either more or less fluid to be reabsorbed. This can severely alter the characteristics of the stool. Reabsorption of too little water produces diarrhea and can lead to fluid and electrolyte alterations. Reabsorption of too much fluid can cause constipation, which if untreated can lead to bowel obstruction.

GASTROENTERITIS

Gastroenteritis (acute diarrhea) is an inflammation of the stomach and intestines that may be accompanied by vomiting and diarrhea. It can affect any part of the GI tract. Diarrhea is a common problem in children. It may be an acute problem, caused by viral, bacterial, or parasitic infections, or a chronic problem. Children under age 5 years average approximately two episodes of gastroenteritis each year (Burkhart, 1999). Infants and small children with gastroenteritis or diarrhea can quickly become dehydrated and are at risk for hypovolemic shock if fluid and electrolyte losses are not replaced (see Chapter 10).

Etiology and Pathophysiology

Diarrhea in children can have many different causes (Table 17-2). The specific etiology is not always identified. The common mechanism is a decrease in the absorptive capacity of the bowel through inflammation, decrease in surface area for absorption, or alteration of parasympathetic innervation. Children in child care centers and those living in substandard housing with improper sanitation are at increased risk.

Clinical Manifestations

Diarrhea may be mild, moderate, or severe. In mild diarrhea, stools are slightly increased in number and have a more liquid consistency. In moderate diarrhea, the child has several loose or watery stools. Other symptoms include irritability, anorexia, nausea, and vomiting. Moderate diarrhea is usually self-limiting, resolving without treatment within 1 or 2 days. In severe diarrhea, watery stools are continuous. The child exhibits symptoms of fluid and electrolyte imbalance (see Chapter 10), has cramping, and is extremely irritable and difficult to console.

Clinical Therapy

Diagnosis is based on the history, physical examination, and laboratory findings. A thorough history may help in identifying the causative factor. Ask parents about recent exposure to illnesses, use of antibiotics, travel, food and formula preparation, food sensitivities or allergies, and whether the child attends daycare. Physical examination provides a guide to the severity of dehydration (see Chapter 10). The stool can be examined for the presence of ova,

TABLE 17-2 Causes of Diarrhea in Children

ETIOLOGY	BOWEL MANIFESTATIONS
Emotional stress (anxiety, fatigue)	Increased motility
Intestinal infection (bacteria [*E. coli, Salmonella, Shigella*], viral [human rotavirus, enteric adenovirus], fungal overgrowth)	Inflammation of mucosa; increased mucous secretion in colon
Food sensitivity (gluten, cow's milk)	Decreased digestion of food
Food intolerance (lactose, introduction of new foods, overfeeding)	Increased motility; increased mucous secretion in colon
Medications (iron, antibiotics)	Irritation and suprainfection
Colon disease (colitis, necrotizing enterocolitis, enterocolitis)	Inflammation and ulceration of intestinal walls; reduced absorption of fluid; increased intestinal motility
Surgical alterations (short bowel syndrome)	Reduced size of colon; decreased absorption surface

CLINICAL MANIFESTATIONS AND TREATMENT OF DEHYDRATION IN DIARRHEA

DEHYDRATION	CLINICAL MANIFESTATIONS
None	Feed age-appropriate diet of breast milk or regular formula, complex carbohydrates, and meats (especially chicken) Oral rehydration of 10 mL/kg/stool for ongoing losses
Mild (3%–5%)	Oral rehydration with 50 mL/kg for 4–6 hours or until rehydrated 10 mL/kg/stool for ongoing losses and replacement of estimated emesis volume After rehydration, feed age-appropriate diet
Moderate (6%–9%)	100 mL/kg plus replacement of continuing losses during a 4-hour period Reassess ongoing losses every hour and replace volume for volume After rehydration, feed age-appropriate diet
Severe (≥10%)	True emergency which causes shock or near-shock condition Bolus intravenous therapy with normal saline or Ringer's lactate, 20–40 mL/kg/hr Begin oral rehydration solution when level of consciousness improves After rehydration, feed age-appropriate diet

Note: From Snyder, J. (1997). Feeding during diarrhea: New AAP guidelines and innovations in oral rehydration solutions. *Contemporary Pediatrics Meeting Reporter, July 1997,* pg. 6. Adapted.

parasites, infectious organisms, viruses, fat, and undigested sugars. Laboratory evaluation of serum and urine helps in identification of electrolyte imbalances and other deficiencies (Murphy, 1998).

Medical management depends on the severity of the diarrhea and fluid and electrolyte imbalances. The goal of treatment is to correct the fluid and electrolyte imbalances. For mild to moderate dehydration, the child is rehydrated by means of oral rehydration therapy (see Chapter 10). This may be accomplished at home or in the short-stay observation unit in a hospital with solutions such as Pedialyte, Ricelyte, or Lytren. Carbonated beverages and those containing high amounts of sugar should not be given. Fermentation of sugar in the GI tract causes increased gas, abdominal distention, and an increased frequency of diarrhea.

