

CASE STUDY N12 CELLULITIS

You are assigned to care for a client with the following information:

Patient Data: BG is a 44 yo male weighing 438 pounds at 5' 8

Admission diagnosis: He is admitted for cellulites

Cellulitis is a skin infection that extends into the deeper dermis and subcutaneous tissues.

- Causes deep, red erythema without sharp borders.
- It spreads widely through tissue spaces. The skin is erythematous, edematous, tender, and sometimes nodular.
- *Streptococcus pyogenes* is the usual cause of the infection
- Lymphangitis may occur; if cellulitis is untreated, gangrene, metastatic abscesses, and sepsis result
- Predisposing factors:
 - Older clients are at increased risk for cellulitis due to lowered resistance from diabetes, malnutrition, steroid therapy, or the presence of wounds or ulcers
 - Presence of edema and other cutaneous inflammation or wounds (ex. Tinea, eczema, burns, trauma)
 - There is a tendency for recurrence, especially at sites of lymphatic obstruction
- Treatment: Oral or IV antibiotics that are effective against both streptococci and *S. aureus*.
 - A wound specimen for culture and sensitivity testing should be obtained first (rarely does it prove the causative organism)
 - Soaks may reduce edema and inflammation
 - The enzymes that facilitate a rapid spread of infection produce other significant manifestations such as high fever, tachycardia, confusion, and hypotension.
- Monitor the client's temperature and administer prescribed antipyretic medication
- Prevent cross-contamination by teaching the client proper hand-washing technique and careful handling of soiled linen, clothing, and dressings.
- Standard precautions should be used.

Admission Data: Admitted with complaints of abdominal and scrotal edema and erythema x 3 days.

Past Medial History (PMH): His PMH includes: DM, OSA, COPD, atrial flutter, dyslipidemia, cellulitis, chronic back pain, HTN, venous stasis ulcers, chronic peripheral bilateral edema (CHF vs compression of IVC r/t obesity), and necrotizing faciitis (buttock).

Atrial flutter: A dysrhythmia from an ectopic pacemaker or the site of a rapid reentry circuit in the atria. It is characterized by rapid "saw-toothed" atrial wave formations that are usually followed by a slower, regular ventricular response. It produces a rapid atrial rate, generally from 220 to 350 bpm. The AV node cannot conduct all the atrial impulses that bombard it, so the ventricular rate is actually slower than the atrial rate. Therefore, the pulse (which reflects ventricular rate) may be normal even though the atrial rate may be very fast. Atrial flutter most commonly occurs in association with the following:

- Coronary artery disease
- Mitral valve disease
- Atrial enlargement caused by septal defects
- Pulmonary embolus
- Thyrotoxicosis
- Alcoholism
- Pericarditis

Dyslipidemia: A serum cholesterol level > 200 mg/dL. This disease is due mainly to lifestyle habits in westernized countries. Given that our pt is very obese, this is not surprising. High cholesterol is related to atherosclerosis, which is a risk factor for coronary artery disease, cerebrovascular disease, PAD, renal artery stenosis and abdominal aneurysm. Remember that the HDL is the “healthy” cholesterol and the LDL is the “lethal” cholesterol. LD > 130 is bad, and HDL <37 is bad if you’re male, <47 is bad if you’re female. Dyslipidemia is treated by diet, activity, and medications. A 1% decrease in cholesterol results in a 2% decreased risk of CHD.

Venous Stasis Ulceration: The end stage of chronic venous insufficiency. Prolonged venous pressure slows nutrient blood flow, which deprives cells of needed oxygen, glucos, and other substances. Skin of the lower legs ulcerates, causing a stasis ulcer, which occurs as a result of stasis of blood. It is characteristically located in the lower third of the leg (malleolar or gaitor area). IMPORTANT...you must determine the cause of the ulcer before beginning treatment...if arterial disease is present you should absolutely not use compression devices b/c they can restrict arterial inflow blood.

Management of VSA includes elevating the legs (6 inches), wound care, moist dressings and support stockings. Gravity is the major enemy of this disease and walking is encouraged (promotes venous return).

Hypertension represents a major cause of stroke, cardiac disease and renal failure. Scientists have not been able to detect a single cause for HTN. It includes changes in renal regulation of sodium and extracellular fluids, in aldosterone secretion and metabolism and in norepi secretion and metabolism.

