burch, J., & Buchan, D. (2004). Support and guidance for failure and enterocutaneous fistula care. *Gastrointestinal Nursing*, 2(7), 25-32.

- Eating should be encouraged in stable patients with a fistula and are receiving parenteral nutrition. Eating helps maintain a healthy lining of the remaining gut. (p.27)
- “it is important for the patient to receive dietary advice that may help reduce fluid losses and help prevent blockages in stoma appliances.” (p. 27)
- “Once fluids and a soft diet are tolerated, patients should generally be advised to eat a high calorie, high salt, low fibre and low residue diet.” (p. 27)
- “an oral fluid restriction of 1 litre of free/hypotonic fluid such as water, tea, and oral supplements, and 1 litre of electrolyte solution over a 24 hour period may be implemented (Small, 2003).” (p. 27)
- “the electrolyte solution should have a minimum sodium concentration of 90mmol/l to maximize sodium and fluid absorption in the shortened small intestine. This electrolyte solution is stronger than most commercially available rehydration preparations.” (p. 27)



- Hyperglycaemia is a risk with parenteral feeding: blood glucose monitoring should be carried out on initiation and discontinued after 24 hours if normal. P.28
- It is advisable to perform daily urinalysis for glucosuria: measuring urine volume and the sodium content is helpful in the diagnosis of dehydration. P. 28
- Rebound hypoglycaemia occurring on discontinuation of parenteral feed can be avoided by decreasing the rate of the infusion towards the end of the feed. P. 28
- To prevent and detect electrolyte imbalance and dehydration, blood chemistry should be monitored daily until considered stable while on parenteral feeds. It can then be decreased to twice a week. P.29
- Teach client to avoid fizzy and/or artificially sweetened drinks as both stimulate peristalsis of the gut, which in turn, increases output. P.30
- Transit time may be further slowed by advising the patient not to drink for 30-60 minutes prior to eating and up to an hour after eating (Small, 2003). (p. 28)
- “Without basic measurements, such as an accurate fluid balance chart (Moore, 2003), daily weight and vital signs, it is impossible to determine whether the patient is benefiting from the parenteral nutrition, or whether the therapy is having a detrimental effect. The nurse has a vital role to play in monitoring and in the prevention and detection of potential complications.” (p. 28)
- “Weight should be monitored daily and at the same time each day to help determine fluid volume overload or deficit.
- “A weight gain or loss of more than 0.5 to 1kg in 24 hours indicates fluid gain/loss respectively (Tait, 2000).” p. 28
- Use the same scales and ensure that the patient’s fistula/stoma appliances are empty to enhance the accuracy of the weight measurement. P. 28

**32. Burch, J. (2003). The nursing care of a patient with enterocutaneous faecal fistulae. British Journal of Nursing, 12(12), 736-740.**

- Advise on foods that should pass more slowly through the digestive tract. P737
- Excessive oral intake can increase output (Nightingale, 2001). P. 737
- “Some indigestible foods cause blockage(s) in the fistula appliance.” P. 737



- 33.** Chamberlain, R. S., Kaufman, H. L., & Danforth, D. N. (1998). Enterocutaneous fistula in cancer patients: etiology, management, outcome, and impact on further treatment. *The American Surgeon*, 64, 1204-1211.
- “Patients with cancer are more likely to be malnourished, hypermetabolic, and immunocompromised from previous forms of therapy and their underlying disease, thus resulting in lower rates of fistula resolution and higher rates of morbidity and mortality.”p.1211
- 34.** Eakin, M. (1991). Fistulae: a nursing challenge. *Dimensions in Oncology Nursing*, 5(3), 26-31.
- The elemental diet must be given through a feeding tube distal to the fistula site. P.28
- 35.** Evenson, A. R., & Fischer, J. E. (2006). Current management of enterocutaneous fistula. *Journal of Gastrointestinal Surgery*,10(3), 455-464.
- In cases of proximal fistulae, feeding may be infused into the fistula if there is sufficient distal small bowel length (approximately 4 feet) and no distal occlusion. P. 459
  - “Vitamins and trace minerals are often deficient in malnourished patients with enterocutaneous fistulae.”p.459
  - “we often provide twice the recommended daily allowance of vitamins and trace minerals, and up to 10 times the recommended daily allowance for vitamin C and zinc.” p. 459
  - “For long-standing small bowel fistulae, supplemental copper, folic acid, and vitamin B12 may be necessary.” p. 459
  - Enteral tube feedings should be decreased in the days preceding operation to allow luminal antibiotic preparation. P. 462
  - The provision of supplementary nutrition is advised until the patient is able to consistently consume 1500 kcal by mouth. P. 463
  - Passage through the traditional steps of dietary advancement (clear fluids, full fluids etc), is unlikely to be tolerated by these patients. Instead, starting a soft diet approximately 1 wk post-op and inviting family members to bring in the patient’s favorite foods may increase the patient’s desire to eat. P.463
  - Cycling the tube feeding overnight may increase the patient’s appetite during the day.



- The provision of zinc supplements with 220 mg per day may improve or restore the patient's sense of taste and increase food intake. P. 463
- 36.** Haffejee, A. A. (2004). Surgical management of high output enterocutaneous fistulae: a 24 year experience. *Current Opinion in Clinical Nutrition and Metabolic Care*, 7, 309-316.
- Tight glycaemic control has been shown to be a valuable therapeutic manoeuvre to reduce dramatically both post-op morbidity and mortality. p. 309
  - Trace minerals such as copper and zinc should be supplemented. P.309
  - A minimum intake of 1500 calories is necessary before parenteral feeding can be discontinued. P.309
  - "it appears to be safe to commence enteral feeds in the absence of bowel sounds." p. 311
  - "our results also suggest that residual volumes do not correlate with the development of enteral feeding-related complications." p. 311
  - Nutritional support is central to the management of patients with high-output ECF. P.309
  - More recent studies have reported that factors such as antibiotic use and the serum albumin level are more important than feed tonicity in causing tube-feeding diarrhea in critically ill patients. P. 311
  - "Enteral nutrition was not given via nasogastric or nasoduodenal tubes at night for fear of aspiration." P. 311
  - "A protocol-driven feeding technique is essential to prevent unnecessary stoppages and decrease enteral feeding-related complications."p.311
  - "Trace element deficiency (zinc) was documented in 14 pts during the study period" p. 314.
  - "Approximately 50% of patients require home parenteral nutrition after their inpatient episode." [in the UK]. P. 315.
- 37.** Hollington, P., Mawdsley, J., Lim, W., Gabe, S. M , Forbes, A., & Windsor, A. J. (2004). An 11-year experience of enterocutaneous fistula. *British Journal of Surgery*, 91, 1646-1651.
- Limit the intake of low-sodium fluids to 500 mls per day plus 1000 mls of electrolyte solution. P. 1647
  - Drinking large volumes with food was discouraged. P. 1647



