Disease State Management Program
Disease State Management Program

Our commonly treated disease states, doctors to target, support groups, resources, and typical IV medication therapies.

Michele Summerville, 2015 Pharm.D. Candidate
May Tran, 2015 Pharm.D. Candidate
Table of Contents

Achalasia 1
Acute Pyloric Stenosis 2
AIDS 3
AIDS related Enteropathy 4
Alzheimer’s Disease 5
Amyotrophic Lateral Sclerosis 6
Aspiration Pneumonia 7
Bowel Obstructions 8
Cellulitis 9
Cerebrovascular Accident 10
Chronic Pancreatitis 11
CIDP 12
Colon Adenocarcinoma 13
Colon Cancer 14
Common Variable Immunodeficiency 15
Congestive Heart Failure 16
Crohn’s Disease 17
Cystic Fibrosis 18
Dysphagia 19
Endocarditis 20
Fistula 21
Gastric Adenocarcinoma 22
Gastroparesis 23
Guillain-Barre Syndrome 24
Head Injury 25
Hyperemesis 26
Ischemic Bowel 27
Lyme Disease 28
Multiple Sclerosis 29
Myasthenia Gravis 30
Neurological Impairment 31
Organic Brain Syndrome 32
Osteomyelitis 33
Pancreatic Adenocarcinoma 34
Pancreatic Pseudocysts 35
Paralytic Ileus 36
Parkinson’s Disease 37
Pneumonia 38
Primary Immune Deficiency 39
Radiation Enteritis 40
Achalasia is a disorder of the esophagus that affects its ability to move food towards the stomach. At the point where the esophagus meets the stomach, a muscular ring, the lower esophageal sphincter, normally relaxes to promote swallowing. In people suffering from achalasia, this ring does not relax properly. The inability to relax properly may be due to nerve damage.

Symptoms of achalasia are backflow of food, chest pain, cough, difficulty swallowing, heartburn, and unintentional weight loss.

Achalasia is a rare disorder that may occur at any age. However, it is most common in middle aged or older adults. The cause for as to why the muscles fail to contract is unknown.

Achalasia may be difficult to diagnose because it presents in a similar manner to many other gastric disorders. Some tests that may aid in the diagnosis are an esophageal manometry, an esophagram, or an endoscopy.

Currently, there is no cure for achalasia but symptoms may be managed through treatment.

IV Medications for Achalasia

IV medications are most commonly used to prevent malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patients weight and tolerance</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
</tbody>
</table>
Acute pyloric stenosis is a narrowing of the region leading from the stomach to the first part of the small intestine, the pylorus, due to an enlargement of the muscle that surrounds the opening. This condition affects mostly infants during the first 2-6 weeks of life, but it may occur in adults as well.

The condition presents with progressively worse bouts of non-bilious, projectile vomiting. Dehydration and weight loss may also occur.

- Pyloric Stenosis affects about 3 in every 1,000 infants in the United States.
- Males are more likely to have pyloric stenosis than females.

Diagnosis is made through a physical exam, which would reveal an olive shaped mass in the abdomen. Following that an ultrasound or barium swallow may be done.

IV Medications for Acute Pyloric Stenosis

IV treatment is generally used to treat malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at an increased risk for overhydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the specific needs of the patient.</td>
<td>Monitor patients weight and tolerance</td>
</tr>
</tbody>
</table>

Doctors to Target

- Gastroenterologist

Support Groups

- Infant Reflux Disease www.infantrefluxdisease.com
- WebMD Community forums.webMD.com

Resources

- digestive.niddk.nih.gov
- www.nlm.nih.gov
Acquired Immune Deficiency Syndrome (AIDS) is the final stage of HIV disease, which causes severe damage to the immune system. AIDS is caused by the human immunodeficiency virus (HIV). The virus attacks the immune system and leaves the body vulnerable to a variety of life-threatening infections and cancers. HIV is primarily transmitted by sexual intercourse, contaminated blood transfusions and hypodermic needles, and from mother to child during pregnancy, delivery, or breastfeeding.

Symptoms include: chills, fever, sweats, swollen lymph nodes, weakness, weight loss.

- People who have HIV may have no symptoms for 10 years or longer.
- AIDS is the leading cause of death for ages 25-44 in the U.S.

IV Medications for AIDS
IV medications are used to manage symptoms and prevent recurring infections.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous Immunoglobulin (IVIg)</td>
<td>100-400 mg/kg every 3-4 weeks</td>
<td>May cause headache, dermatitis, abdominal pain, acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency.</td>
</tr>
<tr>
<td>Ganciclovir</td>
<td>5mg/kg daily for 7 days per week or 6mg/kg daily for 5 days per week</td>
<td>Contraindicated in patients with thrombocytopenia. Caution in patients with anemia and bone marrow suppression.</td>
</tr>
<tr>
<td>Foscavir</td>
<td>60mg/kg every 8 hours for 14-21 days</td>
<td>Caution in patients with renal impairments and electrolyte imbalance. Patients with existing seizure or other neurological disorder require close monitoring.</td>
</tr>
<tr>
<td>Acyclovir</td>
<td>10-15mg/kg every 8 hours for 10-21 days</td>
<td>Caution in patients with renal impairment and patients with a preexisting seizure disorder or neurological disease.</td>
</tr>
</tbody>
</table>

Doctors to Target
- HIV/AIDS Specialist
- Infectious Disease Specialist

Support Groups
- AIDS Healthcare Foundation www.aidshealth.org
- HIV/AIDS Support Groups www.hivaidstribe.com/groups/

Resources
- www.clinicalpharmacology.com
- www.webmd.com/hiv-aids
AIDS related enteropathy is pathology of the intestine as a complication of AIDS. The most common manifestations present as diarrhea, nausea, vomiting, and abdominal pain. AIDS related enteropathy is commonly the cause of diarrhea in AIDS patients who lack pathogens. It may result from the indirect effects of HIV on the normal balance of the intestines. The imbalance may lead to weight loss, small bowel overgrowth or vomiting. The signs/symptoms may include stools that are looser than normal or greater than 3 stools per day for 7 days. Diagnosis of AIDS related enteropathy is difficult due to the lack of pathogen.

**IV Medications for AIDS related Enteropathy**

IV treatment is generally used to treat malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at an increased risk for overhydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
</tbody>
</table>

**Doctor to Target**
- Gastroenterologist
- HIV/AIDS Specialist

**Support Groups**
- AIDS Healthcare Foundation
  www.aidshealth.org
- HIV/AIDS Support Groups
  www.hivaidstribe.com/groups/

**Resources**
- www.clinicalpharmacology.com
Alzheimer's disease (AD) is an irreversible, progressive brain disease that slowly destroys memory and thinking skills. It is the most common form of dementia—the loss of cognitive functioning and behavioral abilities to such an extent that affects a person's daily life.

Symptoms include:
- memory problems, confusion, problems recognizing family and friends, inability to learn new things, hallucinations, inability to communicate.
- The greatest risk factor in developing AD is increasing age.
- Majority of patients are ages 65 and older.
- AD is the 6th leading cause of death in the U.S.
- There is no current cure for AD.

**IV Medications for Alzheimer’s Disease**

IV medications are used to manage symptoms or slow disease progression.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous Immunoglobulin (IVIg)</td>
<td>1-2 g/kg every 2-4 weeks; Not currently FDA approved for treatment of Alzheimer’s Disease</td>
<td>May cause headache, dermatitis, abdominal pain, acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance</td>
</tr>
</tbody>
</table>
Amyotrophic Lateral Sclerosis (ALS), also known as Lou Gehrig’s disease, is a degenerative disease of the nerve cells in the spinal cord and brain that affect the voluntary muscle control. In ALS, these nerve cells deteriorate or die, making them no longer able to send messages to the muscles. This leads to twitching, muscle weakness, and eventually complete paralysis.

In about 10% of cases, ALS is caused by a genetic defect but in the remainder of cases the cause is unknown. There are no known risk factors, except having a family member with the hereditary form of the disease.

Symptoms usually don’t develop until after age 50, but they may occur earlier. Symptoms may include:
- Difficulty breathing
- Difficulty swallowing
- Muscle weakness
- Paralysis
- Speech problems
- Weight loss

Diagnosis of ALS generally begins with a physical exam. Additional tests such as CT scans, MRIs, a spinal tap, nerve conduction studies, or blood tests may also be used.