Related risk factors for our guy:

- gender (more common in men)
- diabetes mellitus
- stress (maybe, who knows?)
- obesity
- high dietary intake of saturated fats or sodium
- tobacco use (if he smokes)
- sedentary lifestyle

Clinical Manifestations of HTN:

- The large vessels and peripheral vessels weaken and become sclerotic.
- Lumina narrow, causing even lower blood flow to the heart, brain and lower extremities
- As damage continues, large vessels may become occluded or may hemorrhage causing infarction.
- Small vessel damage causes structural changes in the heart, kidney and brain
- Intimal lining of small vessels is damaged leading to:
 - Decreased blood supply to tissues of heart, brain, kidney and retina
 - Progressive functional impairment of these organs
 - Infarction of the tissue due to chronic ischemia

Ulcers are cleaned with normal saline. Clean dry, scaly skin with saline or mild soaps. Cover ulcer with a nonadherent dressing.

Apply lanolin-containing lotion.

Must use some kind of compression, be it stockings or elastic wraps. Greatest tension at foot & ankle. Rewrap 2x day.

An Unna boot is a form of bandage impregnated with calamine, zinc oxide and glycerine. Change weekly or biweekly. Achieves healing rates of 70%.

Treatment of HTN:

Lifestyle modifications along with drug therapy can control HTN. The need for drug therapy is determined by blood pressure and the presence of target organ damage or risk factors.

If a pt enters the hospital with HTN, find out if he has been taking his meds. If not, help identify reasons for noncompliance. Evaluate the pt...after successful treatment, the pt will have a BP under 140/90 at rest, will be able to tolerate activity, and absence of enlargement of left ventricle (ECG or chest x-ray).

Diabetes Mellitus, Type 2: Diabetes is a chronic disease related to hyperglycemia. There is limited beta-cell response to hyperglycemia...the beta cells chronically exposed to high glucose levels become less efficient when responding to more glucose (desensitization).

Special considerations for the pt with DM include:

- Monitor blood glucose levels regularly
- Perform daily foot care
- Will need more insulin if under stress (even if they don't take at home)
- Increased risk of infection
- Potential for poor wound healing
- Avoid nephrotoxin drugs

Caution for patients undergoing surgery

- Regulation of blood glucose levels; labs; early morning surgery; IV infusion of insulin for insulin dependent clients usually with glucose 5%; blood glucose within one hour of the operation
- Obtain a blood glucose level 4-6 times daily (observe for hypoglycemia—decrease BP, increase HR, avoid catheterization to prevent infection; use sterile technique to change wound dressings; observe for skin breakdown)

Peripheral Bilateral Edema: Is essentially edema in one of the extremities, rather than in both. In his case, it's in the legs and the case says "CHF vs compression of IVC r/t obesity." I'm not sure if this means it's one or the other, or both or what. I guess it's essential to know it can definitely be caused by either one.

How does CHF cause edema? In CHF, the heart cannot maintain the cardiac output necessary to accommodate the body's needs and/or the venous return. So, the heart is not pumping enough blood and blood pressure drops, cardiac output drops and the pt is fatigued. You also get blood backing up. In LEFT HEART FAILURE, the blood backs up to the lungs causing pulmonary edema. Fluid gets into the alveoli and reacts with surfactant and you get foamy sputum. If it's RIGHT HEART FAILURE, you get peripheral edema and a tender/enlarged liver. Just remember where the blood is coming from and you can remember what each type of heart failure causes. The blood coming in to the right heart is coming from the tissues, and the blood coming in to the left heart is coming from the lungs. Make sense?

Inferior vena cava syndrome (IVCS) is a result of obstruction of the inferior vena cava. It can be caused by invasion or compression by a pathological process or by thrombosis in the vein itself. Causes: Compression through external pressure by neighboring structures or tumors, either by significantly compressing the vein or by promoting thrombosis by causing turbulence by disturbing the blood flow. This is quite common during the third trimester of pregnancy when the uterus compresses the vein in the right side position.

IVCS presents with a wide variety of signs and symptoms, making it difficult to diagnose clinically.

- Edema of the lower extremities and tachycardia (pregnant women exhibit some other symptoms, but our guy's not pregnant, just really fat)

Some general treatments for edema are to RICE (rest, ice, compress, elevate), use anti-inflammatory agents if the edema is causing a tissue perfusion problem. The nurse will need to assess CSM and temp in areas distal to the edema...also measure the area (mark the area so you can remeasure in same spot).