- 38.** Kaushal, M., & Carlson, G. L. (2004). Management of enterocutaneous fistulae. *Clinics in Colon and Rectal Surgery*, 17(2), 79-87
- Signs of dehydration and altered skin turgor should be carefully looked for. P.80
  - Intravenous replacement of magnesium is frequently required. P.80
  - “It is unclear whether allowing patients whose fistulae might close spontaneously unrestricted access to oral diet and fluid would in fact delay or prevent fistula closure.” p.84
  - In patients with small bowel fistulae and [the inability to heal], Fistuloclysis (the infusion of feed directly through the fistula into the small intestine distal to the fistula opening) is an option for nutritional support. P.85
  - Fistuloclysis is safer and less expensive than parenteral nutrition and prevents atrophy of the small intestine distal to an ECF. P.85
- 39.** Lal, S., Teubner, A., & Shaffer, J. L. (2006). Review article: intestinal failure. *Aliment Pharmacol Ther*, 24, 19-31.
- The term “intestinal failure” was originally defined by Fleming and Remington as ‘a reduction in the functioning gut mass below the minimal amount necessary for adequate digestion and absorption of food’p.20
  - Impaired intestinal function and increased metabolic demand in the septic patient leads to progressive weight loss.
  - Weight and BMI provide simple and objective measures, but caution is advised in pts with precarious fluid balance: rapid fluctuations are likely to reflect changes in hydration, rather than lean body mass. P.24
  - Enteral nutrition is certainly the modality of choice in patients with a functional gastro-intestinal tract. P.25
  - Fistuloclysis has proven a successful means of providing nutrition. P.25
  - Patients may require a varied combination of both enteral and PN according to the degree of dysfunction of their intestinal tract. P.25
- 40.** Lloyd, D. A. J., Gabe, S. M., & Windsor, A. C. J. (2006). Nutrition and management of enterocutaneous fistula. *British Journal of Surgery*, 93, 1045-1055.
- No study has specifically investigated metabolic derangement from ECF. P.1050
  - Insulin resistance with critical illness. P.1050



- It is important to understand that overfeeding [the patient with ECF] may be deleterious: because of the relative insulin resistance, overfeeding may result in worsening hyperglycemia, hypertriglyceridaemia and hepatic stenosis. P.1050
  - It has been suggested that the increased sepsis ... is due to overfeeding. P. 1050
  - There is a large body of evidence in the critical care literature that suggests enteral nutrition is superior to parenteral nutrition in ICU and post-op setting. P.1051
  - Early enteral feeding after elective GI surgery has been shown to be superior to 'nil by mouth' regimens with regard to lower complication rates and reduced hospital stay: Meta-analysis suggested that early enteral feeding might reduce the risk of anastomotic dehiscence. P.1051
- 41.** Makhdoom, Z. A., Komar, M. J., & Still, C. D. (2000). The small intestine, nutrition and malabsorption. *J Clin Gastroenterol*, 31(3), 195-204.
- These patients should receive 2 times the recommended daily allowance for vitamins and trace minerals, 5-10 times the RDA of vitamin c and zinc and selenium supplementation. P.202
  - When patients have lost 20% or more of their usual body weight due to severe malnutrition, TPN should be initiated gradually to avoid a re-feeding syndrome, especially in patients with uncorrected electrolyte deficits. P.202
- 42.** Misra, T., & Gramlich, L. (2004). Gastrointestinal fistulas: nutritional considerations. *Clinical Nutrition Rounds*, 4(7).
- The authors review the clinical importance, diagnosis, and general management of gastrointestinal fistulas, with a specific emphasis on the role of nutritional therapy.
- 43.** Nightingale, J. M. D. (2003). The medical management of intestinal failure: methods to reduce the severity. *Proceedings of the Nutritional Society*, 62, 703-710.
- The patient with a high-output stoma is likely to feel thirsty. P.705
  - The jejunum does not absorb bile salts or vitamin B12. P.706
  - The administration of hypotonic fluid is detrimental, as it increases Na losses (refs) P.706
  - Calcium oxalate renal stones occur in 25% of pts with a retained colon (ref). p.708



- The formation of calcium oxalate stones is prevented by advice about a low-oxalate diet (avoid rhubarb, spinach, beetroot, peanuts and excessive amounts of tea), reducing or avoiding excess fat, taking oral CA supplement. P. 70

**44.** Parrish, C. (2005). The Clinician's Guide to Short Bowel Syndrome. Practical Gastroenterology, Series 31, 67-106.

- Summary of the challenges faced in meeting fluid and electrolyte balance in patients with short bowel syndrome. It offers pathways to help the clinician minimize the use of I.V. and TPN therapy while optimizing the quality of life for patients through proper nutritional assessment, and adequate pharmaceutical and nutritional therapy with the goal of maximizing gut absorption.

## Pressure

**45.** Pontieri-Lewis, V. (2005). Management of gastrointestinal fistulae: a case study. MEDSURG Nursing, 14(1), 68-72.

- Bowel rest by keeping the patient NPO is recommended for at least 4-8 weeks (ref). P.69

**46.** Teubner, A., Morrison, K., Ravishankar, H. R., Anderson, I. D., Scott, N. A., & Carlson, G. L. (2004). Fistuloclysis can successfully replace parental feeding in the nutritional support of patients with enterocutaneous fistula. British Journal of Surgery, 91, 625-631.