IV Medications for ALS

IV medications are most commonly used to prevent malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of patient</td>
<td>Monitor patients weight and tolerance</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
</tbody>
</table>

Doctors to Target
- ALS Specialist
- Neurologist

Support Groups
- The Amyotrophic Lateral Sclerosis Association
  www.alsa.org
- ALS Support and Help Forum
  www.alsforums.com

Resources
- www.mayoclinic.com
- www.clinicalpharmacology.com

http://discovermagazine.com/2008/dec/25-
Aspiration pneumonia occurs when gastrointestinal contents inadvertently travel into the lungs. It is the most serious complication associated with tube-feedings but also occurs in patients with decreased consciousness, neuromuscular disease, airway/GI tract abnormalities, vomiting, or those that are bedridden. Gastric acid causes chemical injury and contents containing bacteria cause infection.

Symptoms of aspiration pneumonia may include:
- Coughing
- Shortness of breath
- Fatigue
- Bluish color to the skin due to lack of oxygen

Diagnosis of aspiration pneumonia may be aided by a chest x-ray, blood tests, a bronchoscopy, or a CT scan of the chest.

IV Medications for Aspiration Pneumonia

IV medications used to treat bacterial aspiration pneumonia

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levofloxacin</td>
<td>750mg IV daily (5-14 days)</td>
<td>Adjust dose with renal impairment</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>400mg IV q8-12h x 7-14 days</td>
<td>Adjust dose with renal impairment</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>40mg/kg/day IV divided every 6-8 hrs</td>
<td>Use caution in patients with hepatic impairment</td>
</tr>
<tr>
<td>Metronidazole</td>
<td>7.5mg/kg IV q6h x 7-10 days (longer if severe infection)</td>
<td>Consider dose adjustment with severe renal impairment</td>
</tr>
</tbody>
</table>

Doctors to Target
- Infectious Disease Specialist
- Pulmonologist

Support Groups
- Dailystrength
  www.dailystrength.org/c/pneumonia
- Inspire
  www.inspire.com

Resources
- IDSA guidelines
- Harrison’s Principles of Internal Medicine
- Lexicomp

Dailystrength
www.dailystrength.org/c/pneumonia
Inspire
www.inspire.com
**Description**

Bowel or intestinal obstruction is a partial or complete blockage of the bowel that results in failure of the intestinal contents to pass through. It can be a mechanical or functional obstruction. Mechanical obstructions can be caused by abnormal tissue growth, scar tissue from surgery, foreign bodies, gallstones, hernias, etc. A functional obstruction is an ileus, a condition where the bowel does not work correctly but there is no structural problem.

Symptoms include: abdominal distention, fullness, gas, abdominal pain, breath odor, constipation, diarrhea, and vomiting.

- Intestinal obstruction is a medical emergency
- Complete obstruction often requires surgery

**IV Medications for Bowel Obstructions**

IV medications include fluid replacement and TPN.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Parenteral Nutri-</td>
<td>Formula is designed to meet the</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>tion (TPN)</td>
<td>caloric needs of the patient</td>
<td></td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 L every day</td>
<td>Patients with kidney and heart disease are at increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
</tbody>
</table>

**Doctors to Target**

- Gastroenterologist

**Support Groups**

- Irritable Bowel Syndrome Self Help and Support Group
  www.ibsgroup.org/
- Ostomy Support Group: Bowel Obstruction
  www.inspire.com/groups/ostomy/discussion/bowel-obstruction-10/

**Resources**

- www.clinicalpharmacology.com
- www.webmd.com
Cellulitis

Description
Cellulitis is a skin infection caused by bacteria, usually staphylococcus or streptococcus. Normal skin has many types of bacteria on it. Any break in the skin, such as cuts, sores, or bites can let the bacteria into the skin which then spreads to deeper tissues causing infection.

Symptoms: The affected area will be warm, red, swollen, and tender. As the infection spreads, symptoms may include fever, chills, and swollen glands.

- Diabetics and people with weak immune systems can get cellulitis without having a break in the skin.
- See a doctor right away if the infected area spreads, is on your face or groin, or if you experience fever or chills.
- Treatment includes antibiotics, usually for a week.

IV Medications for Cellulitis
IV antibiotics are used for more serious cases, i.e. people with weak immune systems.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin</td>
<td>500 mg every 6 hours or 1 g every 12 hours (adjust dosing per patient)</td>
<td>Caution in patients with renal impairment. Potential for ototoxicity and nephrotoxicity</td>
</tr>
<tr>
<td>Daptomycin (Cubicin)</td>
<td>4 mg/kg once every 24 hours for 7-14 days</td>
<td>Caution in patients with inflammatory bowel disease, a history of myopathy, or peripheral neuropathy</td>
</tr>
<tr>
<td>Linezolid (Zyvox)</td>
<td>600 mg every 12 hours for 10-14 days</td>
<td>Caution in patients with uncontrolled hypertension, untreated hyperthyroidism, carcinoid syndrome or severe</td>
</tr>
</tbody>
</table>

Resources
- www.clinicalpharmacology.com
- www.webmd.com
- www.mayoclinic.com

Doctors to Target
- Dermatologist
- Infectious Disease Specialist
- Internal Medicine Physician

Support Group
- Cellulitis Support Group www.mdjunction.com/cellulitis

www.globalrph.com/antibiotic/cellulitis.htm
Cerebrovascular Accident

Description
A cerebrovascular accident (CVA), or stroke, is when blood flow to a part of the brain stops. If blood flow is stopped for longer than a few seconds, the brain cannot get blood and oxygen leading to brain cell death and causing permanent damage. There are two major stroke types: ischemic stroke and hemorrhagic stroke. Ischemic stroke involves a blood clot or clogged arteries block blood flow to the brain. Hemorrhagic stroke occurs when a blood vessel in the brain ruptures.

Symptoms include: headache, loss of balance, change in hearing or alertness, trouble walking, and confusion.

- CVA is the 4th leading cause of death in the U.S.
- CVA patients may recover completely, or have some permanent loss of function

IV Medications for Cerebrovascular Accident
IV medications are used for stroke recovery as well as stroke prevention.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patient’s weight and tolerance.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Neurologist

Support Groups
- American Stroke Association
  1-888-4-STROKE
  www.strokeassociation.org
- The Stroke Network
  www.strokenetwork.org/

Resources
- www.clinicalpharmacology.com
- www.stroke.org

www.fiteveryday.com/sunlight-increase-risk-stroke/
Chronic Pancreatitis

Description
Chronic pancreatitis is the inflammation of the pancreas that does not heal or improve and gets worse over time eventually leading to permanent damage.

When inflammation of the pancreas occurs, it is no longer able to produce enzymes that are needed to digest food. As a result, the body may not be able to digest fats. Damage to the portion of the pancreas that produces insulin may also lead to diabetes.

Chronic pancreatitis more often occurs in men and it often develops between ages 30-40.

Symptoms of pancreatitis include:
- Abdominal pain
- Chronic weight loss
- Nausea, diarrhea, and vomiting

Diagnosis of pancreatitis may be aided by several tests, including the fecal fat test, measuring the serum amylase, serum IgG4, serum lipase, and serum tripsinogen. An abdominal CT or ultrasound may also aid in diagnosis.

IV Medications for Chronic Pancreatitis
IV medications are most commonly used to prevent malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 liters per day</td>
<td>Patients with renal dysfunction are at an increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>(TPN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patients weight and tolerance</td>
</tr>
</tbody>
</table>

Doctors to Target
- Gastroenterologist
- Pancreatitis Specialist

Support Groups
- Pancreatitis Support Group
  Pancreasfoundation.org/
- Pancreatitis Association International
  pancassociation.org

Resources
- www.mayoclinic.com
- www.clinicalpharmacology.com

Description
Chronic pancreatitis is the inflammation of the pancreas that does not heal or improve and gets worse over time eventually leading to permanent damage.

When inflammation of the pancreas occurs, it is no longer able to produce enzymes that are needed to digest food. As a result, the body may not be able to digest fats. Damage to the portion of the pancreas that produces insulin may also lead to diabetes.

Chronic pancreatitis more often occurs in men and it often develops between ages 30-40.

Symptoms of pancreatitis include:
- Abdominal pain
- Chronic weight loss
- Nausea, diarrhea, and vomiting

Diagnosis of pancreatitis may be aided by several tests, including the fecal fat test, measuring the serum amylase, serum IgG4, serum lipase, and serum tripsinogen. An abdominal CT or ultrasound may also aid in diagnosis.

IV Medications for Chronic Pancreatitis
IV medications are most commonly used to prevent malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 liters per day</td>
<td>Patients with renal dysfunction are at an increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>(TPN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patients weight and tolerance</td>
</tr>
</tbody>
</table>
Description
Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) is a rare autoimmune disorder. This disease damages the myelin sheaths, the protective covering of nerve cells, leading to progressive weakness and impaired sensory functions.