For severe dehydration, rehydration is accomplished by intravenous infusion with a solution chosen to correct the specific imbalances. Isotonic fluid such as normal saline with glucose or Ringer's lactate are commonly used solutions (see Chapter 10 for further information about solutions to correct dehydration). As soon as possible, clear liquids are introduced and then the child progresses to a regular diet. Foods generally are not withheld for more than 1 or 2 days (Eliason & Lewan, 1998).

If the diarrhea is caused by bacteria or parasites, antimicrobial therapy may be prescribed.

NURSING MANAGEMENT

Nursing Assessment and Diagnosis

The nurse may encounter the child and family in the emergency department, urgent care center, clinic, or office. The child may be cared for over several hours at a clinic or urgent care center so that dehydration is treated with intravenous infusion and/or oral rehydration, and then sent home with instructions for parents to care for the child. If the child is hospitalized, it is important to assess onset, frequency, color, amount, and consistency of stools. If the child is also vomiting, monitor the amount and type of vomitus. Initial and ongoing physical assessment of the child focuses on observing for signs and symptoms of dehydration, which reflect underlying fluid and electrolyte status. Evaluate urinary output and specific gravity. Weigh the infant or child on admission and daily thereafter. Monitor vital signs every 2 to 4 hours. If the child is febrile, water loss will be increased, contributing to the dehydration. Assess skin integrity, especially in the perineal and rectal areas, and note any breakdown or rashes.

NURSING ALERT

Antiemetics and antidiarrheals (e.g., Donnagel and Kaopectate) should generally not be used in infants and young children, as they do not reduce actual fluid loss, and can mask the signs and symptoms of more serious illnesses.

The accompanying nursing care plan lists common nursing diagnoses for a child with gastroenteritis. The following diagnoses may also be appropriate:

- *Anxiety (child and parent),* related to change in health status
- *Sleep pattern disturbance,* related to pain
- *Altered nutrition: Less than body requirements,* related to inability to ingest sufficient nutrients

CLINICAL TIP

Avoid using commercial baby wipes when changing the diaper of an infant with diarrhea. Chemicals in the wipes may cause additional irritation and skin breakdown.

Planning and Implementation

Nursing care focuses on providing emotional support, promoting rest and comfort, and ensuring adequate nutrition. The accompanying nursing care plan summarizes nursing care for the child with gastroenteritis.

Provide Emotional Support

The child may have been ill for several days or become suddenly ill a short time before seeking health care. The child and parents are usually anxious, so it is important to allow them to talk and ask questions. The child may require blood tests to help direct rehydration therapy. Using therapeutic play techniques, such as allowing the child to manipulate equipment, can reduce anxiety (see Chapter 5). To promote a trusting relationship, be honest if a procedure will hurt. Encourage the child to express anger, fear, and pain.

Promote Rest and Comfort

Most children with gastroenteritis are quite ill and awaken frequently with periods of vomiting and diarrhea. Provide a quiet, restful environment. Darken the room and keep interruptions to a minimum. To reduce the child's anxiety, encourage parents to room-in. Place the child's favorite toys and comfort objects within reach. Keep the child's mouth moistened with a glycerine swab, a wet washcloth, or an occasional ice chip.

Ensure Adequate Nutrition

Liquids are offered throughout the illness, even if an intravenous infusion is in place. Follow guidelines for oral rehydration therapy in Chapter 10. If tolerated, the CRAM diet can be started. Infants are breast fed or given formula. After about 1 week, the child should be consuming a normal diet for age.

Discharge Planning and Care in the Community

Discharge teaching should begin on arrival at the health care facility. Instruct parents on what to expect as the child's GI system returns to normal function. Teach the parents about the symptoms of dehydration and what to do if diarrhea recurs. Be sure that parents understand the recommended diet progression. Emphasize the necessity of good hygiene practices to prevent the spread of microorganisms that can cause gastroenteritis. If the child attends child care, then ask the parent to alert the care center about the gastroenteritis so the staff can watch for other cases and take steps to prevent the spread of infection.

HOME CARE

An effective way to treat diarrhea is the CRAM diet. Teach its components to parents and give them ideas of how to include the following foods in the child's diet.

Complex carbohydrates (e.g., cereals, toast, pasta)
Rice
and
Milk

Evaluation

Expected outcomes of nursing care for the child with gastroenteritis include the following:

- Correction of dehydration
- Adequate nutritional intake
- Return to normal bowel function
- Parental description of signs of dehydration
- Parental knowledge of importance of handwashing in decreasing transmission of infectious agents
- Maintenance of intact skin

NURSING ALERT

Handwashing is the most important measure that can be taken to prevent the spread of gastroenteritis.