- "All patients were fed by continuous infusion (Fistuloclysis), for 12-16 h overnight, but were encouraged to eat a low-residue diet during the day." P. 627
- To minimize output from the proximal limb of small bowel fistulae, oral fluid intake was restricted to a maximum of 1500 ml/day. P.627
- The findings of the present study suggest that Fistuloclysis can satisfactorily maintain nutritional and metabolic status in a group of patients who would otherwise have required TPN. P.629

**47.** Willicutts, K., Scarano, K., & Eddins, C. W. (2005). Ostomies and fistulae: a collaborative approach. Practical Gastroenterology, November, 63-79.

- When possible, enteral nutrition is preferable: it may allow the patient to be discharged from hospital sooner and avoid the financial obligations associated with home parenteral nutrition. P.72





- To minimize fistula output in patients with distal fistulae, a fiber free formula and/or diet should be used and the patient be fed as proximately as possible from the fistula. P.74
- If the fistula is proximal to the site where feedings enter the bowel, a fiber-containing formula can be given.
- Reinfusion of proximal fistula output into a more distally placed jejunostomy tube has been employed to prevent loss of electrolytes, trace elements and protein. (refs). P.74
- Patients with high output fistulae who are not on parenteral nutrition may require extra vitamin and mineral supplementation.p.74

**48.** Wiltshire, B. L. (1996). Challenging enterocutaneous fistula: a case presentation. *J WOCN*, 23(6), 297-301.

- Weight gain can necessitate alterations to the pouching procedure. P.300

**49.** Chaudhry, C. R. (2004). The challenge of enterocutaneous fistulae. *MJAFI*, 60(3), 235-238

- The author summarizes a review of 17 cases over a six year period where an enterocutaneous fistula occurred from surgical complications. Various management modalities such as the use of octreotide, antibiotics and total parenteral nutrition, introduced to stabilize the patient, are discussed. The author concludes that, rather than following a conservative line of management for expectant spontaneous closure, staged surgery will result in a higher fistula closure rate.

## Operational-Systems Barriers

**50.** Beitz, J. M, & Caldwell, D. (1998). Abdominal wound with enterocutaneous fistula: a case study. *J WOCN*, 25, 102-106.

- Caregiver, unfamiliar with the technique [alternative wound drainage method], had introduced ABD-style dressings into the system, thereby defeating its efficacy. (p.103)

**51.** Burch, J., & Buchan, D. (2004). Support and guidance for failure and enterocutaneous fistula care. *Gastrointestinal Nursing*, 2(7), 25-32.



- Each hospital/clinical area should have a clear protocol for suspected central venous catheter infections to guide nurses caring for patients on parenteral feed. P.28
  - A structured training programme is used to teach patients how to manage a central venous catheter and home parenteral feeds safely. P30 (also in: Hollington, P., Mawdsley, J., Lim, W., Gabe, S. M., Forbes, A., & Windsor, A. J. (2004). An 11-year experience of enterocutaneous fistula. *British Journal of Surgery*, 91,1646-1651)
  - In UK, patients on home parenteral nutrition have access to a 24 hour support line via home care, in hospital access to a nutrition nurse specialist, and community nutrition clinics. P.30 ( also in: Hollington P, Mawdsley J, Lim W, Gabe SM, Forbes A, Windsor AJ. (2004). An 11-year experience of enterocutaneous fistula. *British Journal of Surgery*, 91, 1646-1651.)
- 52.** Cobb, A., & Knaggs, E. (2003). The nursing management of enterocutaneous fistulae: a challenge for all. *Wound Care*, September: S32-S38.
- “Use of a formal assessment tool is recommended to provide evidence of comprehensive patient assessment at each stage.” P. s34
  - “Recognize that inexperienced caregivers frequently provide care for the patient.” (Rolstad and Wong, 1993). P.s35
  - To expect the nursing staff to change a leaking appliance without prior involvement is unacceptable.
  - It is particularly important that community staff have the skills and expertise, together with all necessary equipment, to deal with appliance changes in the patient’s home. P.s35
  - Use of a care plan is recommended to standardize management and facilitate good practice. P.s35
  - “Nursing interventions to manage the fistula effectively need to begin as soon as the patient presents with symptoms of a fistula and should not be left until a medical diagnosis has been made (Phillips and Walton, 1992)” p. s35
- 53.** Evenson, A. R., & Fischer, J. E. (2006). Current management of enterocutaneous fistula. *Journal of Gastrointestinal Surgery*, 10(3), 455-464.
- “A skilled enterostomal therapist can significantly contribute to the care of patients with ECF”. P. 460



- 54.** Haffejee, A. A. (2004). Surgical management of high output enterocutaneous fistulae: a 24 year experience. *Current Opinion in Clinical Nutrition and Metabolic Care*, 7, 309-316.
- The evidence that the presence of a nutrition team improves clinical outcome among patients on intravenous feeding has been supported by a number of studies. P. 310 (references 12-27 in article).
  - A complete nutritional support team consists of: clinicians, nurses, dietitians, pharmacists, a microbiologist, a physiotherapist, and a stomatherapist.
  - “A protocol-driven feeding technique is essential to prevent unnecessary stoppages and decrease enteral feeding-related complications.” p.311
  - “Approximately 50% of patients require home parenteral nutrition after their inpatient episode.” [in the UK]. P. 315.
- 55.** Hollington, P., Mawdsley, J., Lim, W., Gabe, S. M., Forbes, A., & Windsor, A. J. (2004). An 11-year experience of enterocutaneous fistula. *British Journal of Surgery*, 91, 1646-1651.
- Patients managed by a combined intestinal failure team, comprising medical, surgical and specialist nursing staff, dieticians, pharmacists and social workers. P.1647
  - “The authors believe that the multidisciplinary care provided for these patients is of great importance” p.1650
- 56.** Kaushal, M., & Carlson, G. L. (2004). Management of enterocutaneous fistulae. *Clinics in Colon and Rectal Surgery*, 17(2), 79-87.
- The specialist nurse and/or enterostomal therapist has an extremely important role to play in the management of the skin around fistula sites. P.83
  - “Using dedicated nursing staff and strict adherence to aseptic protocols, specialist centers have achieved remarkably low (zero) rates of inpatient line-related sepsis and shown that these can even be extended to patients managing their own parenteral nutrition at home.” p.84
- 57.** Kordasiewicz, L. M. (2004). Abdominal wound with a fistula and large amount of drainage status after incarcerated hernia repair. *J WOCN*, 31(3), 150-153.