Symptoms that often manifest include tingling or numbness, weakness of arms and legs, loss of deep tendon reflexes, fatigue, and abnormal sensations.

- More common in young adults, in men more than women
- First line of therapy includes corticosteroids, plasmapheresis, and IVIG
- Relapses and remissions vary greatly with each patient

IV Medications for CIDP
IV medications include IVIg, immunosuppressants, and corticosteroids

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous Immunglobulin (IVIg)</td>
<td>2 g/kg for 5 days for 3-6 months, then 100-400 mg/kg every 3-4 weeks</td>
<td>May cause headache, dermatitis, abdominal pain, acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency</td>
</tr>
<tr>
<td>Rituximab</td>
<td>375 mg/m² every week for 4 weeks</td>
<td>May cause headache, fever, chills, nausea, heartburn</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>Dosing is individualized depending on severity of disease and patient response</td>
<td>Can mask, reactivate, or exacerbate infections; Can result in the development of secondary infection</td>
</tr>
</tbody>
</table>

Doctors to Target
- CIDP Specialist
- Neurologist

Support Groups
- Living with CIDP www.livingwithcidp.org
- GBS/CIDP Foundation 1-866-224-3301 www.gbs-cidp.org
- National Institute of Neurological Disorders and Stroke www.ninds.nih.gov/disorders

Resources
- www.clinicalpharmacology.com
- www.emedicine.medscape.com/article/1172965
- www.ninds.nih.gov/
Adenocarcinoma is a type of cancer that originates from glandular tissue. Glandular tissue is a type of epithelial tissue.

Colon adenocarcinoma may present nonspecifically in early stages but through progression presentation may show abdominal tenderness, macroscopic rectal bleeding, a palpable abdominal mass, or hepatomegaly.

Risk factors for colon adenocarcinoma include:
- Hereditary
- Environmental exposures
- Inflammatory syndromes that affect the gastrointestinal system

Diagnosis may involve a CT scan, a PET scan, a colonoscopy, a sigmoidoscopy, or a double contrast barium enema.

IV Medications for Colon Adenocarcinoma

IV medications are most commonly used to eradicate cancer or manage side effects.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorouracil (5-FU)</td>
<td>300-1000mg/m²/day for 4-5 days as a continuous infusion every 4 weeks.</td>
<td>Contraindicated in patients with bone marrow suppression, pregnancy, infection, malnutrition, and dihydropyrimidine dehydrogenase deficiency. May cause alopecia, nausea, vomiting, drowsiness, hand and foot syndrome, and skin irritation.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Zofran</td>
<td>32 mg infused over 15 minutes about 30 minutes before chemotherapy</td>
<td>May cause bradycardia, constipation, diarrhea, fever, or blurred vision. Caution in patients with electrolyte imbalance.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Oncologist

Support Groups
- Cancer Support Community [www.cancersupportcommunity.org](http://www.cancersupportcommunity.org)
- American Cancer Society [www.cancer.org](http://www.cancer.org)
- Cancercare [www.cancercare.org](http://www.cancercare.org)

Resources
- [www.mayoclinic.com](http://www.mayoclinic.com)
- [www.clinicalpharmacology.com](http://www.clinicalpharmacology.com)
- [www.cancer.org](http://www.cancer.org)
Colon, or colorectal, cancer is cancer that starts in the large intestine (colon) or the rectum. There is no single cause of colon cancer. Some risk factors include: older than 60 years old, African American, diet high in red or processed meats, and inflammatory bowel disease.

Symptoms include: abdominal pain and tenderness, blood in stools, diarrhea, constipation, and weight loss.

- Colorectal cancer is one of the leading causes of cancer-related deaths in the U.S.
- Early diagnosis can often lead to a complete cure
- Treatment depends on the location, size, and extent of spread
- Surgery is the most common treatment for colon cancer

IV Medications for Colon Cancer
IV medications are most commonly used to eradicate cancer or manage side effects.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorouracil (5-FU)</td>
<td>300-1000 mg/m²/day for 4-5 days as a continuous infusion every 4 weeks</td>
<td>Contraindicated in patients with bone marrow suppression, pregnancy, infection, malnutrition, and dihydropyrimidine dehydrogenase deficiency. May cause alopecia, nausea, vomiting, drowsiness, hand and foot syndrome, and skin irritation.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at increased risk for overhydration. Monitor</td>
</tr>
<tr>
<td>Zofran</td>
<td>32 mg infused over 15 minutes about 30 minutes before chemotherapy</td>
<td>May cause bradycardia, constipation, diarrhea, fever, or blurred vision. Cauti-</td>
</tr>
</tbody>
</table>
Common Variable Immunodeficiency

**Description**
Common Variable Immunodeficiency (CVID) is a group of primary immunodeficiencies which involve low levels of most or all of the immunoglobulin classes, a lack of B lymphocytes or plasma cells, and frequent bacterial infections. Immunodeficient people cannot get rid of germs or protect themselves from new germs.

Symptoms depend on the type of defect and can include: recurrent and persistent infections, enlarged lymph nodes, abdominal pain, and fatigue.

- CVID is the most commonly encountered primary immunodeficiency
- Patients with CVID often have a history of recurrent infections, commonly affecting the upper and lower respiratory tracts.

**IV Medications for CVID**
IV medications are used to prevent and treat infections or to boost the immune system

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamimune-N (IVig)</td>
<td>100-400 mg/kg once monthly</td>
<td>Contraindicated in patients with IVig hypersensitivity, hyperprolinemia and IgA deficiency.</td>
</tr>
<tr>
<td>Gammagard (IVig)</td>
<td>300-600 mg/kg once every 3-4 weeks</td>
<td>Contraindicated in patients with IVig hypersensitivity, hyperprolinemia and IgA deficiency.</td>
</tr>
</tbody>
</table>

**Doctors to Target**
- Immunologist

**Support Groups**
- Immune Deficiency Foundation 1-800-296-4433
  http://primaryimmune.org
- Primary Immunodeficiency Resource Center 1-866-INFO-4-PI
  www.info4pi.org

**Resources**
- [www.clinicalpharmacology.com](http://www.clinicalpharmacology.com)
- [www.nichd.nih.gov/health](http://www.nichd.nih.gov/health)
- [www.webmd.com](http://www.webmd.com)

http://www.beltina.org/health-dictionary/common-variable-immunodeficiency/-cvid-symptoms.html
Congestive Heart Failure

Description
Congestive Heart Failure (CHF) is a condition where the heart cannot pump enough blood to the rest of the body, causing blood to back up in other areas of the body. Fluid builds up in the lungs, liver, gastrointestinal tract, and the arms and legs. This is a long term condition that may affect one or both sides of the heart. The most common cause is coronary artery disease (CAD), a narrowing of the small blood vessels that supply blood and oxygen to the heart.

Symptoms: shortness of breath, coughing, edema, dizziness, fatigue, rapid or irregular heartbeats.
- Weight gain, especially over a day, can be a sign that your heart failure is getting worse
- Roughly 550,000 people are diagnosed each year
- Treatment includes lifestyle changes and medications

IV Medications for Congestive Heart Failure
IV antibiotics are only used for decompensated heart failure.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dobutamine</td>
<td>Initially 0.5-1 mcg/kg/min as a continuous IV infusion, then titrated every few minutes</td>
<td>Contraindicated in patients with idiopathic hypertrophic subaortic stenosis or uncorrected hypovolemia</td>
</tr>
<tr>
<td>Dopamine</td>
<td>3-10 mcg/kg/min as a continuous infusion; start at low end for elderly patients</td>
<td>Contraindicated in patients with pheochromocytoma, ventricular fibrillation, and ventricular tachycardia</td>
</tr>
<tr>
<td>Milrinone</td>
<td>Usual infusion rate is 0.5 mcg/kg/min, max rate of 0.75 mcg/kg/min; Initial loading dose of 50 mcg/kg</td>
<td>Should not be used in patients with severe valvular heart disease</td>
</tr>
</tbody>
</table>

Doctors to Target
- Cardiologist

Support Groups
- Heart Failure Support Group
  www.dailystrength.org/c/Heart-Failure/support-group
- Mended Hearts
  1-888-432-7899
  http://mendedhearts.org

Resources
- www.clinicalpharmacology.com
- www.webmd.com
- www.chfpatients.com

http://twomedicure.com/articles/heart.htm
Crohn’s Disease

Description
Crohn’s Disease is a form of inflammatory bowel disease that may affect any part of the gastrointestinal tract. It most commonly affects the intestines and/or colon. In patients with Crohn’s Disease, the immune system reacts inappropriately and attacks the body’s normal bacterial inhabitants, which ultimately leads to ulcerations and bowel injury.