NURSING CARE PLAN The Child with Gastroenteritis

GOAL	INTERVENTION	RATIONALE	EXPECTED OUTCOME
1. Diarrhea related to infectious process			
	NIC Priority Intervention: **Diarrhea Management:** Prevention and alleviation of diarrhea.		NOC Suggested Outcome: **Fluid and Electrolyte Balance:** Balance of water and electrolytes in the intracellular and extracellular compartments of the body.
The child's bowel function will be restored to normal.	■ Obtain baseline vital signs and monitor every 2–4 hours. ■ Observe stools for amount, color, consistency, odor, and frequency. ■ Test stools for occult blood. ■ Monitor results of stool culture and sample for ova and parasites. ■ Wash hands well before and after contact with the child. ■ Isolate the child until the cause of the diarrhea is determined. ■ Assist the child with toileting and hygiene. ■ Administer prescribed oral rehydration and intravenous solutions. ■ Notify the physician if diarrhea persists, stool characteristics change, or other symptoms of dehydration/electolyte imbalance occur.	■ Fluid and electrolyte imbalances can alter vital body functions. ■ Aids in the diagnosis and in monitoring the child's status. ■ Frequent defecation and some infectious organisms can cause bleeding. ■ Rapid notification of the physician will facilitate treatment. ■ Helps prevent transmission of microorganisms. ■ Prevents exposure of other patients and staff. ■ The child may be weak, incontinent, physically impaired, or anxious and require assistance to use the bathroom. ■ Provides necessary fluids and nutrients. ■ Ensures early intervention.	The child's bowel function returns to normal.
2. Fluid Volume Deficit related to active fluid volume loss			
	NIC Priority Intervention: **Fluid Monitoring:** Collection and analysis of patient data to regulate fluid balance.		NOC Suggested Outcome: **Fluid and Electrolyte Balance:** Balance of water and electrolytes in the intracellular and extracellular compartments of the body.
The child will remain hydrated and will begin to drink fluids within 24 hours of admission.	■ Monitor intake and output. Be sure to document time of each voiding. ■ Compare admission weight to preadmission weight. Assess weight daily. ■ Assess level of consciousness, skin turgor, mucous membranes, skin color and temperature, capillary refill, eyes, and fontanels every 4 hours.	■ Will determine if output exceeds input. Long periods of time without urine output can be an early indicator of poor renal function. A child should produce 1 mL of urine/kg/hr. ■ The degree of dehydration can be determined by the percentage of weight loss. Daily weights aid in determining progress toward rehydration. ■ Will determine degree of hydration and adequacy of interventions.	The child has normal fluid and electrolyte balance as indicated by laboratory evaluation and physical examination.

(continued)

NURSING CARE PLAN The Child with Gastroenteritis (continued)

GOAL	INTERVENTION	RATIONALE	EXPECTED OUTCOME
2. Fluid Volume Deficit related to active fluid volume loss (continued)			
	■ Assess for vomiting.	■ Vomiting frequently accompanies diarrhea and contributes to the child's fluid loss.	
	■ Provide oral fluid and electrolyte replacement solution if able to tolerate.	■ Less invasive than IV fluids. Provides for replacement of essential fluids and electrolytes.	
	■ Provide and maintain IV replacement therapy, as ordered.	■ Use of IV replacement is based on the degree of dehydration, ongoing losses, insensible water losses and electrolyte results.	
3. Risk for Impaired Skin Integrity related to altered fluid status			
	NIC Suggested Intervention: **Skin Surveillance:** Collection and analysis of patient data to maintain skin integrity		NOC Priority Outcome: **Tissue Integrity:** Structural intactness and normal physiologic function of skin.
The child will remain free of skin breakdown and rashes.	■ Assess skin of perineum and rectum for signs of skin breakdown or irritation.	■ Early assessment and intervention can prevent worsening of the condition.	The child's perianal and rectal tissue remains pink and intact.
	■ Provide prevention or restorative care for infants as follows:		
Preventive care:			
	■ Change diapers every 2 hours or as needed.	■ Minimizes skin contact with chemical irritants from stool and urine.	
	■ Use cloth diapers rather than disposable.	■ Minimizes the mechanical and chemical irritation from disposables.	
	■ Wash diaper area after each soiling.	■ Removes traces of stool if present.	
	■ Apply A & D ointment.	■ Provides a barrier and protects intact or reddened skin from becoming excoriated.	
Restorative care:			
	■ Place the infant prone and leave the buttocks open to air.	■ Promotes air circulation to the area.	
	■ Notify the physician if the skin is severely broken or peeling or if a rash is present.		
	■ For toddlers and older children:		
	■ Tub bathe at least daily (if condition allows) in tepid water. Pat the area dry.	■ Helps loosen any fecal matter without scrubbing, which can cause additional irritation to the skin.	
	■ Discourage the wearing of underwear if possible.	■ Allows air to circulate and prevents accumulation of moisture.	
	■ Apply A & D ointment at least four times daily.	■ Provides a barrier and protects intact or reddened skin from becoming excoriated.	