- The expertise of the CWOCN and the interdisciplinary approach with a nurse practitioner and plastic surgeon provided options to achieve goals and quality care.
- 58.** Kozell, K., & Martins, L. (2003). Managing the challenges of enterocutaneous fistulae. *Wound Care Canada*, 1(1), 10-14.
- Medical and nursing care demand a complementary, interdisciplinary approach if successful closure of an ECF is to be achieved. P.14
- 59.** Lal, S., Teubner, A., & Shaffer, J. L. (2006). Review article: intestinal failure. *Aliment Pharmacol Ther*, 24, 19-31.
- Type 2 intestinal failures ... require multidisciplinary intervention... to permit recovery. P.20
  - The multifaceted etiology of Type 2 intestinal failure calls for a structured approach to its management. P.21
  - A therapeutic strategy that can be adopted, termed the “Sepsis-Nutrition-Anatomy- Plan” or “SNAP” serves as a useful guide to managing type 2 intestinal failure. See p. 22
  - A multidisciplinary team comprising dietitians, pharmacists, biochemists, enterostomal therapists, nurses, microbiologists, radiologists, pain specialists, surgeons and physicians should combine to provide appropriate input into the patient’s care from the onset of intestinal failures. P.26
  - Depending on the nature of the pts disease, involvement of urologists, gynecologists and/or plastic surgeons may be necessary. P.26
  - Perhaps the optimum management strategy is to avoid its occurrence wherever possible: e.g. Making an early diagnosis of potentially ischemic intestine or by adopting a careful surgical approach aiming to prevent adhesions and avoid technical errors .... P.29
- 60.** Lloyd, D. A. J., Gabe, S. M., & Windsor, A. C. J. (2006). Nutrition and management of enterocutaneous fistula. *British Journal of Surgery*, 93, 1045-1055.
- There is no universally accepted classification scheme for ECF. P.1046
  - In the hands of an experienced practitioner [skin care] results can be dramatic. P.1047



- 61.** Lynch, A. C., Delaney, C.P., Senagore, A. J., Connor, J. T., et al. (2004). Clinical outcome and factors predictive of recurrence after enterocutaneous fistula surgery. *Annals of Surgery*, 240(5), 825-831.
- The setting of an institution with access to multispecialty care resulted in an acceptable level of success with ECF closure with a very low mortality and morbidity. P.831
- 62.** Oneschuk, D., & Bruera, E. (1997). Successful management of multiple enterocutaneous fistulae in a patient with metastatic colon cancer. *Journal of Pain and Symptom Management*, 14(2), 121-124.
- The potential extent and complexity of problems associated with fistula development supports the use of a multidisciplinary team in addressing physical rehabilitation, maintaining family cooperation and pt-family relations. P.124
- 63.** Pontieri-Lewis, V. (2005). Management of gastrointestinal fistulae: a case study. *MEDSURG Nursing*, 14(1), 68-72.
- Treating patients with a GI fistula requires a comprehensive team approach. P.68
  - If possible, it is crucial that the professional nurse work collaboratively with the WOCN to develop a plan of care to contain the fistula effluent etc. p.69
- 64.** Renton, S., Robertson, I., & Speirs, M. (2006). Alternative management of complex wounds and fistulae. *British Journal of Nursing*, 15(16), 851-3.
- Often a collaborative approach by specialist nursing teams can lead to a more comprehensive assessment of the patients needs and several viable treatment options, p.851
  - Clinician's time is perhaps the greatest resource compromised when managing complex wounds and fistulae.
- 65.** Teubner, A., Morrison, K., Ravishankar, H. R., Anderson, I. D., Scott, N. A., & Carlson, G. L. (2004). Fistuloclysis can successfully replace parental feeding in the nutritional support of patients with enterocutaneous fistula. *British Journal of Surgery*, 91, 625-631.
- ... It may not be possible to train the elderly and those with impaired vision and dexterity to administer home parenteral nutrition, necessitating prolonged hospital admission. P.625



- The training period for Fistuloclysis was significantly shorter than that required for home parenteral nutrition; Fistuloclysis may therefore reduce the length of hospital stay for selected patients. P.630

**66.** Willicutts, K., Scarano, K., & Eddins, C. W. (2005). Ostomies and fistulae: a collaborative approach. *Practical Gastroenterology*, November: 63-79.

- Suctioning systems are not long-term management solutions as they require... a caregiver who is not only capable of understanding and maintaining the equipment, but also dedicated to the time required for managing the system. P.78
- The nutritional therapy and skin care management of patients with ostomies and fistulae is best accomplished using a multi-disciplinary approach that includes a clinical nutritionist and a WOC nurse. P.79

## Nursing Pharmaceutical interventions

**67.** Arebi, N., & Forbes, A. (2004). High output fistula. *Clinics in Colon and Rectal Surgery*, 17(2), 89-98.

- “Reduction in gastrointestinal tract fluid secretion is an integral part of fistula treatment” (p90): (ref: Feldman, M., & Goldschmiedt, M. (1991). Gastric HCO<sub>3</sub> secretion: relationship with Na<sup>+</sup> secretion and effect of acetazolamide in humans. *Am J Physiol*, 261(2Pt1), g320-g326.)
- “Loperamide and codeine phosphate help to slow intestinal transit and may reduce fistula output by this mechanism”(p93)
- “Gastric volume secretion is minimized by gastric acid inhibition with proton pump inhibitors, which also has a small effect in reducing electrolyte loss” (ref: 24 in article)
- “Both lansoprazole and omeprazole significantly decrease basal and pentagstrin-induced acid secretion with a dose-dependant response”(ref: 25, 26 in article) (p.93)

**68.** Benbow, M., & Losson, G. (2002). Fistula management following an appendectomy: nursing challenges. *Journal of Wound Care*, Feb; 11(2), 59-61.

- Assess and reassess pain levels. (p61)

**69.** Burch, J. (2004). Priorities in nursing management of fistulae in a community setting. *Wound Care*, June: S6-S14.

- “Anti-diarrhoeal agents such as loperamide can be used to further reduce the output, if required and are most effective if taken 30



minutes prior to meals (Nightingale, 2001). (p. s12) {Also referenced in: Burch J., & Buchan, D. (2004). Support and guidance for failure and enterocutaneous fistula care. *Gastrointestinal Nursing*, 2(7), 25-32 and Burch, J. (2003). The nursing care of a patient with enterocutaneous faecal fistulae. *British Journal of Nursing*, 12(12), 736-740}.