OSA/Obstructive Sleep Apnea: A common disorder that is often undiagnosed. People with sleep apnea literally stop breathing repeatedly during their sleep, often for a minute or longer and as many as hundreds of times during a single night. Sleep apnea can be caused by either complete obstruction of the airway (obstructive apnea) or partial obstruction (obstructive hypopnea—hypopnea is slow, shallow breathing), both of which can wake one up. The site of obstruction in most patients is the soft palate, extending to the region at the base of the tongue. The arousal from sleep usually lasts only a few seconds, but brief arousals disrupt continuous sleep and prevent the person from reaching the deep stages of slumber, such as rapid eye movement (REM) sleep, which the body needs in order to rest and replenish its strength. Once normal breathing is restored, the person falls asleep only to repeat the cycle throughout the night. Typically, the frequency of waking episodes is somewhere between 10 and 60. A person with severe OSA may have more than 100 waking episodes in a single night. Patients with OSA often complain of waking up feeling like they had never slept at all. They often feel worse after taking a nap than they did before napping.

The primary risk factor for OSA is excessive weight gain. The accumulation of fat on the sides of the upper airway causes it to become narrow and predisposed to closure when the muscles relax.

The physical signs that suggest OSA include loud snoring, witnessed apneic episodes, and obesity. Hypertension is prevalent in patients with OSA, although the exact relationship is unclear. A high score on the Epworth Sleepiness Scale is also a strong indicator of possible sleep apnea.

The most obvious complication arising from OSA is diminished quality of life brought on by chronic sleep deprivation and the symptoms described above. Some linkage between OSA and coronary artery disease, heart attack, and stroke has been demonstrated. OSA aggravates congestive heart failure by placing stress on the heart during sleep. Post-surgical complications may result from disruptions in breathing caused by obstructive sleep apnea.

Several treatment options exist for dealing with OSA. These include weight reduction, [oral appliances](#), [positional therapy](#), [positive pressure therapy](#), and [surgical options](#).

COPD: COPD refers to several disorders that affect the movement of air in and out of the lungs, such as obstructive bronchitis, emphysema, or asthma. Smoking is the primary risk factor for COPD. Air pollution, second-hand smoke, hx of childhood resp infections, exposure to industrial chemicals, and heredity are other risk factors.

Chronic obstructive bronchitis results from inflammation of the bronchi, leading to increased mucus production, chronic cough, and eventual scarring of the bronchial lining. Chronic bronchitis is characterized by the following:

1. An increase in the size and number of submucous glands in the large bronchi which increases mucus production.
2. An increased number of goblet cells, which also secrete mucous.
3. Impaired ciliary function, which reduces mucus clearance.

When mucociliary defenses are impaired, there is an increased risk of infection. The thick mucus and inflamed bronchi obstruct the airways, which then collapse, and air is trapped in the distal portion of the lung. This leads to reduced alveolar ventilation. PaO₂ falls and PaCO₂ may increase. Polycythemia (overproduction of RBCs) occurs.

Emphysema is a disorder in which the alveolar walls are destroyed, which leads to permanent distention of the air spaces. Difficult expiration is the result of the destruction of the alveolar walls, partial airway collapse, and loss of elastic recoil. Pockets of air form between the alveolar spaces (blebs) and within the lung parenchyma (bullae). This leads to increased ventilatory dead space. The work of breathing is increased.

Some common complications are respiratory tract infections, spontaneous pneumothorax, sleep onset dyspnea, frequent early morning awakenings, and hypoventilation during sleep (which may lead to hypoxia).

Necrotizing Fasciitis (buttock): Necrotizing fasciitis (NF) is a bacterial infection, in which bacteria attack the soft tissue and the fascia. NF can occur in an extremity following a minor trauma, or after some other type of opportunity for the bacteria to enter the body such as surgery. The Group A Strep infection (flesh eating bacteria) is most common with minor trauma. A mixed bacterial infection is often the cause after surgery.

EARLY SYMPTOMS (usually within 24 hours) :

- Usually a minor trauma or other skin opening has occurred (the wound does not necessarily appear infected)
- Some pain in the general area of the injury is present. Not necessarily at the site of the injury but in the same region or limb of the body
- The pain is usually disproportionate to the injury and may start as something akin to a muscle pull, but becomes more and more painful
- Flu like symptoms begin to occur, such as diarrhea, nausea, fever, confusion, dizziness, weakness, and general malaise
- Intense thirst occurs as the body becomes dehydrated

The biggest symptom is all of these symptoms combined. In general you will probably feel worse than you've ever felt and not understand why.