Common symptoms include:
- abdominal pain, fever, fatigue, loss of appetite, pain with passing stool, persistent watery diarrhea, and weight loss.
- Crohn’s Disease may occur at any age, usually ages 15-35.
- People with a family history of Crohn’s disease are more likely to get it.
- There is no cure; the goal of therapy is to suppress the inflammatory response.

IV Medications for Crohn’s Disease
IV medications are most commonly used to suppress inflammatory response.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infliximab (Remicade)</td>
<td>5 mg/kg at 0, 2, and 6 weeks and then 5 mg/kg every 8 weeks</td>
<td>Higher risk than general population for development of malignant lymphoma</td>
</tr>
<tr>
<td>Natalizumab (Tysabri)</td>
<td>300 mg given over 1 hour every 4 weeks; Discontinue if patient does not respond by 12th week</td>
<td>Contraindicated in patients with murine protein hypersensitivity and progressive multifocal leukoencephalopathy</td>
</tr>
</tbody>
</table>

Doctors to Target
- Gastroenterologist

Support Groups
- The Crohn’s and Colitis Foundation of America
  1-888-694-8872
  www.ccfa.org/chapters/
- Crohn’s Disease Forum
  www.crohnsforum.com/

Resources
- www.clinicalpharmacology.com
- www.ccfa.org
- www.mayoclinic.com
Cystic Fibrosis

Description
Cystic Fibrosis (CF) is an inherited chronic disease state that affects mainly the respiratory and digestive systems. It is caused by a defective gene causing the body to produce thick and sticky mucous. The mucous can clog the lungs making it difficult to breathe and promote infections. The mucous may also prevent the digestive enzymes from reaching the intestines which may lead to malnutrition.

Common symptoms include: salty skin, persistent productive cough, lung infections, & poor growth/weight gain with good appetite.

- On average, CF patients only live until their mid-thirties.
- Currently, there is no cure for CF.
- Therapies are designed to manage the symptoms and complications.

IV Medications for Cystic Fibrosis
IV medications are most commonly used to treat bacterial infections in the lungs that result from cystic fibrosis.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobramycin</td>
<td>3-6 mg/kg/day in 2-3 divided doses</td>
<td>Ototoxicity, nephrotoxicity, hypersensitivity, caution for pregnant women</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>500 mg single daily dose for at least 2 days</td>
<td>Contraindications: hepatitis, jaundice, hypersensitivity</td>
</tr>
<tr>
<td>Ciprofloxin</td>
<td>400 mg every 12 hours</td>
<td>Caution in patients with renal disease, hepatic disease and pregnant women</td>
</tr>
</tbody>
</table>

Doctors to Target
- CF Specialist
- Pulmonologist
- Gastroenterologist

Support Groups
- Cystic Fibrosis Foundation 1-800-344-4823 www.cff.org
- March of Dimes 407-599-5077

Resources
- www.clinicalpharmacology.com
- www.cff.org
Dysphagia is difficulty swallowing, which usually indicates a problem with your throat or esophagus. It may occur when the nerves and muscles in your throat and esophagus do not function normally, such as after a stroke or a brain or spinal cord injury. Dysphagia may also be caused by blockage of the throat or esophagus, such as with gastroesophageal reflux disease, esophagitis, or tumors.

Symptoms include: difficulty controlling food in the mouth, coughing, choking, or pain when swallowing, frequent pneumonia, and unexplained weight loss.

- Dysphagia can be a serious threat to one’s health because of the risk of aspiration, pneumonia, malnutrition, dehydration, weight-loss, and airway obstruction.
- Dysphagia occurs most often in older adults.

IV Medications for Dysphagia

IV medications include enteral and hydration.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patient’s weight and tolerance.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 L every day</td>
<td>Patients with kidney and heart disease are at increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Otolaryngologist
- Gastroenterologist
- Neurologist
- Speech-language Pathologist

Support Group
- National Foundation of Swallowing Disorders
  www.swallowingdisorderfoundation.com/

Resources
- www.clinicalpharmacology.com
- www.webmd.com/digestive-disorders
- www.emedicine.medscape.com/article/324098
Description
Endocarditis is an infection of the inner lining of the heart, the endocardium. It generally occurs when bacteria from other parts of the body travel through the blood stream and reach the heart. Most people who develop endocarditis have a previously existing abnormality of the heart.

Major risk factors for endocarditis include:
- Artificial or damaged heart valves
- Congenital heart defects
- Permanent central venous access lines
- Illegal IV drug use

Endocarditis may cause several major complications such as heart failure, infections in other parts of the body, and stroke.

Diagnosis can be done using blood work, transesophageal echocardiogram, electrocardiogram, chest x-ray, CT scan, or using magnetic resonance imaging (MRI).

IV Medications for Endocarditis
IV medications are used to eliminate the bacteria in the endocardium.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin</td>
<td>1 gram every 12 hours&lt;br&gt;Pharmacist is to adjust dosing</td>
<td>Caution in patients with renal dysfunction and pregnant patients. Infuse slowly to avoid Redman’s syndrome.</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>1-2 grams every 12 hours for at least 4 weeks</td>
<td>Do not use in patients with jaundice or mix with any calcium containing solutions or products. Caution in pregnant patients.</td>
</tr>
<tr>
<td>Daptomycin</td>
<td>6 mg/kg every 24 hours for 2-6 weeks</td>
<td>Caution in patients with renal dysfunction, pregnancy, ulcerative and pseudomembranous colitis.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Infectious Disease Specialist
- Cardiologist

Support Groups
- Inspire<br>www.inspire.com/conditions/endocarditis

Resources
- www.mayoclinic.com
Fistulas

Description
A fistula is an abnormal connection between an organ, vessel, or intestine and another structure that is usually the result of injury or surgery. Fistulas can also result from diseases and may occur in many parts of the body. There are three main types of fistulas: blind, complete, and incomplete. Blind fistulas connect to two structures but is only open on one end. Complete fistulas have both external and internal openings. Incomplete fistulas are tubes from the skin that is closed on the inside and does not connect to any internal structure. Symptoms vary depending on the location of the fistula.
- Crohn’s disease is the leading cause of anorectal fistulas.
- Fistulas are used therapeutically in patients with end stage renal disease.
- Treatment often involves surgical intervention combined with antibiotics.

IV Medications for Fistulas
IV medications include TPN and Infliximab (immunosuppressant).

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Parenteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Nutrition (TPN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infliximab (Remicade)</td>
<td>5 mg/kg at weeks 0, 2, and 6 then every 8 weeks; may increase dose to 10 mg/kg.</td>
<td>Higher risk than general population for development of malignant lymphoma</td>
</tr>
</tbody>
</table>

Doctors to Target
- Gastroenterologist
- Urologist
- Nephrologist

Support Groups
- Fistula Support-IBD Support Group Forums
  www.ibdsupport.org/forums/forum/64-fistula-support/
- Fistula Foundation
  www.fistulafoundation.org/

Resources
- www.clinicalpharmacology.com
- www.nlm.nih.gov/medicineplus/ency/article
- www.fistulafoundation.org
Description

Adenocarcinoma is a type of cancer that originates from glandular tissue. Glandular tissue is a type of epithelial tissue.

Gastric adenocarcinoma may present nonspecifically in early stages but may progress to anorexia, heartburn, nausea, or vomiting. It is one of the most common forms of stomach cancer.