- The unpleasant taste of electrolyte rehydration solution can be made more tolerable by making the drink cold, and/or adding a small amount of cordial. (p. s12) {Also referred to in: Burch, J. (2003). The nursing care of a patient with enterocutaneous faecal fistulae. *British Journal of Nursing*, 12(12), 736-740.}

**70.** Burch, J., & Buchan, D. (2004). Support and guidance for failure and enterocutaneous fistula care. *Gastrointestinal Nursing*, 2(7), 25-32.

- “The timing of anti-diarrhoea medication is crucial and drugs such as loperamide, codeine phosphate and omeprazole should be taken 30-60 minutes prior to the meal.” (p. 27)

**71.** Draus, J. M., Huss, S. A., Harty, N.J., Cheadle, W. G., & Larson, G. M. (2006). Enterocutaneous fistula: are treatments improving? *Surgery*, October, 570-578.

- “When patients had a favorable response to octreotide, this effect was apparent within 3 days, as has been reported by others.” p.573
- “It is our recommendation that, once patients have been stabilized, a trial of octreotide is worthwhile. If there is a significant reduction in fistula output within 3 days, octreotide should be continued.” p. 573

**72.** Evenson, A. R., & Fischer, J. E. (2006). Current management of enterocutaneous fistula. *Journal of Gastrointestinal Surgery*, 10(3), 455-464.

- “The presence of an enterocutaneous fistula without evidence of sepsis (high fever, rigors, and hypotension) or a localized infection (cellulitis, pneumonia, etc.) does not warrant antibiotic therapy.” p.458
- “Indiscriminate use of prophylactic antibiotics in patients with enterocutaneous fistulae will lead to the emergence of highly resistant bacteria”. P.458
- “Special consideration should be given to the treatment of fungal infections in patients with enterocutaneous fistulae.” p. 458
- Acid suppression may aid in the prevention of gastritis and stress ulceration [with the use of H<sub>2</sub>-receptor antagonists or proton-pump inhibitors), whereas decreasing fistula output will allow easier control of electrolyte and acid-base imbalances. P.459
- Sulcrafate can be use to decrease gastric acidity: also decrease fistula output.



- 73.** Hollington, P., Mawdsley, J., Lim, W., Gabe, S. M., Forbes, A., & Windsor, A. J. (2004). An 11-year experience of enterocutaneous fistula. *British Journal of Surgery*, 91, 1646-1651.
- High doses of antimotility drugs were given. P. 1647
  - Octreotide was given on a trial basis over 3 days, but was discontinued if there was no reduction in output.
- 74.** Kaushal, M., & Carlson, G. L. (2004). Management of enterocutaneous fistulae. *Clinics in Colon and Rectal Surgery* 17(2), 79-87.
- Repeated estimation of fistula pH may allow estimation of effectiveness of gastric acid secretion suppression: the fistula output should be neutral or even alkaline with effective treatment. P.80
  - Additional consideration should be given to antifungal chemotherapy. P.81
  - Kozell, K., Martins, L. (2003). Managing the challenges of enterocutaneous fistulae. *Wound Care Canada*, 1(1), 10-14.
  - Long-term pain issues must be addressed and colleagues in both acute and palliative care can provide expert guidance in this area. P.13
- 75.** Lal, S., Teubner, A., & Shaffer, J. L. (2006). Review article: intestinal failure. *Aliment Pharmacol Ther*, 24, 19-31.
- Tight glycaemic control with insulin infusion improves post-operative outcome. P.22
  - Somatostatin is believed to induce intestinal atrophy. P.1051
- 76.** Makhdoom, Z. A., Komar, M. J., & Still, C. D. (2000). The small intestine, nutrition and malabsorption. *J Clin Gastroenterol*, 31(3), 195-204.
- It was noted that insulin and octreotide are compatible with each other when given simultaneously. P.201
- 77.** McDoniel, K. et al. (2007). Use of Clonidine to decrease intestinal fluid losses in patients with high output short-bowel syndrome. *Journal of Parenteral and Enteral Nutrition*, 28(4), 265-269.
- Two case reports demonstrating that Clonidine can effectively reduce intestinal fluid and electrolyte losses. The authors suggest that this alpha2-adrenergic receptor agonist should be considered as an additional treatment option in patients with short bowel syndrome and high intestinal outputs.
- 78.** Nightingale, J. M. D. (2003). The medical management of intestinal failure: methods to reduce the severity. *Proceedings of the Nutritional Society*, 62, 703-710.
- Drug therapies to reduce output need to be given in the daytime before food. P.706





- Anti-diarrhoeal drugs may be given 0-5 hours before food to slow GI transit and allow more time for absorption.
  - Loperamide 2-8 mg is used in preference to codeine phosphate, as it is not sedating, is not addictive and does not impair pancreatic function (ref). P.706
  - Occasionally it is beneficial to add codeine phosphate to loperamide treatment. P.706
  - Anti-secretory drugs are generally only effective if the stoma output exceeds the oral intake. P.706
  - Most patients with a jejunostomy are in precarious Mg balance mainly as a result of Na depletion. P.707
  - Vitamin K problems are unusual. P.707
- 79.** Oneschuk, D., & Bruera, E. (1997). Successful management of multiple enterocutaneous fistulae in a patient with metastatic colon cancer. *Journal of Pain and Symptom Management*, 14(2), 121-124.
- “a cream containing silver sulfadiazide was applied, and this alleviated the burning of the abdominal skin.” p. 122
- 80.** Pontieri-Lewis V. Management of gastrointestinal fistulae: a case study. *MEDSURG Nursing* 2005; 14(1): 68-72
- 81.** Parrish, C. (2005). *The Clinician’s Guide to Short Bowel Syndrome. Practical Gastroenterology, Series 31, 67-106.*
- Summary of the challenges faced in meeting fluid and electrolyte balance in patients with short bowel syndrome. It offers pathways to help the clinician minimize the use of I.V. and TPN therapy while optimizing the quality of life for patients through proper nutritional assessment, and adequate pharmaceutical and nutritional therapy with the goal of maximizing gut absorption.
- 82.** Renton, S., Robertson, I., & Speirs, M. (2006). Alternative management of complex wounds and fistulae. *British Journal of Nursing*, 15(16), 851-3.
- The clinician must ensure appropriate pain relief is prescribed [for dressing changes]. P.852
- 83.** Willicutts, K., Scarano, K., & Eddins, C. W. (2005). Ostomies and fistulae: a collaborative approach. *Practical Gastroenterology*, November, 63-79.
- Use of these [octreotide, Somatostatin] medications in patients with fistulae is controversial due to a lack of studies showing improved closure rates. P.78
  - These drugs should be discontinued in 48 hours if there is no reduction in fistula output or if the fistula does not close within 2-3 weeks of initiating treatment (ref) p.78