ADVANCED SYMPTOMS (usually within 3-4 days):

The limb, or area of body experiencing pain begins to swell, and may show a purplish rash

The limb may begin to have large, dark marks, that will become blisters filled with blackish fluid

The wound may actually begin to appear necrotic with a bluish, white, or dark, mottled, flaky appearance

CRITICAL SYMPTOMS (usually within 4-5 days):

Blood pressure will drop severely and the body begins to go into toxic shock from the toxins the bacteria are giving off. Unconsciousness will occur as the body becomes too weak to fight off this infection.

NF must be treated in the hospital with antibiotic IV therapy and aggressive debridement (removal) of affected tissue. Other treatments will take place depending upon the level of toxicity or organ failure being experienced by the patient. Medications to raise blood pressure, blood, and a new medicine called intravenous immunoglobulin (IVIG) are also used. A hyperbaric oxygen chamber is sometimes used in certain cases involving a mixed bacterial infection.

What's the likely outcome?

Anywhere from minimal scars to death and everywhere in between. For those lucky enough to survive most often at least some removal of skin is required. Often this requires skin grafting. Amputation is sometimes needed to remove the affected limb. Legs, hands, fingers, toes, arms, have all been sacrificed to save the life of NF patients.

Abdominal Edema & Scrotal Edema: Can be caused by heart failure. Something to ask about!

Erythema: Is basically just redness of the skin.

Diagnostic Data:

Doppler ultrasound (abd/leg): detect irregularities in the structure of the arteries; detect plaque or stenosis of lower extremity artery, as evidenced by turbulent blood flow or changes in the Doppler signals indicating occlusion.

(Does this just refer to the Doppler ultrasound and vascular disorders?)

Abnormal results: reduction in vessel diameter of more than 16 %, indicating stenosis; aneurysm.

- Interfering factor: cigarette smoking, because nicotine can cause constriction of the peripheral arteries and alter results
- Before: explain to pt; inform that it is painless; remove all clothing from extremity; instruct to abstain from smoking for at least 30 minutes before the test
- During: Arterial studies
 - Performed with use of BP cuffs; a conductive paste is applied to skin overlying artery distal to cuffs, If the AB index (the ankle pressure divided by the brachial pressure) is less than 0.85, it indicates arterial occlusive disease within the extremity.
 - Takes about 30 minutes
- After: Encourage pt to verbalize fears; Remove gel; inform pt that physician must interpret studies; results will be available in a few hours

CXR: Posteroanterior, lateral, and oblique chest x-ray films assist in assessing the heart, lungs, and aorta. Anatomic changes and line or tube placements can be assessed; however specific pathologic changes of the heart are difficult to determine the x-ray examination.

BNP:

- B-type natriuretic peptide (BNP) is a protein secreted from the ventricles in response to overload (heart failure).
- As the degree of heart failure worsens, the level of BNP secreted into the blood increases.

Side note:

Liver enzymes may reflect the degree of liver failure.
Elevated BUN and creatinine levels reflect decreased renal perfusion

ECHO:

- Echocardiography: useful in assessing the ability of the heart walls to contract and relax. The transducer is placed on the chest, and the images are relayed to a monitor screen
- Noninvasive diagnostic procedure (uses ultrasonography)
- Records the structure and motion of that area in relation to its distance from the anterior chest wall
- Wall motion is abnormal in ischemic or infarcted areas
- Complications such as mitral regurgitation, rupture of the left ventricle, and pericardial effusion can be detected

Transesophageal Echocardiography (TEE): transducer is placed against walls of the esophagus; used to view the posterior wall of the heart

- Higher quality picture of the heart. Useful in clients who have thickened lung tissue or thick chest walls or obese

INTERVENTIONS ORDERED

Bi-Level Positive Airway Pressure

Positive airway pressure (PAP) is a method of [respiratory ventilation](#) used primarily in the treatment of [sleep apnea](#). It is also used for pts in [respiratory failure](#), and in neonates. In these patients, PAP ventilation can prevent the need for endotracheal [intubation](#), or allow earlier extubation.