The risk factors include:
- Family history of gastric cancer
- An infection in the stomach caused by *Heliobacter pylori*
- A polyp in the stomach larger than 2 cm
- Inflammation of the stomach for an extended time period
- Pernicious anemia
- Smoking

IV Medications for Adenocarcinoma

IV medications are most commonly used to eradicate cancer or manage side effects.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorouracil (5-FU)</td>
<td>500mg/m2 IV bolus days 1-5 every 28 days</td>
<td>Contraindicated in patients with bone marrow suppression, pregnancy, infection, malnutrition, and dihydropyrimidine dehydrogenase deficiency. May cause alopecia, nausea, vomiting, drowsiness, hand and foot syndrome, and skin irritation.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at increased risk for overhydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Zofran</td>
<td>32 mg infused over 15 minutes about 30 minutes before chemotherapy</td>
<td>May cause bradycardia, constipation, diarrhea, fever, or blurred vision. Caution in patients with electrolyte imbalance.</td>
</tr>
</tbody>
</table>

Doctors to Target

- Oncologist

Support Groups

- Cancer Support Community [www.cancersupportcommunity.org](http://www.cancersupportcommunity.org)
- American Cancer Society [www.cancer.org](http://www.cancer.org)
- Cancercare [www.cancercare.org](http://www.cancercare.org)

Resources

- [www.mayoclinic.com](http://www.mayoclinic.com)
- [www.clinicalpharmacology.com](http://www.clinicalpharmacology.com)
- [www.cancer.org](http://www.cancer.org)
Gastroparesis

Description

Gastroparesis is a condition that causes the stomach to be unable to release its contents, yet there is no blockage. Normally food is propelled through the stomach by a series of muscle contractions but in people suffering from gastroparesis the muscles of the stomach wall work poorly or not at all. The cause of gastroparesis is unknown. It may be related to a disruption of nerve signals to the stomach or it is also a common complication of diabetes. Risk factors for gastroparesis include:

- Diabetes
- Use of medications that block certain nerve signals
- Infection
- Gastrectomy
- Parkinson’s Disease

Symptoms of gastroparesis usually include abdominal distention, nausea, weight loss, vomiting, and premature abdominal fullness after meals.

IV Medications for Gastroparesis

IV medications are most commonly used to prevent malnutrition and increase gastric motility.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metoclopramide</td>
<td>10mg before meals and at bedtime.</td>
<td>Contraindicated in patients with seizures, GI obstructions, and pheochromocytoma. With long-term or high dose usage, there is a risk to develop tardive dyskinesia, a CNS disorder.</td>
</tr>
<tr>
<td>Zofran</td>
<td>32 mg infused over 15 minutes every 24 hours</td>
<td>May cause bradycardia, constipation, diarrhea, fever, or blurred vision. Caution in patients with electrolyte imbalance.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patients weight and tolerance.</td>
</tr>
</tbody>
</table>

Doctors to Target

- Gastroenterologist

Support Groups

- Gastroparesis Awareness: www.gpawarenessfund.com
- American Motility Society: www.motilitysociety.org/patient/support.shtml

Resources

- www.mayoclinic.com
- www.clinicalpharmacology.com
Guillain-Barre Syndrome

Description
Guillain-Barre Syndrome (GBS) is an autoimmune disorder in which the body's immune system attacks parts of the nervous system. It most often affects the nerve covering, or myelin sheath, causing demyelination. When this occurs, signals may move slower or not at all. Most people who suffer from GBS make a complete recovery, but some may suffer from lifelong complications.

What exactly triggers the syndrome is currently unknown. It may occur at any age, but is most commonly found in people ages 30-50.

Guillain-Barre syndrome may occur along with:
- AIDS
- Herpes Simplex Virus
- Mononucleosis

It also occurs commonly after bacterial or other minor infections.

Symptoms typically include muscle weakness (or paralysis), low blood pressure, loss of reflexes, numbness, sensation changes, and uncoordinated movement.

Diagnosis usually includes a medical examination which may show muscle weakness or problems with autonomic (involuntary) body functions. Tests such as a cerebrospinal fluid sample, ECG, nerve conduction velocity test, electromyography (EMG), or pulmonary function test may also aid in the proper diagnosis.

IV Medications for Guillain-Barre Syndrome

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous Immunoglobulin (IVIG)</td>
<td>400 mg/kg every 24 hours for 5 days</td>
<td>May cause headache, dermatitis, abdominal pain, or acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency</td>
</tr>
</tbody>
</table>

Doctors to Target
- Neurologist

Support Groups
- Guillain-Barre Syndrome Foundation International [www.gbs-cipd.org](http://www.gbs-cipd.org)
- Guillain-Barre (GBS) Support Group [www.dailystrength.org/c/Guillian-Barre-Syndrome-GBS/support-group](http://www.dailystrength.org/c/Guillian-Barre-Syndrome-GBS/support-group)

Resources
- [www.mayoclinic.com](http://www.mayoclinic.com)
- [www.clinicalpharmacology.com](http://www.clinicalpharmacology.com)
Description

A head injury is any trauma that may injure the scalp, skull, or brain. It may be a closed injury or an open, or penetrating, injury. A closed head injury means that there was a hard blow to the head from an object, but it did not break the skull. An open head injury is one where the striking object broke the skull and entered the brain.

The most common injury is a concussion, in which the brain is shaken. Other head injuries include scalp wounds and skull fractures.

Some common causes of head injuries include:
- Accidents at home, work, outdoors, or while playing sports.
- Falls
- Physical assaults
- Traffic Accidents

Some head injuries result in changes in brain function. These injuries are called traumatic brain injuries.

Head injuries may also result in a hematoma. A hematoma is a localized collection of blood outside of the blood vessels.

IV Medications for Head Injury

IV medications are most commonly used to prevent malnutrition and dehydration.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 liters per day</td>
<td>Patients with renal dysfunction are at an increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
</tbody>
</table>

Doctors to Target

- Neurologist

Support Groups

- Brain Injury Support Group
  www.dailystrength.org
- Brain Injury Association of America
  www.biausa.org

Resources

- www.emedicinehealth.com
- www.clinicalpharmacology.com
- www.nlm.nih.gov
Hyperemesis

Hyperemesis gravidarum (HG) is a severe form of morning sickness. It is extreme, persistent nausea and vomiting related to pregnancy that may result in dehydration. HG is thought to be caused by rapidly rising blood levels of a hormone called human chorionic gonadotropin (HCG), which is released by the placenta.

Symptoms include:
- weight loss, dehydration, nutritional deficiencies, lightheadedness, and fainting.
- Symptoms can be aggravated by hunger, fatigue, prenatal vitamins, odors, and diet.
- HG most commonly occurs in the first trimester of pregnancy.
- Treatment response varies among women.

IV Medications for Hyperemesis

IV medications include hydration, antiemetic, and nutrition therapies.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 L every day</td>
<td>Patients with kidney and heart disease are at increased risk for overhydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Ondansetron (Zofran)</td>
<td>4-8 mg 2-3 times per day; May be given IV or SQ continuously</td>
<td>May mask the symptoms of adynamic ileus, GI obstruction, or gastric distention after abdominal surgery.</td>
</tr>
<tr>
<td>Metoclopramide (Reglan)</td>
<td>5-10 mg every 8 hours as needed; May be given SQ continuously</td>
<td>Contraindicated in patients with GI bleeding, GI obstruction, GI perforation, pheochromocytoma, or seizures.</td>
</tr>
</tbody>
</table>

Support Groups

- H.E.R. Foundation
  www.helpher.org/forum3/
- Hyperemesis gravidarum Survivors
  www.angelfire.com/nt/hugs/
- Sidelines National High Risk Pregnancy Support Network
  1-888-447-4754
  www.sidelines.org

Resources

- www.clinicalpharmacology.com
- www.americanpregnancy.org
- www.webmd.com

Doctor to Target

- OB/GYN
Ischemic Bowel

An ischemic bowel is damage to part of the small intestine due to decreased blood supply. The hallmark symptom of ischemic bowel is abdominal pain. Additional symptoms include diarrhea, fever, and vomiting.

There are several possible causes of ischemic bowel disease, including blockage or narrowing of the arteries, or a blockage in the large intestine.

Risk factors for ischemic bowel disease, include:
- Advanced age
- Recent heart attack
- Congestive heart failure
- Colon cancer
- Diabetes
- Dehydration
- Pregnancy
- Peripheral vascular disease

Tests to diagnose ischemic bowel disease may include an x-ray of the abdomen, a CT or MRI of the abdomen, a colonoscopy, or an angiography.

IV Medications for Ischemic Bowel

IV medications are used to prevent malnutrition and dehydration.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 liters per day</td>
<td>Patients with renal dysfunction are at an increased risk for overhydration. Monitor serum electrolytes and fluid status.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Gastroenterologist
- Vascular Surgeon

Support Groups
- Gastrointestinal Disorders Support Group
  www.drugs.com/answers/support-group/gastrointestinal-disorders/

Resources
- www.clinicalpharmacology.com
Description
Lyme Disease is a bacterial infection caused by the bacterium *Borrelia burgdorferi* and is transmitted to humans by the bite of infected ticks. If left untreated, infection can spread to joints, the cardiovascular, and the nervous system.

Symptoms include: fever, headache, fatigue, and a characteristic skin rash that looks like a bull’s-eye called erythema migrans.