- Lomotil (diphenoxylate) is habit-forming if taken in doses that are larger than prescribed. To help prevent possible abuse, atropine has been added. P.79

## Psychosocial-Spiritual-Quality of Life

**84.** Arebi, N., & Forbes, A. (2004). High output fistula. *Clinics in Colon and Rectal Surgery*, 17(2), 89-98.

- “Attentive and systematic nursing also permits the assessment of the psychological state of the patient...” (p92)
- Benbow, M., & Losson, G. (2002). Fistula management following an appendectomy: nursing challenges. *Journal of Wound Care*, Feb; 11(2), 59-61.
- Conservative approach involves good patient support and preparation for surgery at a later date. (p59)
- Two of four key issues in patient management (conservative approach) are: removal of odour and application of an effective appropriate device: 2) Good communication between patient, caregivers and staff. (p.59)
- Client at risk of depression related to pain and fistula: enlist support of family and appropriate pain relieving modalities. (p61).

**85.** Burch, J. (2004). Priorities in nursing management of fistulae in a community setting. *Wound Care*, June, S6-S14.

- “Even if the patient receives parenteral nutrition, they are often allowed oral intake too. This may be of no nutritional value because of the reduced absorption, but may help to maintain a better quality of life.” (ps12)

**86.** Burch, J., & Buchan, D. (2004). Support and guidance for failure and enterocutaneous fistula care. *Gastrointestinal Nursing*, 2(7), 25-32.

- Eating should be encouraged in stable patients with a fistula and are receiving parenteral nutrition. Eating is a social activity that is linked to psychological well being (Forbes 1997). (p.27)
- Being attached to an intravenous infusion for up to 14 hours overnight [at home] may restrict usual daily activities and requires good psychological support to prepare the patient for some lifestyle adjustments that may need to be made. P.30
- Nursing staff can assist clients by promoting positive but realistic expectations which can help them achieve psychological wellbeing (Benjamin 2002). P30
- Independent care of fistula and stoma can decrease the worry, pain, odour and embarrassment of leaking appliances as wear-time is lengthened. P 31



- Regular contact with the stoma care nurse helps the patient restore confidence and self esteem and return to independence (Porrett and Joels 1996) p.32
- 87.** Burch, J. (2003). The nursing care of a patient with enterocutaneous faecal fistulae. *British Journal of Nursing*, 12(12), 736-740.
- “The patient found not eating traumatic, and although eating was of little nutritional value, it was important to him.” P.737
  - “Forbes (1997) suggests that it is important to maximize the gastrointestinal function, which, supplemented with fluids and nutrients if required, provides the patient with the best quality of life” P.737
  - Once healing occurs, scarring can be severe and extensive. P. 740
  - “It is important to ensure the patient is kept motivated, as the healing time for a fistula can be extensive and further surgery may be required in many situations.”p.740
- 88.** Chamberlain, R. S., Kaufman, H. L., & Danforth, D. N. (1998). Enterocutaneous fistula in cancer patients: etiology, management, outcome, and impact on further treatment. *The American Surgeon*, 64, 1204-1211.
- “...the development of enterocutaneous fistula in a cancer patient may limit the ability of that patient to precede with additional adjuvant curative or palliative therapeutic modalities of care.” p.1204 and p.1210
- 89.** Cobb, A., & Knaggs, E. (2003). The nursing management of enterocutaneous fistulae: a challenge for all. *Wound Care*, September: S32-S38.
- Use of a care plan is recommended to standardize management and facilitate good practice. P.s35
  - “Education and ongoing support to the patient and their relatives is essential to decrease anxiety.” p. s37
  - “The development of a fistula is frightening, with added mental trauma of bowel fluid leaking uncontrollably from the abdomen.” P. s37
  - “Patients may experience depression as the treatment process is often over a very long period of time and often includes a number of re-admissions to hospital if changes in the general condition occur.” P. s37
  - “Patients need time and opportunity to express their fears and anxieties.” p. s37
- 90.** Dearlove, J. L. (1996). Skin care management of gastrointestinal fistulae. *Surgical Clinics of North America*, 76(5), 1095-1109.
- The decision of which method or product to use for each patient with one or several GI cutaneous fistulae may initially require a trial-and-



error period and a period of close re-evaluation and modifications.  
P.1100

**91.** Eakin, M. (1991). Fistulae: a nursing challenge. *Dimensions in Oncology Nursing*, 5(3), 26-31.

- “the patient with a fistula often suffers from an extended hospitalization, pain, risk of sepsis, malnutrition, and emotional distress.” p. 26
- The selection of appropriate appliance is often a case of “trial and error”. P. 30
- “Teach the patient that the management plan will change as healing occurs.” p. 30
- Long hospitalization results in separation from family and loved ones as well as increased financial burdens.
- Usually the fistula is an unexpected complication and the patient has had no time to be psychologically prepared.
- Self-esteem is threatened when stool is draining from the abdomen.
- Fear and anxiety, related to alteration of body function, is experienced by many patients with ECF
- The nurse needs to assess these problems or needs to plan techniques that will assist the patient’s own coping skills.
- The nurse should listen to patients when they express their concerns and should use appropriate interventions.
- Fear of the loss of love from significant others is another reaction.
- Encourage family members to participate in the care and encourage discussion on how family members can support the patient with ECF.
- Loss of control is another feeling expressed by patients with an ECF: allowing the patient to participate in planning and implementing care will give him or her some control.
- The goal of psychosocial interventions is to assist the patient to live as normally as possible in his or her home environment.