BiPAP (Bilevel Positive Airway Pressure) provides two levels of pressure:

- Inspiratory Positive Airway Pressure (IPAP), and a
- lower Expiratory Positive Airway Pressure (EPAP) for easier exhalation.



There are three modes of use for the BiPAP.

- S (Spontaneous) - The device triggers IPAP when flow sensors detect spontaneous inspiratory effort and then cycles back to EPAP.
- T (Timed) - The IPAP/EPAP cycling is purely machine-triggered at a set rate, expressed in breaths per minute (BPM).
- S/T (Spontaneous/Timed) - Like spontaneous mode, the device triggers to IPAP on patient inspiratory effort. But in spontaneous/timed mode a "backup" rate is also set to ensure that patients still receives a minimum number of breaths per minute if they fail to breathe spontaneously.

Optional features of the device

- A heated water chamber can increase patient comfort by [humidification](#). The temperature can usually be adjusted or turned off to act as a passive humidifier if desired. In general, a heated humidifier is either integrated into the unit or has a separate power source (i.e. plug).
- For [passive humidification](#), air is blown through an unheated water chamber and is dependent on ambient air temperature. It is not as effective as the heated humidifier described above, but still can increase patient comfort by eliminating the dryness of the compressed air. This is usually a separate unit and does not have a power source.

Optional features generally increase the likelihood of PAP tolerance and compliance.

- Ramp is used to temporarily lower the pressure to allow the user to fall asleep more easily. The pressure gradually rises to the prescribed level over a period of time that can be adjusted by the patient and/or the DME provider.
- Exhalation pressure relief gives a short drop in pressure during exhalation to reduce the effort required. This feature is known by the trade name C-Flex and EPR.
- Flexible chin straps are used to help the patient to not breathe through the mouth, thereby keeping a closed pressure system. The straps are elastic enough that the patient can easily open his mouth if he feels that he needs to.
- Data logging records basic compliance info or detailed event logging, allowing the sleep physician (or patient) to download and analyze data recorded by the machine to verify treatment effectiveness.

When is a BiPAP used (what type of patients?)

- Acute type 1 or 2 respiratory failure.
- Face mask oxygen delivery insufficient or harmful to health (COPD?)
- Congestive cardiac failure
- Asthma.
- Not used in cases where the airway may be compromised, or consciousness is impaired.
- Premature babies in NICU

How does it work?

During inspiration, the inspiratory positive airway pressure forces air into the lungs - thus less work is required from the respiratory muscles). At expiration, the bronchioles and alveoli are prevented from collapsing. If they were allowed to collapse, significant pressures would be required to re-expand them. With the BiPAP, the amount of air remaining in the lungs at the end of a breath is greater (this is called the Functional residual capacity). The chest and lungs are therefore more expanded. From this more expanded resting position, less work is required to inspire. It's a circle!

Tracheostomy

- Used to maintain airway patency
- The diameter of tube must be smaller than the trachea so that it lies comfortably within the tracheal lumen
- Air should be able to pass between the outer wall of the tube and the tracheal mucosa, and allow adequate perfusion to tracheal tissue
- Common sizes: 6-8 mm
- Made of nonreactive plastic (used only once/pt), stainless steel, sterling silver, or silicone
- Must have a 15-mm hub for attachment to mechanical ventilation circuits, or manual resuscitator bags
- Short tubes with an angle of 60 degrees are most often used
- Tubes may have an inner cannula or a single cannula
- Inner cannulas will need to be removed periodically for cleaning (they may be reusable or disposable)

Barriers to Compliance

Mask must have a tight seal, and be held on very firmly.

Most people find wearing the mask uncomfortable.

Breathing out against the positive pressure resistance (the expiratory positive airway pressure component, or EPAP) is also unpleasant.

Anxiety and claustrophobia disorders (meds can be used to diminish anxiety)

- An inflated cuff (with air, sterile water, or foam) permits mechanical ventilation (they deter secretions from the upper airway leaking into the lower airway, but do not create an absolute barrier).