- Black-legged ticks carry the disease and can be so small that they can be almost impossible to see
- Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, applying pesticides, and reducing tick habitat
- Most cases can be treated successfully with a few weeks of antibiotics

IV Medications for Lyme Disease

IV medications consist of antibiotics and IVIg.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftriaxone (Rocephin)</td>
<td>1-2 g daily for 10-28 days</td>
<td>Caution in patients with hypersensitivity to penicillin</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>2 g every 8 hours for 2-4 weeks</td>
<td>Caution in patients with hypersensitivity to corn products</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>100 mg daily for 14-21 days</td>
<td>Caution in patients with severe hepatic disease; Contraindicated in patients with tetracycline hypersensitivity</td>
</tr>
<tr>
<td>Intravenous Immunglobulin (IVIg)</td>
<td>100-400 mg/kg every 3-4 weeks; dosing varies; not currently FDA approved for treatment of Lyme Disease</td>
<td>May cause headache, Dermatitis, Abdominal pain, Acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency</td>
</tr>
</tbody>
</table>

Doctor to Target
- Infectious Disease Specialist

Support Groups
- Lyme Disease Support Group www.mdjunction.com/lyme-disease
- Florida Lyme Disease Network www.health.groups.yahoo.com/group/FL-Lymedisease-network/

Resources
- www.clinicalpharmacology.com
- www.cdc.gov/lyme/
- www.idsociety.org
- www.webmd.com
Multiple Sclerosis

Description

Multiple Sclerosis (MS) is an autoimmune disease that affects the brain and spinal cord. The body’s own immune cells attacks the nervous system causing inflammation and direct damage to myelin sheaths, the protective covering of nerve cells.

Symptoms vary and can affect many parts of the body. Episodes can last for days, weeks, or months and can alternate with periods of reduced or no symptoms.

- MS affects women more than men.
- There is no known cure.
- Therapies may slow the disease progression.
- The goal of therapy is to control symptoms and to help maintain a normal quality of life.

IV Medications for Multiple Sclerosis

IV medications available to slow disease progression or treat symptoms

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novantrone</td>
<td>12 mg/m(2) every 3 months; maximum dose: 8-12 doses</td>
<td>Nausea, Hair thinning, Decreased white blood cell count</td>
</tr>
<tr>
<td>Tysabri</td>
<td>300 mg every 4 weeks</td>
<td>Headache, Fatigue, Joint pain</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>200 mg daily for a week, followed by 80 mg every other day for 1 month</td>
<td>For acute MS exacerbations. Long term use should be avoided</td>
</tr>
<tr>
<td>Intravenous Immunoglobulin (IVIg)</td>
<td>1 gm/kg given monthly</td>
<td>May cause headache, dermatitis, abdominal pain, or acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency.</td>
</tr>
</tbody>
</table>

Doctors to Target

- Neurologist
- Urologist

Support Groups

- Multiple Sclerosis Foundation
  1-888-MSFOCUS
  www.msfocus.org

- National MS Society
  1-800-344-4867
  www.nationalmssociety.org

- MS LifeLines
  1-877-447-3243

Resources

- www.clinicalpharmacology.com
- www.msfocus.org
Myasthenia Gravis

Description
Myasthenia gravis (MG) is an autoimmune, neuromuscular disorder. Normally, an electrical impulse from the brain will generate the release of a neurotransmitter called acetylcholine (ACh). ACh will then bind to receptors to carry out muscle contraction. In MG, there can be up to an 80% reduction in receptors, which leads to muscle weakness. The reduction of receptors is caused by a malfunctioning antibody that destroys or blocks the receptor site.

In many cases, the first noticeable symptom is weakness of the eye muscles. The severity of muscle weakness will vary greatly between individuals.

Diagnosis of MG includes using a blood test to detect immune molecules or ACh receptor antibodies, an endrophonium test, an electromyography, and imaging studies.

There is currently no cure for MG, but there are various treatments to help manage the symptoms.

IV Medications for Myasthenia Gravis
IV medications work to control the symptoms and complications of Myasthenia Gravis

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravenous Immunoglobulin (IVIg)</td>
<td>400 mg/kg each day for 5 successive days</td>
<td>May cause headache, dermatitis, abdominal pain, or acute respiratory distress syndrome. Contraindicated in patients with albumin hypersensitivity, hyperprolinemia, and IgA deficiency.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Neurologist
- Pulmonologist
- Neuro-opthamologist

Support Groups
- Daily Strength
  www.dailystrength.org
- Myasthenia Gravis Foundation of America
  www.myasthenia.org

Resources
- www.ninds.nih.gov
- myasthenia.org
Neurological Impairment

Description
Neurological Impairment refers to a wide range of disorders that affect the central nervous system and may lead to some physical or mental problems. Neurological Impairments can affect a range of different capabilities, such as memory or motor skills.

Not all neurological impairments are present at birth. Some may be acquired later in life as a result of a brain or spinal cord injury. Often times the outcome is similar. There are several common ways to classify different neurological impairments. Childhood aphasia, for example, may be developed from birth or acquired through injury and mostly affects speech and language skills. Another is minimal brain dysfunction, which involves neurological disorders that relate to learning and behavior. A third class is learning disabilities. These mainly concern disorders that are related to general understanding and language comprehension.

The severity of these neurological impairments is closely related to the severity of the disorder.

IV Medications for Neurological Impairment

IV medications are most commonly used to prevent malnutrition

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula designed to meet the caloric needs of patient</td>
<td>Monitor patients weight and tolerance.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula dosed to meet the caloric needs of patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Neurologist

Support Groups
- National Institute of Neurological Disorders and Stroke
  www.ninds.nih.gov/Disorders/disorder-index.htm

Resources
- www.clinicalpharmacology.com
- www.ninds.nih.gov
Organic Brain Syndrome (OBS) is a general term to describe medical diseases or physical disorders that may cause diminished mental function. Psychiatric illnesses are generally not included.

Symptoms may present differently based on the disease but in general OBS causes agitation, confusion, long-term loss of brain function, or short-term loss of brain function.

There are many medical conditions that may cause OBS. Some of these are:

- Brain injury caused by trauma
- Breathing conditions
- Cardiovascular disorders
- Degenerative disorders
- Drug and alcohol related conditions
- Infections

Tests for diagnosis depend on the disorder, but may include blood tests, a head CT scan, or a head MRI.

### IV Medications for Organic Brain Syndrome

IV medications may be used to prevent malnutrition

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patients weight and tolerance.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
</tbody>
</table>

### Doctors to Target

- Neurologist

### Support Groups

- Brain Injury Support Group: [www.dailystrength.org](http://www.dailystrength.org)

### Resources

Osteomyelitis is an infection of the bone or bone marrow. Microorganisms may infect the bone generally through 3 pathways: through the bloodstream, from a nearby infection, or direct contamination. Some of the most common microorganisms that cause osteomyelitis are: *Staphylococcus aureus*, *streptococcus* species, and *enterobacter* species.

Some of the risk factors for osteomyelitis are:

- Recent injury or orthopedic surgery
- Circulation problems
- Invasive medical tubing
- Use of IV street drugs

Diagnosis of osteomyelitis can be done by imaging tests and/or a bone biopsy.

### IV Medications for Osteomyelitis

IV medications are commonly antibiotics that are used to treat the bone infection

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceftriaxone</td>
<td>2 grams every 24 hours for 4-6 weeks</td>
<td>Do not use in patients with jaundice or mix with any calcium containing solutions or products. Caution in pregnant patients.</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>1 gram every 12 hours for 4-6 weeks</td>
<td>Caution in patients with renal dysfunction and pregnant patients. Infuse slowly to avoid Redman’s syndrome.</td>
</tr>
<tr>
<td></td>
<td>Dosing adjusted by pharmacist based on levels</td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td>300mg every 6, 8, or 12 hours for 4-6 weeks</td>
<td>Do not use in patients with ulcerative or pseudomembranous colitis. Monitor LFTs.</td>
</tr>
</tbody>
</table>
Description

Adenocarcinoma is a type of cancer that originates from glandular tissue. Glandular tissue is a type of epithelial tissue.

Pancreatic adenocarcinoma is the most common type of pancreatic cancer. Common symptoms include: painless jaundice, upper abdominal pain, weight loss, and tuss-seau sign.

Risk Factors include:
- Smoking
- Advanced age
- Male sex
- Chronic pancreatitis
- Diabetes mellitus
- Family history of pancreatic cancer

Diagnosis is usually made by using abdominal ultrasounds, an abdominal CT scan, or a biopsy.