**92.** Evenson, A. R, & Fischer, J. E. (2006). Current management of enterocutaneous fistula. *Journal of Gastrointestinal Surgery*, 10(3), 455-464.

- “A skilled enterostomal therapist can significantly contribute to the care of patients with ECF”. P. 460

**93.** Haffejee, A. A. (2004). Surgical management of high output enterocutaneous fistulae: a 24 year experience. *Current Opinion in Clinical Nutrition and Metabolic Care*, 7, 309-316.

- These acutely ill patients need arduous daily care, and their slow progress can result in demoralization of both patients and staff: this



leads to difficulty of communication between professionals and patients. P. 315

- 94.** Kaushal, M., & Carlson, G. L. (2004). Management of enterocutaneous fistulae. *Clinics in Colon and Rectal Surgery*, 17(2), 79-87.
- Inability to control fistula losses is extremely demoralizing for the patient. P. 83
  - Where there is obvious mucocutaneous continuity, spontaneous fistula closure cannot occur and, provided skin care is not compromised, patients can be allowed to eat and drink, which is of great benefit in maintaining morale. P. 84
  - “Attempts should be made to address psychological morbidity before embarking on further treatment.” P.86
  - Development of a post-op ECF is usually a devastating complication and results in prolonged hospitalization, pain, malaise, further surgery, and major psychological morbidity, frequently compounded by anxiety regarding body image. P.87
  - The psychological sequelae include depressive illness, anxiety, guilt and institutionalization and may take many months to resolve. P.87
  - The services of a clinical psychologist with experience of complex surgical care can be very valuable. P.87
  - Many of the problems can be managed by good communication and rapport between the patient, the patient’s family and sympathetic medical and nursing staff. P. 87
- 95.** Kordasiewicz, L. M. (2004). Abdominal wound with a fistula and large amount of drainage status after incarcerated hernia repair. *J WOCN*, 31(3), 150-153.
- Case study: patient experienced frustration, embarrassment with the leaking effluent and found the odor intolerable. Upset at having an ostomy. P.150
  - Adequate containment of effluent and returning to surgery for re-anastomosis was desired to ensure the patients well-being. P.150
  - Diligent efforts, creativity, and trial and error are essential components when managing high-output stomas and promoting wound healing. P.151
  - “The patient’s emotional status improved as the containment and management of the abdominal wound improved.” p.151
- 96.** Kozell, K., & Martins, L. (2003). Managing the challenges of enterocutaneous fistulae. *Wound Care Canada*, 1(1), 10-14.
- The overall goal of conservative treatment is to promote the patient’s physical and psychological well-being. P.12
  - Repeated failure in replication of a containment protocol can be demoralizing for the patient. P.13



- The health-care practitioner must be cognizant of the psychosocial implications of isolation, withdrawal and depression inherent in such prolonged treatment courses. P.13
  - The patient's and family's physical and psychological health is of pivotal concern for the health care team p.13
  - As the plan of care evolves, education and re-education of the family unit are required. P.13
  - Diversional therapy and consultation with team members from social work and psychology are beneficial.
- 97.** Lal, S., Teubner, A., & Shaffer, J. L. (2006). Review article: intestinal failure. *Aliment Pharmacol Ther*, 24, 19-31.
- Support from a trained psychologist is essential throughout and following the patient's hospital stay.p.26
  - It is perhaps important to realize that coping strategies may be different for patients with chronic diseases such as Crohn's or intestinal pseudo-obstruction who develop intestinal failure more gradually over a period of time, when compared with patients with massive intestinal infarction who can develop intestinal failure overnight. P.26
  - It is important to restrict the oral intake of hypotonic fluid (500-1000 ml/d) in patients with a high output jejunostomy, while encouraging the use of an oral glucose-electrolyte sol'n.p.27
  - Use high dose anti-motility drugs. P.27 and anti-secretory agents.
- 98.** Lloyd, D. A. J., Gabe, S. M., & Windsor, A. C. J. (2006). Nutrition and management of enterocutaneous fistula. *British Journal of Surgery*, 93, 1045-1055.
- Attention should be paid to psychological support. P.1945
  - Psychological support is sometimes overlooked, but is of great importance. P.1047
  - The combination of an open wound and the production of fistula effluent are likely to have a detrimental effect on body image. P. 1047
- 99.** Lynch, A. C., Delaney, C. P., Senagore, A. J., Connor, J. T., et al. (2004). Clinical outcome and factors predictive of recurrence after enterocutaneous fistula surgery. *Annals of Surgery*, 240(5), 825-831.
- ECF may be catastrophic to the health and quality of life. P.830
- 100.** Makhdoom, Z. A., Komar, M. J., & Still, C. D. (2000). The small intestine, nutrition and malabsorption. *J Clin Gastroenterol*, 31(3), 195-204.
- Home TPN may improve the quality of life for the patient... p.202



- 101.** Metcalf, C. (1999). Enterocutaneous fistulae. *Journal of Wound Care*, 8(3), 141-142.
- Psychological support is paramount. P.141
  - Patients have to cope not only with the physical discomfort caused by corrosive small bowel fluid and the appliances needed to deal with this, but also the mental trauma of a post-op complication and the sight of small bowel fluid leaking uncontrollably from the abdomen. P.141
  - Patience, flexibility and ingenuity are essential prerequisites for all nurses involved in the care of these patients P.141
  - Often a trial- and error approach. P.141
- 102.** Nightingale, J. M. D. (2003). The medical management of intestinal failure: methods to reduce the severity. *Proceedings of the Nutritional Society*, 62, 703-710.
- One of the four aims in the management of patients with intestinal failure is to achieve a good quality of life. P.704
- 103.** Oneschuk, D., & Bruera, E. (1997). Successful management of multiple enterocutaneous fistulae in a patient with metastatic colon cancer. *Journal of Pain and Symptom Management*, 14(2), 121-124.
- For many cancer pts ... close attention and care directed toward the presence of complications associated with fistula development may aid in maintaining quality of life. P.121
  - [in a case study] the patient's mood improved dramatically as her function improved. P.123
  - [in a case study] the patient's psychological distress was associated with her decreased function and concern regarding disfigurement due to her fistulae. P.123
  - [in a case study] it was more important to the patient to maintain the pleasure of eating than to decrease fistula output. P.123
  - The adequate analgesia, and physiotherapy and occupational therapy had major roles in allowing this pt to increase function and ultimately return to the community.
- 104.** Pontieri-Lewis, V. (2005). Management of gastrointestinal fistulae: a case study. *MEDSURG Nursing*, 14(1), 68-72.
- The plan of care should.... Provide patient education.
- 105.** Renton, S., Robertson, I., & Speirs, M. (2006). Alternative management of complex wounds and fistulae. *British Journal of Nursing*, 15(16), 851-3.
- Contact of effluent onto skin causes great distress to the patient; they experience severe itching, pain, and perhaps most disturbing a sense of hopelessness at the continual discharge of effluent. P.851