Postoperative care for tracheostomy

- Assess amount, color and consistency of secretions
- Observe for indication of shock, hemorrhage, respiratory insufficiency, or complications related to the client's general condition
- Performing suctioning: suction based on assessment, not routinely, using sterile technique, preoxygenation, and hyperinflation, without routine instillation of normal saline (it increases airway trauma, which can lead to tracheal infection, and risk of pulmonary edema)
- Do not allow smoking (do not use aerosol sprays cans near the person do not create dust clouds/shake bedding)
- Be careful that hair does not fall in it (cover it with cloth during shaving)
- Use aseptic technique when working with the tracheostomy (hand-washing, gloves, sterile supplies and solutions).
- Change dressings if they are soiled and damp. Use normal saline to clean stoma. Check for blood and mucus-soaked dressings (microorganism growth) and skin integrity (irritation and maceration)

Nasogastric Tube

See notes module 13 notes for procedural process (no need to write it out if we just went over it).

Nursing management of the pt with an NG tube:

- Clean and lubricate external nares (they may become sore because of crusted secretions around the tube. Always use a water-soluble lubricant to avoid the possibility of lipid pneumonia when using oil-based lubricant)
- Make sure tape isn't irritating
- Administer frequent oral hygiene to remove debris, increase comfort, maintain a healthy oral cavity, stimulate saliva secretion
- Client's mouth is normally dry (no stimulus for salivary secretions and tube causes mouth breathing)
- Pt suck on ice to help stimulate salivation if permitted
- Request order for anesthetic mouth rinse or lozenges because of sore throat from tube
- Assess throat for cricoid chondritis (irritation of the cricoid cartilage of the larynx) as indicated by pain in ears, sore throat, stridor, bloody sputum, mild hoarseness
- Measure GI losses and monitor potassium levels because it is one of the major electrolytes lost through suctioning
- Normal saline is preferred irrigating solutions because water increases electrolyte loss (it is a hypotonic solution. Make sure irrigating solution is documented as intake unless it is removed when contents are aspirated).

Study Questions:

- Develop a response plan for each lab and diagnostic study. Would you treat it? Record the normal finding? Do patient teaching? Set priorities for your response. Are there any labs missing that are important to know because of pathophysiology or medications? (As examples: 1. The PaCO₂ is high at 92 and the pH is low at 7.30. Is this the chronic state for this COPD pt? How can you get the PaCO₂ down? 2. The A1C is high. What does this mean? What if a repeat blood sugar showed 110? How do you explain that with the high A1C? 3. The creatinine is 0.6. Will you need to hold any medications? 4. Why are we doing an ultrasound, CXR, BNP and ECHO?)

Be prepared to respond to results of these tests. 5. What lab test monitors safety of warfarin? Respond to values of this test.)

- b) Does this patient have an infection? Examine the pro and con evidence. Are you missing any data that would help you make this determination? What are you going to do about it? Start or stop antibiotics? Put him in isolation?
- c) How does a BiPAP work? Can you give more oxygen via nasal prongs or oxygen mask? Compare BiPAP, nasal prongs and oxygen masks. For example, what would make you switch from nasal prongs to oxygen mask or BiPAP? What would make you switch back?
- d) Anticipate adverse effects from pain medication. How could you minimize these?
- e) How can you safely mobilize this patient?
- f) Prepare the patient to go to surgery and to return from surgery.

LAB	ON ADMISSION		
CBC with differentials			
WBC (4-10.6k/cumm)	5.6		
RBC (4.3-5.65m/cumm)			
Hgb (11.6-15g/dl)/ (13.3-16.5g/dl)	12		
Hct (39.5-49.5%)/(36-46%)	34.6		
Platelets (150-400k/cumm)	205		
Neutrophils (40-70%)			
Chem Profile			
Glucose (70-110mg/dl)	234		
Na+ (135-145meq/L)	139		
K+ (3.5-5meq/L)	3.8		
CL (98-107meq/L)	89		
CO2 (22-31mmol/L)			
BUN (5-21mg/dl)	12		
Creatinine (.5-1.3mg/dl)	0.6		
Calcium (8.6-10.1mg/dl)			
H2CO3	41		
ABG's (on 4L O₂ NP)			
PaO ₂	88		
Saturation	95%		
PaCo ₂	7.30		
HC0 ₃	45		
pH			
Hepatic Profile			
ALT/SGPT (11-66)			
AST/SGOT (15-46)			
Alk Phos (38-126)			
T Bilirubin (.2-1.3)			
Protein Tot. (6.3-8.2)			
Albumin (3.5-5.2)			
Direct bilirubin (.2-1.3)			
Pancreatic Enzymes			
Amylase (30-110)			
Lipase (23-300)			
OTHER			
Cholesterol	114		
HDL	20		
Triglycerides	231		