IV Medications for Adenocarcinoma

IV medications are most commonly used to eradicate cancer or manage side effects.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorouracil (5-FU)</td>
<td>600 mg/m² IV bolus on days 1, 8, 29, and 36 with doxorubicin and mitomycin every 8 weeks</td>
<td>Contraindicated in patients with bone marrow suppression, pregnancy, infection, malnutrition, and dihydropyrimidine dehydrogenase deficiency. May cause alopecia, nausea, vomiting, drowsiness, hand and foot syndrome, and skin irritation.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Zofran</td>
<td>32 mg infused over 15 minutes about 30 minutes before chemotherapy</td>
<td>May cause bradycardia, constipation, diarrhea, fever, or blurred vision. Caution in patients with electrolyte imbalance.</td>
</tr>
</tbody>
</table>
Description
A pancreatic pseudocyst is a fluid-filled sac in the abdomen, which may also contain tissue from the pancreas, pancreatic enzymes, and blood. They usually develop after an episode of acute pancreatitis, chronic pancreatitis, and/or abdominal trauma.

Symptoms include: abdominal pain radiating to the mid back, bloating, difficulty eating and digesting food.

- Complications include infection, hemorrhage, obstruction and rupture.
- Pseudocysts are not true cysts because they are lined by granulation tissue instead of a single layer of epithelial cells.
- If symptoms are severe or complications appear, the pseudocysts may need to be drained or removed.

IV Medications for Pancreatic Pseudocysts
IV nutrition is for patients with severe pathology of the GI tract which does not allow absorption of sufficient nutrients to maintain weight and strength.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance</td>
</tr>
</tbody>
</table>

Doctors to Target
- Gastroenterologist

Support Groups
- The National Pancreas Foundation
  http://pancreasfoundation.org
- The Pancreatitis Association
  http://pacassociation.org/

Resources
- www.clinicalpharmacology.com
- www.nlm.nih.gov

http:///www.ecureme.com/atlas/data/pancreatic_pseduocyst
Paralytic Ileus

Description
Paralytic Ileus, also known as pseudo-obstruction, is the occurrence of an intestinal blockage without the presence of a physical obstruction. It is a leading cause of intestinal obstruction in infants and children.

The symptoms may present as abdominal distention, breath odor, constipation, diarrhea, or vomiting.

There are many factors that may cause paralytic ileus, including:
- Chemical, electrolyte, or mineral disturbances
- Complications of intra-abdominal surgery
- Decreased blood supply to abdomen area
- Infection
- Use of certain medications, especially narcotics

Tests done to lead to the diagnosis of paralytic ileus include: abdominal CT scan, abdominal x-ray, barium enema, and upper GI and small bowel series. Absence of bowel sounds is also a sign of paralytic ileus.

IV Medications for Paralytic Ileus
IV medications may be used to prevent malnutrition.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of patient</td>
<td>Monitor patients weight and tolerance</td>
</tr>
<tr>
<td>TPN</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance</td>
</tr>
<tr>
<td>Zofran</td>
<td>32 mg infused over 15 minutes every 24 hours</td>
<td>May cause bradycardia, constipation, diarrhea, fever, or blurred vision. Caution in patients with electrolyte imbalance</td>
</tr>
</tbody>
</table>

Doctors to Target
- Gastroenterologist

Support Groups
- Gastrointestinal Disorders Support Group
  www.drugs.com/answers/support-group/gastrointestinal-disorders/

Resources
- www.nlm.nih.gov
- www.iffgd.org

http://www.empowher.com/files/ebSCO/
Description

Parkinson’s Disease (PD) is a neurodegenerative brain disorder that progresses slowly. In PD, the death of dopamine-generating cells in a region of the midbrain leads to tremors and difficulty with walking, movement, and coordination. Symptoms include: slowed movements, loss of fine hand movements, difficulty writing, tremors at rest, pill-rolling, stooped position, no facial expression.

- PD most often develops after age 50.
- In some cases, PD may run in families.
- The term “parkinsonism” refers to any condition involving the types of movement changes seen in PD.
- There is no cure, but medications may markedly improve symptoms.

IV Medications for Parkinson’s Disease

IV medications are used to manage symptoms.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patient's weight and tolerance.</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>10-50 mg IV or IM</td>
<td>Caution in patients with asthma, chronic obstructive pulmonary disease, bladder obstruction, and pregnancy.</td>
</tr>
</tbody>
</table>

Doctors to Target

- Neurologist

Support Groups

- National Parkinson Foundation
  1-800-4PD-INFO (473-4636)
  www.parkinson.org

Resources

- www.clinicalpharmacology.com
- www.parkinson.org
- www.mayoclinic.com/health/parkinsons-disease
Pneumonia

**Description**

Pneumonia is an inflammatory respiratory condition caused by an infection in the lungs. In adults, pneumonia caused by bacteria, usually *S. pneumoniae*, is the most common. Children are more frequently infected by viral pneumonia. It may also be caused by different fungal or parasitic infections.

There are several different types of pneumonia. Community acquired pneumonia, health-care acquired pneumonia, aspiration pneumonia, and opportunistic pneumonia. Some of the risk factors for pneumonia include:

- Age
- Smoking
- Certain diseases, especially those that weaken the immune system
- Exposure to certain chemicals or pollutants
- Having COPD and using inhaled corticosteroids for more than 24 weeks

Tests that are usually used to diagnose pneumonia include a physical exam, a chest x-ray, and blood and mucus tests.

**IV Medications for Pneumonia**

IV medications are most commonly used to treat infections in the lungs.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azithromycin</td>
<td>500 mg as a single dose every 24 hours for at least 2 days</td>
<td>Contraindicated in patients with hepatitis, jaundice, and hypersensitivity.</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>1-2 gm IV or IM every 24 hours in combination with a macrolide antibiotic or doxycycline.</td>
<td>Do not use in patients with jaundice or mix with any calcium containing solutions or products. If used within 3 months to treat pneumonia, use an antibiotic from a different class.</td>
</tr>
<tr>
<td>Piperacillin/Tazobactam</td>
<td>3.375 gm every 6 hours for 7-10 days</td>
<td>Caution in patients with renal disease, cystic fibrosis, asthma, and children. May cause GI upset.</td>
</tr>
</tbody>
</table>

**Doctors to Target**

- Infectious Disease Specialist
- Pulmonologist

**Support Groups**

- Dailystrength
  www.dailystrenght.org/c/pneumonia
- Inspire
  www.inspire.com/conditions/pneumonia

**Resources**

- www.mayoclinic.com
- www.clinicalpharmacology.com

http://newspaper.li/static/
Primary Immunodeficiency

Description
Primary immunodeficiency diseases are a group of conditions in which the immune system does not function properly or is missing. These conditions are relatively rare and are caused by intrinsic or genetic defects. Immunodeficient people cannot get rid of germs or protect themselves from new germs. Symptoms depend on the type of defect and can include: recurrent and persistent infections, developmental delay due to infection, or predisposition to autoimmune disease.

- Primary immunodeficiencies are inherited
- Majority are diagnosed in children under age one.
- The World Health Organization has identified more than 80 kinds of primary immunodeficiency diseases.

IV Medications for Primary Immunodeficiency
IV medications are used to prevent and treat infections or to boost the immune system.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamimune-N (IVig)</td>
<td>100-400 mg/kg once monthly</td>
<td>Contraindicated in patients with IVig hypersensitivity, hyperprolinemia and IgA deficiency.</td>
</tr>
<tr>
<td>Gammagard (IVig)</td>
<td>300-600 mg/kg once every 3-4 weeks</td>
<td>Contraindicated in patients with IVig hypersensitivity, hyperprolinemia and IgA deficiency.</td>
</tr>
</tbody>
</table>

Doctors to Target
- Immunologist
- Child Health Specialist
- Oncologist

Support Groups
- Immune Deficiency Foundation 1-800-296-4433 http://primaryimmune.org
- Primary Immunodeficiency Resource Center 1-866-INFO-4-PI www.info4pi.org

Resources
- www.clinicalpharmacology.com
- www.primaryimmune.org
- www.nichd.nih.gov/health
- www.webmd.com

http://www.kabafusion.com/patients/primary-immunodeficiency.html
Radiation enteritis is damage to the lining of the intestines due to radiation therapy, a type of cancer treatment. Radiation therapy uses high-powered x-rays to kill cancer cells and may also damage cells that make up the lining of the intestines.

Anyone who receives radiation therapy to the abdominal or pelvic area is at risk, including people with cervical, pancreatic, prostate, uterine, or colon and rectal cancer.