- Some dressing changes may take hours.... This may be a painful experience for the patient, not only physically but psychologically. P. 852
  - Perhaps more disturbing for the patient is the view of the wound and fistula when the dressing is removed.
  - The nurse must be sensitive to the patient's needs and offer support and reassurance before, during and after the procedure. P. 852
- 106.** Thomas, Hess C. (2002). Managing an external fistula, part 2. *Nursing2002*, 32(9), 22-24.
- Managing a fistula can be an emotional... Challenge for you and your patient. P.22
  - Explain the procedure to the patient to alleviate anxiety. Answer her questions. P.22
- 107.** Willicutts, K., Scarano, K., & Eddins, C. W. (2005). Ostomies and fistulae: a collaborative approach. *Practical Gastroenterology*, November, 63-79.
- Quality of life for the pts with a fistula rests on the reliability of their pouching system. (refs)p.78
- 108.** Wiltshire BL. Challenging enterocutaneous fistula: a case presentation. *J WOCN* 1996; 23(6): 297-301
- [in a case study], the husband went through a period where he needed to distance himself from the care he provided to his wife. P.298
  - To cope with leaking problems when out or travelling, the patient carries a large bag filled with fistula wound supplies, which has allowed them to travel. P.300
  - Advised by nurses to reschedule pouch changes rather than wait for leaks to occur. P. 300
  - Evolving situation requires many alterations to be made to fistula wound management. P.300



## Appendix B: Nursing Strategies: Comfort Through Containment of Effluent

A number of strategies to provide patient comfort have been described in the literature. The following is a listing of nursing interventions that can be considered:

- Treat denuded perifistular skin with silver sulfadiazine to reduce burning (Oneschuk, 1997).
- Avoid the use of skin barrier wipes or seals that contain alcohol (Hess, 2002).
- Shave the hair in the area around the wound or fistula to increase adhesion of the appliance or dressing (Burch, 2004).
- Instruct the patient to rest in bed for at least 30 minutes after an appliance change to prevent leakage (Burch & Buchan, 2004).
- Empty the appliance frequently, especially before the patient ambulates (Burch, 2003).
- Ensure the patient is provided with adequate analgesia prior to commencing the fistula appliance change especially if the procedure is painful for the patient (Renton, Robertson, & Speirs, 2006).
- Attach the appliance to a bedside drainage system to prevent the weight of the effluent from disrupting the appliance seal and to increase the appliance wear time (Kordasiewicz, 2004). Moreover, attach the system to low wall suction (60 to 80 mmHg) to create an airtight seal (Dearlove, 1996).
- Insert a large-lumen catheter, such as a #22 Fr. Foley with extra holes cut along the side, into an appliance system covering a fistula to direct the drainage away from the fistula. Ensure that the catheter does not come into direct contact with the fistula or the wound by placing a gauze pad or non-adherent dressing over the fistula or wound bed (Pontieri-Lewis, 2005) (Dearlove, 1996).
- Hold non-sterile gauze against the fistula opening while preparing for appliance placement to wick away the drainage and prevent leakage on the skin (Thomas Hess, 2002). Alternatively, hold a suction catheter close to the orifice of the fistula to remove the effluent. This prevents spillage onto the perifistula skin prior to appliance placement (Black, 2000). Do NOT insert the suction catheter into the fistula or bowel (Burch, 2004).



- Apply a light dusting of skin barrier and brush away the excess to provide an absorptive and protective layer on the skin surface and to enable other products to adhere to the skin (Thomas Hess, 2002). Alternatively, apply a non-sting barrier film to the peristoma skin to provide skin protection and prevent possible damage when removing appliances (Cobbs & Knaggs, 2003).
- Increase the frequency of the appliance change if extensive corrosion on the inner edge of the appliance is noted when removing the old appliance (Burch & Buchan, 2004).
- Use a hair dryer, on a cool setting, to dry the peristoma skin gently and quickly (Burch, 2003).
- Plan the time of the appliance change to avoid times when the fistula is active, such as after meals (Burch & Buchan, 2004).
- Apply paste to any irregular indentations or creases in the peri-wound area to create a smooth surface. Additionally, mound skin barrier seals and apply them in an overlapping manner around the outer edges of the wound and fistula to protect the skin and facilitate adhesion of the appliance (Cobb & Knaggs, 2003).
- Apply strips of film dressing or skin barrier wafer around the edges of the pouch adhesive to secure the appliance system (Cobb & Knaggs, 2003).
- Do not attempt to “patch-up” a leaking appliance as this is rarely effective (Cobb & Knaggs, 2003).
- Use warm tap water to cleanse the fistula area since this field is not considered sterile (Burch, 2004).
- Select a pouch with a skin barrier backing rather than an adhesive backing to provide greater durability and skin protection (Dearlove, 1996). Choose an extended wear barrier that will not melt down as quickly as a standard barrier if the fistula output is high.
- Change the appliance at least every 7 days (Burch, 2004).
- Place gentle, but firm pressure (with warm hands) over the appliance to help ensure good bonding between the appliance and the abdomen (Burch, 2004).



- Prevent skin stripping from tape removal by applying a skin barrier on the skin surface to which tape is applied. Montgomery straps or tubular mesh may also be employed to hold dressing in place (Eakin, 1991).
- Place charcoal dressing over a primary dressing to contain odour (Dearlove, 1996). Keep in mind that charcoal becomes ineffective when wet. Moreover, sprinkling crushed Flagyl tablets into the wound along with more frequent dressing changes will control odour from the fistula (Kozell & Martins, 2003).



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