Symptoms vary depending on what part of the intestines received the radiation. They include:

- Bleeding or mucus from the rectum
- Diarrhea or feeling the need to have a bowel movement most or all of the time
- Loss of appetite
- Nausea and vomiting
- Stomach cramping or pain
- Pain in the rectal area

**IV Medications for Radiation Enteritis**

IV medications include enteral, total parenteral nutrition and hydration.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patient’s weight and tolerance.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 L every day</td>
<td>Patients with kidney and heart disease are at increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
</tbody>
</table>

**Doctors to Target**

- Oncologist
- Gastroenterologist

**Support Group**

- CancerCare
  1-800-813-HOPE (4673)
  www.cancercare.org
- American Cancer Society
  www.cancer.org/treatment/supportprogramsservices/index

**Resources**

- www.clinicalpharmacology.com
- www.cancer.gov/cancertopics

www.mayo.edu/mshs/careers/radiation-therapy
Radiation esophagitis is the inflammation of the esophagus as a side effect of radiation therapy. It is common in people who receive radiation therapy to the chest area for esophageal cancer, lung cancer, lymphoma, and other cancers. The inflammation can cause narrowing of the esophagus, perforation or rupture, or a hole in the tissue. Esophagitis feels like an internal sunburn and usually develops 2-3 weeks after the initiation of radiation therapy.

Symptoms include: difficulty swallowing, painful swallowing, heartburn, hoarseness, and sore throat.

- The higher the daily dose of radiation, the more likely it is the person will develop esophagitis.
- Once radiation is completed or suspended, esophagitis usually resolves within 2-4 weeks.

**IV Medications for Radiation Esophagitis**

IV medications include enteral, total parenteral nutrition and hydration.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patient’s weight and tolerance.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Hydration</td>
<td>1-2 L every day</td>
<td>Patients with kidney and heart disease are at increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
</tbody>
</table>

**Doctors to Target**
- Otolaryngologist
- Speech-language Pathologist
- Oncologist

**Support Group**
- National Foundation of Swallowing Disorders
  www.swallowingdisorderfoundation.com/

**Resources**
- www.clinicalpharmacology.com
- www.emedicine.medscape.com/article/174223
- www.curetoday.com/index.cfm/fuseaction/article.printarticle/
Rheumatoid Arthritis

**Description**
Rheumatoid Arthritis (RA) is a chronic autoimmune inflammatory disorder that can affect many tissues and organs. It affects the lining of joints, causing a painful swelling that can eventually lead to bone erosion and joint deformity. Symptoms include: morning stiffness that lasts more than an hour, bilateral joint pain, chest pain, numbness in hands and feet.

- More common in women than men.
- Generally more common in middle aged people.
- RA usually requires a lifelong treatment

**IV Medications for Rheumatoid Arthritis**
IV medications are used to reduce inflammation and/or prevent or slow joint damage.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tocilizumab (Actemra)</td>
<td>4-8 mg/kg over an hour every 4 weeks</td>
<td>Patients on this medication are at increased risk for developing serious infections. Monitor for signs and symptoms of infections, especially tuberculosis</td>
</tr>
<tr>
<td>Infliximab (Remicade)</td>
<td>5 mg/kg at 0, 2, and 6 weeks and then 5 mg/kg every 8 weeks</td>
<td>Higher risk than general population for development of malignant lymphoma</td>
</tr>
</tbody>
</table>

**Resources**
- www.clinicalpharmacology.com

**Support Groups**
- Arthritis Foundation
  1-800-283-7800
  www.arthritis.org
- Rheumatoid Arthritis Support Group
  www.mdjunction.com/

**Doctor to Target**
- Rheumatologist
- Orthopedic Surgeon
Short bowel syndrome, also known as short gut syndrome, is a group of problems related to malnutrition due to the removal of half or more of the small intestines. Food digestion and the absorption of nutrients occurs mainly in the small intestines. Therefore people suffering from short bowel syndrome have a hard time absorbing water and proper nutrients.

Short bowel syndrome is caused by the surgical removal of half or more of the intestine. It may occur following surgery to treat conditions such as:

- Crohn’s disease
- Intussusception
- Bowel injuries
- Cancer
- Necrotizing Enterocolitis in newborns

Some tests that can be done to determine if short bowel syndrome are present include blood chemistry tests, complete blood count, fecal fat tests, or an x-ray of the small intestine.

There is no cure for short bowel syndrome and treatments are aimed at giving the patient proper nutrition.

### IV Medications for Short Bowel Syndrome

IV treatment is generally used to treat malnutrition and dehydration.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydration</td>
<td>1-2 Liters daily</td>
<td>Patients with renal dysfunction are at an increased risk for over-hydration. Monitor serum electrolytes and fluid status.</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance.</td>
</tr>
<tr>
<td>Folic Acid/ Vitamin B12</td>
<td>Dosing is based upon the needs of the patient</td>
<td>Caution in patients with renal dysfunction or with pernicious anemia.</td>
</tr>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patients weight and tolerance.</td>
</tr>
</tbody>
</table>

### Doctor to Target
- Gastroenterologist

### Support Groups
- Short Gut Syndrome: Parents’ Support Group
  - [www.shortgutsupport.com](http://www.shortgutsupport.com)
- Short Bowel Syndrome Community
  - [www.shortbowelsupport.com](http://www.shortbowelsupport.com)

### Resources
- [digestive.niddk.nih.gov](http://digestive.niddk.nih.gov)
Ulcerative Colitis

Description
Ulcerative Colitis is a type of inflammatory bowel disease that affects the lining of the colon and rectum. This disease includes characteristic ulcers, or open sores. The cause is unknown and people with this condition have problems with their immune system. Symptoms include: abdominal pain and cramping, blood and pus in stools, diarrhea, fever, and weight loss.

- The disease usually begins in the rectal area, and may involve the entire colon over time.
- Risk factors include a family history of ulcerative colitis or Jewish ancestry.
- Surgery to remove the colon will cure ulcerative colitis and remove the threat of colon cancer.

IV Medications for Ulcerative Colitis
IV medications include corticosteroids and biological agents.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylprednisolone</td>
<td>Initially 10-40 mg infused over several minutes. Subsequent doses determined by condition</td>
<td>Can mask, reactivate, or exacerbate infections; Can result in the development of secondary infection</td>
</tr>
<tr>
<td>Infliximab (Remicade)</td>
<td>5 mg/kg at 0, 2, and 6 weeks and then 5 mg/kg every 8 weeks</td>
<td>Higher risk than general population for development of malignant lymphoma</td>
</tr>
<tr>
<td>Enteral</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitor patient’s weight and tolerance</td>
</tr>
<tr>
<td>Total Parenteral Nutrition (TPN)</td>
<td>Formula is designed to meet the caloric needs of the patient</td>
<td>Monitoring of electrolytes and weight is necessary to prevent imbalance</td>
</tr>
</tbody>
</table>

Doctor to Target
- Gastroenterologist

Support Groups
- The Crohn’s and Colitis Foundation of America 1-888-694-8872 www.ccfa.org/chapters/
- Ulcerative Colitis Support Group www.mdjunction.com/ulcerative-colitis

Resources
- www.clinicalpharmacology.com
- www.webmd.com
A Urinary Tract Infection (UTI) is an infection in any part of the urinary tract. Most commonly the infection occurs in the bladder or urethra. An infection limited to the bladder or urethra may be painful and irritating, but if the infection spreads to the kidneys the infection may have more serious consequences.

The most common microorganism that causes UTI’s is *E. coli*. Sexually transmitted diseases such as Chlamydia may also result in urinary tract infections. Symptoms generally present as frequent, painful urination.

Women are at a higher risk for UTI’s than men due to their shorter urethra.

The most common test to diagnose a UTI is analyzing the urine for bacteria, pus, or red blood cells. If there are recurrent UTI’s, additional tests may be done to determine if there are any structural abnormalities.

Treatment usually consists of antibiotics.

### IV Medications for Urinary Tract Infections

IV medications are most commonly used to treat bacterial infections of the urinary tract.

<table>
<thead>
<tr>
<th>IV medication</th>
<th>Typical Dosing</th>
<th>Special Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfamethoxazole-trimethoprim</td>
<td>8-10 mg/kg/day in 3-4 equally divided doses for 14 days</td>
<td>Contraindicated in patients with renal dysfunction, infants, neonates, and folate deficiency megaloblastic anemia.</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>750 mg infused over 90 minutes every 24 hours for 5 days</td>
<td>Contraindicated in patients with quinolone hypersensitivity.</td>
</tr>
<tr>
<td>Ciprofloxin</td>
<td>200 mg every 12 hours</td>
<td>Caution in patients with renal disease, hepatic disease and pregnant women.</td>
</tr>
</tbody>
</table>